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# Performance Measurement and Management Control: Innovative Concepts and Practices

Marc J. Epstein  
Jean-François Manzoni  
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Editors



PERFORMANCE MEASUREMENT  
AND MANAGEMENT CONTROL:  
INNOVATIVE CONCEPTS AND  
PRACTICES

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ACCOUNTING VOLUME 20

**PERFORMANCE  
MEASUREMENT AND  
MANAGEMENT  
CONTROL: INNOVATIVE  
CONCEPTS AND  
PRACTICES**

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# CONTENTS

LIST OF CONTRIBUTORS *ix*

PREFACE *xiii*

## **PART I: INNOVATIVE CONCEPTS AND PRACTICES IN PERFORMANCE MEASUREMENT AND MANAGEMENT CONTROL**

THE CHALLENGE OF SIMULTANEOUSLY  
IMPROVING SOCIAL AND FINANCIAL  
PERFORMANCES: NEW RESEARCH RESULTS  
*Marc J. Epstein* *3*

MOTIVATION THROUGH INCENTIVES:  
A CROSS-DISCIPLINARY REVIEW OF  
THE EVIDENCE  
*Jean-François Manzoni* *19*

THOUGHTS ON THE STRUCTURE OF  
MANAGEMENT SYSTEMS TO ENCOURAGE  
CREATIVITY AND INNOVATION  
*Antonio Davila* *65*

## **PART II: INNOVATION AND MANAGEMENT CONTROL**

THE INTRODUCTION OF INNOVATIVE  
PERFORMANCE MEASUREMENT AND  
MANAGEMENT CONTROL SYSTEMS:  
THE ROLE OF FINANCIAL INVESTORS  
AND THEIR ACQUIRED COMPANIES  
*Selena Aureli* *81*

INNOVATION AND PERFORMANCE: SOME EVIDENCE FROM ITALIAN FIRMS <i>Mascia Ferrari and Luca La Rocca</i>	115
THE INTERACTION BETWEEN INFORMATION AND TRUST IN THE CONTROL OF TRANSACTIONAL RELATIONSHIPS: THEORETICAL PERSPECTIVES AND EMPIRICAL SUPPORT <i>Rosa Alba Miraglia and Antonio Leotta</i>	143
SHOULD ROLLING FORECASTS REPLACE BUDGETS IN UNCERTAIN ENVIRONMENTS? <i>Marie-Anne Lorain</i>	177
<b>PART III: INNOVATION AND PERFORMANCE MEASUREMENT</b>	
STRATEGY AND INTEGRATED FINANCIAL RATIO PERFORMANCE MEASURES: A LONGITUDINAL MULTI-COUNTRY STUDY OF HIGH PERFORMANCE COMPANIES <i>Belverd E. Needles, Jr., Anton Shigaev, Marian Powers and Mark L. Frigo</i>	211
PERFORMANCE MEASUREMENT IN STRATEGIC CHANGES <i>Raffaele Fiorentino</i>	253
NONFINANCIAL PERFORMANCE MEASURES: HOW DO THEY AFFECT FAIRNESS OF PERFORMANCE EVALUATION PROCEDURES? <i>Chong M. Lau and Erin Berry</i>	285
THE RELATION BETWEEN EXECUTIVE TIME ORIENTATION AND PERFORMANCE MEASUREMENT <i>Terhi Chakhovich, Seppo Ikäheimo and Tomi Seppälä</i>	309

**PART IV: BALANCED SCORECARD  
AND PERFORMANCE MEASUREMENT  
SYSTEM ADOPTION**

- PERFORMANCE CONSEQUENCES OF  
BALANCED SCORECARD ADOPTIONS:  
CLAIM FOR LARGE-SCALE EVIDENCE AND  
PROPOSITIONS FOR FUTURE RESEARCH  
*Michael Burkert, Antonio Davila and Daniel Oyon* 345
- THE IMPORTANCE OF BALANCED SCORECARDS  
IN HOSPITALS  
*Lars-Göran Aidemark, Stefano Baraldi,  
Elin K. Funck and Andreas Jansson* 363
- ALIGNING STRATEGY AND PERFORMANCE  
MEASUREMENT SYSTEMS IN THE SERVICE  
SECTOR COMPANIES: THE GREEK EXAMPLE  
*Androniki Triantafylli and Apostolos Ballas* 387
- PART V: PROVIDING INFORMATION  
FOR DECISION MAKING**
- MANAGEMENT ACCOUNTING AND  
INFORMATION TECHNOLOGY – SOME  
EMPIRICAL EVIDENCE  
*Maria do Céu F. Gaspar Alves* 429
- THE DIFFUSION OF MANAGEMENT  
ACCOUNTING SYSTEMS IN MANUFACTURING  
COMPANIES: AN EMPIRICAL ANALYSIS OF  
ITALIAN FIRMS  
*Paolo Carenzo and Andrea Turolla* 457
- THE IMPACT OF FIRM CHARACTERISTICS  
ON ABC SYSTEMS: A GREEK-BASED  
EMPIRICAL ANALYSIS  
*Odysseas Pavlatos* 501





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# PREFACE

In 2001, we gathered a group of researchers in Nice, France to focus discussion on performance measurement and management control. Following the success of that conference, we held subsequent conferences in 2003, 2005, 2007, and 2009. This volume contains some of the exemplary papers that were presented at the most recent conference. The conference has grown in number of participants, quality of presentations, and reputation and this year attracted leading researchers in the field from North America, South America, Europe, Asia, Australia, and Africa.

Though the conference has been generally focused on performance measurement and management control and has included presentations on many facets of the topic, each year we have also focused on a particular theme of current interest. This year's theme was directed at innovative concepts and practices. This includes creative management approaches to solving challenges of performance measurement and management control and improving organizational performance. It also includes the innovative use of theoretical, empirical, analytical, experimental, and case-based research to address these topics.

There were three plenary sessions at this conference and the papers are included here. Marc J. Epstein presented recently completed research that challenges the existing paradigm on implementation of sustainability strategies and provides a new way of thinking about the use of management control and performance measurement to improve corporate sustainability performance. Jean-François Manzoni provided a careful reexamination of the topic of incentives drawing on a broad set of multidisciplinary research. His challenges to much of the current research and managerial practices require new and broader approaches to managerial rewards. Antonio Davila integrated much of his recent work on the use of management control practices and research related to organizational creativity and innovation. It provided insights into the significant needs for more progress in both research and managerial practice to encourage increased organizational innovation. All three of these presentations challenge the existing paradigms and propose new and innovative approaches to both the research and practice of performance measurement and management control.

In addition to the three plenary sessions, this volume also includes some of the other excellent papers presented at the conference. The call for papers drew a wonderful response of 250 submissions, so the competition to make a presentation at the conference was quite high. Further, given the space limitations in this book, another competitive selection was required. The contents of this book represent a collection of leading research in management control and performance measurement and provide a significant contribution to the growing literature in the area. This collection of papers also covers a representative set of topics, research settings, and research methods.

From the first year, the conference has relied heavily on EIASM and Graziella Michelante for organization and management and their enthusiastic participation and excellent work has been critical to the conference's success. We thank them along with Conference Co-Chairman Eric Cauvin and all of the speakers and participants at the conference. Their attendance and enthusiastic participation made the conference an enjoyable learning experience. We are hopeful that this book will continue the search for additional understanding and development in performance measurement and management control, and provide guidance for both academic researchers and managers as they work toward improving organizations.

Marc J. Epstein  
Jean-François Manzoni  
Antonio Davila  
*Editors*

**PART I**  
**INNOVATIVE CONCEPTS AND**  
**PRACTICES IN PERFORMANCE**  
**MEASUREMENT AND**  
**MANAGEMENT CONTROL**





# THE CHALLENGE OF SIMULTANEOUSLY IMPROVING SOCIAL AND FINANCIAL PERFORMANCES: NEW RESEARCH RESULTS

Marc J. Epstein

## ABSTRACT

*Neither management leaders nor academic researchers have developed adequate responses or explanations to the general lack of success in implementations of sustainability strategies. Consistent with the theme of this conference, we have examined innovative concepts and practices of leading companies that have successfully implemented sustainability. In sustainability, as in other areas of performance measurement and management control, new paradigms and practices and more research may be needed to improve organizational performance.*

Corporate CEOs and academic researchers alike have generally accepted that corporate social and environmental impacts must be integrated into operational and capital investment decision making to more effectively manage leading corporations. They have also recognized that effective management of

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a variety of stakeholder interests (including shareholders, customers, suppliers, employees, and the general public) is critical for organizational success. But, the challenge that both managers and academics continue to face is that though there is broad agreement on these issues, effective implementation typically remains elusive. Large corporations have found it challenging to integrate sustainability into day-to-day decision making.

So, if CEOs acknowledge the importance of sustainability and effective stakeholder management, why has the implementation remained so challenging? It is no longer a discussion of why, what, or whether to focus on sustainability – but how. And, management research and practice might suggest that the implementation should be similar to other implementations of organizational strategies and the alignment of strategy, structure, systems, performance measures, and rewards would lead to successful execution. But success has been difficult and the explanations for these difficulties have been unsatisfactory. And, neither academic research nor managerial practice has been effective in describing how this implementation differs and how to simultaneously achieve excellence in sustainability and financial performances.

## **THE CHALLENGES OF SUSTAINABILITY IMPLEMENTATION**

Top management typically cascades these management decisions on sustainability down in the organization to be responsive to local issues because the sustainability impacts are often local. Only a small number of these decisions are typically made at corporate headquarters. As these decisions are made at the business units, geographical units, and facilities, individual managers must make the appropriate trade-offs as they arise on social and environmental versus financial impacts. Typically, the vice president of sustainability (who often reports to the CEO) requests improved sustainability performance while the CEO and CFO are demanding improved financial performance. At the same time, little guidance and support is presented to senior- and middle-level operations managers to aid in the decision making and the trade-offs that must often occur.

Much of the managerial and academic literature emphasizes the critical importance of top management commitment. Yet, here, even with that commitment, sustainability implementation is very challenging and often fails. And, it seems that our management accounting, management control,

and performance measurement research has failed us, and not provided either guidance or explanation as to how to succeed in corporate sustainability.

One explanation is that implementing sustainability is fundamentally different. For operating goals, the direct link to profit is usually clear. And, for innovation, though also long term and difficult to predict and measure, the intermediate goal is new products and the ultimate goal is increased profit. In these implementations of general operating goals or innovation goals, companies set missions and strategies and develop aligned systems, structures, culture, performance measures, and rewards.

For sustainability though, the goal is to simultaneously achieve excellence in both social and financial performances. Measuring and managing this paradox creates more challenges. It is often unclear how to make the trade-offs. It is often unclear how stakeholders will respond to managerial actions. The incentives are typically poorly aligned. The corporate and societal priorities often change and the costs of implementing sustainability constantly changes. So, the standard successful implementation approaches often fail.

Part of the challenge is that managers at all levels are being asked to simultaneously manage social and financial performances. Most corporate incentives and rewards are aligned with measures of short-term financial performance of revenue and profit goals. Thus expenditures related to social and financial issues that are not mandated by regulation remain discretionary and the incentive pressures often cause dilemmas for many managers. Further, systems and measures typically do not support effective measurement or management of the trade-offs that often exist between social and financial objectives and success. Neither do they often facilitate the trade-offs between short-term and long-term goals. Managers need guidance on how to balance social and financial objectives and measure success, which they seldom receive.

In *Making sustainability work: Best practices in managing and measuring corporate social, environmental, and economic impacts* (Epstein, 2008b), I addressed the integration of social, environmental, and economic impacts into management decisions and the implementation of sustainability into large organizations. Through a relatively comprehensive look at the systems, structures, performance measures, rewards, culture, and people that are used to successfully integrate sustainability into the fabric of many organizations, my research continued to discover excellent companies that are committed to sustainability and were still finding the implementation to be enormously challenging. To address this issue, Adriana Rejc Buhovac, Kristi Yuthas, and I began a new field research project to explore how four successful companies were able to successfully implement sustainability and overcome

the challenges that were commonly seen in other global organizations (see Epstein, Rejc Buhovac, & Yuthas, 2009, 2010).

In my presentation to this conference in 2007 (Epstein, 2008a), I presented an introduction to this paradox of simultaneously managing social and financial performances in both for profit and nonprofit settings and different industries. That discussion was set within the analysis of alternative organizational missions and the challenges of aligning appropriate performance measures and rewards with those missions. Too often, organizations are not able to achieve their missions and strategies, in part, due to their inability to stay focused on the missions and having inadequate systems, structures, and culture in place to motivate performance consistent with the desired missions.

The simultaneous management of social, environmental, and financial goals and performances is recognized as one of the most critical challenges in the field of sustainability and is sometimes seen as paradoxical. The challenge of integrating corporate social, environmental, and financial impacts into operational and capital investment decisions relates to the various tensions between goals. Social and financial initiatives may benefit one another in the long term, but they are often conflicting in their need for resources and agendas in the short run. Also, financial initiatives are associated with clear, measurable, short-term metrics, whereas measurements of social performance are often uncertain and long term. Sometimes, there are win/win situations, such as when waste and emissions are reduced, saving both company costs and environmental damage. But, often the decision alternatives are seen as trade-offs and managers throughout the business units and facilities must struggle to improve social, environmental, and financial impacts simultaneously while being accountable for excellent performance in all.

In this current work, the focus is on sustainability and what formal (including organizational design, performance measurement, and reward systems) and informal (including culture, leadership, and people) organizational systems are used in best practice companies to facilitate success in sustainability implementations. The current project's findings were surprising and caused us to describe a new paradigm for implementation that is more descriptive of successful sustainability integrations.

## **MAKING SUSTAINABILITY WORK**

In my recent book (Epstein, 2008b), I described a new model (Exhibit 1) based on my research. The model and the book provide details on the

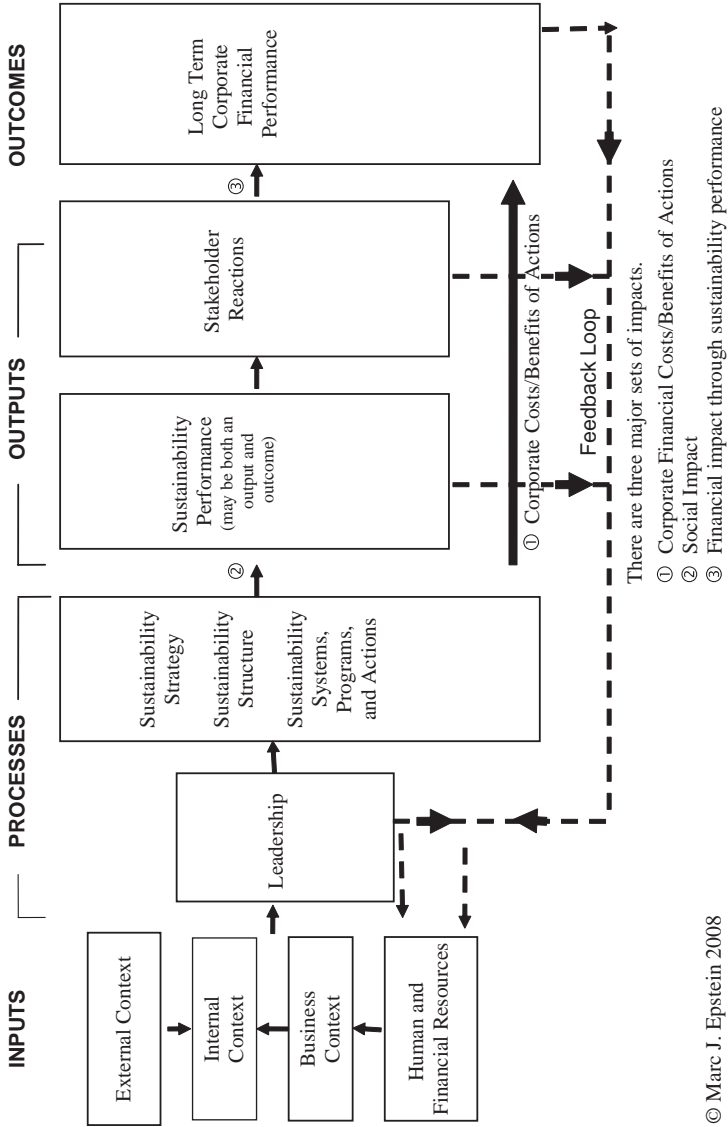


Exhibit 1. Making Sustainability Work.

drivers and measures that can be used to drive success in the implementation of corporate sustainability. This includes cost management, capital investment, performance measurement, reward, and other formal systems that can be used to implement sustainability. The book describes and integrates the prior field, empirical, experimental, archival, and theoretical research and provides a model for implementation. Though many organizations have found the book and model helpful, it did not adequately address why so many well-intentioned and well-managed companies were finding it more challenging to implement sustainability than other organizational strategy implementations. This was one of the primary motivations for the new research study that has provided important new results.

## THE NEW RESEARCH PROJECT AND RESULTS

In 2007, we began work on this new research project to discover what permitted some companies to successfully implement sustainability when so many others were unable to do so. We also wanted to examine how leading corporations are integrating economic, social, and environmental impacts into day-to-day management decision making. This led to the development of five research questions.

### *Primary Research Question*

- (1) How do companies and their managers effectively manage social and financial goals and performance simultaneously?

### *Secondary Research Questions*

- (2) What are the challenges and barriers?
- (3) What characteristics of organizations, issues, and leaders enable more/less success?
- (4) What support systems (organizational design, performance evaluation, rewards, and culture) facilitate managing social and financial performances simultaneously?
- (5) What other support could be provided (leadership, strategy, organizational structure, communication, and formal and informal systems)?

Overall, the study aimed to identify those aspects of management control and strategy implementation that were most critical to sustainability success and investigate how they were operationalized in these successful companies.

### *Research Design and Sites*

The project was titled “Managing Social and Financial Performance Simultaneously: Corporate Best Practices” and sponsored by the Foundation for Applied Research of the Institute of Management Accountants in the United States. Four leading companies were selected as research sites: (1) Nike, (2) Procter & Gamble, (3) Nissan, and (4) Home Depot.

Nike is the world’s leading designer, marketer, and distributor of athletic products and clothing. Procter & Gamble is one of the world’s leading branded consumer products companies. The Home Depot is the world’s largest home improvement specialty retailer. And, Nissan North America is a unit of Nissan Motor Co., a leading global auto manufacturer. All of these companies have reputations for leading practices in the management of sustainability and have high ratings on various indexes on sustainability performance. All these companies agreed to provide significant access and time to aid on this project. (Though some of the important elements and findings of the research are summarized here, a more complete discussion can be found in Epstein et al., 2009, 2010.)

After extensively examining previous relevant, related literature and research in management control, sustainability, environmental management, and related topics, the field research visits were started. Open-ended, semi-structured interviews were conducted with senior managers, business unit and facility managers, geographical unit managers, functional managers, and sustainability managers. The study investigated how managers are currently making the trade-offs and simultaneously managing social, environmental, and financial performances and the systems and performance measures they are currently using to facilitate these decisions. It specifically looked at the characteristics of organizations and their environments, their formal and informal support systems and processes (including performance evaluation, rewards, organizational culture, leadership, etc.), and initiatives that facilitate managing social, environmental, and financial performances simultaneously. It attempted to provide a better understanding of the role of hard and soft implementation systems. Hard systems are the formal systems that include organizational structure, performance evaluation, and incentive



systems used to motivate employee behavior. Soft systems are the informal systems such as organizational culture, leadership, and people.

*New Research Findings*

Some of the key research findings from the four sets of field research visits are summarized in Table 1. In general, the findings were surprising and answered many of the basic managerial and academic research questions of both the project and the field of inquiry. Since much of the work in management control and performance measurement, generally and in sustainability specifically, has focused on the formal systems more than the informal systems, the finding of a heavy reliance on the informal systems of leadership, culture, and people is significant. On a personal note, though *Making sustainability work* is broadly focused on sustainability implementation, there is clearly an emphasis on the formal systems including the cost management, capital investment management, social risk management, performance measurement, and reward systems along with organizational

**Table 1.** Success Factors in Managing Social, Environmental, and Financial Performances Simultaneously.

Success Factors	Evidence from Nike, P&G, the Home Depot, and Nissan
Balance financial and sustainability goals	<ul style="list-style-type: none"> <li>● Trade-offs between the social, environmental, and financial goals and performances are not seen as difficult – usually seen as win/win</li> <li>● Sustainability tensions are solved by using new ideas, creativity, and innovation</li> </ul>
Make sustainability the business case	<ul style="list-style-type: none"> <li>● Keen awareness of anticipated stakeholder reactions to sustainability that ultimately have a financial impact</li> <li>● Stakeholder impacts are implicitly included in strategic and operational decision making</li> </ul>
Leadership	<ul style="list-style-type: none"> <li>● Consistent CEO and senior leadership support of sustainability and sustainability manager has authority across the company</li> <li>● Clear communication of sustainability strategy, policies, and goals</li> </ul>
Strong culture	<ul style="list-style-type: none"> <li>● Innovation, creativity, entrepreneurship, and volunteerism are the building blocks</li> <li>● Openness, autonomy, and initiative are the norms supporting a strong, innovative culture</li> <li>● Broad sharing of culture through communication</li> </ul>

design as important levers to improve sustainability performance. Much less attention was devoted in the field of study generally, or in the book specifically, to the soft or informal systems.

Because many sustainability actions are difficult to specify, leading companies also place heavy reliance on distributed leadership and are learning to facilitate effective decisions in the business units and facilities. Learning is increased and shared across the organizations as the decision rights are more effectively decentralized. As these decisions are distributed throughout organizations, there is also more reliance on culture and leadership. This is consistent with less reliance on formal systems since the managers see the formal systems as less critical or sometimes not critical at all. One of the challenges of implementing sustainability effectively is that many organizations see capitalism and citizenship as competing paradigms. These leading corporations in our research study fundamentally have a different view.

They have developed a new paradigm. These leading companies do not see the conflict between managing both social and financial performances and can simultaneously manage both because they are using the tension as a source for new ideas and more innovation and creativity rather than as impediments to decision making. They see social versus financial interests not as competing but as complimentary.

## **IMPLICATIONS OF THE RESEARCH AND GUIDANCE TO MANAGERS AND RESEARCHERS**

Nike, Procter & Gamble, the Home Depot, and Nissan (North America) are among the largest and most important companies in their industries. But these companies' evident drive for sustainability is nurtured primarily by internal factors, leadership, organizational culture, and people, in particular, rather than externally. These factors were found to be the most critical determinants of successful management of the various trade-offs that middle managers face when they try to simultaneously manage social, environmental, and financial performances.

### *Commonalities and Differences between the Studied Firms*

There are several commonalities across the studied firms that facilitate sustainability decision making. *Corporate culture* in each company is

broadly shared and emphasizes norms critical for innovations such as openness, autonomy, initiative, and risk taking. This aspect of the culture has already been found crucial for ambidextrous organizations (Tushman & O'Reilly, 1996). These companies promote both local autonomy and risk taking and ensure local responsibility and accountability. A common overall organizational culture that builds on sustainability helps managers and other decision makers deal with the trade-offs that the simultaneous management of social, environmental, and financial goals often causes.

A second commonality across the studied firms relates to their *leadership*. In these companies, there is less conflict for the middle managers in balancing social, environmental, and financial performances because those conflicts are resolved higher up in the organization. Upper management in these organizations believes in benefits relating to sustainability, and in many cases sustainability values have been incorporated into the culture and other soft systems in the organization. Middle managers are able to make sustainability trade-offs because they know they will be supported by leaders.

Thirdly, all four companies are *consumer focused* and the corporate and brand image is very important to them. These companies try to downplay rather than publicize their sustainability accomplishments. They successfully *integrated sustainability* into their strategic business units. It seems that their CSR or sustainability departments are in a position of power within the company and have close relationships (either personal or formal) with powerful decision makers in the organization. Despite the fact that they evaluate performance mostly based on financial considerations, they succeeded to ensure that all employees are aware of their sustainability efforts and that they consider *sustainability as value* or even as their personal issue.

## SUSTAINABILITY IMPLEMENTATION SUCCESS

In Nike, Procter & Gamble, the Home Depot, and Nissan North America, social and environmental considerations are deeply embedded into decision making. Their sustainability performance is primarily driven by their leadership and organizational culture. And, their managers have a keen awareness of anticipated stakeholder reactions in the near and long term and have incorporated them into their sustainability strategies and culture. These leading companies have made many trade-offs spontaneous because the concerns for social and environmental impacts have been incorporated

into the companies' corporate culture. And the role of leadership in accomplishing this is critical.

Strategy and leadership are minimum enablers of successful sustainability. But so is culture. Organizations can use formal and informal processes – hard and soft implementation tools – for effective execution. But, surprisingly we found the informal tools to be far more critical for implementation success than previously anticipated.

Learning is also more critical than previously thought. Organizations must implement systems to help managers learn about managing social and financial actions. Learning is important because of the distributed leadership and the allocation of decision rights down in the organization. Middle managers thus need to better understand the culture, leadership, and the various dimensions of social, environmental, and financial objectives and performances to make effective decisions. Experience, education, and organizational support are all critical. Companies have found that they must make social and financial responsibilities an integral part of the strategy, leadership, and culture throughout the organization and make it a part of discussions and thinking related to operational and capital investment decisions on a regular basis. They must also build more leadership capacity for effective sustainability decision making and performance.

Much of the management control research emphasizes the importance of performance measures. But, we also saw in this research that when companies implement formal performance measures too quickly, it often compromises learning. So, one of the core ideas of this new research on sustainability performance is that implementing through motivating specific actions often cannot work because it hurts badly needed learning. Thus, corporations need to think of implementation approaches beyond incentives and recognize that informal systems and learning are critical for success. Further, in these leading companies, sensitivity to sustainability issues is deeply embedded in innovation and R&D. Increased risks, such as environmental emissions, climate change, potentially dangerous products, unsafe supply, etc. create new opportunities for innovation to improve both sustainability and financial performances.

## **IMPROVING RESEARCH AND PRACTICE IN CORPORATE SUSTAINABILITY**

Company leaders need to encourage more innovation and entrepreneurship in their organizations to address the risks in a sustainable and profitable

manner. Opportunities lie in both technological innovation (products) and business model innovation (processes). Changes in product manufacturing and service delivery, in particular, can result in products and services that are more social and environmental friendly.

The significant challenge of trying to simultaneously manage social, environmental, and financial performances is one of the most critical challenges in the field of sustainability. The evidence supports two new conclusions. First, informal systems, such as organizational culture, and leadership may be more important to drive sustainability implementation compared to formal systems and processes and more than previously thought. It provides at least a partial explanation for why implementation of sustainability has been so difficult for major corporations and the failure of traditional management control and performance measurement literature and practice to adequately address this issue.

Second, some leading companies recognize how corporate financial performance is impacted by stakeholder reactions to corporate sustainability performance. Recognizing the financial value of stakeholder impacts minimizes the magnitude of the loss in a “win/lose” scenario or, when the value of these impacts exceeds the cost of an initiative, turns it into a “win/win” scenario. These two findings, however, conflict with one another. At the same time as the companies’ informal systems strongly promote sustainability, their formal systems seemingly have a very traditional focus on financial performance. But, the managers operating under these systems do not believe these systems to be in conflict and they do not perceive a high level of tension. Thus, a new paradigm has been developed to explain the field research findings.

The study’s finding of the importance of soft or informal systems and processes for successful management of sustainability might come as somewhat surprising. Most of the literature on management control and strategy implementation focuses on hard or formal systems and processes, such as organizational design, performance evaluation, and incentive systems used to motivate employee behavior. But, these systems alone have not typically been successful in implementations of corporate sustainability strategies. Corporate performance measurement, incentive, and reward systems can be critical tools to implement sustainability and align the interests of the corporation, senior managers, and all employees. However, these systems must usually be a part of a broader set of systems aiming to motivate and coordinate employee actions and corporate culture.

Formal systems that measure and reward performance and encourage employees to pursue sustainability are often necessary to improve social and

environmental impacts, to communicate the value of sustainability to the organization, and to hold employees accountable for their contribution to sustainability efforts. But to be effective, they need to be built on principles, such as measurability, objectivity, and fairness. Some companies explicitly state that they do not want to measure sustainability impacts directly because they are difficult to capture. Or, they do not want to invest the effort to measure social impacts, because the managers intuitively believe that their sustainability efforts work. Rather, they choose metrics related to outcomes reasonably close to the cause-and-effect relationships chain. Social impacts are sometimes seen to be more difficult to measure than financial results, because they are often intangible, hard to quantify, and difficult to attribute to a specific organization, and have a long time horizon. This difficulty often presents obstacles in producing compelling evidence of impact and mission achievement. Though increased sustainability measures are available and often a valuable component in sustainability implementation, some of the leading companies have not focused on them – or are only now focusing on measures of success. They have instead focused on getting the informal systems right first before concentrating on the measurement.

While these companies may have a formal sustainability strategy, structure, and systems in place, it seems that their impact on people behavior is stronger through the internal context that they affect. CSR or sustainability departments play an important role in educating other business units about *why* the company should engage in sustainability efforts (through educational and other efforts to influence the organizational culture and values) in addition to influencing *how* the company acts to include sustainability in decision making (such as developing tools for incorporating sustainability). In P&G and the Home Depot, there is also a strong emphasis on promoting employees from within, which additionally builds a strong culture. People know the P&G (or the Home Depot) way and it makes it easier to build culture when companies hire at the bottom and then promote. Companies must otherwise find ways to sensitize new employees to the culture which is often challenging. When employees have long-term commitments, they are willing to do more voluntary actions that help the long-term interests of the company and their associates since they will be with them for their career. All four companies educate and train individuals throughout their organizations to be sensitized to sustainability issues and rely on staff who are specifically dedicated to sustainability programs.

For improved sustainability performance, sustainability strategy is only a minimum enabler. Best practice companies will also have other formal and informal systems and processes in place, of which leadership, organizational

culture, and people may be among the most important drivers of effective sustainability decision making. The CEOs should communicate (and over-communicate) the importance of sustainability to the organization and establish a culture of integrating sustainability into day-to-day management decisions. Commitment to social and environmental concerns must be consistently communicated both in words and actions. Organizational culture supporting sustainability decisions can serve to inspire and motivate employees to take sustainability obligations seriously. In addition, in their recruitment and development practices, companies may seek to create in their employees a passion and commitment to sustainability. This leads to contributions that are good for the society, the environment, and the company bottom line.

So, balancing social and financial performances simultaneously has been a significant challenge for both nonprofit and for-profit organizations at all managerial levels. Implementation has typically failed because organizations have not infused sustainability into the leadership and culture. And, they have viewed the tension of managing social and financial performances simultaneously as a conflict rather than as a source for innovation and creativity. Thus, corporations often fail at effective management of social impacts (and NGOs often fail at achieving their social mission). Our new research finds that the informal systems are at least as important as the formal systems typically used.

Providing the leadership, strategies, systems, culture, learning, and support to aid managers in making the trade-offs in social and financial performances, and recognizing that these can be complimentary, is critical for success. So, for successful implementation, social and financial performances both must be integral components of strategy and culture. Leadership must be committed to sustainability and build additional organizational capacity. Actions are more difficult to specify so distributed leadership is more critical. Support with management control, performance measurement, and reward systems as appropriate. But, the support of leadership, mission, culture, and people are even more critical. All of these should be used to implement learning as to how to make the trade-offs and make the challenging managerial decisions (or eliminate the trade-offs). Managers must integrate social and financial performances into all strategic decisions.

In contrast to most other organizational changes, the sole purpose here is to improve social, environmental, and financial performances simultaneously. It is often difficult for managers to evaluate the trade-offs between social, environmental, and the financial goals and performances because it is difficult to measure the impact of social and environmental performances

and to quantify the resulting benefits. The constant uncertainty about how much sustainability is necessary, the constantly changing emphasis on and costs of implementing sustainability, and the long time horizons necessary to measure the financial benefits of sustainability make it difficult to implement sustainability in the same way that other corporate strategic initiatives are implemented. While considered a critical tool to implement sustainability and align the interests of the corporation, generally, formal implementation systems have a secondary role in the successful implementation of sustainability.

## CONCLUSION

The focus of this conference has been on performance measurement and managerial control, with the theme this year centered on innovative concepts and practices. There are increasing demands for both the research and practice to become more innovative. Teaching requires more innovative development and delivery of content. Practice requires experimentation with new methods to replace methods that have not worked and to adapt to changing environments that demand new approaches to strategy implementation.

This topic has been increasing in importance in both managerial practice and research with more attention in both the managerial and academic press. And, innovation is needed both to adapt to the new societal and organizational demands and to replace approaches that have just not worked. I have worked in this field for most of my career and have acknowledged the lack of progress in advancing either managerial practice or academic research. The research briefly summarized here is an attempt to develop a new paradigm for improved research and practice.

The exploratory work cited here attempts to provide a credible explanation for why many implementations of corporate sustainability have failed. It also provides a synthesis of what some successful companies have done that have led to success. Finally, it provides some guidance to managers for improving sustainability performance.

But, more research is necessary. These are critical problems in both managerial practice and organizational studies and the research is in its infancy. Innovative research of both concepts and practice is needed. This exploratory work looked closely at four leading companies and the results here need further testing at other leading companies, and testing to determine whether these findings could be implemented in laggards to help them



achieve success. So, examination through standard field research is needed, but carefully designed and implemented action research is also necessary.

Much research is also needed on the evaluation of stakeholder impacts and the integration into management decision making. Management control and performance measurement are critical elements to succeed in the implementation of sustainability. The role of formal and informal systems in the success of the implementations has been insufficiently examined. More focus on research on this topic has significant potential to improve both the research and practice in sustainability and improve organizational social, environmental, and financial performances simultaneously.

## REFERENCES

- Epstein, M. J. (2008a). Aligning, measuring, and rewarding performance in complex organizations. In: M. J. Epstein & J-F. Manzoni (Eds), *Performance measurement and management control: Measuring and rewarding performance*. UK: Emerald Group Publishing Inc.
- Epstein, M. J. (2008b). *Making sustainability work: Best practices in managing and measuring corporate social, environmental and economic impacts*. USA: Berrett-Koehler Publishers.
- Epstein, M. J., Rejc Buhovac, A., & Yuthas, K. (2009). *Managing social/environmental, and financial performance simultaneously: A new paradigm*. Rice University: Working Paper.
- Epstein, M. J., Rejc Buhovac, A., & Yuthas, K. (2010). Implementing sustainability: The role of leadership and organizational culture. (April), Strategic Finance.
- Tushman, M. L., & O'Reilly, C. A., III. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4), 8–30.

# MOTIVATION THROUGH INCENTIVES: A CROSS- DISCIPLINARY REVIEW OF THE EVIDENCE

Jean-François Manzoni

## ABSTRACT

*Over the last decades, the accounting and control literature has featured much studying of and debate about the role and designing of incentives. Over the last year or so, the debate over incentives and bonuses has become a much more public one, as illustrated by the current public furor over bankers' bonuses and frequent calls to limit them and/or tax them more heavily. The public nature of the debate is new, but the emotional intensity is not; an intense emotionality has often characterized discussions of these subjects in print, as recently illustrated by a controversy between supporters and opponents of goal setting published in Academy of Management Perspectives.*

*This chapter tries to structure the debate by defining – and clarifying the interactions between – key components of the debate. I then review some – by no means all – of the evidence available in three streams of research: goal setting, self-determination theory, and economics. A surprisingly large number of commonalities emerge from this review. I then revisit in light of this review two accountability models I had*

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*introduced at a previous conference as well as a forthcoming field study of the sophisticated approach developed by a successful multinational corporation.*

Over the last decades, the accounting and control literature has featured much studying of and debate about the role and designing of incentives. These subjects came up in previous editions of the conference that spawned this volume. I contributed to this debate on two occasions. In the first conference (Manzoni, 2002a), I contrasted two approaches to motivation and rewarding: the traditional incentive alignment model (characterized by a search for clear and unambiguous accountability) and an approach aiming at directing managers' attention beyond what they can strictly control and introducing managerial subjectivity in the evaluation process in order to try to find the right balance between completeness and controllability.

In the last conference, I (Manzoni, 2008) examined the slow and insidious evolution that has led us from Kerr's (1975) very reasonable reminder that "the reward system should not be too inconsistent with the behavior we are hoping to get from people" to the omnipresent precept that "what gets measured gets done" and the apparent belief that *the* key to getting things done is to find a way to pay people to do it.

I wondered to what extent we, as a research community, were not putting too much emphasis on (a small component of) the reward system to solve complex problems. Linking significant rewards to specific outcomes does work, no doubt. That is, it gets people to do more of what we are paying them for. But we face two problems: one, we cannot always pay people exactly for what we want them to do. So we do not get exactly what we want (and we get some other stuff we do not want). Two, we hope for A, B, C, D, and E, some of which are negatively correlated, but we often can only measure accurately (and hence only reward) A.

Fortunately, I concluded, practitioners have been more careful than the research community! They maintain a lot of subjectivity (a term often perceived negatively, which can be replaced by the more positive and sophisticated term "expert judgment") in the performance evaluation and reward process; they use multiple levers to shape behavior; and in particular, excellent organizations make extensive use of the "cultural lever."

Over the last year or so, the debate over incentives and bonuses has become a much more public one, as illustrated by the current public furor over bankers' bonuses, leading some governments to discuss (and in France and the UK, to enact) special laws aimed at increasing the taxation of such

bonuses, and leading some banks to reduce the amounts paid in bonuses this year and to pay a greater proportion of these bonuses in stock rather than cash.

The public nature of the debate is new, but the emotional intensity is not. This intense emotionality has also often characterized discussions of these subjects in print. Alfie Kohn's (1993) charge against incentives led to such a barrage of reactions that *HBR* felt the need to publish many of them in their next issue. Kohn has continued his attack in several books since then. Similarly, Dan Pink (2009) – another popular writer – has also contributed his own summary. Both authors (and many similar critics) present analyses that are very critical of any form of financial incentives. Supporters of goals and financial incentives often reply with equal intensity, in the process sometimes presenting an insufficient attention to the limitations of goals and incentives.

Such intensity was visible recently in a controversy between supporters and opponents of goal setting. This debate, published in *Academy of Management Perspectives*, became quite personal with both parties throwing unflattering epithets at one another and explicitly questioning one another's professional ethics and competence.

My intention with this chapter is to try to structure the debate and review some of the evidence available. To structure the debate it is important to start by agreeing on the key concepts and vocabulary, and to distinguish related but distinct concepts such as goal setting and incentive compensation, intrinsic and extrinsic motivation, autonomous and controlled motivation. I also review the evidence gathered in the psychology literature on the overjustification effect and in the economic literature on the crowding-out effect (a broader notion than the overjustification effect). I then propose a personal summary and conclude with a practical illustration, summarizing Kohlemainen's (2010) findings from a field study of the sophisticated approach developed over the years by a very successful multinational corporation.

## **A RECENT INSTANCE OF CONTROVERSY: THE DEBATE ON GOAL SETTING**

Ordóñez, Schweitzer, Galinsky, and Bazerman (2009a) struck first. “We contend that goal setting has been over prescribed,” they said.

Goal setting has powerful and predictable side effects that are far more serious and systematic than prior reviews of goal setting have acknowledged

and which have received far too little attention in the management literature.

- Goals can focus attention so narrowly that people overlook other important features of the task.
- Setting appropriate goals is a difficult intricate process and the goals could be set too narrowly. Goal setting may cause people to ignore important dimensions of performance that are not specified by the goal-setting system. One example would be focusing too much on (specified) short-term goals and neglecting (less-clearly-specified) long-term goals.
- Too many goals: goals that are easier to achieve and measure may be given more attention than other goals.
- Inappropriate time horizon. Again the story here is one of the short-term goals receiving too much attention at the expense of the longer-term goals.

Stretch goals are another dimension that can cause serious side effects. High commitment to very demanding goals may lead people to:

- Take too much risk or select suboptimal solutions. (Some studies show that people motivated by specific challenging goals adopt riskier strategies and choose riskier gambles.)
- Resort to unethical behavior – misrepresenting their performance level and/or adopting unethical methods to boost performance – especially in the presence of lax oversight, financial incentives, and organizational cultures with a weak commitment to ethics. (Furthermore), “we postulate that *aggressive goal setting within an organization increases the likelihood of creating an organizational climate ripe for unethical behavior*” (p. 10, italics in original).
- Decrease satisfaction with below-goal-but-high-quality outcomes and reduce self-efficacy.

Goals can also inhibit learning and cooperation:

- High commitment to meeting a challenging goal on a complex task may concentrate too much attention on task performance and not enough on experimenting and learning. Locke and Latham recommend using “learning goals” rather than “performance goals” in complex situations, but that is not so easy to do!
- Also, high commitment to meeting a challenging goal may decrease production of “extra-role behavior”, including cooperation.

Goals can reduce intrinsic motivation. Intrinsic motivation involves “engaging in a task for its own sake.” Rewards have been found to decrease intrinsic motivation, and so do goals.

Setting (productive) goals is not easy. When goals are applied to groups of people, if the same goal is given to everyone it will be too hard for some and too easy for others. If individual goals are set, the fairness of the system will be questioned.

An individual with several goals could set some easy goals and some “what the hell” difficult goals ... . Goals would be OK on average but the individual would receive more rewards this way.

Managers should use goals with great caution and ask themselves a list of 10 questions.

Most research has been conducted in simple, well-specified domains with well-specified performance measures (on tasks featuring limited uncertainty). “Goals cause the most harm in complex, natural settings where outcomes are interdependent, monitoring is difficult, and cheating is possible” (p. 13).

Proponents of goal setting have privileged their publication record over academic rigor (including by systematically ignoring disconfirming studies) and providing sound managerial advice.

### **LOCKE AND LATHAM (2009)**

Predictably, especially given the last section of [Ordóñez et al. \(2009a\)](#), [Locke and Latham \(2009\)](#) were not amused. They argued that [Ordóñez et al. \(2009a\)](#) attacked empty handed and without real data, making excessive use of a few (often poorly researched) anecdotes and news headlines; that they displayed very selective attention to the literature, carefully selecting from a very small number of studies that have argued or found against goal setting, several of which have methodological faults, and failing to mention the considerably larger number of studies that supported the positive effects of goal setting.

Yes, linking rewards to goal attainment can – and in a number of studies has been found to – have dysfunctional consequences. But in many other studies, these negative consequences did not materialize. And uncontroversially, say [Locke and Latham](#), considerable evidence shows that “a goal to which a person is committed increases effort, prolongs persistence, and cues people to search for strategies to attain it” (p. 19).

A goal can also “provide purpose to an otherwise meaningless task; it provides a sense of accomplishment. It is a standard for assessing one’s personal effectiveness” (p. 20).

Goal-setting impact on all the dimensions reviewed by [Ordóñez et al. \(2009a\)](#) is much less clear-cut than they imply. The evidence is much more heterogeneous.

It is egregious and insulting to attack us for bad scholarship, for disregarding evidence and for failing to investigate negative side effects of goals.

Organizations cannot thrive without being focused on their desired end results any more than an individual can thrive without goals to provide a sense of purpose. (p. 22)

Six months later, the two parties revisited their disagreement.

[Ordóñez, Schweitzer, Galinsky, and Bazerman \(2009b\)](#) replied something like this:

Our goal was not to review yet again the literature, but rather to put the spotlight on the negative side effects that have rarely been studied or even allowed to happen in laboratory experiments typically featuring simple tasks in simple contexts. The studies we quote are outliers only because the literature has not actively looked for side effects. We need to design more studies investigating this domain!

Surprisingly, [Ordóñez et al. \(2009b\)](#) then went on to use a few more anecdotes, not always clearly or reliably associated with the reckless pursuit of demanding goals.

They also argued that Locke and Latham should not attack them personally, and that by doing so Locke and Latham were doing exactly what they were (unfairly) arguing [Ordóñez et al. \(2009a\)](#) had done to them.

[Latham and Locke \(2009\)](#) replied that in their view, it was incorrect to state that data were rapidly accumulating against the effectiveness of goal setting. They acknowledged that a few studies do find divergent results, but, they said, (a) these results are weaker than [Ordóñez et al. \(2009a, 2009b\)](#) suggest and (b) there are very few of them, compared to hundreds of studies featuring different tasks and different populations in different countries documenting the positive impact of setting specific, challenging goals.

Furthermore, they said (rightly so, in my view), the role of goal setting in [Ordóñez et al. \(2009a, 2009b\)](#) anecdotes is not always clear nor is it established reliably by careful research.

Overall, concluded Latham and Locke, [Ordóñez et al. \(2009a, 2009b\)](#) accuse us of bad scholarship but we are fine and they are the ones producing bad scholarship.

This was a fascinating exchange. On one hand, Latham and Locke indeed have hundreds – they claim over a thousand – published studies supporting the positive effect on motivation and performance of setting specific, challenging goals, and the robustness of this finding does command respect. On the other hand, we all know of cases where the intense pursuit of ambitious goals led people to dysfunctional outcomes, for their organizations and/or for themselves.

In fact, Latham and Locke themselves have discussed this situation in a number of writings, reviewing in the process some of their practical recommendations for practitioners. I picked two articles in particular to summarize their findings and suggestions.

### **LATHAM AND LOCKE (2006)**

Goal directed action is an essential aspect of human life. Without goal directed action people cannot obtain the values that make their survival and happiness possible. ... Goal setting is first and foremost a discrepancy-creating process. Goals “create constructive discontent with our present performance. (p. 332)

More than 1000 studies conducted by behavioral scientists on more than 88 different tasks (in all parts of the world) show that specific high goals are effective in significantly increasing a person’s performance – regardless of the method by which they are set. (p. 332)

Assigned goals can be as effective as self-set or participatively set goals, provided the manager provides logic or rationale. On the other hand, participation in goal setting can lead to the setting of higher goals, leads to the discovery of effective task strategies and can hence increase a person’s self-efficacy that the goal is attainable.

Compared to moderately difficult, easy, “do your best” goals and no goals at all, specific and difficult goals lead to greater effort, focus, persistence and performance, as well as greater satisfaction with the task, individuals setting higher goals (because self-satisfaction becomes contingent on a higher level of performance), and less boredom on “uninteresting tasks” (as the mental focus shifts to goal attainment and behavior hence becomes purposeful).

Latham and Locke (2006) further argue that “goal-setting and feedback are the core of self-management” (p. 334). In one study, unionized workers who set a specific goal for job attendance, wrote a behavioral contract with themselves as to self-administered (rewards and punishments) and then kept a daily log of their job attendance had significantly lower absenteeism than



their colleagues who did not engage in this self-regulation exercise. Goals hence do not need to be “tools of oppression” in the hands of managers demanding ever higher performance; they can also be self-management tools helping individuals to direct their own energy and deriving a greater sense of purpose and accomplishment.

Still, acknowledge [Latham and Locke \(2006\)](#), a number of enabling factors and pitfalls have been identified over the years. They review 10 such pitfalls and propose remedies to address them:

1. “When people lack the knowledge and skill to attain a performance goal, giving them a difficult goal sometimes leads to poorer performance than telling them to do their best.” (That’s because) “a performance goal may misdirect their cognitive resources to sheer effort and persistence, which proves futile for goal attainment in the absence of knowledge on how to attain it” (p. 334).

*Remedy:* Assign specific, high-learning goals. They prompt people to generate solutions to an impasse, implement them, and monitor their effectiveness. (They are also more under the individual’s control and hence less stressful. I cannot promise I will be effective, but I can promise I will learn from my successes and errors.)

2. Conflicting goals given to individuals required to cooperate can lead to lower group performance.

*Remedy:* “Set a superordinate goal or vision ... (that will) unite people by giving them a case to rally around which in turn replaces opportunistic behavior and replaces it with cooperative interdependence.” If this “group goal” is associated with a group reward, so much the better. This “group goal” modifies the perceived identity/the perceived boundaries of the group. This superordinate goal can/should be complemented by specific high goals that make the superordinate goal concrete.

*Note:* This particular set of recommendations makes great sense but is not easy to implement:

- The “specific high goals” will focus on more controllable – and hence more “selfish” dimensions of performance. These can easily become the main focus of the appraisal effort ... . How do you maintain sufficient focus on the superordinate goal?
- If attainment of the superordinate goal is insufficiently influenceable by individuals, it will in itself exert a reduced motivational force.

- Profit sharing can help as a concrete manifestation of this “larger entity” we want the employees to feel part of and care about. But this identity must be supported by other mechanisms as well. Which ones?
3. Goals can induce fear of failure, especially when the goal is crafted in terms of error rate (“do not mess-up on more than 3 of these 15 problems”). When the same difficulty of target was framed positively (find the answer to 12 or more of these 15 problems), performance increased.

*Remedy:* Frame goals positively.

*Note:* Again the recommendation makes great sense. But the process that explains this phenomenon is unclear. By emphasizing the failure rate, one makes failure and its consequences more salient. That is clear. Now, why does this lead to lower performance? Because it increases stress (especially as the number of mistakes rises)? Because it leads people to “play-not-to-lose”, i.e., it reduces risk-taking and innovativeness? This would be an interesting avenue for research.

4. Goals can have an adverse effect on risk-taking (and hence learning, of which failure is an unavoidable component), especially if failure to attain a specific high goal is punished.

*Remedy:* (1) Encourage and celebrate learning, especially learning from errors. It helps to keep the focus on the task rather than ourselves. (It also helps protect self-efficacy.) (2) Allow sufficient time for complex goals (as an attempt to ensure the goal will not be perceived as unattainable). If failures to reach specific high goals are “judged severely,” people will strive to set less difficult or vague goals.

*Note:* This is clever advice, but probably not very easy to implement. I know extremely few managers and even fewer companies that celebrate learning from failures ...

5. Repeated success at reaching goals can lead to the setting of even higher goals and the dysfunctional persistence of previously successful strategies (dysfunctional because the environment has changed sufficiently for the strategy to have outlived its usefulness).

*Remedies:* (1) Break the “distal goal” into subgoals to increase the amount of feedback created. (2) Encourage creative conflict, e.g., by appointing and rotating “nay sayers.”

6. When money is tied to goal attainment, dysfunctional side effects can appear like misrepresentation of performance, devious strategies meant to improve performance at a cost to the organization, or attempts to set easier goals in order to increase expected payoff. The latter is particularly regrettable, as it decreases the idea-generating benefits of setting difficult goals.

Remedies to reduce “gaming” (misrepresentation of performance, devious strategies):

Make sure there are set ethical standards and (a) model them from the top, (b) put organizational controls in place to monitor compliance, and (c) show zero tolerance of deviations from the standards.

Remedies to reduce the pressure to set lower targets:

- (a) Set two levels of goals: a stretch goal that people are not punished for not meeting, provided the second goal – less ambitious and set relative to competition – is achieved.
- (b) Continuous linear bonus system above a minimum threshold.

*Note:* To reduce the pressure on setting a lower threshold, this system must start paying from zero (or from a number even lower than the threshold and independent of the threshold). If this number is low, the bonus slope – and hence the “raw attraction of the reward” will be severely reduced.

- (c) Introduce judgment (which allows the consideration of dimensions for which quantitative targets or measures are imperfect) via a panel of subject-matter experts (to reduce individual bias and increase the amount of information brought to bear on the problem).

7. Excessive commitment (desperate over-commitment) to an excessively high goal, because goal attainment ends up being tied to the individual’s, the group’s, or to the organization’s sense of identity and self-worth. This intense commitment to a goal that is no longer attainable or desirable can lead the organization to adopt dysfunctional strategies (and refuse to review strategies that have proven successful in the past but whose revision would entail short-term costs and the failure to attain short-term goals).

*Remedy:* Leaders must remain flexible and must be willing and able to reassess goals and plans based on the results they observe.

*Note:* This recommendation sounds eminently reasonable but is very hard to implement; when does “commitment to a goal” stop, and “over-commitment”/“foolishness” begin?

8. Nongoal performance dimensions get ignored: That is an issue, but let us be frank it is also the flip side of the coin. Goals focus our attention and energy, that is why they are useful, and they can only focus attention and energy on dimensions for which a goal is set!

*Remedy:* “If a certain outcome or action is critical, a goal should be set for it” (p. 337).

9. Goals may increase an individual’s stress, especially if they are challenging &/or too numerous.

*Remedy:* Assign a reasonable number of goals (three to seven) and “ensure that employee self-confidence is commensurate with the difficulty level of the goal” (e.g., by providing sufficient training and resources for employees to be – and feel – prepared for the challenges they will encounter in pursuing these goals).

*Note:* Most managers I work with face more than three to seven goals. Also, in real life, performance depends on a number of exogenous factors over which the employees have limited to no control. Ensuring a sufficiently high degree of self-confidence may require setting a target that is low enough to be manageable under a very negative state of nature and will hence turn out to be less than very difficult in most cases. This problem may contribute to explain [Merchant and Manzoni’s \(1989\)](#) observation that most profit center managers tended to report very high probability of budget achievement.

10. High-performing employees may end up being penalized for their excellence (and as a result may be overly stressed, demotivated, or even leave the organization) if goal difficulty keeps being ratcheted up as a result of their achieving past difficult targets.

*Remedy:* Let high-performing individuals and teams set their own goals and strategies to attain them.

In summary, [Latham and Locke \(2006\)](#) acknowledge that setting specific, challenging goals has potential drawbacks, but they believe that these drawbacks can be overcome or prevented by applying the recommendations presented above. Clearly, though, some of these recommendations are “easier said than done,” which explains why, in real life, a number of organizations and managers experience some of these drawbacks.

[Latham and Locke \(2006\)](#) briefly discussed as one of the challenges of using goals their being tied to monetary incentives. [Locke \(2004\)](#) devoted

a short but dense article to this very subject. He started by quoting a 2004 WSJ article reporting that in a Hewitt survey, 83% of companies with a pay-for-performance system said that their incentive plan was “only somewhat successful or not working at all.”

He then discussed four ways to link goals and incentives:

1. Stretch goals with bonuses for success: This method has the pros and cons of a strong incentive featuring a cutoff point (strong incentives to make sure the hurdle is crossed – legitimately or not – but low incentives to strive beyond target, etc.)
2. Multiple goal levels with multiple bonus levels: Less temptation to cheat, but less striving for the top target.
3. Linear system without cutoffs: On the positive side, no incentives related to the cutoff points and no upper limit. But other things equal, lower payoff slope and hence less “motivational pull” to improve performance at the margin.
4. Motivate by goals and pay for performance as assessed subjectively by a team of senior managers. This is the best method in terms of flexibility and comprehensiveness, provided the organization’s top managers are knowledgeable and objective enough to exercise this discretion productively.

Locke (2004) adds a few additional points:

Goals should be set for all significant *performance outcomes* and *critical actions* leading to these outcomes. Constructing causal maps showing the relationship between actions and outcomes is a good idea.

Bonus systems are supposed to focus attention and effort in a certain direction to the exclusion of others. Hence, do not be surprised if they do! But rather think very carefully about what actions and outcomes are most important to you.

We could add that the organization should also think about how these most important actions and outcomes are related to other actions and outcomes in the causal map, in order to select the set of measures that will best capture the behaviors and outcomes the organization wants to observe. “Best capture” means that good measures are available for them, where “good measures” are complete, controllable and noise-free. In my ongoing work with organizations I am often struck by how crude some incentive systems can be. Thus crudeness reflects a lack of involvement and investment by the system’s owners.

Any link – but particularly a quantitative/mechanical link – between bonuses and goal attainment is bound to create a temptation to try to game the system – by misreporting performance or by improving it in ways that overestimate the actions' positive impact on the short- and/or long-term health of the organization. Top management is responsible for making sure managers operate in an environment that discourages such gaming: They must set ethical standards, model them from the top, put organizational controls in place to monitor compliance, and show zero tolerance of deviations from the standards.

To avoid cognitive overload and maintain sufficient simplicity (“Ideal reward systems are simple,” p. 132), there should probably be between three and seven goals, “depending on how complex they are and how much time was allowed for completion.”

To reflect the strong interdependence that characterizes most organizations, goals should be integrated across the entire organization. “This is usually impossible due to time constraints.” Hence organizations should foster knowledge sharing by paying bonuses in part based on peer ratings of knowledge sharing and/or how well the company does as a whole.”

This is a strong remark. Locke (2004) is thus advocating more subjectivity in bonus determination as well as “profit sharing” type of arrangements.

Goals should only be changed under fairly restricted conditions, otherwise they lose their credibility.

Note that this prescription is somewhat contradictory with Latham and Locke's (2006) recommendation that managers should remain flexible and willing to modify goals, a recommendation I labeled “hard to implement”.

Locke concludes on another strong remark: “Effective bonus plans are extraordinarily difficult to set up and to maintain. *It has been said that it is better to have no bonus system at all, other than simply merit pay, than to have a bad one.* Bad incentive plans encourage people to do the wrong things in the wrong way, and they lead to cynicism, anger, and indifference” (p. 133, italics added).

All in all, the picture that emerges from Locke and Latham's work is much more measured and sophisticated than Ordóñez et al. (2009a, 2009b) had given them credit for. Locke and Latham acknowledge some of the

challenges organizations face when trying to set specific, challenging goals, and they offer several recommendations to support implementation. These recommendations include:

- Do not use too many goals. Three to seven makes sense.
- Goal setting is serious business. Invest time and attention in the process!
  - People *will* work more on measured areas than on others. You must hence select carefully the few goals you want to set, to make sure you capture the high-leverage items that can be measured accurately enough.
  - For each dimension measured, it may make sense to set two levels of difficulty – a challenging one and a more realistic one.
- You may need to modify these goals as the year progresses. But do not do it too often and too easily.
- Linking goals to rewards is tricky business! If you do it, do it well or do not do it at all. The best approach is to maintain a loose link between goals and rewards and complement the process with managerial subjectivity, ideally operating in teams. To be effective, such an approach requires well-informed and competent managers.
- Goals will drive effort, even more so when linked to rewards, and some of this effort may be misguided and directed in inappropriate directions. You must hence make sure that appropriate ethical standards exist and that they are modeled and enforced to discourage, prevent, and if necessary detect and sanction employee misbehavior.
- Make sure that the pursuit of goals does not drive out learning and experimentation. Set learning goals, celebrate “good failures,” and ensure that discussions remain open and challenging.
- Do not let local goals make people lose sight of the common good. Make sure everyone’s goals are complementary and linked to the larger-group goals, and reinforce the sense of belonging to the larger group by setting some (superordinate) goals and linking them to the reward system.

Let us come back to this later. For now, let us turn our attention to a body of work that has received considerable attention over the years and was heavily quoted by [Ordóñez et al. \(2009a, 2009b\)](#).

## **THE SELF-DETERMINATION THEORY PERSPECTIVE**

[Gagné and Deci’s \(2005\)](#) paper – reprinted in the 2009 *Journal of Organizational Behavior*’s special issue presenting the eight most influential

articles over the journal's "Thirty Years of Shaping a Discipline" – provides a very helpful summary of the evolution of self-determination theory (SDT).

SDT actually started out in life as "cognitive evaluation theory" (CET), building on Deci's (1971) results: Some students were paid to work on a popular puzzle called Soma. Another group of students performed the same task but without rewards. When the rewards were discontinued, the students who had previously been paid were far less inclined to continue playing with the puzzle than their colleagues who had not been paid. Introducing rewards had apparently reduced their motivation to solve the puzzle "just for the fun of it."

In another study, Lepper, Greene, and Nisbett (1973) promised a group of 3–5-year-old children that they would receive a "good player" ribbon for drawing with felt-tipped pens. A second group of children played with the pens and received an unexpected reward (the same ribbon), and a third group was not given any reward. All of the children played with the pens, a typically enjoyable activity for preschoolers. Later, when observed in a free-play setting, the children who received the reward promised to them played significantly less with the felt-tipped pens, again suggesting that expected rewards undermine intrinsic motivation in previously enjoyable activities. A replication of this experiment by Greene, Sternberg, and Lepper (1976) found that rewarding children with certificates and trophies decreased intrinsic interest in playing math games.

These studies established the fact that intrinsic motivation could be damaged when incentives were provided for engaging in an activity that people might have chosen to do anyhow. This became known as the "overjustification effect." Throughout the 1970s and 1980s several dozen experiments investigated the effects of extrinsic rewards on intrinsic motivation and tested specific propositions of Deci and Ryan's CET. Three meta-analyses (Rummel & Feinberg, 1988; Tang & Hall, 1995; Wiersma, 1992) reviewed the evidence and concluded that expected, tangible rewards made contingent upon doing, completing, or excelling at an interesting activity indeed tended to undermine intrinsic motivation for that activity. Cameron and Pierce's (1994) meta-analysis concluded the opposite – overall, rewards do *not* decrease intrinsic motivation. This disagreement evolved into a controversy and generated several papers and some heated exchanges.<sup>1</sup>

Deci et al.'s (1999) meta-analysis of 128 experiments seems to have established a few robust conclusions: First, that whereas positive feedback tends to enhance intrinsic motivation, tangible rewards tend to undermine it – but *not under all conditions*. In particular, tangible extrinsic rewards did not undermine intrinsic motivation when rewards were given independent of



specific task engagement – e.g., a salary – or when the rewards were not anticipated – e.g., an unexpected bonus. Even more, tangible extrinsic rewards could actually *enhance* intrinsic motivation when they were accompanied by a supportive interpersonal context.

As Gagné and Deci (2005) point out, CET progressively lost momentum because it was perceived to be largely impractical: For one, many tasks performed in real life by adults at work are not necessarily very intrinsically interesting and hence do not generate much intrinsic motivation. Second, most employees need to earn a living and using monetary rewards as a part of a motivational strategy is perceived by many as practical and appealing.

Deci and Ryan hence broadened their approach and developed SDT (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000). SDT is rooted in a set of assumptions about human nature and motivation: Human beings are inherently motivated to grow and achieve, and will fully commit to and even engage in uninteresting tasks when their meaning and value is understood. Employees who appear passive and unmotivated developed these attitudes over the years, including through their (past or current) experience of working conditions undermining inherent motivation (Stone, Deci, & Ryan, 2009).

Central to SDT is the distinction between *autonomous motivation* and *controlled motivation*, which is broader than the previous distinction between intrinsic and extrinsic motivation.

When people act for *autonomous reasons*, they engage in the activity because of the fun/enjoyment they derive from performing the activity itself (i.e., intrinsic motivation) or because of the personal meaning they derive from accomplishing the task (identified or integrated regulation). People act for *controlled reasons* when their objective is to obtain the external rewards (money, grades, or status) that the activity/goal may produce (i.e., external regulation) or because they feel pressured or coerced (they would feel ashamed, guilty, or anxious if they did not engage in the activity) or desirous of praise or rewards (i.e., introjected regulation) (Fig. 1 presents a recap of this autonomy-control continuum).

In SDT, extrinsic motivation can hence vary in the degree to which it is autonomous versus controlled. SDT posits a controlled to autonomous continuum to describe the degree to which an external regulation has been internalized. A regulation that has been taken in by the person but has not been accepted as his or her own is said to be “introjected” and provides the basis for “introjected regulation.” Examples of introjected regulation include contingent self-esteem (which pressures people to behave in order to feel worthy) and ego-involvement (which pressures people to behave in order to support their ego). In this case, regulation is within the person

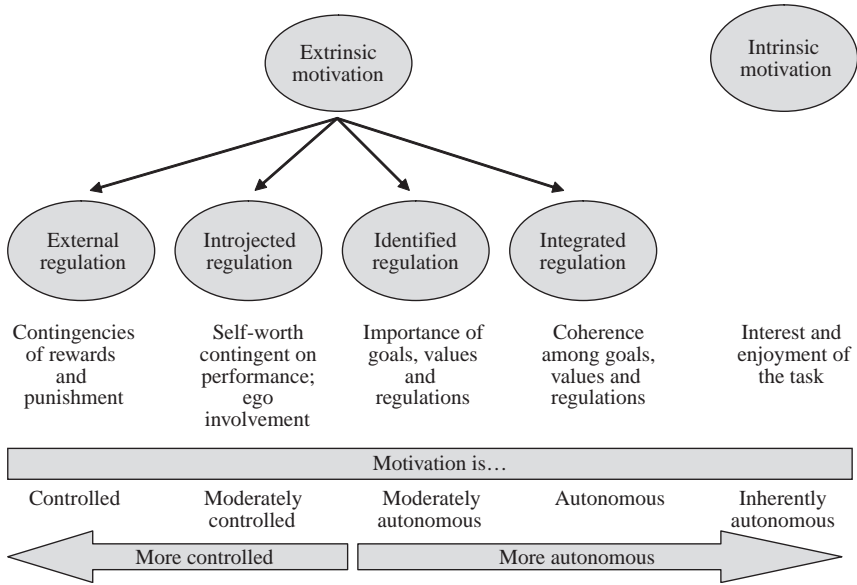


Fig. 1. The Self-Determination Continuum (Adapted from Gagné & Deci, 2005).

but this is relatively controlled form of internalized extrinsic motivation. “I work because it makes me feel like a worthy person.”

Being autonomously extrinsically motivated requires that people identify with the value of a behavior for their own self-selected goals. With “identified regulation,” people feel greater freedom and volition because the behavior is more congruent with their personal goals and identities. They perceive the cause of their behavior to have an internal personal locus of causality. SDT also posits an even more autonomous type of motivation, “integrated regulation” where the behavior “is an integral part of who the person is and emanates from their sense of self.”

I have found it hard to really get a good grasp of how this “integrated regulation” differs from “identified regulation,” where the person engages in an activity that s/he would not normally engage in, save for the fact that this activity plays a useful role in helping the individual reach a personal goal that is important for him/her.

SDT posits that human beings are moved by three basic psychological needs:

*Autonomy*, i.e., the experience of acting with a sense of choice, volition, and self-determination.

*Competence*, i.e., exercising one's abilities effectively or improving them; the belief that one has the ability to influence significant outcomes.

*Relatedness*, i.e., the experience of having satisfying and supportive social relationships.

Regarding the question “how universal are these three needs?”, Stone et al. (2009) believe that more research is needed but cite two studies (Chirkov, Ryan, Kim, & Kaplan, 2003; Vansteenkiste, Zhou, Lens, & Soenens, 2005) whose findings “suggest that (these three human needs) are universal – they transcend culture and context.”

The needs for autonomy and competence underlie intrinsic motivation. That is, aside from being exposed to an interesting/pleasant task, people need to feel competent and autonomous to maintain intrinsic motivation.

In the many cases where intrinsic motivation is not present or sufficient, however, it is desirable for individuals to *internalize* the need to perform these activities, i.e., to take in values, attitudes, or regulatory structures such that the external regulation of the behavior is transformed into an internal regulation and hence no longer requires the presence of an external contingency.

This internalization process is facilitated by contexts that fulfill the needs for relatedness and competence. When people experience satisfaction of the needs for relatedness and competence with respect to an activity, they will tend to internalize its value and regulation. But satisfaction of the need for autonomy while internalizing is also necessary for the value and regulation to be more fully internalized so the subsequent enactment of the behavior will be autonomous.

This distinction between “autonomous” and “controlled” *matters* because autonomous motivation and autonomously motivated behavior tend to be associated with more *positive outcomes* than controlled motivation and behavior. Studies indeed show that work climates promoting the satisfaction of the needs for autonomy, competence, and relatedness enhance employees' intrinsic motivation and promote internalization of extrinsic motivation, which combine to produce superior work outcomes such as superior:

- Persistence and maintained behavior change
- Effective performance, particularly on tasks requiring creativity, cognitive flexibility and conceptual understanding
- Job satisfaction

- Positive work-related attitudes
- Organizational citizenship behaviors
- Psychological adjustment and well-being.

SDT has devoted a great deal of attention to understanding the impact of the context on individual's motivation. But it recognizes the fact that an individual's motivation is also influenced by one's stable dispositions. SDT refers to individuals' General Causality Orientation and distinguishes three such orientations:

- Autonomy orientation, which reflects a general tendency to experience social contexts as autonomy supportive and to be self-determined.
- Control orientation, which reflects a general tendency to experience social contexts as controlling and to be controlled.
- Impersonal orientation, which reflects the general tendency to be amotivated (i.e., having limited intention to act).

A number of studies have examined the association between these General Causality Orientations and other dimensions of personality and behavior. They show that the autonomy orientation is positively related to a number of positive features such as self-actualization, self-esteem, ego development, integration in personality, and satisfying interpersonal relationships; the control orientation is associated with public self-consciousness, the type A behavior pattern, defensive functioning, and placing high importance on pay and other extrinsic motivators; while the impersonal orientation has been found to be related to an external locus of control and to self-derogation and depression.

Regarding individual differences and personal motives, research has shown, across varied samples with varied indicators of well-being, that the strong valuing of extrinsic (relative to intrinsic) goals is negatively associated with well-being (Kasser & Ryan, 1993, 1996; Sheldon & Kasser, 1995). Specifically, "people for whom it is highly important to amass wealth, present an attractive image and become popular or famous tend to report ill being, including greater anxiety, depression, narcissism, psychosomatic symptoms, conduct disorder, and high-risk behaviors, as well as poorer self actualization, self-esteem, vitality, and social functioning" (Sheldon, Ryan, Deci, & Kasser, 2004, p. 484).

Is this negative association driven by the content of the goals, or by the reasons that lead the individual to pursue them? That is, is the problem the quest for extrinsic goals in itself, or the quest for external goals for "controlled reasons"? The evidence is mixed. Carver & Baird (1998)

and Srivastava, Locke, and Bartol (2001) presented results suggesting that the negative well-being association with the quest for financial success was motive-driven, but Sheldon et al. (2004), looking at both the quest for financial rewards and the broader quest for extrinsic goals presented evidence suggesting both factors were at play.

Note that in Sheldon et al. (2004), the two aspects (relative pursuit of extrinsic goals and controlled motivation) are positively correlated, but at 0.26 not very highly so. So while it appears that people do tend to pursue extrinsic goals more for controlled than autonomous reasons, the two dimensions do appear to capture different aspects as well. The controlled nature of the motivation is hence a problem, but so seems to be the quest for external rewards, and money in particular.

### *Autonomy-Supportive Contexts and Behavior*

Other things equal, the task and task context can play a big role in supporting intrinsic motivation and autonomous behavior. Hackman and Oldham's (1980) job characteristics theory argued that the most effective means of motivating individuals is through the optimal design of jobs. In particular, internal work motivation would be increased by designing jobs that:

1. Provide variety, involve completion of a whole, and have a positive impact on the lives of others.
2. Afford considerable freedom and discretion to the employee.
3. Provide meaningful performance feedback.

SDT agrees with these prescriptions, but adds that beyond the job and its context, the manager's interpersonal style also matters a great deal. Deci, Connell, and Ryan's (1989) field experiment was particularly enlightening in this respect:

First, it showed that managerial autonomy support was positively associated with employees' job satisfaction, trust in the organization and corporate management, and displayed more positive work attitudes.

In this study, *managerial autonomy support* was defined as:

- Acknowledging subordinates' perspective (needs and feelings).
- Offering choice and providing opportunities for employees to take initiative (make choices and solve problems), rather than pressuring them to behave in specified ways.
- Giving meaningful rationales and noncontrolling informational feedback.

Deci et al. (1989) also showed that managers could be trained to become more autonomy supportive. The training consisted of managers spending a total of six days with a change agent over a 2–3 month period. Results showed that the level of managers' autonomy support increased in the intervention sites relative to the control group sites, and that these changes led to improvements in subordinates' perception of their jobs, managers, and organization.

Several other studies have examined how the context can be designed to provide the autonomy support that leads to such internalization. Deci, Eghrari, Patrick, and Leone (1994) identified three aspects of *communication* as critical to achieving greater internalization – both in terms of time spent on the task and attitudes toward it:

- (i) *The framing of the message.* Research has shown that providing a *meaningful rationale* for engaging in an uninteresting activity can facilitate internalization and boost autonomous motivation (Joussemet, Koestner, Lekes, & Houliort, 2004). Furthermore, when the rationale given focuses on an intrinsic goal (e.g., it will facilitate personal growth) rather than an extrinsic one (e.g., it will help you earn more money), people persist longer and display deeper processing and better conceptual learning (Vasteenkiste, Lens, Sheldon, & Deci, 2004).
- (ii) *Using language that conveys choice.* Autonomy-supportive communication styles emphasize words like “could,” “may,” and “if you like” – as opposed to “must,” “should,” and “have to” which are experienced as controlling.
- (iii) *Acknowledging the perspective of employees.* In particular, recognizing that people may not find an important activity interesting facilitates integration of its value and regulation.

Deci et al. (1994) made one more very important observation: The intensity of the internalization process was a function of how many of these autonomy-supportive dimensions were present. In the group of participants exposed to two or three of these dimensions, the internalization tended to be *integrated* as reflected in significant positive correlations between the amounts of subsequent behavior and self-reports of valuing the task and feeling free while doing it. Whereas in the group exposed to zero or one facilitating factor, the internalization was *introjected*, as reflected by negative correlations between the amount of subsequent behavior and the self-report variables.

In complementary studies, other features of autonomy-supportive managerial behavior associated with subordinates' adoption of more

autonomous goals included facilitating the identification with the group, increasing follower self-efficacy, and linking work values to follower values (see [appendix](#) for a list of dimensions of autonomy-supportive behaviors).

I listed above a number of desirable outcomes associated with autonomous motivation and autonomously motivated behavior. In addition to being one of the predictors of autonomous motivation and autonomously motivated behavior, managerial autonomy support has been found to be positively associated with subordinates' satisfaction of their needs for competence, relatedness, and autonomy; job satisfaction; job performance; performance evaluations; persistence; acceptance of organizational change; psychological adjustment; and organizational commitment.

Two more important findings:

1. In several studies, autonomous motivation was associated with more effective performance on *relatively complex tasks*, but there is *no difference* or even a short-term advantage for controlled motivation when *mundane, effort-driven tasks* are involved.
2. Research by [Koestner and Losier \(2002\)](#) found that while intrinsic motivation yielded better performance on tasks that were interesting, *autonomous extrinsic motivation* led to better performance on tasks that were not in themselves interesting but were important and required discipline or determination.

Put together these studies suggest that autonomous motivation consisting of *a mix of intrinsic motivation and internalized extrinsic motivation* is superior in situations that involve both complex tasks that are interesting and less complex tasks that require discipline. When the job involves only mundane tasks there appears to be no performance advantage to autonomous motivation, although there maybe a job satisfaction and well-being advantage.

[Gagné and Deci's \(2005\)](#) extensive review of the literature confirms the significant benefits individuals and organizations can derive from environments that foster intrinsic motivation and autonomous extrinsic motivation. Several components of such environments have already been identified:

- Individual dispositions in terms of causality orientation (toward autonomous motivation) and moderate desire for extrinsic rewards
- Job/task characteristics, which can make the task more or less intrinsically appealing
- Autonomy-supporting work climates, and particularly the behavior of the manager.

Gagné and Deci (2005) also identified a few promising avenues for further research:

Overall, more research needs to be directed at understanding how to promote autonomous extrinsic motivation, as there is indeed evidence showing that for certain types of task autonomous extrinsic motivation can be the most effective form of motivation.

In particular,

- More work needs to be done in work settings to isolate concrete managerial behaviors that represent autonomy support (and can then be empirically tested to show that they indeed support autonomy and facilitate internalization).
- More research needs to focus on the conditions under which performance-contingent rewards could be productive.
  - (a) A number of studies have shown that the effect of performance-contingent rewards on intrinsic motivation and internalization depends on several contextual factors, in particular the interpersonal climate. Indeed, in at least one study, tangible extrinsic rewards administered in a supportive interpersonal context actually enhanced intrinsic motivation. In this context, the reward may have conveyed a *competence-affirming message*, over and above the potentially autonomy-reducing signal introduced by the reward (but lessened by the supportive interpersonal climate).
  - (b) More generally, studies of reward effects on intrinsic motivation have generally featured the traditional dichotomous conceptualization of intrinsic versus extrinsic motivation. More research needs to examine reward effects with respect to the internalization of extrinsic motivation.
- Some studies suggest that effective work groups can facilitate internalization of extrinsic motivation and positive work group outcomes. More research is needed to investigate the impact of relatedness among work group members and between each member and his or her manager.
- More research is needed to understand how these various factors can interact to promote intrinsic and extrinsic autonomous motivation at work.

In a more recent article, Stone et al. (2009) proposed six recommendations that should help managers and organizations develop a culture of high performance based on autonomous motivation:

1. Asking open questions and inviting participation in solving important problems



Many managers are more comfortable with (or simply do not know how to proceed differently than by using) interactive styles that prevent, rather than create, supportive dialog and engagement by the other party. Potential impediments (and habits that should be eradicated) include imposing a premature focus on the conversation, confrontation, labeling (e.g., “he’s a weak performer”), blaming (e.g., “you failed us here”), and playing the “I’m an expert” role. Managers *can* be trained to formulate inquiries that invite and allow the exploration of employees’ views.

## 2. Active listening including acknowledging the employees’ perspective

Open questions should be followed by active listening that includes explicit acknowledgement of the employees’ perceptions of a problem. Again, managers can be trained to develop strong active listening skills, including techniques such as reflective listening and summarizing.

## 3. Offer choices within structure including the clarification of responsibilities

This point is relevant in the interpersonal domain, where the manager offering or jointly developing with subordinates a list of possible actions to address a problem logically follows from a dialog based on open questions and active listening.

One of the challenging aspects of such discussions is the identification of what’s discussable and what’s not. In some cases, a decision has been made (e.g., staff reduction) and is no longer open for discussion. But such decisions still often leave some margin of maneuver, which can be used within a process called Informational Limit Setting that features four steps: State the rule, explain (provide a meaningful rationale for) the rule, express empathy for the other’s point of view and allow as much margin of maneuver as possible on the implementation of the decision.

Beyond offering some measure of choice at the interpersonal level, the organization can also design systems and processes that offer more possibilities of impact and competent action by employees. For example, by eliminating unnecessary approvals, simplifying processes, or establishing more transparent processes.

## 4. Providing productive and effective feedback

Positive feedback can be stated in very controlling ways that actually undermine autonomous motivation. And of course critical feedback can

easily become controlling, disempowering, and competence reducing. Feedback discussions can also undermine the quality of the relationship between boss and subordinate, thus lowering the effectiveness of the next feedback session. The challenge is to learn to offer feedback in a way that is not only likely to be acted upon, but will also support the employee's sense of competence, autonomy, and relatedness.

Stone et al.'s (2009) title for this section is "providing sincere feedback that acknowledges initiative and factual, non-judgmental feedback about problems". The title itself is complex! Entire books have been written on this subject, which makes it difficult to offer a two-sentence summary. One of the challenges of helping managers improve on this dimension is the fact that while most training programs focus on the interaction during which feedback is being delivered, the battle is actually largely won or lost *before* the meeting, through the way managers prepare for the meeting and frame the interaction in their mind and through the quality of the relationship that the two parties have established (see Manzoni, 2002b).

5. Minimizing coercive controls such as rewards and comparisons with others

Too many managers, say Stone et al. (2009), assume that money is the only relevant consideration. They then use monetary rewards to control subordinates' behavior. This is suboptimal for several reasons. First, using financial rewards to drive behavior appeals to controlled motivation which tends to lead to less effective and persistent behavior, especially on complex tasks. Second, it increases the salience of financial rewards and encourages people to strive for them, which has been found in numerous studies (and several countries) to be associated with negative outcomes such as poorer psychological health and lower satisfaction with pay and benefits.

6. Develop talent and share knowledge to enhance competence and autonomy

Personal and career development can be desired for controlled reasons (including for the additional financial benefit they imply) or for autonomous reasons (e.g., because they will involve the possibilities of developing one's talent, of having more autonomy or being able to achieve more within the organization). Managers and organizations should encourage employees to

think about development for “autonomous” reasons, which again is more likely to happen if the organization tends to de-emphasize financial rewards.

Beyond these six avenues, Stone et al. (2009) comment on the dysfunctional consequences of what they call “accountabalism,” a term they borrow from Weinberger (2007) to refer to the tyranny of strict accountability and the tendency it creates for managers to resort to overlearned, command-and-control approach.

In particular, they cite an old study by Deci, Spiegel, Ryan, Koestner, and Kauffman (1982) where the authors asked two groups of participants to teach other participants to solve some spatial-relations problems. One group of “teachers” was held accountable for their learners’ performance and were told to ensure that their subordinates achieved high standards. No mention of accountability was made to the second group of “teachers.”

Results were quite spectacular: Compared to those who did not face explicit accountability, “teachers” facing accountability for learner performance talked more than twice as much, gave three times as many instructions, criticized more than twice as often, used nearly three times as many controlling words such as “should,” and were rated by trained observers as being much less empowering. As for their learners, those assigned to the accountability condition were less satisfied and less effective in solving the problems on their own.

Pressure for results can hence have dysfunctional consequences on manager’s ability to support their subordinates’ autonomy. Stone et al. (2009) emphasize the importance for managers to learn to absorb the pressure from above without passing it down. They also give a detailed account of the Deci et al. (1989) intervention within Xerox (mentioned above), during which the authors successfully trained managers to develop a leadership style that delivers on the three fundamental needs of autonomy, competence, and relatedness.

### *So Where Does all this Leave us?*

Years of research in SDT has led to a few robust findings on the disadvantages of relying on “carrot-and-stick approaches” and has identified a number of promising avenues for managers and organizations intent on creating autonomy-supportive environments and developing the engaged, resilient, cooperative, healthy and effective workforces that such environments can produce. The goal is no longer to pursue intrinsic motivation only, but rather a balance of intrinsic motivation and internalized extrinsic

motivation, where unpleasant tasks are taken on with intensity and persistence because tackling them helps us reach the objectives we have set for ourselves. (This reminds me of a quote from Tom Landry, the famous coach of the Dallas Cowboys in the 1970s, who said “Leadership is getting someone to do what they don’t want to do, to achieve what they want to achieve.”)

I have summarized some of these avenues above, including the importance of training the management hierarchy to be able to produce behavior that supports employees’ needs for autonomy, competence, and relatedness; the design of jobs and the development of a structure and of systems and processes that also foster autonomy, competence, and relatedness; the recruitment of employees oriented toward autonomous behavior and not overly seeking external rewards and wealth; financial rewards being downplayed, but no longer considered evil and used in part to reinforce the sense of belonging to the group.

SDT has placed most emphasis on the managerial behavior dimension, which is starting to be reasonably fleshed out. Looking at the list in [appendix](#) and at some of the points above does highlight how different this is from “mainstream management,” which probably contributes to explain why, as [Stone et al. \(2009\)](#) note with regret, so many managers talk about empowerment and autonomy significantly more than they act that way and indeed continue to rely on “carrot-and-stick” approaches to drive employee behavior.

## THE ECONOMICS LITERATURE

The basic idea that monetary rewards could lead to lower effort supply has been hard to accept in a discipline that has the relative price effect as one of its main foundations and which has typically not distinguished between intrinsic and extrinsic motivation. As far back as 1970, [Titmuss \(1970\)](#) argued that paying people to give blood would reduce people’s willingness to give blood. But he provided no evidence for his claim, and [Upton’s \(1973, 1974\)](#) empirical support for Titmuss’s hypothesis seems to have received limited attention.

Inspired by the work pioneered by Deci and Ryan, Bruno Frey – a Swiss economist – developed motivation crowding theory (MCT) ([Frey, 1997](#); [Frey & Jegen, 2001](#)). MCT recognizes that the introduction of monetary rewards will typically trigger a positive price effect, but argues that this price effect may be partly, completely, or even more than compensated for by

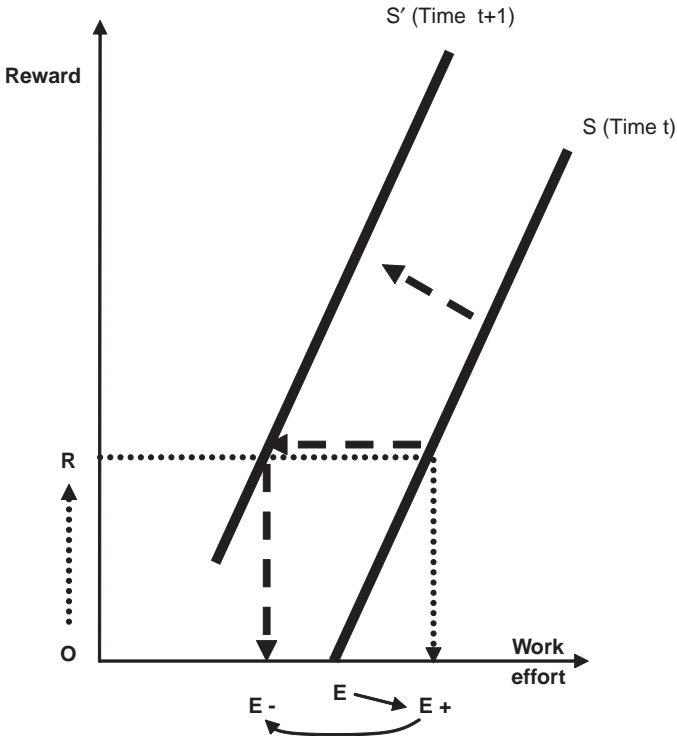


Fig. 2. The Evolution of Effort Upon Introduction of a Reward (Frey & Jegen, 2001).

a reduction in intrinsic motivation and hence in intention to produce the behavior.

In Fig. 2, for example,  $S$  is the traditional supply curve based on the relative price effect. Raising the external reward for work effort from  $O$  to  $R$  increases work effort from  $E$  to  $E+$ . The “crowding-out effect” induces the supply curve to shift left to  $S'$ , at which point effort goes down to  $E-$ . In this case, the example is set up so that the new effort level is lower than the initial effort level (which would represent a double loss for the principal), but MCT recognizes that the net effect is not necessarily always negative.

Similar to SDT, MCT does not equate external intervention with a reduction in intrinsic motivation. MCT recognizes the fact that some external interventions can have positive impacts on intrinsic motivation.

But also similar to SDT, MCT posits that intrinsic motivation decreases when the external intervention (monetary rewards and/or orders and sanctions) leads to reduced self-determination and/or reduced self-esteem.

1. When the individual perceives the external intervention as reducing their self-determination – when the individual feels “strongly encouraged” to behave in a specific way by the external intervention – they will feel overjustified if they maintain their intrinsic motivation (and will hence reduce it in order to reach a new equilibrium).
2. When an external intervention carries the notion that the actor’s motivation is not acknowledged (e.g., I feel the need to pay you to do this because I do not trust that you would do it otherwise), the actor’s intrinsic motivation is effectively rejected and the actor’s self-esteem is impaired, leading to lower intrinsic motivation.

Frey and Jegen (2001) review a number of studies that identified instances of crowding-out effects. Some of these studies were conducted in laboratory settings (involving issues of reciprocity, extending and breaching contracts under varying levels of law enforcement, and compliance with pollution standards). Others were field-based and involved tasks/situations as different from one another as number of hours worked under different intensity of monitoring, readiness to offer voluntary work and intensity of effort in that work, parents late to pick up their children at day care, citizens’ willingness to accept a nuclear waste repository in their neighborhood and tax compliance.

Since then research has progressed and other authors have contributed. Rost and Osterloh (2009) propose a broader crowding-out effect, where the dependent variable is no longer intrinsic motivation but performance and which features three components: the overjustification effect, the spill-over effect, and the multitasking effect.

1. Overjustification effect, where adding an extrinsic motive leads to an overjustification – too much motivation for performing this task. To restore balance, the intrinsic motivation for the task decreases and the locus of causality for performing the task becomes external.

*Note:* Lindenberg (2001) proposes an interesting theory to explain this phenomenon. He posits that goals compete for the privilege of being the main influence of cognitive processes. The strongest goal will win, triggering a “frame” that influences what information will be attended to, how it will be processed, what alternatives are being considered, and how alternatives are chosen.

Lindenberg (2001) proposes three fundamental frames:

- Gain frame – Goal is to improve one’s resources
- Hedonic frame – Goal is to feel better
- Normative frame – Goal is to “act appropriately.”

The gain frame is powerful because (a) tangible rewards can be counted (as opposed to other goals that are intrinsically less easy to quantify); (b) money is a very attractive currency as it can be stored away and traded now or later for other pleasures. The normative frame is the most precarious and is “difficult to hold up against the onslaught of hedonic or gain frames.”

While Deci and Ryan would say that the external intervention shifts the Perceived Locus of Causality from internal to external, Lindenberg (2001) would say that it shifts the framing from a Hedonic or a Normative frame to a Gain frame.

Using an analytical modeling approach, James (2005) also concluded that motivation crowding out will occur when rewards are perceived as controlling, which he said is more likely to occur when the *object of the agent’s intrinsic motivation is the source of the agent’s extrinsic compensation* and when the *incentives* offered to the agent are *large*.

2. The spill-over effect: Individuals offered extrinsic rewards to perform tasks that they might have otherwise performed for intrinsic reasons will now increasingly expect other tasks to be rewarded. In particular, incentives crowd out intrinsically motivated voluntary cooperation *beyond* that subject to the incentive mechanism. For example, a child rewarded for clearing the table will also expect to be rewarded for taking out the garbage.
3. Multitasking effect: Individuals concentrate on tasks that are being rewarded, at the expense of other tasks that may be useful for the organization but are not being rewarded. (The tasks may not be rewarded because the reward system is imperfectly designed, and/or because they are very hard to measure accurately. The net result is they are not being measured and individuals overperform on measured and rewarded dimensions and underperform on unmeasured dimensions.)

Bénabou and Tirole (2003, 2006) have proposed two additional paths that can lead to lower autonomous motivation for a task following its link with a reward:

4. The introduction of incentives by the manager leads the workers to reassess their beliefs about their own quality or about the nature, interest,

and difficulty of the task, as in: “If you are willing to pay me to do this, it can’t be really pleasant or easy, can it?”

5. If the worker obtains esteem from others for voluntarily performing an action, this social valuation can be spoiled by a perceived change in the value of his actions caused by the extrinsic incentives. The worker would lower effort out of concern that others will suspect that s/he is performing the action in order to secure the reward and would hence not give him/her as much social credit for the action.
6. One final reason that may cause an external reward to lead to lower production is in the case of prosocial behavior, where the individual knows that s/he “should be” engaging in this behavior. S/he would engage in such behavior through self-monitoring and self-management, motivated in part maybe by the concern for what others will think (point #5 above), but also by the individual’s desire to live up to a certain social standard/ideal. In that context, the reward would signal to the individual that such costly self-management is not really expected and is unlikely to be rewarded, which would relieve the individual of his/her self-imposed constraint.

An interesting example of the last two dimensions can be observed in some business schools via the policy to “buy-back” some faculty private time for additional teaching within the institution. This buy-back typically occurs at a rate that is below market rate for at least some faculty members, and hence requires some degree of “cooperative behavior” from these individuals. I remember sitting in front of a new Dean who was essentially telling me that in his view, the buy-back procedure was really a transaction and hence (a) did not in any way constitute an institutional contribution, (b) was not “expected” anymore. My off-load teaching promptly went down to zero.

When I joined my current employer, a similar system applied and off-load teaching was expected as a part of the collective effort to make the institution successful. I hence cooperated, until one day where the subject came up with the President and I was no longer sure I understood “the deal.” So I asked: “Is off-load teaching a mere transaction, or is it also institutional contribution”? The President immediately understood my question and said “It is absolutely part of institutional contribution!” ... . My point was this: I know that I am forfeiting money every additional day I teach inside the institution. But I like it here and I am happy to help, provided you know I am helping and once in a while you say “thank you!” If you now think I am doing this for the money and if you no longer appreciate and acknowledge the effort I am making, then I am no longer



doing it! And if you now want to *buy* my time, your compensation cost for this activity will have to increase by orders of magnitude.

This is also exactly what a very famous colleague at a previous institution once said to a Dean who was exploring the idea of starting to “pay” for certain activities that heretofore we had engaged in voluntarily. “Listen,” the colleague said, “if you try to pay me to do this, I’ll stop doing it immediately!”

One more point in the economics literature. Because such a high proportion of the accounting and control literature focused on designing incentive contracts refers to the principal agent paradigm and other economic models, I thought economists would be equally focused on the design of incentive compensation for managers. But Prendergast’s (1999) extensive review of “the provision of incentives in firms” painted a very different picture.

Indeed, Prendergast (1999) highlights several times during his review the fact that explicit incentive contracts can only apply effectively in cases where the tasks performed are simple and measurable enough, which is by far a minority of cases. In his words:

Pay-for-performance is constrained by the noisiness of the measures used and the ability of agents to handle risk. (p. 8)

“Contracts cannot specify all relevant aspects of worker behavior.” As a result, agents can typically game the compensation system (by “multitasking”).

As a result, it is predicted that in those positions where there are significant opportunities for reallocation of activities, there will be an absence of pay-for-performance; in essence, complex jobs will typically not be evaluated through explicit contracts. (p. 9)

I believe there has been an insufficient focus on workers whose outputs are hard to observe, in particular those where subjective assessments are used. Instead, the understandable focus of the literature has been on occupations (such as CEOs, mutual fund managers, professional golfers etc.) for which measures of output are available. *However the majority of workers do not satisfy these criteria. Instead, most workers are evaluated on subjective criteria.* (p. 11, italics added)

*Note:* Prendergast later explains that for CEOs, “aggregate measures of performance are available through, say, the stock price return, which is relatively exempt from multi-tasking concerns” (p. 22). I guess “relatively” is the key word in this sentence ...

It is important to bear in mind here in evaluating these studies that each of the cases the documented below, the nature of the job carried out by the workers is “simple”, in the sense that an aggregate measure of the worker’s performance is easily available. (p. 16)

In each of the cases considered above, workers carry out “simple” jobs. (p. 17)

Many jobs are complex, in the sense that many aspects of those jobs are hard to contract over. As a result, the use of explicit contracts could cause agents to focus too much on those aspects of the job included in the contract to the detriment of those that are excluded. (p. 22)

A disappointment of the economics literature has been to the paucity of information collected on the evaluation of workers with poorly measured output. Despite the fact that most workers in the economy are evaluated subjectively, the economics literature has largely focused on the aggregation of observed objective signals. While we have learned much from this literature, the *set of workers with easily observed output is a small fraction of the population.* (p. 33, italics added)

Frey and Jegen (2001) also noted that one of the reasons economists tend to over-rate the power of payment-based measures is that they tend to focus on simple tasks and task environments where is limited intrinsic motivation to lose because the task is not very intrinsically appealing, output is easy to measure, and there are limited risks of “multitasking,” and where some of the other sources of motivation (particularly a tightly knit small group) are not necessarily available.

## A PERSONAL SUMMARY

My interest in SDT goes back over 20 years. Over that period, I have spent about 100 days a year working with executives in a teaching, research, or consulting capacity. Through that period I have also been an employee and to a lesser extent a manager in social systems we call business schools.

Looking back at the SDT research stream for this review, I realize that over the years I have internalized a few fundamental assumptions about human beings: In particular, I believe that under the right conditions, the overwhelming majority of people – not all, but the overwhelming majority – try to do a good job. And in a surprisingly high number of cases, they will try to do the best job they can. A key word in this sentence is of course “under the right conditions,” which implies that (a) this may not be the case at any given point in time and some individuals may need to grow back into this desire, (b) the right conditions must be created and the manager has a major role to play in doing so.

I have also come to believe that as a general rule, people should have a strong say in how they go about doing their job. Three major reasons: (a) people should and typically do know more about their job than their boss; (b) people learn from their own experience much more than they learn from explanations given by others in the absence of experience; (c) people

tend to be much more committed to decisions they strongly influenced. Their involvement hence improves the likelihood that they will *own* the decision and its implications, which should yield better performance and better learning over time.

Last, I have come to appreciate the motivation that can come from being part of a high-performance group that one identifies with and want to be part of. I think that many of us – most of us, probably – feel the need to be part of something exciting that is bigger than we are, some collective enterprise that makes a difference in the world – to make the world a better place if possible, but often simply to make an impact. It may also be a way to affirm our existence ... As an individual researcher, teacher, and consultant I have some impact on the world. As a member of a group of 50 some colleagues and 300 or so staff members (or as a manager or a member of the management team in a corporation), I have a much bigger impact and a much richer life. I am counted on by my colleagues, *I matter!* And I can count on them too, and together we care and look out for one another. I derive a feeling of security from being part of this group. The group also stimulates and pushes me, and while cooperation is our norm and we hence try not to compete with one another, there is a form of emulation that helps us perform at a higher level.

In [Manzoni \(2002a\)](#), I contrasted two approaches to motivation and rewarding: The traditional incentive alignment model (characterized by a search for clear and unambiguous accountability, see [Fig. 3](#)) and an approach aimed at directing managers' attention beyond what they can strictly control and introducing managerial subjectivity in the evaluation process in order to try to find the right balance between completeness and controllability (see [Fig. 4](#)).

Based on the review above and my experience with executives and organizations over the years, I would complement this “new paradigm” with the following ideas:

Do not try to solve all problems with the reward system. To use rewards as a clear individual motivating force, you will have to increase the amounts involved, create competition among individuals, make the reward system more visible, and/or select some performance dimensions at the expense of others. In the process, you will have a hard time measuring performance accurately enough and without encouraging what the economists call “multitasking.” In addition, the conditions described above (large awards, competition among people, high visibility of the awards and selection of clear directions and exclusion of others) are exactly the conditions identified by as likely to encourage controlled motivation. You may very well get your

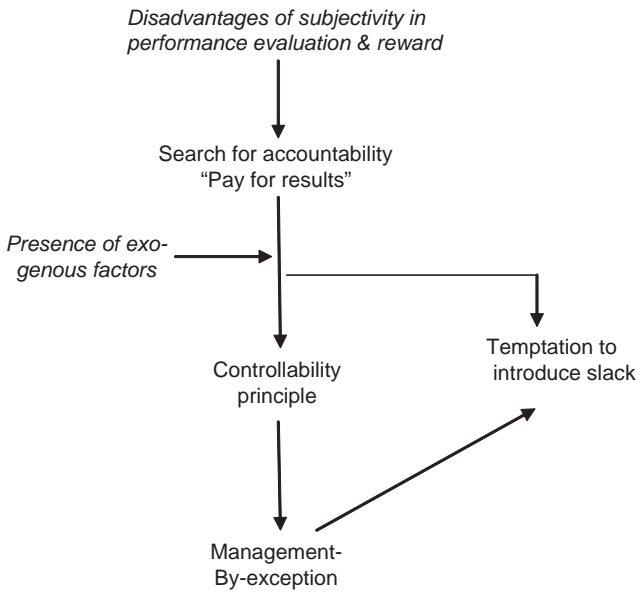


Fig. 3. The Traditional Management Control, Incentive Alignment Paradigm.

way in the short term (i.e., get an increase in the dimensions you are now rewarding due to the “price effect”), but you will be getting controlled behavior which is likely to have negative consequences in the short term (e.g., possible gaming/multitasking) and medium/long term (e.g., less effective and persistent behavior).

In particular, do not try to pay for prosocial/citizenship types of behavior, as these are probably the kind that are most likely to decrease in the very short run due to the overjustification/crowding-out effect. Even worse, your starting to pay for prosocial behavior may trigger a clear self-fulfilling process, where you interpret the decrease in prosocial behavior as the proof that introducing incentives was indeed needed. On that basis you would reinforce the incentives, thus creating a system where you will have to pay more and more for the rewarded – and increasingly, for the hitherto unrewarded – prosocial behaviors.

Instead, work on all the managerial levers at your disposal. Think of these levers in terms of the 7Ss, Galbraith’s Star model or my own representation in Fig. 5. But use all the levers, including:

- Designing the jobs and the relationships between them (organizational structure and processes) in a way that enhances the intrinsic appeal of the

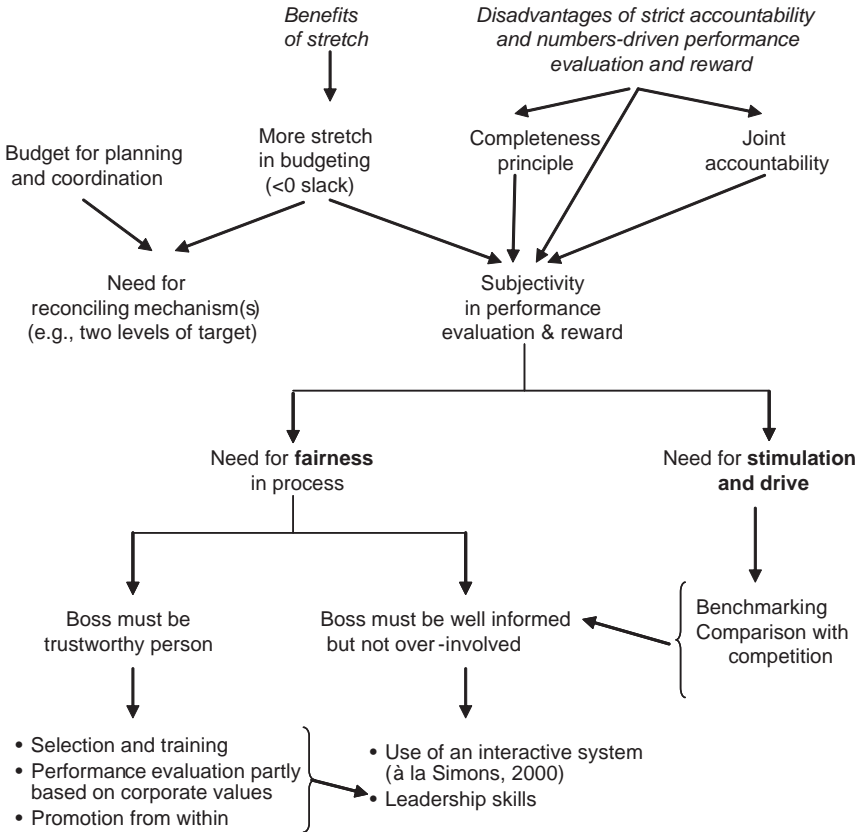


Fig. 4. A New, High-Performance Management Control Paradigm?

job and taps people’s sense of autonomy/impact, competence and relatedness.

- In particular, create a sense of interlocked identities (from the larger group to the smaller, more local communities) people can feel attached to.
- Train managers to enhance the ability of enough of them to produce a supportive interpersonal style (as discussed above).
- Recruit people with a strong orientation toward autonomous motivation and a low desire for financial rewards.
- Model from the top of the organization and reinforce particularly during new employees’ socialization process the kind of prosocial behavior and,

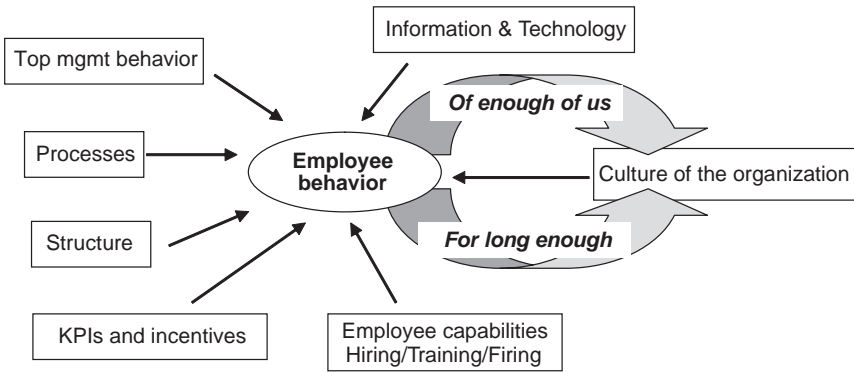


Fig. 5. Managerial Levers Influencing Individual Behavior.

more generally, the organizational culture needed and desired. (Evidence shows that internalization is facilitated by explicit or implicit endorsement of behaviors by significant others [Gagné & Deci, 2005](#)).

- You can, of course, also establish some financial rewards, especially if these rewards:
  - Are not too easy to calculate and predict
  - Are not too large
  - Are not linked too explicitly to specific prosocial behavior and other specific activities, but rather to outcomes, and especially group outcomes
  - Are determined via a system that allows informed, competent, and trusted managers to add “expert judgment” and ensure that hard-to-measure performance dimensions are taken into account.

Working on this list and remembering the chapter I wrote for the last conference ([Manzoni, 2008](#)), I am struck by the large number of practices listed above that were also included in my – or rather [Lorange’s \(2002, 2008\)](#) – description of the IMD approach to managing a business school. I knew two years ago that this was a well-thought-out system, but I had not realized it was so consistent with goal setting and SDT prescriptions.

This list also includes a number of features of the system used within Egon Zehnder, one of the most successful executive search firms: In particular, the very collective approach to compensation, the strong sense of group (instead of an emphasis on the local office), and the considerable importance placed on recruiting people who are likely to be good fits and on explaining to them how the system works in order to help them self-select as well (see [Zehnder, 2001](#); [Lowe, 2004](#)).

It also happens that as I was preparing for this conference I was also acting as guest co-editor for a special issue of *Long Range Planning on Strategic Performance Measurement*. This role gave me an opportunity to read several drafts of Kohlemainen's (2010) study and to consider its contribution and implications. Kohlemainen's objective was to provide a rich example of how a "strategic performance measurement system" can become part of a dynamic system, where strategy and tactics are continuously adapted and the organization obtains both empowerment and alignment. She found this system within DynCorp, a disguised name for a successful global leader in the telecommunications industry within which over the course of two years, she conducted about 30 interviews and discussions with managers from different parts of the organization.

Reading her study, I was struck by how much her findings echoed the reviews above and my modest (2002) proposal of a "new paradigm."

### **AN INTERESTING SUPPORTING DATA POINT: THE KOHLEMAINEN (2010) STUDY**

Typical of large multinationals, DynCorp's structure features a complex matrix, with three "sectors," global functions, and regions. The organization has historically nurtured a strong organizational culture, characterized by openness and empowerment, edge and intensity (a strong performance drive), and a lot of active discussions.

DynCorp features many discussions on and around the organization's strategy, and the way this strategy needs to be deployed and translated into action plans. The organization organizes an annual "DynCorp café" process, complemented by "strategy release events" that combine to ensure widespread involvement throughout the organization.

DynCorp tracks the performance of its business and horizontal units by tracking a series of "Common Measures" perceived to be drivers of EVA, including growth, profit, productivity, market share, and customer satisfaction. These Common Measures tend to be stable over time.

Sectors and horizontal units have their own scorecards. Targets change, but measures tend to be relatively stable. Performance on these measures are continuously tracked and discussed by the relevant top managers, similar to what Simons (2000) would call an interactive system.

Performance evaluation and reward involves two complementary processes: the semi-annual performance appraisal (SAPA) and the annual performance evaluation (APE).

The SAPA process unfolds every six months. Each individual is called upon to select a maximum of nine performance dimensions. This selection is meant to be discussed with the individual's manager, but the process is really meant to be very decentralized. The selection should be based on the company's goals and strategy, the sector/horizontal unit's strategy and action plans and the way the individual is expected to support them, as well as a few "Corporate Focus Areas," i.e., key areas/initiatives that DynCorp is in the process of deploying.

The nine dimensions can include qualitative ones, but for each dimension three levels of objectives will be defined (high, target, minimum). Of the nine dimensions, a maximum of six are taken into account for the calculation of the individual's bonus. The other three will not enter into the calculation, at least not mechanically. This bonus calculation is acknowledged to involve a fair amount of subjectivity. Managers are allowed to take into account the impact of actual exogenous conditions on the subordinate's measured performance, and/or are allowed to modify the individual's targets during the period. Performance on these six plus three dimensions is the object of continuous discussions during bosses and subordinates.

While the SAPA process determines the individual's bonus level, the APE influences other rewards offered to subordinates, including their salary level, training, and promotion possibilities. The APE is meant to lead to a comprehensive evaluation of the subordinate's performance, including both the "what" (including the individual's performance vs. their goals) and the "how," including the extent to which subordinates "live" and contribute to DynCorp's corporate values. These corporate values are very present within DynCorp, starting with the recruiting process. After a few years where "what" and "how" were weighed 60/40 in the overall appraisal, the weights were recently changed to attribute equal importance, with again a high degree of subjectivity left to the manager.

Kohlemainen (2010) discusses a number of mechanisms that contribute to DynCorp's ability to feature such a high degree of managerial judgment/subjectivity in its performance evaluation and reward system. In particular, she highlights the following dimensions:

- Subordinates are actively involved in the selection of the dimensions over which they will be evaluated and of the performance levels that will be expected of them.
- DynCorp's various systems and processes nurture ongoing dialog between boss and subordinates. This dialog allows for a continuous adjustment



of tactics and targets and ensures that bosses are very well informed about their subordinates' actions and actual performance level.

- These discussions might also allow bosses to try to micro-manage their subordinates. In practice, however, such micro-management is prevented by the fast-paced nature of the industry, the large span of control managers must deal with as well as the fact that such micro-management would be contrary to DynCorp's values, which are taken very seriously by the organization's top management and are enforced by the APE process.
- Empowerment is also supported by small number of measures used. One of the ways managers can restrict their subordinates' autonomy is by setting tight goals on a large number of dimensions. The proliferation of tight goals ends up severely restricting subordinates' ability to take action. DynCorp managers are restricted to a maximum of six dimensions, plus three for discussion only.
- The semi-annual horizon may also contribute to making the subjectivity more manageable for both bosses and subordinates, as events and discussions remain "fresher" in people's minds than when an annual horizon is used.
- Managers have the right to inject their "expert judgment" into the SAPA and APE processes, but they must also document their decisions in writing. They are trained to put DynCorp values into practice and are evaluated on the extent to which they do so.
- Last but not least, [Kohlemainen \(2010\)](#) was struck by the "learning and development" climate that seemed to permeate the organization and, in particular, boss-subordinate relationships. Individuals facing significant performance challenges were not "punished," but rather were helped and coached by their boss who developed and deployed with them a "personal development plan."

DynCorp is but one organization, of course, though one that has managed to remain the global leader for years in an extremely competitive industry. [Kohlemainen's \(2010\)](#) interviewees described these practices as important components of the company's success over the years. Also, somewhat reassuringly, the approach [Kohlemainen \(2010\)](#) describes is very consistent with the findings of years of research in goal setting and SDT. It is also quite congruent with the model I proposed in [Fig. 4](#).

Over the last few years, the accounting and control research community has devoted considerable time, energy, and space in its journals to the study of actual and potential incentive practices. I continue to believe, as do many of the researchers whose work I reviewed above, that this search for the

ultimate compensation contract is (a) largely disconnected from the way most organizations are managed, (b) misguided in that it encourages managers to think of the reward system as a major lever – and even *the* major driver – for behavior, as opposed to one of many levers, which we should make sure does not “stand in the way” and is “generally congruent” with the kind of behavior we are hoping to stimulate, as opposed to being the main driver for this behavior.

So much exciting and insightful work in being conducted in various strands of the psychology, economics, and management literatures that has direct potential implications for the accounting and control community. I hope this chapter provides some opportunity for cross-fertilization.

## NOTE

1. Three commentaries by Kohn (1996), Lepper, Keavney, and Drake (1996), and Ryan and Deci (1996) appeared in the same issue of *Review of Educational Research* arguing that Cameron and Pierce’s (1994) review was flawed and its conclusions inappropriate. Cameron and Pierce (1996) responded in the same issue. Eisenberger and Cameron (1996) wrote in support of Cameron and Pierce, leading Deci, Koestner, and Ryan (1999) to conduct a very extensive review of 128 experiments. The same protagonists went at it one more time two years later, still in the *Review of Educational Research* (Deci, Koestner, & Ryan, 2001; Cameron, 2001; Deci, Ryan, & Koestner, 2001).

## REFERENCES

- Bénabou, R., & Tirole, J. (2003). Intrinsic and extrinsic motivation. *Review of Economic Studies*, 70(3), 489–520.
- Bénabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *The American Economic Review*, 96(5), 1652–1678.
- Cameron, J. (2001). Negative effects of reward on intrinsic motivation – A limited phenomenon: Comment on Deci, Koestner, and Ryan. *Review of Educational Research*, 71(1), 29–42.
- Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward and intrinsic motivation: A meta-analysis. *Review of Educational Research*, 64(3), 363–423.
- Cameron, J., & Pierce, W. D. (1996). The debate about rewards and intrinsic motivation: Protests and accusations do not alter the results. *Review of Educational Research*, 66(1), 39–52.
- Carver, C. S., & Baird, E. (1998). The American dream revisited: Is it what you want or why you want it that matters? *Psychological Science*, 9, 289–292.
- Chirkov, V., Ryan, R. M., Kim, Y., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on

- internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology*, 84, 97–109.
- Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, 18(1), 105–115.
- Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology*, 74(4), 580–590.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, 62(1), 119–142.
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125(6), 627–668.
- Deci, E. L., Koestner, R., & Ryan, R. M. (2001). Extrinsic rewards and intrinsic motivation in education: Reconsidered once again. *Review of Educational Research*, 71(1), 1–27.
- Deci, E., Ryan, R. M., & Koestner, R. (2001). The pervasive negative effects of rewards on intrinsic motivation: Response to Cameron. *Review of Educational Research*, 71(1), 43–51.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Deci, E. L., & Ryan, R. M. (2000). The ‘what’ and the ‘why’ of goal pursuits: human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.
- Deci, E. L., Spiegel, N. H., Ryan, R. M., Koestner, R., & Kauffman, M. (1982). Effects of performance standards on teaching styles: Behavior of controlling teachers. *Journal of Educational Psychology*, 74(6), 852–859.
- Eisenberger, R., & Cameron, J. (1996). Detrimental effects of reward: Reality of myth? *American Psychologist*, 51(11), 1153–1166.
- Frey, B. S. (1997). *Not just for the money: An economic theory of personal motivation*. Brookfield, CT: Edward Elgar Publishing.
- Frey, B. S., & Jegen, R. (2001). Motivation crowding theory. *Journal of Economic Surveys*, 15(5), 589–611.
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331–362.
- Greene, D., Sternberg, B., & Lepper, M. R. (1976). Overjustification in a token economy. *Journal of Personality and Social Psychology*, 34(6), 1219–1234.
- Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- James, H. S., Jr. (2005). Why did you do that? An economic examination of the effect of extrinsic compensation on intrinsic motivation and performance. *Journal of Economic Psychology*, 26(4), 549–566.
- Joussemet, M., Koestner, R., Lekes, N., & Houliort, N. (2004). Introducing uninteresting tasks to children: A comparison of the effects of rewards and autonomy support. *Journal of Personality*, 72(1), 141–169.
- Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology*, 65(2), 410–422.
- Kasser, T., & Ryan, R. M. (1996). Further examining of the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22, 80–87.
- Kerr, S. (1975). On the folly of rewarding A, while hoping for B. *Academy of Management Journal*, 18(4), 769–783.

- Koestner, R., & Losier, G. F. (2002). Distinguishing three ways of being highly motivated: A closer look at introjection, identification, and intrinsic motivation. In: E. L. Deci & R. M. Ryan (Eds), *Handbook of self-determination research* (pp. 101–121). Rochester, NY: University of Rochester Press.
- Kohlemainen, K. (2010). Dynamic strategic performance measurement systems: Balancing empowerment and alignment. *Long Range Planning*, 43.
- Kohn, A. (1993). Why incentive plans cannot work. *Harvard Business Review*, 71(5), 54–63.
- Kohn, A. (1996). By all available means: Cameron and Pierce's defense of extrinsic motivators. *Review of Educational Research*, 66(1), 1–4.
- Latham, G. P., & Locke, E. A. (2006). Enhancing the benefits and overcoming the pitfalls of goal setting. *Organizational Dynamics*, 35(4), 332–340.
- Latham, G. P., & Locke, E. A. (2009). Science and ethics: What should count as evidence against the use of goal setting? *The Academy of Management Perspectives*, 23(3), 88–91.
- Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology*, 28, 129–137.
- Lepper, M. R., Keavney, M., & Drake, M. (1996). Intrinsic motivation and extrinsic rewards: A commentary on Cameron and Pierce's meta-analysis. *Review of Educational Research*, 66(1), 5–32.
- Lindenberg, S. (2001). Intrinsic motivation in a new light. *KYKLOS*, 54, 317–342.
- Locke, E. A. (2004). Linking goals to monetary incentives. *Academy of Management Executive*, 18(4), 130–133.
- Locke, E. A., & Latham, G. P. (2009). Has goal setting gone wild, or have its attackers abandoned good scholarship? *The Academy of Management Perspectives*, 23(1), 17–23.
- Lorange, P. (2002). *New vision for management education: Leadership challenges*. Oxford: Pergamon Press.
- Lorange, P. (2008). *Thought leadership meets business: How business schools can become more successful*. Cambridge: Cambridge University Press.
- Lowe, S. C. (2004). *Marketplace masters: How professional service firms compete to win*. Westport, CT: Praeger Publishers.
- Manzoni, J.-F. (2002a). Management control: Toward a new paradigm? In: M. J. Epstein & J.-F. Manzoni (Eds), *Performance measurement and management control: A compendium of research* (pp. 15–46). Kidlington, Oxford: Elsevier Science.
- Manzoni, J.-F. (2002b). A better way to deliver bad news. *Harvard Business Review*, 80(9), 114–119.
- Manzoni, J.-F. (2008). On the folly of hoping for A, simply because you're (trying to) pay for A. In: M. J. Epstein & J.-F. Manzoni (Eds), *Performance measurement and management control: Measuring and rewarding performance* (pp. 19–41). Bingley, UK: Emerald.
- Merchant, K. A., & Manzoni, J.-F. (1989). The achievability of budget targets in profit centers: A field study. *The Accounting Review*, 64(3), 539–558.
- Ordóñez, L. D., Schweitzer, M. E., Galinsky, A. D., & Bazerman, M. H. (2009a). Goals gone wild: The systematic side effects of overprescribing goal setting. *The Academy of Management Perspectives*, 23(1), 6–16.
- Ordóñez, L. D., Schweitzer, M. E., Galinsky, A. D., & Bazerman, M. H. (2009b). On good scholarship: Goal setting, and scholars gone wild. *The Academy of Management Perspectives*, 23(3), 82–87.

- Pink, D. H. (2009). *Drive: The surprising truth about what motivates us*. New York, NY: Riverhead.
- Prendergast, C. (1999). The provision of incentives in firms. *Journal of Economic Literature*, 37(1), 7–63.
- Rost, K., & Osterloh, M. (2009). Management fashion pay-for-performance for CEOs. *SBR*, 61(April), 119–149.
- Rummel, A., & Feinberg, R. (1988). Cognitive evaluation theory: A meta-analytic review of the literature. *Social Behavior and Personality*, 16, 147–164.
- Ryan, R. M., & Deci, E. L. (1996). When paradigms clash: Comments on Cameron and Pierce's claim that rewards do not undermine intrinsic motivation. *Review of Educational Research*, 66(1), 33–38.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Sheldon, K. M., & Kasser, T. (1995). Coherence and congruence: Two aspects of personality integration. *Journal of Personality and Social Psychology*, 68, 531–543.
- Sheldon, K. M., Ryan, R. M., Deci, E. L., & Kasser, T. (2004). The independent effects of goal contents and motives on well-being: It's both what you pursue and why you pursue it. *Personality and Social Psychology Bulletin*, 30(4), 475–486.
- Simons, R. (2000). *Performance measurement & control systems for implementing strategy: Text and cases*. Upper Saddle River, NJ: Prentice Hall.
- Srivastava, A., Locke, E. A., & Bartol, K. M. (2001). Money and subjective well-being: It's not the money, it's the motive. *Journal of Personality and Social Psychology*, 80(6), 959–971.
- Stone, D. N., Deci, E. L., & Ryan, R. M. (2009). Beyond talk: Creating autonomous motivation through self-determination theory. *Journal of General Management*, 34(3), 75–91.
- Tang, S.-H., & Hall, V. C. (1995). The overjustification effect: A meta-analysis. *Applied Cognitive Psychology*, 9(5), 365–404.
- Titmuss, R. M. (1970). *The gift relationship*. London: Allen and Unwin.
- Upton, W. E. (1973). *Altruism, attribution and intrinsic motivation in the recruitment of blood donors*. Doctoral Dissertation, Cornell University.
- Upton, W. E. (1974). Altruism, attribution and intrinsic motivation in the recruitment of blood donors. In: *Selected readings in donor recruitment* (Vol. 2, pp. 7–38). Washington, DC, American National Red Cross.
- Vansteenkiste, M., Zhou, M., Lens, W., & Soenens, B. (2005). Experiences of autonomy and control among Chinese learners: Vitalizing or immobilizing? *Journal of Educational Psychology*, 97, 468–483.
- Vasteenkiste, M., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supported contexts. *Journal of Personality and Social Psychology*, 87(2), 246–260.
- Weinberger, D. (2007). The folly of accountablism. In D. J. Watts & Y. Hori, et al., *The HBR List*. *Harvard Business Review*, 85(2), 20–54.
- Wiersma, U. J. (1992). The effects of extrinsic rewards in intrinsic motivation: A meta-analysis. *Journal of Occupational and Organizational Psychology*, 65(2), 101–114.
- Zehnder, E. (2001). A simpler way to pay. *Harvard Business Review*, 79(4), 53–61.

**APPENDIX. LIST OF DIMENSIONS IDENTIFIED IN  
VARIOUS STUDIES AS AUTONOMY SUPPORTIVE**

- Understanding and acknowledging subordinates' perspective (needs and feelings)
- Encouraging opportunities for employees to take initiative (make choices and solve problems)
- Minimizing pressure and controls
- Offering choice
- Giving meaningful rationales
- Giving noncontrolling informational feedback
- Facilitating employee's identification with the group
- Increasing the subordinate's self-efficacy
- Linking work values to the subordinate's values
- Structuring work to allow interdependence among employees and identification with work groups.



# THOUGHTS ON THE STRUCTURE OF MANAGEMENT SYSTEMS TO ENCOURAGE CREATIVITY AND INNOVATION

Antonio Davila

## ABSTRACT

*Management accounting and control systems play a relevant role in the creative side of the innovation process. However, the traditional paradigm of this research field focused on optimizing efficiencies in the organization if it runs into problems when confronted with creativity. To progress on our understanding of the role of these systems in creative settings, our assumptions need to be challenged. Studies have to look at new systems and also reinterpret the role of traditional tools such as budgets and incentives. The focus of the researcher will change from the design of the tools themselves to their use and the interaction of these tools with concepts such as inspiration, identity, and social trends. Successful organizations today rely to a larger extent on creativity and innovation to gain competitive advantages and also combine an environment supportive to this new competitive dimension with a relentless focus on execution. They manage this organizational duality of systems to maintain a delicate equilibrium between chaos and routine.*

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## 1. INTRODUCTION

The first part of the 21st century has reinforced the shift for value creation from organizations excellent at standardizing, mass production, and efficiency to organizations that compete on new concepts that engage the customer and shift her attention from price to functionality and aesthetics. A CEO from a successful fashion company indicated that only one company can be the low cost producer, “the rest of us, he said, have to surprise our customers.” However, we still carry a significant heritage from this management view created in the early part of the 20th century. Income statements have one line for revenues and multiple lines to explain costs, reflecting this view of detailing efficiencies rather than value creation.

Management accounting and control is not an exception. Its conceptual framework was developed during the early period of industrialization. Even if at some point it might have lost its relevance, its regained significance meant a retooling of the existing mechanisms, rather than a break with its view on how organizations work (Johnson & Kaplan, 1991).

The premise of this article is not that the knowledge developed under this paradigm is not relevant anymore. On the contrary, these concepts are both important and useful because efficient use of resources will remain a cornerstone of management. Even these new organizations that compete on delighting the customer are also very good at execution. Additional research is needed and should be welcome to further improve the organizations’ ability to manage resources. Rather, the premise of this article is that this new organizational landscape requires a new paradigm in management accounting and control (Kuhn, 1962). This paradigm will examine how the information environment, the various types of control mechanisms from basic economic incentives to more elaborate boundary and belief systems (Simons, 1995) can support and enhance the efforts to create new concepts.

The objective of this article is to support the need to think about how this new paradigm will look like. It does not attempt to outline these new concepts; the empirical evidence and the accumulated theoretical work are still too sparse to venture. In an effort to interest the reader about the new roles that management accounting and control is playing in these companies, the article contrasts these roles to the ones that these management tools have in the “efficiency” paradigm. Next, it gives an overview of the creativity literature highlighting those concepts that might be relevant to build the “creation” paradigm. This overview of creativity does not mean that this is the only literature relevant to this view on management accounting and control. It is discussed because creativity and control have often been viewed as opposites

that do not mix, much like oil and water. Yet, creativity has become an important aspect of organizations that surprise the customer. It is not the only aspect. The ability to execute is paramount to value creation and the “efficiency” paradigm dominates here. As Edison put it, genius is 1% inspiration, 99% perspiration. Yet this 1% is gaining relevance in organizations. And tools for executing strategy have to be built to respect and protect this 1% that makes the difference when dealing with the customer. The final section of the article provides examples that illustrate some thoughts on how these new concepts might look like. At this point, these thoughts are based on observations and clues that have appeared during my own research and that of my colleagues. As they are not based on systematic data collection and well-defined research questions, they remain thoughts.

## **2. CONTRASTING PARADIGMS**

The purpose of management accounting and control systems differs across the “efficiency” and the “creation” paradigms. The “efficiency” paradigm was built on the premise that certain people plan and design (managers and engineers) while others execute (line people). This idea intimately associated with Taylorism was later picked up in the early work on strategy (Andrews, 1971). In the management control literature, this tradition was picked up in the feedback model associated with the thermostat metaphor (Ashby, 1960). The objective of management control (Anthony, 1965) is to align goals and implement the strategy designed at the top as efficiently as possible. On the management accounting side, detailed cost information allows managers to assess whether efforts to redesign processes and products reduce costs or increase revenues. Nonfinancial measures are relevant as they provide leading information about this dual objective. For instance, quality measures monitor the causes of quality costs and visibility over these drivers enhances management efforts to reduce these costs. Similarly, nonfinancial measures associated with revenue-enhancing efforts are often focused on the delivery process: time to market, delivery time, customer complaints, or customer satisfaction. Seldom have these measures gone into leading indicators of product, service, or business model success; or measures of innovation risk. The objective of management accounting information is often to see through the organization to discover opportunities to improve execution. The assumption behind this need to see through is the separation between the people who analyze, design, and decide the strategy – who need access to this information to do their job – and the people that implement the strategy who

physically interact with processes and activities but are assumed to lack the motivation and/or the skills to participate in strategy formation. A more cynical view of this assumption, which might be right in certain settings, is that these tools are not to move information to those people motivated and skilled, but rather for those people who are unskilled to exert their power and maintain their privileged access to resources by controlling information and capturing knowledge (Baxter & Chua, 2003).

Various concepts in management control characterize the “efficiency” paradigm. Budgets are set to provide early warnings of potential deviations that need to be investigated because something unplanned is happening. Unfavorable variances are often interpreted as bad because processes were not executed as expected. Somebody in the execution team did not do what he was supposed to. Favorable variances are often seen as lucky events that helped the organization deliver above expectations. Markets turned to be better than expected or somebody found a way to improve processes and this knowledge is quickly moved to the designers (top management).

The concept of agency costs is also characteristic of management control within this paradigm. Agency costs are associated with the separation of ownership and control. Delegation is a second best solution because the agent’s objectives are not fully aligned with those of the principal and efficiency is lost. The role of performance measures in agency relationships is to write contracts between the principal and the agent. The ability of these measures in capturing the effort and the information of the agent and the design of the contract determine the efficiency loss. A common assumption is to picture the agent as effort averse who will only exert effort if the payoff is larger than the cost of effort. This assumption is relevant in that economic incentives become a critical piece in designing organizations. Effort aversion is not a required characteristic of agency research and the use of economic incentives neither. Yet, these two characteristics are often implicit in the interpretations of theoretical models. Another common (although not necessary) assumption is to model the agent as risk averse who values stability and avoids uncertainty.

Other concepts are also characteristic of this efficiency paradigm, often rooted in the economics discipline. The concepts of economies of scale or learning curves are supported through efficiency arguments. Economies of scale arguments lead to larger organizations that take advantage of costs decreasing with size. Learning curve arguments lead to standardization to reduce costs through accumulated volume. These concepts are built upon the idea of efficiency at the expense of variety, experimentation, and discovery of business models.

Contingency theory in management accounting research also implicitly relies on the assumption of efficiency. The hypotheses that predict certain management tools being better fitted to certain settings are often based on efficiency arguments. Fit happens when the lowest cost configuration is adapted to the particular environment that the organization is embedded in. Empirical evidence is mostly consistent with these arguments. This evidence reinforces the idea that the “efficiency” paradigm is highly relevant to organizations. However, looking at the world only through this lens misses certain aspects of management accounting and control that are becoming more relevant and, more importantly, are giving successful organizations the edge over competitors.

The “creation” paradigm contrasts with the earlier view. Management accounting and control are tools to stimulate ideas and communicate knowledge. It shares with Simons’ concept of interactive system the characteristic of supporting search efforts. However, this idea goes all the way down to creative teams in fashion companies, to cross-functional teams that scout the world for new ideas in technology companies, or to business development teams in infrastructure management companies looking for new services for their customers. It also differs in that these management tools do not necessarily focus on the search effort but combine stages of convergence and divergence. At certain stages, they create an organizational environment to have people focus on meeting deadlines or functionality goals. At other stages through the processes, they encourage variance when people are looking for new concepts. The challenges are how to sequence this divergence–convergence through time and how to avoid divergence becoming scattered energy and convergence becoming narrowness. Simons’ concepts of belief and boundary systems become relevant to manage these tensions.

Another aspect that characterizes this alternate view is the belief that analysis, design, and decision around strategic options are dispersed around the organization (and outside the organization). If everybody can perform the task of creating, then management accounting and control will move information throughout the organization not only to “see through” the hierarchy but to identify and fund opportunities. Management control systems identify these ideas, move them to the people with decision rights about resource allocation, and support the implementation of those that are most attractive. The bottom-up role is not any more to control strategy implementation, but to facilitate strategy formation.

The shift from efficiency to creation has significant implications on the design of management accounting and control. The objective is not to find inefficiencies, mistakes, or implementation failures; the objective is to

experiment and learn from these experiments to discover new dimensions of customer value, new deployments of the company's capabilities to access new segments or new markets, or new ways to structure the business model. Variances are not to find a person responsible for the mistake or to codify new knowledge and extract the rents associated with it. Variances are opportunities to learn as a team. The emphasis on teams highlights the variety required to create that is seldom isolated in one person. Management accounting information looks outside rather than inside and the mix of revenues, customers' buying patterns, or competitors' products become more relevant internally than the cost lines.

The concept of coercive versus enabling bureaucracy (Adler & Borys, 1996) speaks to a shift where management accounting and control provides an information and motivational environment for people to feel confident about the compromise of the organization toward them and their capabilities. The focus moves from avoiding mistakes and hiding them to avoid being penalized to managing and understanding risk. Failures are not seen as inefficiencies that should have been avoided but as outcomes associated with creation. Management systems are not designed to avoid failures but to manage risk. Moreover, these systems are adapted to the level of risk. Systems for incremental innovation with low levels of risk and high knowledge are very different from those for radical innovation with high levels of risk and low knowledge.

The concept of agency and divergence of objectives is also toned down in favor of a team perspective. Management systems reinforce the identity that brings together the organization (and each team within the organization). They focus on the commonalities among colleagues rather than on their differences. As illustrated in Section 4, team identity is not to be mixed up with lack of economic incentives and straight salaries. Actually, these compensation policies may easily lead to people disengaging from the team because they are perceived as unfair. The fact that economic incentives have often been interpreted within an agency framework does not mean that this is the only interpretation or the one that best reflects reality. More importantly, lack of incentives and straight salaries can be as damaging as badly used incentive systems.

The "creation" paradigm is not to replace the "efficiency" paradigm. It is not that the latter one is bad or outdated and the former good and the way into the future. The challenge is to combine both paradigms within an organization and to mix them in the most responsive way given the organization. The weight on creation is different for a fashion design company compared to that for a public service. The meaning of creation for

the design of management systems is also different in a software company compared to that in a biotech firm. Successful organizations have realized the importance of both of these paradigms in designing their management accounting and control systems. They have “efficiency” systems that do not undermine “creation” systems and conversely “creation” systems do not overrun “efficiency” systems to put the company at too much risk. These organizations have temporarily found the right equilibrium between these contrasting forces.

### **3. CREATIVITY RESEARCH**

Creativity research itself goes way back into the past (Galton, 1869). The initial interest was on what made individuals creative; individual creativity is still today a very fertile ground for research (Zhou, 2007). The progress in the psychology of creativity become relevant to management accounting and control systems because of their impact on the working environment of people. Research has also evolved toward society as a whole and why certain societies and certain periods in history have been more prone to creative activities than others (Simonton, 2007).

Organizational creativity is a fairly recent field (Metha, 2009). Its objective is to study what makes certain organizations come up with more creative solutions that are often translated into innovations and value creation. Amabile (1996) addresses this question from a social psychology perspective studying the impact of the individual’s environment into his creative results. She identifies three components of creativity. The first component is domain-relevant skills such as factual knowledge, technical skills, and special talent. Second, creativity relevant processes such as cognitive style, application of heuristics and working style are not task specific but associated with the personality and work habits. Third, task motivation that drives the person to engage and express creative actions. Amabile highlights the role that intrinsic motivation plays in enhancing task motivation. Intrinsic motivation is associated with aspects such as intrinsic engagement, autonomy, goal orientation, and self-regulatory mechanisms. Selection and training systems are most relevant control systems to the first two components, while performance measures, incentives, boundaries, team identity, resource availability, or inspirational systems are most relevant to task motivation (Davila & Ditillo, 2010). Woodman, Sawyer, and Griffin (1993) highlight the characteristics of the group where the person is engaged such as composition, processes, and organizational context (including management systems) as

relevant sociopsychological factors to individual creativity. The idea that the context influences individual creativity has been extended including factors classified into field variables such as the people around and domain variables including rules, symbols, and common practices (Csikszentmihalyi, 1996). The people in the field change the domain as they adopt or reject creative acts. Ford (1996) extends this idea and proposes that creativity is a subjective judgment of the people in the field through sensemaking. Creativity becomes a social construct that organizations and society create. Management control systems are the repositories of many of these rules and symbols (performance measures) and through their changes managers influence the creative domain of organizational members. The interaction with external constituencies also becomes an important aspect of creativity and again management systems often play a relevant role in structuring these relationships and moving the information through the company.

Unsworth (2001) has suggested to look at creativity not as a uniform construct but as a meta-concept that groups different concepts. She identifies four types of creativities depending on whether the idea is open or closed and the driver of engagement as external or internal: expected creativity, responsive creativity, proactive creativity, and contributory creativity. The specific taxonomy is not as relevant as the proposed unpacking of creativity. The multidimensional nature of the concept suggests alternative taxonomies, which may help in better understanding the variation of management systems and their functionality in creative settings.

Bechky & Hargadon (2006) extend the concept of collective mind to collective creativity where the collective effort adds beyond the sum of the individual through four interrelated activities: help seeking, help giving, reflective reframing, and reinforcing. Again, the role of management systems in these four activities goes beyond their traditional remoteness to creativity.

Finally, Metha (2009) in his dissertation provides an important element to further understand individual creativity in organizational contexts. Starting from role theory, he uses an ethnographic research methodology to identify when and why people engage in or refrain from creative actions. He describes how people's initial role enactment determines their predisposition toward creativity. Some enactments exclude creativity, while others include it. However, as interactions happen, this initial enactment changes through the experience of the individual within the group. Individuals may reinforce their original enactment of their role, they may also exclude creativity from their original role definition if they perceive nonreception or rejection of his ideas (role contraction), or they may redefine their role to include creativity if the reaction to expressing an idea is positive (role expansion). He further

examines the evolution of creative contributions from different individuals and teams as leadership evolves through changes in the problems that the organization faces. Here again, management systems are an important element in structuring roles and interaction between people. They may be designed to purposely exclude contributions and forcing role contractions or they may encourage ideas supporting role expansion into creative acts.

This quick overview of creativity research highlights the dynamic nature of theory evolution in this field. As creativity within organizations has gained in relevance, new concepts are emerging to better understand the phenomenon. But more interestingly, this evolution refers to and reinforces the role that the organizational environment and management control systems as critical components of this environment. The field's constant reference to the context of the individual and even to the idea of organizational creativity suggests that these systems are not irrelevant or peripheral to the phenomenon, but central to it. The suggested roles are consistent with a "creation" paradigm, yet the absence of a management systems' research framework and the extended belief that control systems are grounded on an "efficiency" paradigm have fully ignored the important role that these systems play in creative environments.

#### **4. SOME THOUGHTS ON THE NEW VIEW ON MANAGEMENT ACCOUNTING AND CONTROL**

This section provides some examples as to how the same management accounting and control tools are interpreted in a very different way across organizations. These examples are then used to illustrate aspects of these tools that this different view on management accounting and control might emphasize.

Stock-related securities are sometimes distributed in for-profit organizations to people working at the company. However, the interpretation given to them differs. One high-growth startup company emphasized their incentive properties. These securities aligned all the employees around value creation as reflected in stock price. They were linked to a performance measure – stock price – that reduced the divergence between owners and employees (making these latter also owners). They granted the company the "right" to have employees work hard and long hours because their effort was translated into value for each employee. The "efficiency" paradigm transpires through the idea of alignment between owners and employees or the reward for effort associated with working long hours. This view of



stock-related securities is not uncommon. Most arguments for granting these securities to managers are based on variations grounded on the idea of reducing agency costs such as aligning incentives. In this particular company, a severe downturn in the stock market (bursting of the Internet bubble) led to a drop of more than 80% of the stock price and a high turnover among employees who saw their incentive dilute in the drop.

Contrast the above interpretation of stock-related securities with the following case. The company, also fairly young, grounded its growth on designing and delivering innovative products. It also relied heavily on this type of securities. Yet, its objective was to give employees the opportunity to share on the gains that they contributed to create. In creating value, especially companies relying heavily on creativity and people's ingenuity, people put a lot of personal energy into the project. Value comes from sharing on a common effort, the organization benefits from this sharing among employees with very different skills. The idea of a fixed salary to avoid the unwanted consequences of these securities was discarded. People quickly realize that the company is good at sharing the effort but bad at sharing the gains and as soon as they learn this, they lower their energy to what they are paid for. One way to rewarding people for their contribution was to share with them on the potential gains. These securities were not intended to motivate or to give any right to demand long hours, but a way to fairly distribute the value created. They were but one piece of a more elaborate motivational system where the vision of the company, recognition elements, and passion for work also carry an important weight.

The following example illustrates how the "efficiency" and "creation" paradigms affect the design of management systems that move information bottom-up. The first company, a successful software company, relied exclusively on an "efficiency" paradigm. Plans were decided at the top of the organization and then cascaded down through objectives for each manager. A recently hired manager came up with an idea to open up an attractive geographic market that the company had so far ignored. She walked into the meeting with her boss to set her quarterly objectives with the idea. Her boss walked with the objectives that he needed her to reach in order to reach his own objectives. Most of us would think that the boss discarded her idea as soon as she mentioned it; the objectives coming from the top were more relevant than her particular idea. The outcome was actually worse. The boss readily appreciated the idea and tried to be responsive to it. She came out of the meeting with all the objectives that her boss had come into the meeting with plus an additional objective: her idea. Because her idea was the last priority in the list, it became 5% of her bonus; in other words, she could only

devote 5% of her time (it would take her about 5 years to make some initial progress on her idea). This manager went into the meeting with an idea and came out with more work and no resources to execute it. This outcome is not that uncommon, every time we suggest an idea to our boss and he responds saying that it is great and that we should do it (without removing any of the other responsibilities) mimics what happened. The system is designed to kill any top-down initiative in an effort to be efficient.

Contrast the above example with another company that believes on the value of ideas coming from all over the organization. In this company, they send groups of engineers and marketing and sales managers to trade shows, customer visits, and visits to distributors to look for ideas. They mix technology and market to have both sides of innovation. If these groups find an interesting idea, they prepare a business plan and they present it to top management. If the idea is considered worth exploring further, the team gets a certain amount of money as well as a significant proportion of their time (often in the range of 80%) to start the exploration. Once they run out of resources, they go back, present their progress and top management decides whether to keep on funding the idea. The process is similar to the funding process of startup companies.

A final example illustrates the relevance of management accounting and control in creative settings. The company competes in the fashion industry through a unique style proposition and growth rates above 80% per year. The cycle requires two collections every year as well as multiple “refreshments” in between. The success of the company depends on the success of each collection and the company is at risk every season (half a year). The creative team is made up of a core team surrounded by other teams that specialize in purchasing, prototyping, or computer design. The company carefully crafts the environment of the team: what is the driving metaphor for the collection, trips to different parts of the world to get fresh ideas, or the interaction among team members (the performance of a member depends on her contribution to the group rather than the success of her designs). Yet, the environment is not only crafted through these inspirational tools. The team also works with clearly set deadlines, information about the best sellers of the last collection (with the idea of having at least a good percentage of the collection based on these best sellers to limit risk), color palettes, and material cost information. It also interacts with people in the prototyping and computer design to check on the manufacturability of the proposed ideas and its final look. In parallel, the company runs a sophisticated, information-intensive logistic system with real time information on sell out from retail outlets to coordinate the overall system spread throughout the world.

This example illustrates the relevance of systems embedded in the creative environment – how the creative process itself is structured around stages that are well defined and follow a convergence–divergence cycle converging into a topic then diverging looking for ideas in their trips, converging into a collection structure (based on last collection’s best sellers), diverging again into individual designs, and converging into the final collection. It also illustrates the organizational duality where systems based on a “creation” paradigm coexist with systems based on an “efficiency” paradigm in the logistic side of the business. In addition, the “efficiency” paradigm enters the creative environment through boundaries around costs, deadlines, and previous collection’s information. The “creation” paradigm also enters the business side through unconventional and creative marketing campaigns.

These examples suggest several thoughts on the role of management accounting and control:

1. The sensitivity to the external world, through participation in trade-shows, inspirational trips, analysis of customers’ behavior, and product preferences is a trait that stands out. Management systems to enhance new ways of creating value are likely to have an external focus. This is in contrast to the design of systems to enhance organizational efficiency that looks internally. The contrast is whether the information focus is the revenue line or the cost line. Management accounting to support creative environments will need to shift from an internal to an external focus. Tools such as the balanced scorecard are about implementing strategy: how the organization will execute a plan. It does have some external information in the customer perspective, but with an internal view: how do customers see our organization. An external focus requires a structured view of players in the market. The Landscape Scorecard (Davila & Oyon, 2009) proposes a systematic way to map the environment and track the main actors around: partners, regulators, entrepreneurial companies, market, and competitors view as well as the internal view that captures ideas from the organization.
2. The optimistic perspective on the brainpower of organizations. Creativity is not exclusive to top management or a certain department. It may come from anywhere within or outside the organization. For management systems, it means that the information flowing from the bottom is not only about whether there are variances against plan. These systems must be rich enough to move ideas and opportunities. Their use has to be such that this information is translated into face-to-face interaction and resource allocation decisions.

3. Performance measures are not as much about efficient use of resources but more about sizing and managing risk. The objective is not to define output–input ratios but to define risk profiles and project portfolios that reflect the risk profile of the company.
4. Most of the same tools are present in creative environments. There are budgets, measurement systems, or incentive systems. However, their use is different. For instance, incentives are not about extracting information out of intrinsically lazy people that do not really want to collaborate, but about being fair in how effort and gains are shared. Budgets are not about blaming them about variances being associated with problems, they are boundary systems that might or might not be hit. Behavioral controls are not to limit opportunistic behavior but to define the field of creation.
5. The “magic” of companies that manage creativity is not in the particular management accounting tools that they adopt – most of them are the same at least in their label. It is not only how they use them, where there is a significant change compared to the “efficiency” paradigm. The most attractive research question is the dynamic interaction of these tools among themselves and their use in supporting “soft” variables such as identity, customer delight, exploration, trends, fashion, and risk.
6. Finally, creative environments require management accounting based on a “creation” paradigm as well as on an “efficiency” paradigm. Creation without execution does not become value. The interesting question is how to create dual companies where these somewhat contrasting paradigms work together.

## **5. CONCLUSIONS**

Edgar Degas said: “Only when he no longer knows what he is doing does the painter do good things.” Organizations will have to get close to the edge where they do not know exactly what they are doing. Efficiency will be a competitive position for a few companies around the world. The others will have to compete on bringing new ideas to the market. But creativity cannot be planned or structured. It needs guided freedom and discipline to translate it into value generating opportunities.

As organizations move toward generating value at the top line rather than through reducing costs, management accounting and control will have to change the paradigm to think about its role in organizations. The traditional focus on the inside, cost lines, and processes will not go away; but it will need to be complemented with a view toward the outside, inspiring and

stimulating their people, the revenue lines, the landscape that opens and closes windows of opportunities and threats. The good news for management accounting and control researchers is that there is a new paradigm that needs to be built through which research will be able to influence practice.

## REFERENCES

- Adler, P. S., & Borys, B. (1996). Two types of bureaucracy: Enabling and Coercive. *Administrative Science Quarterly*, 41(1), 61–89.
- Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview Press.
- Andrews, K. R. (1971). *The concept of strategy*. Homewood, IL: Irwin.
- Anthony, R. N. (1965). *The management control function* (1st ed.). Boston, MA: Harvard Business School Press. (Revised edition in 1988).
- Ashby, W. R. (1960). *Design for a brain, the origin of adaptive behavior*. New York, NY: Wiley.
- Baxter, J., & Chua, W. F. (2003). Alternative management accounting research – whence and whither. *Accounting, Organizations and Society*, 28, 97–126.
- Bechky, B. A., & Hargadon, A. B. (2006). When collections of creatives become creative collectives: A field study of problem solving at work. *Organization Science*, 17, 484–500.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York, NY: Harper Collins.
- Davila, A., & Ditillo, A. (2010). *Creativity and control: How management systems structure creation processes*. Barcelona, Spain: IESE Business School.
- Davila, A., & Oyon, D. (2009). *The Landscape Scorecard: Measurement systems in dynamic environments Barcelona*. IESE Business School Working Paper.
- Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review*, 21(4), 1112–1142.
- Galton, F. (1869). *Hereditary genius*. Macmillan.
- Johnson, T. H., & Kaplan, R. S. (1991). *Relevance lost: The rise and fall of management accounting*. Boston, MA: Harvard Business School Press.
- Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago, IL: University of Chicago.
- Metha, K. (2009). *Role evolution and idea generation. Exploring the process of creativity through ethnography*. Barcelona, Spain: IESE Business School.
- Simons, R. (1995). *Lever of control: How managers use innovative control systems to drive strategic renewal*. Boston, MA: Harvard Business School Press.
- Simonton, D. K. (2007). The social context of innovation. In: T. Davila, M. Epstein & R. Shelton (Eds), *The creative enterprise: Managing innovative organizations and people* (pp. 155–170). Westport, CT: Praeger Publishers.
- Unsworth, K. (2001). Unpacking creativity. *Academy of Management Review*, 26(2), 289–297.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *The Academy of Management Review*, 18(2), 293–321.
- Zhou, J. (2007). Leading for creativity: An employee-manager dyadic approach. In: T. Davila, M. Epstein & R. Shelton (Eds), *The creative enterprise* (Vol. 2, pp. 17–36). Westport, CT: Praeger.

**PART II**  
**INNOVATION AND MANAGEMENT**  
**CONTROL**



# THE INTRODUCTION OF INNOVATIVE PERFORMANCE MEASUREMENT AND MANAGEMENT CONTROL SYSTEMS: THE ROLE OF FINANCIAL INVESTORS AND THEIR ACQUIRED COMPANIES

Selena Aureli

## ABSTRACT

*Purpose – This study aims to investigate the role of private equity and venture capital (PE/VC) operators in the introduction of innovative and sophisticated performance measurement and management control systems (MCSs) within their acquired companies.*

*Methodology/approach – Contingency theory suggests that PE/VC operators represent an important factor of change in a company's control system as they set the motivation for change and facilitate the transformation process within management systems. This study uses an explorative case study to verify this hypothesis. Data are derived from interviews with managers and public information.*

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*Findings – Results demonstrate that PE funds promote the adoption of advanced MCSs such as the Tableau de Bord. Their aim is both to monitor and guide the acquired companies while sustaining their managers' decision-making process. However, company managers can be a critical variable in the process of change. At the same time, the case study confirms that PE/VC funding is positively correlated with the growth of acquired companies.*

*Research limitations/implications – Results are limited to the analysis of a single case study, representing a starting point for further research in other industries and countries.*

*Originality/value of paper – This study sheds light on the role of PE/VC operators in promoting the adoption of MCSs. Moreover, it suggests that despite their supposed short-term orientation these operators invest in the implementation of time-consuming and expensive MCSs.*

## 1. INTRODUCTION

Over the last decade the Italian private equity and venture capital (PE/VC) market has been characterized by intense activity, with small- to medium-sized enterprises – the so-called middle market – as the main targets (Del Giudice & Gervasoni, 2005).<sup>1</sup> Even if the Italian PE/VC market is smaller than in other European countries (on average, funds invest 3 million euros each year in Italy), it usually registers a significant number of transactions per year – reaching 400 investment deals in 2008. At the same time, funds and venture capitalists have become more involved with the acquired companies, confuting their reputation of being “hands-off” stakeholders (conservative and non-interfering) compared to their US colleagues (Bottazzi, Da Rin, & Hellmann, 2004).

Among the various reasons behind this high degree of PE/VC fund involvement in their investee or target companies, the most significant are:

- the need to increase control over acquired companies in order to overcome information asymmetries and the risk of moral hazard when dealing with smaller and unstructured enterprises unused to disclosing company information;
- the opportunity and necessity to guide and sustain target companies actively in order to gain expected returns on investments (despite their

potential these companies do not have the managerial competences needed to pursue a path of rapid growth in today's global, turbulent, and complex competitive environment).

PE/VC funds can take advantage of different instruments to monitor and guide acquired companies, ranging from the establishment of new corporate governance rules, the creation of an advisory committee, the nomination of an external auditor, and the selection of board members (Lerner, 1995; Fried, Bruton, & Hisrich, 1998), to the introduction of management control systems (MCSs) and performance measurement reporting (Jones, 1992; Alvino, 1999).

These instruments are fundamental control tools that help keep things on track. However, PE/VC funds can also use them as dedicated instruments to promote the upside potential of the firm. New board members can contribute to the identification and review of new corporate strategies, while innovative MCSs set up by the institutional investor can better support managers' decisions (e.g., introducing a feed-forward approach) and help them in the identification of qualitative and intangible contemporary key success factors (KSFs).

Traditional accounting control systems may be insufficient to this end. They might be suitable for reporting purposes regarding routine activities but fail to provide guidance to the firm in today's competitive world since they describe the results of past actions and focus mainly on a firm's internal aspects. Thus, PE/VC operators may represent a key factor in encouraging (or imposing) additional and innovative planning and control systems within acquired companies. They may act to monitor the achievement of economic and financial objectives and provide a set of managerial tools important for the direction and functioning of a growing organization.

In order to understand to what extent PE/VC operators contribute to the adoption of innovative MCSs, we decided to analyze the case of an Italian shipyard company, which has received investment from an international PE fund and in which the Tableau de Bord (TdB) management system has been introduced. In particular, this case analysis will allow us to examine the role of the PE/VC operator in relation to different contingency factors that can drive changes in MCSs and to verify if this subject has introduced more sophisticated performance measurement and control systems mainly to improve control over the target company or to help managers face external changes better. Moreover, this case study will help us compare the actual structure and use of this tool with those suggested in the normative literature.

Despite intrinsic limitations due to the qualitative methodology chosen, this study sheds light on how variables that drive the adoption of innovative management tools really act within organizations.

The paper begins with an overview of previous studies that have described the emergence of innovative MCSs focusing on the distinctive characteristics of the Balanced Scorecard (BSC) model proposed by Kaplan and Norton (1992) and its French precursor, the TdB. It then surveys management control literature that has analyzed factors driving change in control tools. The research methodology is presented in Section 3, and Section 4 describes the case study used to illustrate the implementation of the TdB longitudinally. Section 5 is dedicated to the analysis of evidence from the case study and discusses the role of the PE fund along with other variables that have contributed to the introduction and deployment of a new MCS. The last section summarizes the major conclusions of the study.

## 2. THEORETICAL BACKGROUND

### *2.1. From Traditional Accounting Control Systems to Balanced Scorecard Methods*

Management control was defined by Robert Anthony (1965) as “the process by which managers ensure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s objectives.” MCSs have been commonly viewed as mechanisms designed to support the implementation of strategy at the management level, while conceptually separating management control from strategic and operational controls. Within this framework, MCS research has focused mainly on accounting information produced primarily to measure cost efficiency and financial performance, while ignoring external aspects of the business.

When business conditions in the 1980s changed as globalization, demand for customization, quality, and speed revealed many limitations in traditional management accounting, it became evident that a review of this concept was necessary (Hayes & Abernathy, 1980; Johnson & Kaplan, 1987). MCSs became more important in both the formation, implementation and control of strategy (Otley, 1994) as many authors began to demonstrate that lower-level employees should also be involved in strategically significant activities in order to reduce the gap between strategic plans and day-to-day actions (Merchant, 1985; Simons, 1991). In addition to this, strict competition based on differentiation and flexibility suggested that performance measures

needed to shift from measures that focus on financial performance (which represent consequences of past actions) to measures that are able to capture new critical success factors related to customer demand and customer satisfaction (which can provide an insight on the company's future ability to compete and survive) (Chakravarthy, 1986; Palmer, 1992).

Thus, researchers proposed modern approaches that broaden the areas of operation of MCSs and include non-financial indicators in order to provide managers with an integrated system that can directly support the strategic priorities of the business and drive attention more toward the future of the company rather than hinder it by excessive focus on past performance (Merchant, 1985; Nanni, Dixon, & Vollman, 1992; Kaplan & Norton, 1992; Meyer, 1994).<sup>2</sup>

Among the different management tools developed by researchers and practitioners to align employee goals with strategy, important contributions are the Performance Measurement Matrix (Keegan, Eiler, & Jones, 1989), the Performance Pyramid (McNair, Lynch, & Cross, 1990), the Integrated Performance Measurement Systems (Bitici, Carrie, & McDevitt, 1997), and the Performance Prism (Neely & Adams, 2001). The most famous management model, however, is the Balanced Scorecard (BSC) proposed by Kaplan and Norton (1992, 1996).

The BSC has its roots in the work of Johnson and Kaplan (1987) who realized that traditional accounting measurement systems are largely irrelevant because they focus on financial measures while ignoring clients and their needs. They affirm that financial measures alone are not sufficient to evaluate a company's performance, thus reporting should also include measures regarding new competitive factors such as competence and knowledge, customer satisfaction, operational efficiency, and innovation. In 1992, Kaplan and Norton decided to include these business dimensions in the four fundamental perspectives analyzed by the BSC model: finance, customers, internal business processes, and learning and growth perspectives. These dimensions are conceptually linked to each other by causal relationships. In fact, the model assumes that organizational learning and growth are drivers of improvements in internal business processes and that these processes, in turn, drive customer satisfaction, while the customer dimension influences financial results.

Since this procedure implies that strategy is translated into a set of hypotheses about cause and effect relationships, the BSC has evolved from a mere measurement system and a tool for management reporting (as initially proposed) to a strategic instrument that companies use to set and implement strategy at the operational level, aligning the entire organization with the

company's goals (Kaplan & Norton, 1996). One important advantage of the BSC is to translate strategy into objectives and measures in a cascade process from top-level functions to the single lower-ranking individual.

To summarize, the BSC is a strategic control system that has the merit of balance between financial metrics and non-financial metrics and between internal and external factors affecting business strategy. It links strategic objectives (long-term orientation) with annual budgets (short-term orientation), clarifies and gains consensus about strategy, aligns managers' and employees' personal objectives with company strategic goals (especially through the creation of the link between rewards and performance measures of the BSC), tracks individual and collective performances, and defines and communicates company goals to its internal and external stakeholders (Kaplan & Norton, 1996; Butler, Letza, & Neale, 1997; Ittner & Larcker, 1998).

Similar to the BSC – although more than 50 years old – is the Tableau de Bord (TdB) that has been used for decades by French managers to control performances on the basis of key control parameters regarding different organizational aspects of a company (Epstein & Manzoni, 1997). Initially conceived as a tool for the top management designed to provide a quick and global view of a firm's operations and its environment, the TdB evolved in the early 1990s from a tool for diagnosis and reporting to a system that can aid managers in the strategy implementation (Bourguignon, Malleret, & Norrekliit, 2004).

Traditionally, the TdB emerged to meet the information needs of French managers long practiced in guiding and controlling firms through non-accounting data (Lebas, 1996). As leadership positions in French industry were occupied by engineers (not just in the manufacturing areas but also in financial, services and marketing departments) who considered physical information a better basis for decision making, the TdB was developed to provide these managers with non-financial data that could help them both verify the achievement of past objectives and predict a firm's ability to produce positive results in the future. Accounting data were also considered, but they had a secondary role aimed at providing information on financial consequences associated with decision making. The TdB was conceived of as a balanced combination of financial and non-financial indicators (Lebas, 1996).

When general criticism toward traditional management accounting appeared in the late 1980s, supporters of TdB also began to rethink this management tool. In this case, the problem was not accounting for qualitative or physical information (according to Bessire and Baker (2005) French authors have always emphasized on the use of non-financial

information in their reporting models), but rather it became fundamental to place greater emphasis on how to ensure coherence between concrete actions and strategic objectives. This led to the development of causal analyses of performance and the adoption of a pyramidal analysis of company management at the three levels of strategy, management, and operations (Lebas, 1994).

Therefore, both the BSC and the TdB can be categorized as strategic management tools that translate the company mission and strategies into objectives and measures supporting top managers in the implementation of the company's strategy while promoting organizational learning to some extent. In fact, both management control tools sustain the communication and understanding of the firm's purpose, objectives, and strategies to all its members by establishing favorable conditions to organizational learning. Moreover, both models aim to avoid the monopoly of financial accounting (they also consider qualitative and physical data) and use non-financial information to predict future performance demonstrating anticipation (a feed-forward approach) to be more important than reaction.

However, some differences still persist. According to Bourguignon et al. (2004) most of these can be explained in terms of ideological assumptions about how to create social order that influence functions and characteristics of management methods whose construction is aligned with the specific beliefs and implicit ideas of the local society of origin (the United States and France, respectively).

First of all, the BSC always builds on four predetermined categories of measurement (although Kaplan and Norton claimed that other dimensions can be added) while the TdB relies more on managers' subjectivity and their perception of the environment to design areas of measurement, implying that the TdB can take a variety of forms. This is coherent with the fact that the TdB has been grounded in a strong theoretical base of analysis, which roots actions into the firm's political dimension (the so-called mission or purpose of the firm, which is unique for each organization and deals with long-term issues). This suggests that strategy, consequent actions, and their economic dimensions expressed through indicators become specific to an organization and it is not possible to guide the firm with a list of four generic, predefined components as proposed by the BSC (Bessire & Baker, 2005).

Second, the BSC assumes that there is a linear chain of cause and effect relationships among the different areas of measurement whereby better trained employees will lead to more efficient business processes, which in turn will lead to more satisfied customers and to happier stakeholders. This assumption presumes the existence of a sort of generic model of

performance, which makes the BSC easier to implement practically although seriously simplifies reality (Otley, 1998; Nørreklit, 2000). Moreover, since it provides managers with specific routines to follow, this underlying model helps managers cope better with uncertainty in coherence with the American way of managing uncertainty through expert systems. On the contrary, the TdB does not suppose any predefined link among areas of measurement – allowing the possibility that strategic objectives are in conflict.

Third, the BSC presumes a mechanical top-down deployment of strategy, objectives, and measures in the organization, ignoring the fact that strategy is often a process of incremental and collective construction. This is particularly true in France where management methods are not expected to create hierarchies (as in the United States), since social order is mostly embodied in the rituals of social groups (Bourguignon et al., 2004). Here, there is a more significant interaction between hierarchical levels and responsibility can also be shared among managers. The TdB gives to “local” managers the right to choose action variables as it is presumed that no one knows the actual business better than them. This implies strong negotiation on measurement between the various areas and levels as well as the possibility of having a system of shared responsibility.

Lastly, the TdB is less linked to rewards, while the BSC stresses the importance of linking performance measures with the reward system coherently with the idea that in United States anyone who works hard will be fairly evaluated and remunerated. This is due to the fact that the TdB does not embrace the concept of individual responsibility to reward (which is more diffuse in American society and included in its management tools), while it attributes more importance to managers’ learning during the implementation process of the system and the supply of sufficient information for decision making.

## *2.2. Determinants of Changes in MCSs*

As described above, it seems that changes in the competitive environment are the main factors that highlight limitations in existing accounting information and pushed managers and researchers to develop new systems and measures to support strategy implementation and improve performance through measurement. In fact, drawing from contingency theory, researchers have essentially explored external contextual factors, for example, intensity of market competition and internal contextual factors such as size, CEO experience, or other structural business variables (Libby & Waterhouse, 1996)

to understand what stimulates and hampers changes in management systems in the same way that contingency theory was previously used to explain differences in the design and use of management accounting systems (Otley, 1980; Govindarajan, 1988; Chapman, 1997; Chenhall, 2003).

This approach is broadened by another important line of research that links the MCS design to company strategy, where strategy is considered as a unique internal contextual factor (Simons, 1987; Langfield-Smith, 1997). The underlying idea is that every firm has its own mission, objectives, and strategies that imply different informational needs, such that every firm should adapt management systems to its specific situation. In contrast to the mainstream contingency approach, no generalization is possible in this case (Marchini, 1995).

There is also a series of studies that argues that contextual factors explored by contingency theorists are not sufficient to drive changes in concrete terms. Such changes materialize if there are also internal drivers that promote and sustain the introduction of a new managerial systems such as skilful managers – particularly senior managers who can support a project or other agents of change who can influence employees from the top to the shop-floor level.

Belonging to this group are authors like Innes and Mitchell (1990) who have identified three categories of factors that stimulate management accounting changes:

- *Motivators*: general changes in the wider organizational context, especially regarding competitive market conditions, organizational structure, production technologies, and product cost structures;
- *Catalysts*: the more direct reasons for the initiation of change in management accounting practices such as poor financial performance, loss of market share, or the launch of challenging products;
- *Facilitators*: organizational factors contributing to the realization of change initiatives, such as staff and computing resources linked to the accounting function, organizational autonomy from the parent company, and the authority of accountants.

According to Innes and Mitchell, motivators are the factors that drive the emergence of catalyst factors that actually push managers to consider change, but facilitators are also necessary since they prepare the firm for subsequent change initiatives.

More recently, researchers have also linked the adoption of new or improved MCSs to the presence of PE/VC operators in a company's equity (Hellmann & Puri, 2002; Davila & Foster, 2004). Besides contingency



theory, they use different lines of research to provide explanations of control intervention applied by PE/VC operators in their target companies, including information asymmetry and agency cost theory. Most of these studies have actually adopted the agency cost theory of [Jensen and Meckling \(1976\)](#), which describes the relationship between PE/VC operators and managers of the target company as a principal-agent situation.

Considering that a PE/VC investor's arrival can imply a substantial change in a company's governance, strategies, and structure with the definition of new challenging growth targets (it creates motivations and accelerators to change), it is not unusual that it can emerge the need to establish a new control system whose goal is to both control and align individual goals to company objectives and reduce or prevent managers' moral hazard ([Jensen & Meckling, 1976](#)). At the same time, the institutional investor can also contribute to the realization of the new management system providing financial resources and managerial competences (facilitators). Investment funds are not only providers of capital, they increasingly tend to play a partnership role ([Sapienza, Manigart, & Vermeir, 1996](#); [Wright & Burrows, 2008](#)), which bring a broader package of professionalization benefits (over and above financing) to the acquired companies ([Hellmann & Puri, 2002](#)).

Another important consideration is that studies on changes in MCSs have always considered company's top managers as the main actors of any type of evolution in management systems. Top managers usually first identify the need for change, then they plan, organize, and oversee the change as they are the principal subjects interested in creating tools for improving company performance. However, primary stockholders can also identify the need for and guide the promotion of the adoption of new MCSs since their proprietorship status allows them to sit in the Board of Directors – or at least to nominate some top managers and define their responsibilities. This is especially true for PE stockholders that have a significant professional experience in doing business and recognizing changes needed.

From this point of view, the acquisition of a company's equity stake by an institutional investor could represent a significant moment in which to reconsider management systems as this subject modifies the existing context, can operate as a protagonist of change, and can also facilitate the change within the MCS.

Interestingly, much empirical research demonstrates that there is always a positive impact of PE/VC operators on the MCS. They usually produce enhancements in accounting information systems, an increase in the quality of information provided, a more efficient budget preparation process, higher participation among all employees, and an intensification of formal controls

(Jones, 1992; Mitchell, Reid, & Terry, 1997; Ciambotti, Aureli, & Salvatori, 2009). Moreover, PE/VC presence has been significantly associated with high growth rates in both start-ups and established companies (Davila, Foster, & Gupta, 2003; Davila & Foster, 2004). Considering that control systems are critical for providing executives with relevant and timely data to use in their managerial decision making, we may assume that an improvement in MCSs will presumably lead to better decision making and company performance.

### 3. METHODOLOGY

Assuming that changes in MCSs are related to substantial modification in a company's environment and/or internal organization – as suggested by contingency theory – this study proposes that PE/VC operators can represent a relevant driver of change. Instead of describing how frequently this event occurs, we believe it is more important to clarify the deeper causes behind it as well as its consequences. For this reason, we decided to conduct an exploratory research useful to capture the details of the phenomenon. As a consequence, the results of this study are exploratory and are not to be interpreted as the only possible answer to the research question.

The primary methodology used is the case study research approach. In particular, we have identified and chosen to analyze a single case regarding the implementation of the TdB in an Italian shipyard following the suggestions of Dyer and Wilkins (1991). The case study is both illustrative and explorative (Ryan, Scapens, & Theobald, 2002). Despite its limitations, case study research should not be undervalued since it is also possible to build theories from case studies (Mintzberg, 1979; Yin, 1981; Eisenhardt, 1989). In our case, we found this approach very useful. First, it illustrates the concrete adoption of the TdB. Second, it allowed us to explore and understand which variables drive the adoption of innovative management tools and how they act within organizations.

Cited literature on MCS indicates that contingency factors are strongly associated with variation in the design of these systems (Chapman, 1997; Langfield-Smith, 1997), but studies do not explain how firms identify the need to adopt a new MCS. Through the reconstruction of transformations in the examined company, it will be possible to identify who requested the specific control tool and for what reasons, bearing in mind the specific industrial context and changes in the company's strategy that the PE operator introduced during the investment period.

Three types of data were collected for this study: interviews, company data, and public information in the yacht industry. Most of these data were gathered over a two-year period between October 2006 and December 2008. The period of observation covers a decade, from 1998 to 2008.

Research was mainly conducted through personal interviews with executives, including top- and medium-level managers. Interviews were preferred over questionnaires since they offer more flexibility, completeness, spontaneity and there is certainty of response origin, although they are more expensive, and require more time and additional effort in the response codification phase. Interviews focused on managers' experiences with the implementation of the TdB in order to reconstruct the history of its development. Moreover, interviews were also used to understand better the competitive context and confirm the strategy stated in company documents.

Since the company's history is observed through managers' eyes, we are aware that collected information is subjective. This technique, however, allows us to identify which factors and conditions are really relevant for the interviewees and avoids suggesting answers that otherwise would not be given (as would be the case in a questionnaire), potentially leading to distortions (Zammuner, 1998).

Finally, during the period cited we collected public information related to the company and its financial investor in order to match the company's development trend with the phases of early design stage, the roll out, and the ordinary running of the control system.

## **4. CASE STUDY DESCRIPTION**

### *4.1. A Brief Overview of the Yacht Industry*

In this paper, we observe the introduction and use of a new MCS devoted to performance measurement at a single company, which operates in the ship-building industry. Before describing the company it is necessary to provide some key information about this peculiar industry. It has a global dimension while at the same time is very highly fragmented (there are more than 6,000 shipyards around the world).

Yacht building is actually a very complex and long-term activity that usually involves many different players and suppliers, whose clients are spread all over the world. The market is usually divided into sailing and motorboats, the latter representing about two-third of the total units produced. Moreover, the industry can be segmented according to boat type

(fly-bridge, open yacht, sport fisherman, lobster boat, and runabout) and according to boat's length (the main distinction is between megayachts and yachts whose length is less than 24 m).

Over the last decade, two important market changes have occurred in this industry: the emergence of new clusters of high net-worth individuals (e.g., from Russia and other New Developing Countries) and the introduction of new financial instruments (as financial leasing in 2001), which have both increased yacht demand (Ucina, 2006). Italian shipyards that have exploited these opportunities have registered very high performance growth rates. Between 2000 and 2007, the national yacht industry's total turnover tripled and Italian shipyards have become leaders in Europe. Global statistics indicate that Italy is the second yacht producer after the United States in terms of total turnover and number of employees (Ucina, 2007).

In the same period, however, Italian shipyards also faced different challenges. These stem from growing international competition and relevant changes in consumer needs and behaviors, who have begun to require more and more sophisticated, exclusive, and complex products. As demonstrated in different empirical studies (Cherubini & Nastasi, 2005, 2006; Tracogna, 2007; Fortezza, 2008) and confirmed by interviewed managers, customers ask for high levels of innovation and quality and their preferences are progressively driven by intangible aspects. These changes in consumer models have emphasized that firms need to focus more on clients' needs and have to improve their learning and innovation capacity. This means that traditional functional structures are no longer appropriate: companies should maximize their ability to respond to customer needs (e.g., by adopting a divisional structure), organize themselves around processes, and place a greater emphasis on product quality. In addition to this, firms have to invest more in knowledge and information technologies, which can contribute to product advances and efficiently and effectively support the development of innovative solutions.

At the same time, stronger international competition and increasing product complexity have pushed firms to resort to and cooperate with external partnerships more frequently (yacht building has become so complex that it requires the involvement of other firms specialized in painting, coachwork, resin treatment, or in the manufacturing of components such as engines, wood furniture, and electric parts). Thus, the Italian nautical industry has transformed into a networked system of small- and medium-sized enterprises, specialized in different phases of the production process, linked with each other and often led by a larger firm recurring to external partners to maintain flexibility and to access external knowledge (Fortezza, 2008).

In synthesis, it seems that while the general socioeconomic context and the political scenario have remained unchanged, new competitive rules have appeared so that today company competitiveness depends mainly on product innovation, quality, and efficient and effective management of the value chain processes that contribute to satisfy client needs.

#### *4.2. Ferretti and the Entrance of a Private Equity Fund*

Among Italian shipyards, there are two important groups which lead the national and international yacht market: Azimut-Benetti and the Ferretti Group. In this paper, we will analyze the Ferretti Group, which is recognized as one of the first four world players in the design, production, and marketing of luxury motoryachts from 7 up to 85 m.

Although it registered a total turnover of 901 million euros at the end of 2008 and it counts more than 3,000 employees, 9 different brands/business units, 25 production sites, and an international network of approximately 85 distributors, its origins are quite humble. In fact, Ferretti was born in 1968 as a small family firm specialized in selling small motor sailers. The company began to grow in the mid-1980s when the founder Norberto Ferretti decided to shift the company's focus to the production of motorboats measuring up to 25 m and began to participate in offshore competitions, which made the name Ferretti famous and allowed some sales abroad.

Its most significant development dates back to 1998 when the PE fund Permira (ex Schroder Ventures) acquired 66% of the company's capital and launched a process of expansion to be achieved through internal development and a series of acquisitions that allowed the company to enlarge its product range both in terms of length and typology.<sup>3</sup> From 1998 to 2004, Ferretti added eight other brands (Custom Line, Bertram, Pershing, CRN, Riva, Apremare, MochiCraft, Itama) to its historical brand Ferretti, all corresponding to as many business units. In addition to this, new production sites have been constructed and other service companies (manufacturers of fiberglass and interior components) have been acquired.

The entrance of this institutional investor was the result of the encounter of two different interests. On one hand, the PE operator Permira realized at the end of 1990s that it might be very profitable to invest in a sector with a high growth potential such as the nautical sector,<sup>4</sup> where elevated fragmentation of the supply and international reputation of Italian yachts offered an opportunity to create a large nautical pole with a global leadership position. Moreover, Ferretti represented the perfect opportunity

since it had good earnings, a growing turnover, a strong tradition, and expertise in yacht building as well as excellent technical capabilities derived from technological research carried out for sports competitions.

On the other hand, in the same period Ferretti found itself at the crossroads: either the company would remain a small family firm or it would open its property to external investors to obtain the financial resources necessary to develop. Specifically, Ferretti could undertake a strategy of strong internationalization or it could enlarge its product range. Whatever the case, both alternatives required consistent and enduring financial support, so founder Norberto Ferretti decided to reimburse other family members and find a strong financial partner with international experience.

Many strategic initiatives took place in the company over the years following the signing of the deal. First, new corporate governance rules were introduced so that the family's interests and priorities were definitely separated from the company's life and a key role was given to the Board of Directors – where investor representatives sit (together with the founder).

Most importantly, a new general strategy of development was defined. Both the company management (including the founder) and the staff of the institutional investor cooperated to extend the company's presence all over the world by establishing an international strategic network of dealers and to pursue a strategy of expansion through the well-targeted acquisition of firms producing top of the range motoryachts belonging to complementary market segments.<sup>5</sup> In this case, Permira was not a mere supplier of financial resources as it opened its international network of business relationships, which facilitated opportunity identification and allowed Ferretti to be supported by most expert consulting companies during its acquisitions (while bridging the company's weakness in exploiting opportunities of international markets).

Second, the new investor proposed to reinforce the company's competitive strategy of differentiation based on quality and technological innovation while focusing on niche markets (high segment of different types of luxury motoryachts). Since Ferretti had paid modest attention to research and development in comparison to its international competitors, Permira promoted a strong investment effort (up to 50 million euros per year) to find innovative solutions and support advances in employees' competences. This is demonstrated by the creation of a specialized team currently of approximately 90 professionals within the Ferretti Group named the Advanced Yacht Technology (AYT) Engineering division and the creation of the Ferretti Lab. The first is dedicated to the research of new technologies and design solutions, being in charge of planning

and integrating highly innovative solutions.<sup>6</sup> The lab center is concerned with the study of new materials through precise testing and is active in guaranteeing the greatest possible standards of quality. With the same goal, the company's managers were periodically enrolled in training courses and a master program in business administration.

In addition to this, the investment fund sponsored the introduction of new approaches and techniques to manufacturing such as total quality management (TQM), materials requirements planning (MRP), and manufacturing resources planning (MRP II), which all aimed to provide on-time delivery of a quality product to customers and introduce industrial production efficiency without eliminating the artisanal work carried out during the various stages of production – thus guaranteeing exclusive details.

Last but not least, PE also cooperated to fill a gap in managerial competences by attracting and recruiting top- and medium-level managers (also from other industrial sectors) to gain experienced professionals who could handle increasing complexity, company development, and its internationalization process. Functional organization was abandoned for an organizational structure articulated into business units, where each brand could focus better on its own products and market segments while benefiting from the company's centralized purchasing and other group synergies. As well, new information systems and management control tools were deployed.

Thanks to these changes, in just three years the company expanded significantly and evolved from a small-medium-sized firm (as it was prior the entrance of the PE fund) to a large group. Employees grew from about 220 units in 1997 to 1,100 units in 2000, the company's turnover quadrupled (from 47 to 188 million euros) and the number of yachts sold doubled in the same period.

At the end of year 2000, the company was admitted into the Italian stock exchange. However, just two years later, the institutional investor still present among shareholders decided to launch a Voluntary Public Tender Offer together with the company's management team to acquire the entire share of capital of the company. Delisting seemed the best solution for exploiting Ferretti's further potential for growth, which the financial market did not recognize. This was actually a winning decision. The group realized a further expansion through acquisitions and a precise strategic international plan over the following years. Moreover, delisting did not halt the growth trend. From 2003, the number of employees went on rising (15.5% per year on average) to the current 3,000 units, while turnover recorded an increase of about 20% per year. Similarly, the number of boats sold increased steadily from 2003 to 2007 by 18% per year on average – peaking in 2004.

### *4.3. The Deployment of the Tableau de Bord*

Like many small Italian family firms (Marasca & Silvi, 2004), Ferretti has been regularly managed with informal mechanisms and controlled through the exclusive use of accounting data reported in annual financial statements (the balance sheet and the income statement) and annual budgets of sales and production. These documents immediately demonstrated their inadequacy upon the arrival of the PE fund. While preexistent Ferretti management placed great emphasis on economic aspects such as boats' contribution margins and firm earnings to monitor organizational performance, the institutional investor's informational needs were more concerned with financial aspects and variation of the company's assets. Moreover, information had to be provided more frequently and in a more timely fashion.

This brought about in 1998 an initial review of accounting documents prepared by the administrative department and transmitted to the group's Board of Directors. Special attention was dedicated to writing the balance sheet, which conformed to a reporting package containing balance sheet details on variations in company's intangible assets, property plant and equipments, inventory (in particular on work in process on order), current receivables and payables, debts and loans from banks, and shareholder equity. Data reported actual amounts, budget, revised budget (forecast), and the previous year in order to evaluate variances both in absolute and percentage terms. As well, three key business indicators derived from annual accounts had to be provided to the Board of Directors: net financial debt, amount of capital expenditures, and ebitda. Information had to be provided initially at quarterly intervals and then on a monthly basis in coherence with the short-term view that characterizes investment funds (according to managers interviewed).

This information received particular attention because it strongly influences a company's value estimation (which influences the return of investment of a PE fund) and its ability to produce cash to pursue growth objectives. Moreover, they are fundamental to planning and controlling financial sustainability in this particular industry that requires high exposure to financial debts because of significant time lag between payments for operational expenses and the collection of credits.

Such enhancements in the reporting practice were possible, thanks to the employment of additional personnel (e.g., controllers and financial managers) and close cooperation between Permira's staff and company managers. The latter welcomed the new reporting package since they felt that it could help them to cope better with the uncertainty that characterizes the shipyard industry.



In 2000, when the company reached the dimensions of a large global enterprise and a huge quantity of data had to be managed (almost all new brands had been already acquired and each of them still maintained their own information systems), new informational needs were identified. The institutional investor (through its representatives in the Board of Directors) began to ask for a clearer and synthetic view of global company performance (at that time there was too much emphasis on business unit performance, lacking an overall picture of the system) and homogeneous and comparable data among business units. At the same time, since business units and their managers benefited from significant decisional autonomy in order to respond better to customer demand, it became fundamentally important for the Board of Directors to ensure that deliberate strategy would be translated into coherent actions by managers at the local level while also providing them with a tool that could facilitate understanding of cause–effect relationships among variables and processes that influence the achievement of the company’s development goals. Last but not least, the investor was convinced that a greater formalization of management activities had become vital for future company growth since foreseen quotation and greater complexity had revealed that many informal reporting practices (like meetings) turned out to be inadequate, ineffective, and too costly.

This convinced the PE fund to recur to a globally known consulting company that proposed the introduction of the TdB in addition to existing financial statements as it could answer both cited needs of information reporting and personnel control. In particular, consultants argued that TdB was the most suited instrument because it could potentially:

- provide a company overview to the Board of Directors through few key parameters;
- be deployed at corporate, business unit, and functional levels (usually there are as many tableaux de bord as business units and hierarchical levels) so that local managers can also benefit from local indicators to improve their decision making;
- highlight links between company goals and business unit objectives (each document has to be integrated with the others in a nested structure) and relationships between objectives and casual factors expressed through parameters at the local level;
- influence managers’ behavior especially if related to the reward system;
- encompass non-financial measures (e.g., regarding customer satisfaction, innovation, and human resources that represent the most important factors for company performance in the actual competitive environment), which give better information on cause–effect relationships than financial measures.

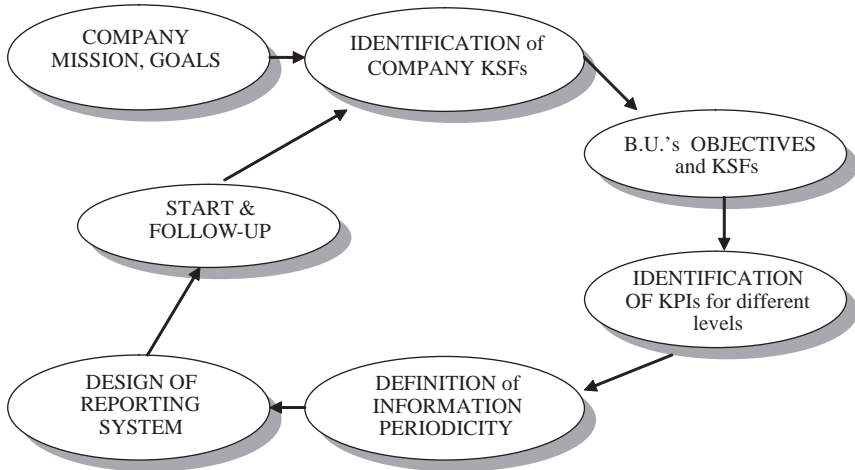


Fig. 1. Logic and Phases of the Reporting Project in Ferretti Group.

Thus, the TdB was proposed for both corporate and business unit levels. Its setup (see Fig. 1) first required the Board of Directors to assert the company's mission and objectives and identify KSFs related these objectives. Second, performance indicators were identified to measure KSFs and the achievement of different goals. Next, the process was applied throughout hierarchical levels with the specification of business unit objectives, KSFs, and relative performance indicators, which all had to be coherent and logically related to corporate goals and measures. In 2001, at the end of this process, TdB appeared to be a bulky report including (both at corporate and business unit level) a financial area of analysis and the monitoring of five other operational areas: marketing and sales, manufacturing, engineering, human resources, and general services with key performance indicators (KPIs) for different hierarchical levels.

Since this was a complex system necessitating strong IT support in collecting, processing, and integrating data, the Board of Directors decided to revise the existing enterprise resource planning system and launched a changeover from Proj (AS400) to SAP for all Ferretti Group brands (which actually became effective only in 2003). Moreover, the Board of Directors planned to link the TdB to a new reward system, which introduced incentives and a partially variable salary for top- and medium-level managers.

Interestingly, Ferretti's mission was "translated" into a series of financial objectives and related key factors that characterize themselves for influencing the company's value generation process (whose performance is

usually expressed through financial parameters such as economic value added or EVA). This implied that great attention was dedicated to the development of the TdB's financial area (see Fig. 2). As demonstrated by the concurrent introduction of the cash flow statement in addition to the balance sheet and the income statement, good financial performances were considered as critical since they represent the fundamental condition (in terms of liquidity and future viability) for allowing the company to pursue its expansion strategy and to invest in innovation, quality, personnel, and manufacturing efficiency (its most important competitive factors).

So, the TdB's financial area was structured to provide the Board of Directors with detailed information on four financial KPIs that were also linked to the reward system in order to develop more sensitivity to financial aspects and the cost of capital in company's organization:

- net increase or decrease in cash (end value resulting from the cash flow statement);
- economic value added or EVA (net ebit–capital charge);<sup>7</sup>
- net financial position (cash and cash equivalents + short- and medium-term financial assets–short- and medium-term financial liabilities);
- coverage (ebit/financial interests).

Unfortunately, its first experimental deployment in selected business units proved to be quite complicated. Managers found the editing of many different reports explaining the construction process, the composition, and variances of financial indicators (tables, graphs, and tree diagrams required significant managerial time) very demanding. Most of them were considered redundant to accounting data. Moreover, some KPIs were not fully understood.<sup>8</sup>

In addition to this, not all business unit managers were comfortable with the selected operational areas of analysis since they did not fully reflect key issues of the yacht industry. Managers also did not consider it rational to include some non-financial measures of marketing, research, or human resources in the TdB. As interviewed managers state, they recognize that the increasing role played by intangible resources as well as the adoption of TQM and JIT techniques contributed to the idea that it was insufficient to rely only on accounting data to predict organization's ability to survive and develop; however, they found that there were many qualitative variables that could not be meaningfully related to company's financial performance. Thus, another simpler version of the TdB was implemented in 2003 after a deep confrontation among PE representatives and company's managers and with the active contribution of business unit managers.

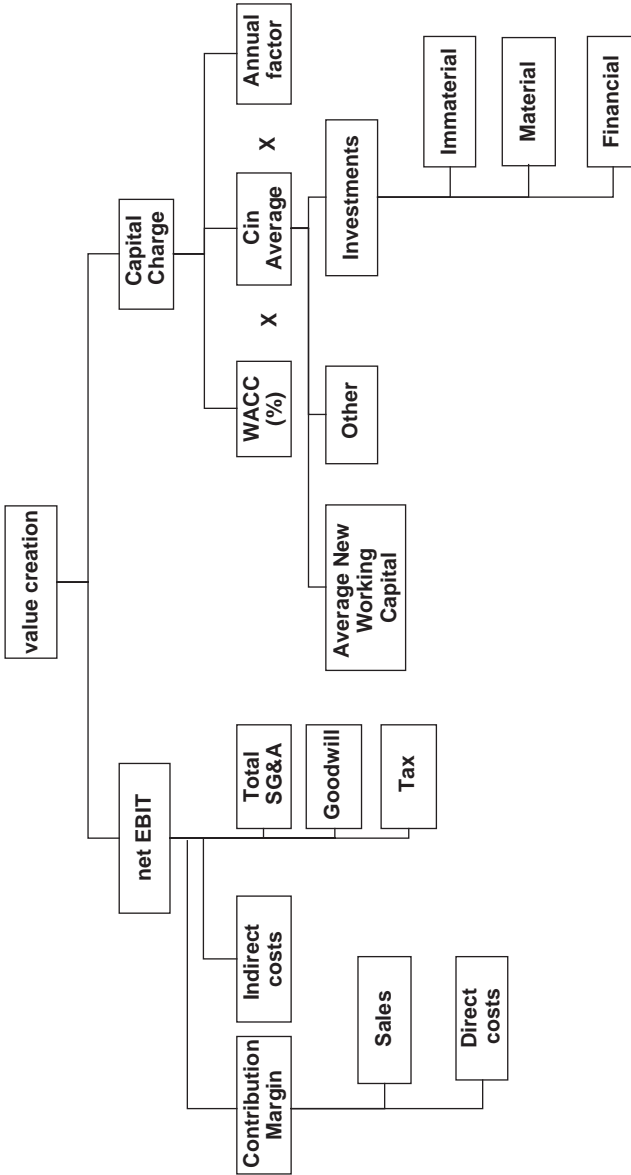


Fig. 2. Example of a Business Unit's Value-Creation Tree.

Today, in Ferretti Group the TdB is conceived primarily as a tool to monitor business results, help managers in decision making, and a way to reinforce company's goals throughout the organization's ranks as it translates into quantifiable indicators.

Its focus is primarily – but not exclusively – on financial measures. The most important KPIs are:

- products' contribution margins
- ebitda
- net working capital
- capex (mainly referred to plugs, moulds, and machinery)
- net financial position.

The report also includes quantitative and statistical data regarding the sales area, manufacturing and purchasing, and the human resources area, which have a strong financial impact on value creation. For example, indicators of sales orders (for the current and the two following years) and indicators of production coverage sorted by boat type (advances in production compared to the current budget and the existing long-term production plan) are fundamental to anticipating payment flows and the company's inventory level before they go beyond an acceptable level. Similarly, it is crucial to know the number of boats shipped and the amount of stock at dealers (both new and old boats) in order to check sales and production plans. Also important is the analysis and classification of purchases made by different company areas since they are useful for anticipating outflows and providing information to adjust future payment terms with suppliers, while human resource indicators regarding both production-floor workers, office workers and managers provide information on worked hours, number and cost of people involved in every boat, which are useful for the calculation of a product's contribution margin.

As interviewed managers stated, strong support in the editing process came from the simultaneous adoption of the integrated computer system SAP, which can also provide additional secondary and detailed information on non-financial data if necessary.

Then, as planned, managerial performance (primarily concerning CEOs, CFOs, COs, directors of marketing and sales) is now evaluated on the basis of KPIs. There is an initial definition of targets to be reached and then the monitoring of levels achieved at the business unit level as well as the individual level. When targets represent individual responsibilities they are accurately chosen in coherence with business unit objectives. Incentive

payments (stock options and/or bonuses) represent the most motivating instruments, but the opportunity of a faster carrier path is also important.

It is interesting to note that interviewees do not think of the current TdB as simply a management-by-exception control tool because it is discussed in all its parts at regular monthly meetings where both operating managers and their business unit superiors participate. It is used to prepare budget forecasts and it serves as research agenda for quarterly meetings with corporate top management and the institutional investor. It does not manage only unfavorable variances but all the data and it involves frequent and regular attention and confrontation among managers, peers, and subordinates who can learn and share the same language (it is a form of interactive control as described by Epstein and Manzoni with reference to the BSC).

Unfortunately, it is difficult to claim that described changes in the MCS are correlated to company performance and its growth trend. In fact, both during the years dedicated to finding the appropriate control system and after the deployment of the final TdB, company data indicate that the organization went on growing on a regular basis. Ferretti has always registered excellent short-term financial performance but also good potential for longer-term performance as demonstrated by its ability to attract resources critical for innovative activity like capital, research partners, and commercial partners.

Only two very small discontinuities in Ferretti's development trend have been recorded – a minor decrease in the company's growth rate (about 4 percentage points less in turnover and employees' average growth rate) registered in 2003 and a rebound in company performance in 2004 that recovered and exceeded performance levels precedent to the reduction. However, they cannot be easily related to the introduction of a new MCS as the delisting in 2002 could also have generated an ambiguous signal to potential customers probably causing a decrease in the company's order book. A real and unexpected halt in Ferretti's growth came only at the end of year 2008 with the worldwide financial and economic crisis.

## **5. DISCUSSION OF RESULTS**

### *5.1. Variables Explaining Change in MCS*

From the history here described through managers' perceptions and memories, it emerges that a PE operator may be a key motivator for the introduction of additional and innovative control systems in acquired companies. This change is related to the particular situation – expressed in

terms of new strategies and a different organizational structure – that arose after its arrival and that has its main supporter in the institutional investor.

Both cited contextual factors are relevant in this case. While a modification in company strategic directions in 1998 did not cause a “revolution” but just some small adjustments in the existing accounting management system, the real innovation occurred with the concurrent increase in the organization’s complexity in 2000. The introduction of TdB appears to be linked with two important influencing circumstances – the formulation of new strategic directions defined coherently in relation to actual changes in the competitive environment (new consumer behaviors and higher intensity of market competition) and an increase in company dimensions and decentralization (related to the creation of different business units) with the subsequent necessity to control better the implementation of deliberated strategies and manage organizational complexity (see Fig. 3). In fact, the proposed new control system had the dual aim of:

- monitoring the achievement of economic and financial objectives linked to the company’s development strategy also through the alignment of employee behavior with company’s goals,
- providing the target firm with managerial instruments important for the direction and functioning of a growing organization where huge information flows need to be gathered and selected for decision making.

Adjustments and innovations in the MCS clearly express the willingness of this particular type of investor and did not arise from modifications in information needs of previous company managers, nor from other external actors such as customers. This is demonstrated by the fact that no particular improvements in existing management systems were carried out autonomously before the arrival of PE, although some previous changes in the competitive environment had already highlighted limitations in traditional accounting systems. The introduction of an integrated system such as the TdB represents such a significant investment that Norberto Ferretti probably would not have undertaken it prior to PE’s arrival. As a small family firm, Ferretti lacked the financial resources, the time to dedicate to the process, and its staff did not have the appropriate mentality. Similarly, output information produced by the new MCS also exactly reflects investor’s needs. Since value creation represents the most important goal of a PE investor, it is quite obvious that the financial area of analysis was more developed than others.

The role of company managers, however, has proven to be fundamental in the deployment process of the new reporting tool. In fact, even if the

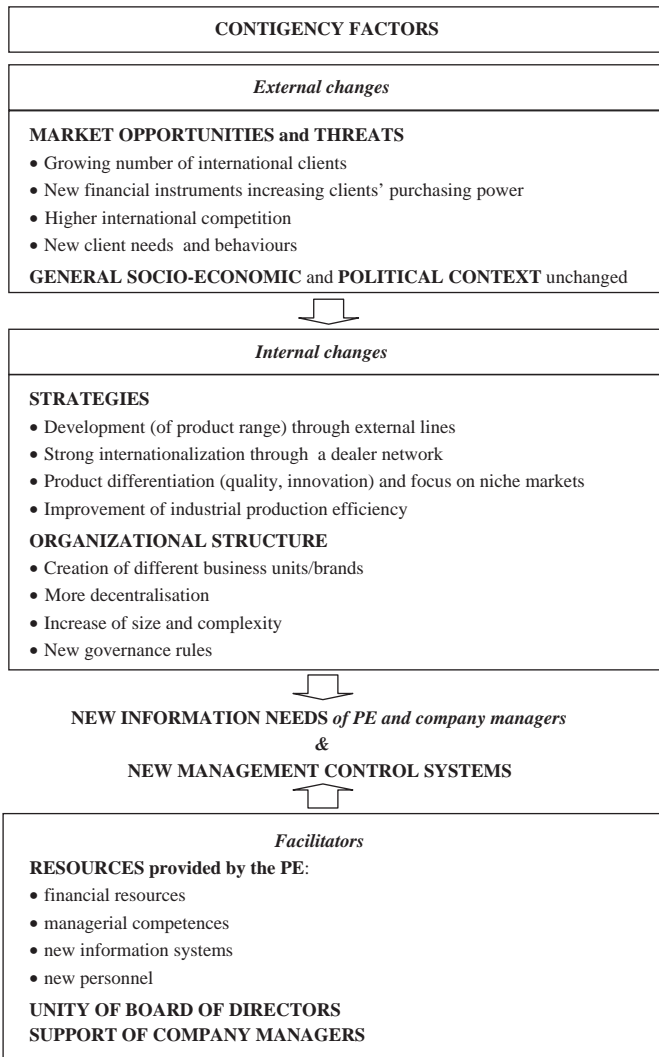


Fig. 3. The Role of the Private Equity (PE) Fund in Generating Change.

knowledge necessary for designing the MCS did not come from existing managers but from outside subjects (the consulting company), they were critical for the adjustment of the TdB to the company's characteristics and its successful deployment.



As the case study demonstrates, managers can seriously hinder the deployment of a new MCS, but at the same time they can also act as key facilitators. In its first version, the TdB encountered resistance due to ignorance, to the creation of excessive managerial workload, and to the fact that EVA and the underlying financial logic was not part of existing managers' language. On the other hand, the second reformulation of the TdB was facilitated by managerial support and has improved, thanks to their suggestions provided after a process of trial and error.

In all phases, managerial support for the system demonstrated to be important (usually revealed by close cooperation between Permira staff and the company's manager). As suggested by Innes and Mitchell (1990), company managers represent the organizational factor that significantly contributed to the implementation of change initiatives (like the availability of an advanced information system as SAP).

In addition to this, two other important factors have also contributed to this successful change. First, the fund has allocated sufficient resources (money, fund managers' time, external consultancy support) to design and implement the system. Second, the Board of Directors (including its founder) was unanimously oriented toward the company's growth and value creation goals.

As theorized in previous research, in this case general changes in the competitive environment such as hyper and global competition, customer demand for quality, exclusive products, and innovative solutions are related to changes in the MCS – although indirectly. They are included in variations occurred in company's strategic directions. The Board of Directors has taken into account threats and opportunities emergent in the external environment (along with company's strengths and weaknesses) in defining: a development strategy based on internationalization, an enlargement of product range through external acquisitions, a competitive strategy based on quality and technological innovation, and modifications in the manufacturing area as well as in the organizational structure.

### *5.2. Characteristics and Appropriateness of the Tableau de Bord Implemented in Ferretti Group*

The TdB adopted in the Ferretti Group is similar to that prescribed by academic researchers since it operates as a reporting tool for both corporate and business unit managers, but it also acts as an instrument to align all employee objectives with corporate goals (linking operations with the strategic dimension and defining performance indicators at corporate,

business unit, and individual levels) influenced by the investor's interest in obtaining satisfactory returns from this investment. Moreover, findings are consistent with mainstream literature that highlights the usefulness of this type of managerial tool for managers' learning and decision making: the TdB illustrates the causal analysis of performance and educates managers' reasoning regarding the financial consequences of their day-to-day actions.

Similar functions are also attributed to BSC, although the two instruments have some differences (see [Section 2.1](#)). Consequently, we question whether BSC could have been a better solution or not.

Initially, the choice of the TdB appears to have been better in this particular case, since it is not a single document applied equally to the entire company (as is the BSC). It contributes to preserve the business unit autonomy necessary to address effectively the different market segments in which Ferretti's brands operate. In fact, the TdB allows each business unit to define different objectives and success factors so that they can better cope with different local issues while respecting the overall group strategy. Moreover, the areas and analytical indicators structured in the TdB can be adapted to specific company and business unit needs, while BSC, with its structured set of four types of indicators, may seem too rigid to the company's managers and thus provoke resistance.

As already reported in other studies ([Epstein & Manzoni, 1998](#)), the actual structure of Ferretti's TdB, however, tends to overemphasize financial measures compared to qualitative and quantitative data. Accounting data do not take a secondary role, as stated by [Lebas \(1996\)](#). As well, some important variables are missing. For example, there are no indicators regarding supplier quality, satisfaction, or forms of cooperation with external subjects – even if this industry is transforming into a networked system of firms.<sup>9</sup> On one hand, this means that this company does not fully benefit from a better understanding of non-financial factors that can better predict future financial performances and drive day-to-day actions. On the other hand, a less-detailed list of non-financial indicators can preserve openness and space in which managers can operate, while still steering the company toward growth.

One possibly dangerous consequence of this financial focus is that the system may encourage too much short-term thinking since today high cash flows and earnings (for which managers are rewarded) often mean fewer investments for the future even if these investments are in the interest of the company. Nevertheless, including capex among the most important KPIs can contribute to reducing this peril.

This shows that the TdB contains indicators (and also objectives) that are somehow in conflict. While looking to maximize the firm's cash flow, managers are also pushed to foster investments in learning and innovation. As explained in the literature on TdB (Nørreklit, 2000), this is probably due to the fact that this instrument offers no predefined linear link among areas of measurement (as does the BSC) and that circular reasoning is more diffused. According to Ferretti's managers, even if it is true that intense learning and innovation efforts contribute to more efficient processes, satisfied customers and better financial performance, it is as much true that development processes depend on financial results. Unsatisfactory financial results can limit the provision of capital necessary to invest in research for innovative solutions.

Lastly, here the TdB is strictly linked to rewards and performances evaluated at corporate, business unit and individual levels. This makes the implemented TdB very similar to the BSC model whose creators stress the importance of linking performance measures with the reward system.

According to Merchant's (1998) classification of control mechanisms, Ferretti's TdB is used as result control, which influences individuals by measuring the result of their actions. At the same time, the TdB also functions as a personnel control mechanism since its deployment process and its periodical review at company's meetings contribute to align personal objectives with those of the organization. Monthly discussions of the TdB represent an occasion in which to reinforce the communication of company objectives and continuous dialog among corporate managers, brand managers, and subordinates and in the final analysis influence employees' behavior in the intended direction.

## 6. CONCLUSIONS

Conscious that this case study cannot lead to general indications, it attempts to provide some advances in the literature regarding changes in MCSs. First, it highlights the role of PE/VC investors in defining MCSs, which have not been deeply analyzed in previous studies on MCS change. What we see is that this type of investor can impose/suggest only some adjustments to existing information systems (as in the first phase) or it can contribute to modifying acquired companies' managerial systems significantly (as occurred with the implementation of TdB). In any case, MCS change is strongly related to contingency factors generated by the PE investor to some extent. Second, it suggests that the management staff is one of the most

critical actors in influencing the introduction of a new MCS. Top as well as lower-level managers can be process facilitators or can hinder, delay, or even prevent the change.

Lastly, it confirms that PE/VC operators, although still having an intrinsically speculative approach to their investments, can contribute to a firm's development. The TdB was not only introduced for control purposes because this instrument also helps the acquired company to manage better growing organizational systems where huge information flows need to be gathered and selected for decision making. Moreover, the PE fund has provided access to research and commercial partners, contributed to the improvement of financial and managerial competences among employees and to an increase in short- and long-term performances that otherwise a small family company could not have obtained. In other words, this study provides a virtuous example of the investor–investee company relationship that would be of interest to both PE/VC operators and organizations searching for financial and managerial support for development.

An important implication of this study is that future research on PE/VC impact on business systems should also take into account these presumably positive contributions to investee companies. Besides financial and quantitative evaluations (investment funds can create or destroy value), it is worthwhile to analyze qualitative aspects of PE/VC intervention such as possible improvements in management systems and organizational culture as well as possible deteriorations in organizational climate and company stability due to excessive use of leverage. Thus, a more comprehensive evaluation should consider, on one side, company's capabilities upgrading and benefits deriving from the establishment of a performance culture and, on the other side, the risks associated with a strong speculative approach of some investors. In this way, it is possible to understand what remains after the exit of PE/VC operators and to what extent companies are prepared to stand alone in today's highly competitive environment.

One important limitation of this study is that results are related to the analysis of a single case study. Thus, it represents a starting point for further research in other industries and countries. Moreover, this study cannot lead to general conclusions because the behavior of professional investors may be very different. For example, venture capitalists usually have fewer resources to dedicate to their target companies compared to PE funds, although they are more long-term oriented, which translates the costs for management system implementation into investments.

In addition to this, the study does not precisely address how the implementation of a new MCS has affected company's performance. We

know that some previous research studies have found a positive correlation between performance and adoption of similar control management tools (Hoque & James, 2000; Davis & Albright, 2004), while others have not (Ittner, Larcker, & Meyer, 2003). In this case, PE/VC funding has had a definite and positive impact on target company growth, it is difficult, however, to state that this performance is strictly correlated to improvements in the management information system. Performance could also depend on other factors such as a more robust international strategy or an increase in the specific segment of the yacht market in which Ferretti Group operates.

Further research should focus on the creation and testing of a logical model devoted to analyzing the influence of different possible internal and external explanatory variables on company performance.

## NOTES

1. According to the Italian Private Equity Monitor, until the year 2005 target companies with a turnover lower than 30 million euros were the “absolute leaders.” Also in 2008 small- and medium-sized enterprises with less than 250 employees and a turnover lower than 50 million euros represent the primary category of actors: they are involved in about 70% of total deals.

2. Similarly, academic research in Italy has begun to emphasize the importance of non-financial performance measurements to manage modern companies also with reference to small- and medium-sized firms. For a review of the literature see Amigoni and Miolo Vitali (2003), Corsi (2006), and Garengo and Biazzo (2005).

3. To date the body of shareholders is formed as follows: 50.2% Candover Fund, 10.7% Permira Fund, 39.1% shared between Norberto Ferretti (Group Chairman) and the group management team because in January 2007, Permira sold to Candover its majority stake of the Group through a secondary buy-out operation.

4. For example, figures demonstrate that the value of yacht production in Italy has grown of 16% from 2005 to 2006 (Ucina, 2006). The interest of PE funds in the nautical sector is also demonstrated by other financial operations occurring in Italy over the last years – for example, Cantieri del Pardo is controlled by The Rhone Capital, Cantieri di Pisa is held by Dresdner Kleinwort Benson, Cantieri Candos was acquired by Balmoral Capital and Franchini Yachts is partially owned by Pentar.

5. Product range enlargement represents a crucial strategy since it is an important driver for attracting and retaining clients who can find all types of boats they need within the group, from the small, entry-level motoryacht when the customer is a newcomer to the luxury steel megayacht for the mature customer. This goal also concerns single business units which are pushed to identify and develop new models (with different lengths, different materials, engine power, access to guidance, etc.) for their segment.

6. The fruit of this continuous research and testing is, for example, the anti-rolling gyro (ARG) system, a technology exclusively developed with Mitsubishi Heavy

Industries, fundamental in eliminating rolling and guarantees maximum comfort during cruising. Other important technological achievements are the EasiDock “Smart Command” that allows maximum manoeuvrability of the boat, and the NAVIOP integrated management system that, in a single screen, allows to have full control of the yacht functions.

7. Contrary to the suggestion by Bennett Stewart (1991), in this case the company’s value creation (also called residual income by some economists) is calculated as “basic” EVA, without any accounting adjustment.

8. For example, besides differences in managers’ financial competence levels, some problems in EVA’s comprehension were related to its underlying approach to calculation. In fact, while EVA is calculated according to an entity (or unlevered) approach such as after-tax operating profits minus the cost of all capital used to produce these profits, Italian accounting tradition defines this “extra profit” as what remains after proprietorship has been adequately remunerated – giving preference to the equity approach.

9. Some key factors that are logically correlated to competitive success, but not objectively linkable to financial performance (e.g., product defect rate, dealer satisfaction level, perception of corporate image and brands) are monitored recurring to other information repositories and documents.

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## REFERENCES

- Alvino, F. (1999). Il ruolo degli strumenti informativo-contabili per il controllo nel Venture Capital. *Rivista Italiana di Ragioneria e di Economia Aziendale*, 99(9/10), 515–528. Settembre-ottobre.
- Amigoni, F., & Miolo Vitali, P. (Eds). (2003). *Misure multiple di performance*. Milano, Italy: Egea.
- Anthony, R. N. (1965). *Planning and control systems: Framework for analysis*. Boston: Harvard University Press.
- Bennett Stewart, G., III. (1991). *The quest for value*. New York: Harper Collins.
- Bessire, D., & Baker, R. (2005). The French tableau de bord and the American balanced scorecard: A critical analysis. *Critical Perspectives on Accounting*, 16(6), 645–664.
- Bitici, U. S., Carrie, A. S., & McDevitt, L. (1997). Integrated performance measurement systems: A development guide. *International Journal of Operations and Production Management*, 17(5), 522–534.
- Bottazzi, L., Da Rin, M., & Hellmann, T. (2004). The changing face of the European Venture Capital Industry: Facts and analysis. *The Journal of Private Equity*, 7(2), 26–53.

- Bourguignon, A., Malleret, V., & Norreklit, H. (2004). The American balanced scorecard versus the French tableau de bord: The ideological dimension. *Management Accounting Research, 15*, 107–134.
- Butler, A., Letza, S., & Neale, B. (1997). Linking the balanced scorecard to strategy. *Long Range Planning, 30*(2), 242–253.
- Chakravarthy, B. S. (1986). Measuring strategic performance. *Strategic Management Journal, 7*(5), 437–458.
- Chapman, C. (1997). Reflections on a contingency view of accounting. *Accounting, Organization and Society, 22*(2), 189–205.
- Chenhall, R. H. (2003). Management control systems design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting, Organization and Society, 28*, 127–168.
- Cherubini, S., & Nastasi, T. (Eds). (2005). *Il marketing della nautica da diporto*. Roma: Nautica Editrice.
- Cherubini, S., & Nastasi, T. (Eds). (2006). *Il marketing della nautica da diporto: La yachting satisfaction*. Roma: Nautica Editrice.
- Ciambotti, M., Aureli, S., & Salvatori, F. (2009). Operatori di private equity e risorse immateriali. Utilizzo e diffusione di strumenti di valutazione e controllo dell'immateriale nelle aziende partecipate. Paper presented at the 32nd AIDEA Annual Conference on Intangible Resources, Italy, Ancona.
- Corsi, K. (2006). I sistemi di indicatori di performance nelle piccole e medie imprese. In: AA.VV. *Scritti in onore di Isa Marchini*, Milano, Italy: Franco Angeli.
- Davila, A., & Foster, G. (2004). Management accounting systems adoption decisions: Evidence and performance implications from startup companies. *Accounting Review, 80*(4), 1039–1068.
- Davila, A., Foster, G., & Gupta, M. (2003). Venture capital financing and the growth of startup firms. *Journal of Business Venturing, 18*, 689–708.
- Davis, S., & Albright, T. (2004). An investigation of the effect of balanced scorecard implementation on financial performance. *Management Accounting Research, 15*(2), 135–153.
- Del Giudice, R., & Gervasoni, A. (2005). La recente evoluzione del mercato italiano del private equity e venture capital. *Liuc Papers, 174*, 1–31.
- Dyer, W., & Wilkins, A. (1991). Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt. *The Academy of Management Review, 16*(3), 613–619.
- Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review, 14*(4), 532–550.
- Epstein, M. J., & Manzoni, J. F. (1997). The balanced scorecard and tableau de bord: Translating strategy into action. *Management Accounting, 79*(2), 28–36.
- Epstein, M. J., & Manzoni, J. F. (1998). Implementing corporate strategy: From tableaux de bord to balanced scorecards. *European Management Journal, 16*(2), 190–203.
- Fortezza, F. (2008). *Processi strategici e di marketing nel settore della nautica da diporto*. Milano, Italy: Franco Angeli.
- Fried, V. H., Bruton, G. D., & Hisrich, R. D. (1998). Strategy and the board of directors in venture capital-backed firms. *Journal of Business Venturing, 13*(6), 493–503.
- Garengo, P., & Biazio, S. (2005). La misurazione delle prestazioni nelle PMI: Un'analisi critica della letteratura. *Piccola Impresa/Small Business, 1*, 3–40.
- Govindarajan, V. (1988). A contingency approach to strategy implementation at the business-unit level: Integrating administrative mechanisms with strategy. *Academy of Management Journal, 31*(4), 828–853.

- Hayes, R. H., & Abernathy, W. (1980). Managing our way to economic decline. *Harvard Business Review*, 58(4), 67–77.
- Hellmann, T., & Puri, M. (2002). Venture capital and the professionalization of start-up firms: Empirical evidence. *Journal of Finance*, 57(1), 169–197.
- Hoque, Z., & James, W. (2000). Linking balanced scorecard measures to size and market factors: Impact on organizational performance. *Journal of Management Accounting Research*, 12, 1–17.
- Innes, J., & Mitchell, F. (1990). The process of change in management accounting: Some field study evidence. *Management Accounting Research*, 1(1), 3–19.
- Ittner, C. D., & Larcker, D. F. (1998). Innovations in performance measurement: Trends and research implications. *Journal of Management Accounting Research*, 10(10), 205–238.
- Ittner, C. D., Larcker, D. F., & Meyer, M. W. (2003). Subjectivity and the weighting of performance measures: Evidence from a balanced scorecard. *The Accounting Review*, 78(3), 725–758.
- Jensen, C. M., & Meckling, H. W. (1976). Theory of the firm: Managerial behavior, agency cost and ownership structure. *The Journal of Financial Economics*, 3, 305–360.
- Johnson, H. T., & Kaplan, R. S. (1987). *Relevance lost – The rise and fall of management accounting*. Boston: Harvard Business School Press.
- Jones, C. (1992). The attitude of owner managers towards accounting control systems following management buyout. *Accounting, Organization and Society*, 17(2), 151–168.
- Kaplan, R. S., & Norton, P. D. (1992). The balanced scorecard: Measures that drive performance. *Harvard Business Review*, 64(1), 71–79.
- Kaplan, R. S., & Norton, P. D. (1996). *The balanced scorecard: Translating strategy into action*. Boston: Harvard Business School Press.
- Keegan, D. P., Eiler, R. G., & Jones, C. R. (1989). Are your performance measures obsolete? *Management Accounting*, 70(12), 45–50.
- Langfield-Smith, K. (1997). Management control systems and strategy: A critical review. *Accounting, Organization and Society*, 22, 207–232.
- Lebas, M. (1994). Managerial accounting in France: Overview of past tradition and current practices. *The European Accounting Review*, 3(3), 471–487.
- Lebas, M. (1996). Management accounting practices in France. In: A. Bihmani (Ed.), *Management accounting. European perspectives*. Oxford: Oxford University Press.
- Lerner, J. (1995). Venture capitalists and the oversight of private firms. *Journal of Finance*, 50(1), 301–318.
- Libby, T., & Waterhouse, J. H. (1996). Predicting change in management accounting system. *Journal of Management Accounting Research*, 8, 137–150.
- Marasca, S., & Silvi, R. (2004). *Sistemi di controllo e cost management tra teoria e prassi*. Torino: Giappichelli.
- Marchini, I. (1995). *Il governo della piccola impresa. Vol. II – La gestione strategica*. Genova: Aspi/Ins-Edit.
- McNair, C., Lynch, R. R., & Cross, K. L. (1990). Do financial and nonfinancial measures have to agree? *Management Accounting*, 5, 26–36.
- Merchant, K. (1985). *Control in business organizations*. Boston: Harvard Business School Press.
- Merchant, K. (1998). *Modern management control systems: Text and cases*. Upper Saddle River, NJ: Prentice-Hall.
- Meyer, C. (1994). How the right measures help teams excel. *Harvard Business Review*, 72(3), 95–103.



- Mintzberg, H. (1979). An emerging strategy of direct research. *Administrative Science Quarterly*, 24(4), 582–589.
- Mitchell, F., Reid, G., & Terry, N. (1997). Venture capital supply and accounting information system development. *Entrepreneurship Theory and Practice*, 21(4), 45–62.
- Nanni, A. J., Dixon, J. R., & Vollman, T. E. (1992). Integrating performance measurement: Management accounting to support the new manufacturing realities. *Journal of Management Accounting Research*, 4, 1–19.
- Neely, A., & Adams, C. (2001). The performance prism perspective. *Journal of Cost Management*, 15(1), 7–15.
- Nørreklit, H. (2000). The balanced scorecard – A critical analysis of some of its assumptions. *Management Accounting Research*, 11(1), 65–88.
- Otley, D. T. (1980). The contingency theory of management accounting: Achievement and prognosis. *Accounting, Organization and Society*, 5(4), 413–428.
- Otley, D. T. (1994). Management control in contemporary organizations: Towards a wider framework. *Management Accounting Research*, 5(3/4), 289–299.
- Otley, D. T. (1998). Performance management and strategy implementation: The role of management accounting in the modern organization. *Proceedings of the Fourth International Management Control System Research Conference*, University of Reading, UK, 6–8 July.
- Palmer, R. J. (1992). Strategic goals and objectives and the design of strategic management accounting systems. *Advances in Management Accounting*, 1, 179–204.
- Ryan, B., Scapens, R., & Theobald, M. (2002). *Research method and methodology in finance and accounting*. London: Thomson.
- Sapienza, H. G., Manigart, S., & Vermeir, W. (1996). Venture capitalist governance and value added in four countries. *Journal of Business Venturing*, 11, 439–469.
- Simons, R. (1987). Accounting control systems and business strategy: An empirical analysis. *Accounting, Organization and Society*, 12(4), 357–374.
- Simons, R. (1991). Strategic orientation and top management attention to control systems. *Strategic Management Journal*, 12(1), 49–62.
- Tracogna, A. (2007). *I cluster del mare. Nautica da diporto e cantieristica navale in Friuli Venezia Giulia*. Milano, Italy: Franco Angeli.
- Ucina. (2006). *La nautica in cifre*. Genova: Ucina.
- Ucina. (2007). *La nautica in cifre*. Genova: Ucina.
- Wright, M., & Burrows, A. (2008). Entrepreneurship and management buy-outs. In: M. Casson, B. Yeung, A. Basu & N. Wadeson (Eds), *The Oxford handbook of entrepreneurship*. Oxford: Oxford University Press.
- Yin, R. J. (1981). The case study crisis: Some answers. *Administrative Science Quarterly*, 26, 58–65.
- Zammuner, V. L. (1998). *Tecniche dell'intervista e del questionario*. Bologna, Italy: Il Mulino.

# INNOVATION AND PERFORMANCE: SOME EVIDENCE FROM ITALIAN FIRMS<sup>☆</sup>

Mascia Ferrari and Luca La Rocca

## ABSTRACT

*Purpose – This paper aims to explain through a statistical model the link between innovation and performance. The data taken into consideration is from Unicredit Group survey for the period 2004–2006 on Italian manufacturing firms.*

*Methodology – We consider a broad concept of innovation: investments in R&D and technology, new processes, new products, innovation in terms of marketing and organization, investments in training of human resources. Performance is measured in terms of ROA without considering extraordinary items and taxes, to eliminate exceptional events and fiscal aspects.*

*Findings – With respect to innovation strategies, we find a weak, but significant, relationship between ROA and innovation. In addition, the influence of innovation on ROA does depend on innovation types and*

<sup>☆</sup> Although the paper is the result of a team work, Mascia Ferrari can be considered the author of sections: Innovation definition, Literature review, Hypotheses development; Luca La Rocca can be considered the author of sections: Data, Model, Empirical findings.

*industry structures. Conversely, the amount of innovation expenditures does not have an influence on performance.*

*Limitations – The main limitations of our analysis are represented by the missing values coming from the financial reporting in short form and by the consideration of a short time period (the year 2006), with reference to the innovation expenditures and the measurement of performance.*

*Implications – From a managerial point of view, our model describing the relationship between innovation drivers and financial performance might represent a useful tool for managers aiming to introduce or implement innovation strategies in their organization.*

*Originality – Innovation is a common topic in econometric studies but not so much in managerial and accounting literature. The goal of the paper is to link macro and micro perspectives in a combined framework based on managerial and financial accounting.*

## INTRODUCTION

Innovation is not a new concept. It is a common topic in political economy or econometric studies, yet it is not well addressed in management and financial accounting literature. In particular, there is a great fragmentation across the fields of study. In econometrics, the approach generally has a macro perspective aiming to highlight the impact of innovation on economic industry, in order to drive government policy and public investments and/or financing.

Even most of the studies with a micro perspective and a political economy background provide results showing the impact of innovation on firm performance or growth with the objective of defining predictable models for a specific industry or country.

A higher level of homogeneity characterizes the micro perspective literature with a managerial focus. This stream of studies, typically, encompasses a strategic management approach with implications in terms of planning and control systems and redesigning firm business models.

Recent literature has offered a more integrated framework, considering both strategic aspects and firm profitability in a balanced scorecard perspective with a cause and effect relationship between leading and lagging indicators.

The measurement of innovation has also generated a lot of fragmentation according to the different analysis perspectives. The most typical indicators

used are Research and Development (R&D) expenditures and patents (OECD, 2002). Nevertheless, the former is just a measure of input, not considering the productivity and the effort spent in the innovation process, and the latter is the “official” result of a process of invention and a partial measure of output, unable to capture other intangible investments in innovation (Mairesse & Mohnen, 2005; Mairesse, Mohnen, & Dagenais, 2006).

In reality, innovation has a broader meaning with reference to both product and process and it is not only technology-driven, but marketing-driven as well.

With reference to this broader concept of innovation, which embraces product innovations, process innovations, marketing innovations, and organizational innovations, according to the indications of the Oslo Manual (OECD, 2005), this paper aims to contribute to the stream of studies based on a managerial perspective with the purpose of verifying a possible relationship between innovation variables and firm performance.

Specifically, we test whether innovation influences performance and whether this influence depends on innovation typologies – product, process, organizational product, organizational process – and on the industry categories identified in Pavitt’s taxonomy (Pavitt, 1984). Therefore, we test whether the innovation expenditures have an influence on performance depending on the industry categories.

The goal of the paper is also to create a connection between macro and micro perspectives, consistently with the data. In fact, the sample we use comes from a survey conducted at a macro level with the purpose of depicting the status of Italian manufacturing firms during the period 2004–2006, with a section dedicated to innovation investments and strategies.

The variables considered in our linear model reflect the broad meaning of innovation mentioned above, while performance is measured in terms of the profitability ratios such as return on assets (ROA), one of the typical firm performance indicators.

Since ordinary least squares do not provide us with a satisfactory fit, due to heavy tails and asymmetry in the response variable, we replace them with a more flexible method based on a skew- $t$  distribution for the error term.

With respect to innovation strategies, we find a weak, but significant, relationship between ROA and innovation. This implies that the effect of innovation on ROA is limited and the latter is probably in large part explained by other variables.

In addition, the influence of innovation on ROA does depend on innovation types and Pavitt’s taxonomy, implying that industry structures and different innovation variables interact in determining the sign and strength of their combined effect.

Conversely, the amount of innovation expenditures does not have an influence on performance depending on the industry categories, although we have some evidence of a positive effect of scaled innovation expenditures for supplier-dominated firms.

The remaining portion of the paper is structured as follows: the second section offers a brief overview of the innovation definition; the third section presents a literature review on innovation; the fourth section develops the Hypotheses; the fifth section describes the data and the sample selection; the sixth section presents the model; the seventh section describes the empirical findings; and the eighth section concludes.

## INNOVATION DEFINITION

Considering the huge amount of literature examining innovation from different perspectives, it is not an easy task to try and define it.

Innovation is often intended as synonymous for R&D, especially in everyday language. However, literature typically refers to the broader meaning of the word, which embraces investments in R&D and technology (Lev, 2001; Lev, Nissim, & Thomas, 2005), new processes, new products, innovation in terms of marketing and organization, investment in training of human resources.

The OECD (1991) definition, even if it is referred to technological innovation, captured many of these aspects: “innovation” is an iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based invention leading to development, production, and marketing tasks striving for the commercial success of the invention.

The core definition considers:

1. an iterative process consisting in the introduction of an invention on the market and a continuous improvement of that innovation;
2. the fact that innovation has to be processed through production and marketing in order to reach the marketplace, otherwise we can only speak about invention.

This iterative process implies different degrees of innovation that can be measured by innovativeness: its degree of newness.

In theoretical literature, the term innovation has been labeled under many typologies with an evident difficulty in comparing the results of different research, especially if coming from diverse fields. Although these categories have similar names, they can be totally different in their substance and vice

versa. Consequently, the definitions and the framework behind the word “innovation” cover a wide range of nuances (Boer & Duing, 2001; Shavinina, 2003; Fagerberg, Mowery, & Nelson, 2004; Meeus & Edquist, 2006; Maital & Seshadri, 2007; Birkinshaw, Hamel, & Mol, 2008). Moreover, if we consider the empirical literature about product innovation (Kotabe & Murray, 1990; Klepper, 1996; Davila, 2000; Fritsch & Meschede, 2001; Kleinknecht & Mohnen, 2002; Bisbe & Otley, 2004; Kumar & Phrommathed, 2005; Damanpour & Aravind, 2006; Kaufman & Woodhead, 2006; Davila, Foster, & Li, 2009), we can find a sort of disorganization.

Joseph Schumpeter is often thought of as the first economist to draw attention to the relevance of innovation. He proposed (in 1934) five types of innovation (OECD, 2005, p. 29):

- introduction of new products,
- introduction of new methods of production,
- opening of new markets,
- development of new sources of supply for raw materials or other inputs,
- creation of new market structures in an industry.

Historically, research on innovation types has followed a technological imperative, assuming that firms mainly organize their innovation efforts through R&D activities, and has thus focused on a narrow definition of product and process innovations associated with the R&D function in manufacturing organizations (Gallouj & Weinstein, 1997; Miles, 2001; Mairesse & Mohnen, 2004).

Theory development and empirical studies of innovation types have not focused on innovation antecedents, namely, environmental and organizational conditions that enhance or hamper the process of generation or adoption of each type (Jansen, Van den Bosch, & Volberda, 2006; Kimberly & Evanisko, 1981; Tornatzky & Fleischer, 1990).

Garcia and Calantone (2002) tried to systematize the literature by creating a sort of ontology on the definition of innovation and innovativeness. However, these authors confirmed that “ad hoc categorizations of innovations into degrees of innovativeness have led to inconsistencies in labeling innovation types.”

A first dichotomy of innovation typologies is based on macro and micro perspectives. In a macro perspective, the focus is on the world, market, or industry, and innovativeness is evaluated with respect to the exogenous context. From a micro perspective, instead, innovation is based on firm or customer focus.

Secondly, innovation discontinuities may originate from a marketing or a technological direction. Product innovation may require new marketplaces to evolve and/or new marketing skills for the firm. Similarly, product innovations may require a paradigm shift in the state of science and technology, new R&D resources, and/or new production processes for a firm. Some products may require discontinuities in both marketplace and technological factors.

The same authors identify radical, really new, and incremental innovations. Radical innovations are those with both marketing and technology discontinuities at the macro level, as well as at the micro level. Really new innovations are those with either marketing or technology discontinuities – not both – at the macro level, and with consistent discontinuities at the micro level (both types or the same as macro). Incremental innovations have discontinuities at the micro level only (marketing, technology, or both).

Considering this kind of definition and typology “chaos” from the literature, we have adopted the definition and the framework of the Oslo Manual published by OECD in his third edition in 2005.

The Oslo Manual aims to provide guidelines for the collection and interpretation of data on innovation, by setting a benchmark for innovation surveys and research for OECD members. In innovation studies it represents a reference point to set a framework in terms of definitions and guidelines that can support time and space comparison.

According to the Oslo Manual (OECD, 2005, p. 46), an innovation is the implementation of a new or significantly improved product (goods or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations.

In addition, the Oslo Manual distinguishes three concepts for the novelty of innovation: new to the firm, new to the market, and new to the world. The first concept covers the diffusion of an existing innovation to a firm (the innovation may have already been implemented by other firms, but is new to the firm). The new to the market and new to the world concepts concern whether a certain innovation has already been implemented by other firms, and whether the firm is the first in the market or industry or worldwide to have implemented it. Firms that first develop innovations can be considered drivers of the process of innovation.

Considering the innovation types, the Oslo Manual (OECD, 2005, p. 48) distinguishes: product innovations, process innovations, marketing innovations, and organizational innovations.

1. A product innovation is the introduction of a product or service that is new or significantly improved with respect to its characteristics or

- intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness, or other functional characteristics. Product innovations can utilize new knowledge or technologies, or can be based on new uses or combinations of existing knowledge or technologies. The term “product” covers both goods and services.
2. A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment, and/or software. Process innovations can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products.
  3. A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion, or pricing. Marketing innovations are aimed at better addressing customer needs, opening up new markets, or newly positioning a firm’s product on the market, with the objective of increasing the firm’s sales.
  4. An organizational innovation is the implementation of a new organizational method in the firm’s business practices, workplace organization, or external relations. Organizational innovations can be intended to increase a firm’s performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus labor productivity), gaining access to nontradable assets (such as noncodified external knowledge), or reducing costs of supplies.

The framework used in the manual represents an integration of insights from various firm-based theories of innovation with the approaches that view innovation as a system.

In our paper we consider the broad concept of innovation of the Oslo Manual, which covers the implementation of a new or significantly improved product or process, a new marketing method, or a new organizational method, workplace organization or external relations, and the relative typologies identified, with the purpose of using its general firm-oriented framework for a specific investigation in the Italian manufacturing context.

## **LITERATURE REVIEW**

Government, academics, and executives have considered innovation as the main source of economic growth and competitive advantage.



In recent years the number of social science publications focusing on innovation in economic and social change has increased. However, a key point impeding research linking innovation processes is intellectual fragmentation across the relevant fields of study and within the same field. In fact, no single discipline deals with all aspects of innovation, even if innovation is a systemic phenomenon whose results interact continuously between many players and organizations. This situation makes it hard for scholars to keep up-to-date with the literature in this field of research.

An evidence of this fragmentation is represented by the fact that scholars working within economic sociology and especially comparative political economy have developed sophisticated treatments of why differences in national institutional frameworks continue to exist in a rapidly globalizing economy. Few scholars within these disciplines, instead, aim to employ macro-level institutional analysis to understand micro-level patterns of innovation (Casper & van Waarden, 2005, p. 25). In fact, this literature has generally not given much attention to the way the institutional environment of organizations influenced their structures, and in turn, innovations within organizations (Walton, 1987).

### *Macro and Micro Perspectives in Innovation and Performance*

From the macro point of view, innovation can be considered in terms of “capacity to create a paradigm shift in the science and technology and/or market structure in an industry” (Garcia & Calantone, 2002).

At a macro level, the different patterns in innovative performance and sectoral specialization by country have attracted quite a degree of attention in recent years (e.g., Archibugi & Pianta, 1994; Patel & Pavitt, 1994, 1996). These authors have posed further questions to be investigated, such as: why are some countries more innovative than others? And in different fields? Why do some countries make radical innovations, while others make more incremental innovations? The differences among countries suggest that nation-specific factors shape the innovation processes and nation-specific structures of organizations and institutions may make the difference.

Countries differ in their innovative performance. As Porter (1990) highlighted, the commercial innovative activity is not spread evenly across nations. In addition, countries differ in other indicators of innovative output: number of patents registered, new products and processes developed, new firms founded in new promising sectors, successful marketing and

commercialization, and trade balance in high-tech products (Casper & van Waarden, 2005).

The above differences in innovation output have traditionally been explained in the economics of innovation by differences in input: amount of investment in R&D, capital investment in general, supply of qualified labor, and so on. However, input factors alone cannot explain national differences in innovative performance. While R&D-related public expenditures have varied over time across various countries, the sectoral specializations of countries appear to have been quite consistent over time.

The relation between innovation and export performance has, in fact, been firstly and deeply studied at the macro level, where studies, both theoretical (Posner, 1961; Vernon, 1966) and empirical (among others Wakelin, 1998; Greenhalgh, 1990), have identified innovation (proxied in different ways, ranging from R&D expenditures to patenting activity) as a potential explanation for different world trade performances of countries (Brusoni, Cefis, & Orsenigo, 2006).

From a micro perspective, innovation is the capacity to influence the firm's existing marketing resources, technological resources, skills, knowledge, capabilities, or strategy (Garcia & Calantone, 2002).

Literature with a micro focus can be categorized into two groups: one with a political economy theoretical background, the other with a managerial theoretical perspective.

In the first stream of literature we can find studies with a focus on European countries, which highlight that at the firm level also innovation is a determinant of firms' export performance (Gourlay & Seaton, 2004; Greenhalgh, Taylor, & Wilson, 1994).

With reference to the Italian context, Basile (2001) and Sterlacchini (1999), respectively, found that the export intensity of innovating firms is systematically higher than that of noninnovating firms and that small non-R&D-performing firms are more likely to export when they have innovative activities.

Focusing on the persistence of innovation, studies have examined the patterns of innovative entry, exit, and survival, by using European Patent Office data for six countries (Malerba & Orsenigo, 1999). These authors found that innovative activities are characterized by high degrees of turbulence: the innovators change substantially over time. A large fraction of new innovators is composed by occasional innovators, while only a fraction of entrants survive and succeed in remaining innovative after their first patent. When they do, however, their technological performance improves consistently in the years that follow. These results could suggest

that although turbulence is a pervasive phenomenon, innovative activities are generated by a relatively stable core of large (both in terms of patents and employees) and persistent innovators (Brusoni et al., 2006).

On the contrary, Geroski, Van Reenen, and Walters (1997) found little evidence of persistence at the firm level. Cefis (2003) found little persistence in general, but strong persistence among the greatest and the smallest innovators. In addition, the results have shown substantial heterogeneity in the degree of persistence across sectors and across firm size. This is the evidence that the intersectoral differences do not concern only persistence in innovative activities, but in general the whole role of innovation in firm performance.

The examination of the impact of innovation on a firm's survival has shown that the ability to innovate increases survival probabilities for all firms and across most industrial sectors (Cefis & Marsili, 2004; Cefis & Ciccarelli, 2005).

Although some studies support the idea that innovation has an impact on a firm's performance, this is not the same if we consider the firm's growth. Possible explanations are represented by the fact that innovation does not have any significant impact on the firm's growth because the latter is driven by other factors, e.g., rates of growth of demand, advertising, price competition. A second interpretation might be that innovation does not translate into growth since other firms are innovating too, thus imitation immediately erodes away differentials in competitiveness across firms. Thirdly, innovation may be considered as a largely random and unpredictable phenomenon (Brusoni et al., 2006).

This nonexhaustive review on macro and micro political economy-based literature shows how innovation has been considered under many points of view with different results, confirming the lack of systematization in approaching the topic.

In the stream of the micro perspective literature with a managerial view, contributions are not as numerous as in the political economy-based one. However, a higher degree of homogeneity characterizes this field. In fact, most of these types of studies present a common strategic background with management accounting implications. Innovation is considered both as a strategic path with internal consequences for the firm and as a key element for strategic competition (Anthony & Christensen, 2005).

In particular, focusing on measurement systems, as one of the sources of information, literature has analyzed how the state of innovation processes can be assessed through measurement systems and how the innovation

strategy of the company affects the use of measures for a particular stage of the process. The results indicate that managers tend to focus on measures that only inform about a specific stage of the innovation process and they combine measures that are informative about a particular phase in the innovation process, rather than using a combination of measures that provide an overview of the different phases of this process (Davila, Epstein, & Matusik, 2004).

If we consider the strategic management field, we can find literature that has studied innovation in terms of reinventing new business processes or models, and creating new markets capable of meeting customer needs (Sujatha, 2006). In this context, innovation is “putting new, high value ideas into action” and strategy is considered from the competitive advantage point of view. This broad framework also takes into consideration organizational aspects, supported by an environment that nurtures talent, and willingness to implement new things. Other literature has provided an overview of the innovation economy’s consequences on the strategy and on the business models in an organizational and knowledge management framework (Davenport, Leibold, & Voelpel, 2006).

Afuah (2003) integrates, with a multiperspective approach, the contributions of economics, organizational theory, marketing, and finance to innovation management, underlying the financial results of innovation.

However, few studies combine the results coming from a managerial inner-looking investigation with the financial accounting perspective.

An integrated analysis is offered in Davila, Epstein, and Shelton (2006) with a start-to-finish model for driving growth from innovation. In particular, these authors define effective strategies and organizational structures for innovation, illustrating how to manage innovation more successfully, through metrics in every phase of innovation processes. The strategic approach is translated into action by integrating the different types of innovation (incremental, semiradical, and radical) and creating a balanced portfolio of innovations. The performance impact is considered in terms of sustainable value creation (Davila et al., 2006, p. 169).

In the same framework, Epstein (2007) provides a description of the drivers and measures of innovation success leading to corporate profitability. In particular, this author presents a set of financial and non financial measures that represent leading and lagging indicators of performance in a cause and effect model: the balanced scorecard.

Our contribution finds a place in this second stream of micro literature. More precisely, within this combined framework based on managerial and financial accounting, our paper aims to create a connection with the macro

perspective, in order to highlight the firm's performance consequences of innovation strategies.

## HYPOTHESES DEVELOPMENT

The purpose of our paper, as previously stated, is to contribute to the study of innovation by creating a link between macro and micro perspectives from a managerial point of view. Considering the Italian manufacturing firms, we address the following research question:

*Is there a relationship between performance (measured as ROA) and innovation?*

In particular, matching the four categories of industries grouped according to Pavitt's taxonomy – supplier dominated, scale intensive, specialized suppliers, science based (see [Appendix A](#)) – and the definition of innovation considered in our paper, our research hypotheses are:

**Hypothesis 1.** innovation has an influence on performance

**Hypothesis 2.** the influence of innovation on performance depends on the innovation typologies – product, process, organizational product, organizational process – and on the industry categories (Pavitt's taxonomy)

**Hypothesis 3.** the amount of innovation expenditures have an influence on performance depending on the industry categories

From the theoretical point of view, the goal of creating a connection between macro and micro perspectives is consistent with the data. In fact, the sample we use comes from a survey conducted at a macro level with the purpose of depicting the status of Italian firms during the period 2004–2006, with a section dedicated to innovation investments and strategies.

We use the data coming from that section integrated with financial data to understand whether there is a (statistically) significant relationship between innovation and performance for the Italian manufacturing firms.

## DATA

We consider data from a survey conducted every three years by the research and strategy department of Unicredit Group, under the supervision of a

scientific committee composed of professors in finance and experts in economics.

A questionnaire was administered to a stratified sample of Italian manufacturing firms. Firms with yearly revenues of no less than 1 million euros were grouped in strata, homogenous in terms of gross product per employee in 2006, based on their number of employees, geographical location, and industries. All firms with more than 500 employees were included in the sample, together with simple random samples of optimal size (according to Neyman's formula) from the other strata. This sampling scheme allows stratum-dependent parameters to be estimated, and more accurate overall estimates to be obtained.

Survey questions on innovation expenditure were formulated according to the subject approach recommended by the Oslo Manual (OECD, 2005, p. 103) for reporting on innovation expenditures. The subject approach considers the total expenditures on innovation activities in a given year or period and covers expenditures for implemented, potential, and abandoned innovation activities. In this respect, it is a straightforward extension of traditional R&D measurement.

The questionnaire data was integrated by Unicredit Group with financial reporting data from the AIDA and CEBI databases (Unicredit Group, 2008). AIDA is a database of about 300,000 firms; 80,000 of them are manufacturing firms with revenues of at least 750,000 euros. CEBI (Centrale dei Bilanci) includes a sample of about 40,000 firms; for some of the years data is integrated with that coming from Cerved; in that case the sample reaches a total of over 100,000 firms.

As a measure of performance we take the ROA ratio excluding taxes and extraordinary items from the numerators, for the following reasons:

- (a) According to Italian fiscal laws, taxes can be the results of a tax planning carried out years before the period considered;
- (b) Extraordinary items, as known, occur occasionally. Thus, they are not the expression of a repeatable performance in the future (Centrale dei Bilanci, 2004).

The reason we use ROA, rather than return on equity (ROE), as measure of performance is represented by the characteristic of this ratio: it allows the firm financing strategy to be neutral with respect to the performance (Alberici, 1987; Silvi, 2006) and the comparison among firms in the sample to be favored.

On the other hand, the forced choice of ROA instead of return on investments (ROI) is due to the fact that our sample is composed of firms with financial reporting both in detailed and short form.

The Italian short-form financial reporting, in fact, does not distinguish between operating and financial liabilities. Consequently, it is not possible to calculate the invested capital net from operating liabilities, which would represent the denominator of ROI, for all the firms.

With reference to the innovation section of the questionnaire, we consider the two questions reported in [Appendix B](#) regarding the amount of expenditures for technological innovation in 2006 and the different innovation types carried out in 2004–2006. As regards innovation expenditures, we take into consideration the total amount of technological innovation expenditures reported at the end of question C2.1.2 in [Appendix B](#) (see the end of the seventh section for more details about this choice).

Consistently with the performance measure used, we scale the innovation expenditures by total assets (net of amortization).

Therefore, our analysis is based on the following variables:

ROA (%) target variable

WF = workforce size (stratification factor with 5 levels)

Zone = firm's location (stratification factor with 4 levels)

Pavitt = firm's sector (stratification factor with 4 levels)

Product = the firm has carried out product innovation (YES/NO)

Process = the firm has carried out process innovation (YES/NO)

ProdOrg = the firm has carried out organizational innovation  
related to product innovation (YES/NO)

ProcOrg = the firm has carried out organizational innovation  
related to process innovation (YES/NO)

InnExp = scaled innovation expenditures

### *Sample Selection*

From the original sample of 5,137 Italian manufacturing firms, we extract a subsample of 4,457 firms by imposing the following constraints: financial reporting data should be available for 2006, and the firm should have reported whether it carried out any product/process/organizational innovation in the years 2004–2006, as well as how much it spent for innovation in 2006. We trim a few outliers off our sample. More precisely, we discard those firms whose ROA is in the upper 1% or lower 1% tail of its distribution (we keep the central 98% observations) or whose scaled expenditures in innovation are in the upper 1% of their distribution.

**Table 1.** Sample Selection in Terms of Work Force, Zone, and Pavitt’s Taxonomy.

WF			Zone			Pavitt		
Original Selected			Original Selected			Original Selected		
11–20	1,721	1,447	Northwest	2,203	1,855	Supplier dominated	2,555	2,150
21–50	1,575	1,325	Northeast	1,492	1,262	Scale intensive	974	827
51–250	1,421	1,206	Central	834	699	Specialized suppliers	1,374	1,150
251–500	235	189	South	608	509	Science based	234	198
> 500	185	158						
Total	5,137	4,325		5,137	4,325		5,137	4,325

This leaves us with 4,325 firms, for which the distribution of the stratification factors is quite close to the original one (see Table 1).

*Descriptive Statistics*

In our subsample, we obtain the following descriptive statistics of our innovation and performance variables:

Product		Process	
No:	2,092	No:	2,380
Yes:	2,233	Yes:	1,945

ProdOrg		ProcOrg	
No:	3,747	No:	3,809
Yes:	578	Yes:	516

I (InnExp > 0)	
0	1
2,968	1,357

Log10 (InnExp)   I (InnExp > 0) = 1					
Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
-4.0160	-1.7720	-1.3560	-1.3970	-0.9794	-0.1264



ROA06	
Min. :	-18.997
1st Qu.:	2.781
Median:	4.983
Mean:	5.916
3rd Qu.:	8.501
Max. :	30.415

where  $I(\text{InnExp} > 0)$  is equal to 1, if  $\text{InnExp} > 0$  is true, and 0 otherwise, and  $\text{Log}_{10}(\text{InnExp}) | I(\text{InnExp} > 0) = 1$  denotes the distribution of  $\text{Log}_{10}(\text{InnExp})$  when only firms for which  $\text{InnExp} > 0$  is true are considered.

The distribution of ROA is also represented in Fig. 1.

The histogram in panel (a) rises to its mode to the left of the mean, then slopes gently towards its right tail, thus showing right asymmetry; it also shows heavy tails compared to the normal curve.

The same distributional features emerge from the boxplot in panel (b), which identifies many outliers compared to the normal distribution, and shows that the third quartile is further from the median than the first quartile.

## MODEL

In order to explain ROA in terms of innovation strategies, we consider the following linear model:

$$\begin{aligned}
 \text{ROA} = & B0 + BSI \times I(\text{Pavitt} = \text{ScaleIntensive}) + \\
 & BSS \times I(\text{Pavitt} = \text{SpecializedSuppliers}) + \\
 & BSB \times I(\text{Pavit} = \text{ScienceBased}) + \\
 & BWF1 \times I(\text{WF} > 20) + BWF2 \times I(\text{WF} > 50) + \\
 & BWF3 \times I(\text{WF} > 250) + BWF4 \times I(\text{WF} > 500) + \\
 & BNW \times I(\text{Zone} = \text{NorthWest}) + BNE \times I(\text{Zone} = \text{NorthEast}) + \\
 & BS \times I(\text{Zone} = \text{South}) + \\
 & BD(\text{Pavitt}) \times I(\text{Product} = \text{YES}) + BC(\text{Pavitt}) \times I(\text{Process} = \text{YES}) + \\
 & BDO(\text{Pavitt}) \times I(\text{ProdOrg} = \text{YES}) + BCO(\text{Pavitt}) \times I(\text{ProcOrg} = \text{YES}) + \\
 & B1 \times I(\text{InnExp} > 0) + BIE(\text{Pavitt}) \times I(\text{InnExp} > 0) \times \text{LogInnExp} + \text{Error}
 \end{aligned}$$

where: (i)  $B0$  is the average ROA of a supplier-dominated firm located in Central Italy with workforce between 11 and 20 and carrying out no innovation; (ii)  $I(\langle \text{expression} \rangle)$  is equal to 1 if  $\langle \text{expression} \rangle$  is true, and 0 otherwise; (iii)  $\text{LogInnExp}$ , only defined when  $\text{InnExp} > 0$ , is the common

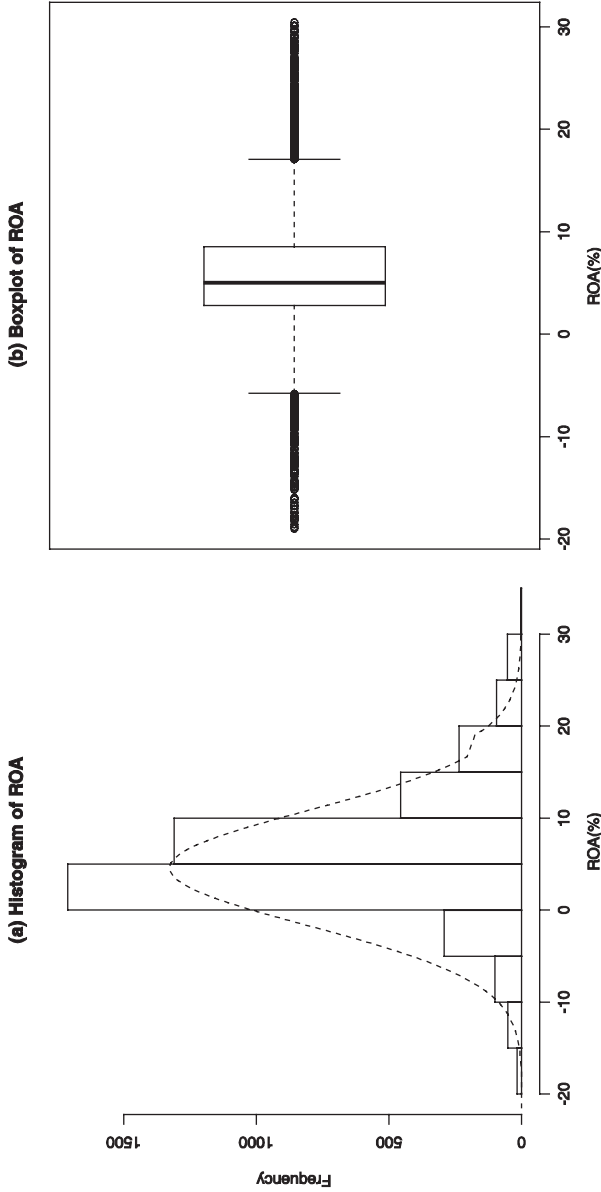


Fig. 1. Graphical representation of ROA.

logarithm (base 10) of the scaled innovation expenditures, centered about their mean (on the log scale), so that  $B_1$  is the marginal ROA for an average strictly positive spending, and  $BIE(Pavitt)$  is the industry-dependent change in ROA corresponding to a tenfold increase in scaled innovation expenditures; (iv) Error is a stochastic error term.

## EMPIRICAL FINDINGS

We first assume a normal distribution for the Error term, and estimate model parameters by means of ordinary least squares (OLS). Thus, we find that innovation strategies explain a tiny, though significant, fraction of ROA variability (as measured by variance):  $R^2 = 2.8\%$ ,  $p\text{-value} = 1.128e-12$ . Then, since the residuals show asymmetry and heavy tails, which is consistent with the boxplot in Fig. 1, we try and improve on the poor fit of our first model by assuming a skew- $t$  distribution (Azzalini & Capitanio, 2003) for the Error term. We fit this second model by means of the SN package (Azzalini, 2009) for  $R$  (R Development Core Team, 2009) and obtain an error distribution with 2.14 degrees of freedom (very heavy tails) and shape parameter equal to 0.67 (right asymmetry).

Notice that, with a right asymmetric Error term, the estimate of  $B_0$  (baseline ROA) falls from more than 6% to less than 4%. In the following, we draw our conclusions based on this second model, which seems more appropriate for our data, but in Table 2 we report both estimates, so that the reader can compare them.

In Table 2, OLS and SN denote the parameter estimates under the two models: SE are the corresponding standard errors, and  $p$  are the  $p$ -values against the hypotheses that each coefficient is (individually) zero.

Overall, innovation strategies have a limited power to explain ROA variability, but some results clearly emerge from our analysis.

First, with respect to the stratification variables, we find a significant negative effect of workforce increase on ROA, with some evidence of an inversion when workforce reaches 500 units, a strongly significant negative effect of being localized in southern Italy ( $-1.37\%$ ), and a strongly significant positive effect of being a specialized-supplier firm ( $+0.88\%$ ), confirming the results concerning the positive relationship between supplier-automaker specialization and performance in the auto industry (Dyer, 1996).

Table 2. Parameter Estimates for the Two Models.

	OLS	SE	p-Value	SN	SE	p-Value
B0 (Intercept)	6.36	0.27	0.0000***	3.69	0.23	0.0000***
Pavitt scale intensive	0.03	0.40	0.9448	-0.12	0.27	0.6684
Pavitt specialized suppliers	1.46	0.37	0.0001***	0.88	0.25	0.0006***
Pavitt science based	0.96	0.82	0.2424	0.57	0.63	0.3676
WF21-50vs11-20	-0.65	0.25	0.0082**	-0.47	0.16	0.0041**
WF51-250vs21-50	-0.46	0.26	0.0751†	-0.34	0.17	0.0471*
WF251-500vs51-250	-0.98	0.51	0.0540†	-0.56	0.35	0.1082
WF>500vs251-500	1.01	0.70	0.1496	0.74	0.51	0.1485
Zone northwest	0.23	0.24	0.3339	0.18	0.16	0.2584
Zone northeast	-0.16	0.29	0.5861	-0.06	0.19	0.7478
Zone south	-1.88	0.33	0.0000***	-1.37	0.21	0.0000***
Pavitt supplier dominated: Product YES	-0.27	0.33	0.4157	-0.33	0.21	0.1137
Pavitt scale intensive: Product YES	-0.12	0.52	0.8202	0.07	0.34	0.8373
Pavitt specialized suppliers: Product YES	-1.26	0.44	0.0042**	-0.74	0.31	0.0159*
Pavitt science based: Product YES	-0.62	1.12	0.5813	-0.64	0.80	0.4270
Pavitt supplier dominated: Process YES	0.73	0.33	0.0262*	0.49	0.21	0.0217*
Pavitt scale intensive: Process YES	-0.10	0.52	0.8518	-0.17	0.34	0.6232
Pavitt specialized suppliers: Process YES	0.44	0.43	0.3125	0.40	0.30	0.1836
Pavitt science based: process YES	0.21	1.10	0.8514	0.51	0.74	0.4947
Pavitt supplier dominated: ProdOrg YES	1.17	0.53	0.0264*	0.71	0.35	0.0434*
Pavitt scale intensive: ProdOrg YES	-0.57	0.79	0.4682	-0.26	0.52	0.6152
Pavitt specialized suppliers: ProdOrg YES	0.73	0.66	0.2657	0.38	0.45	0.4032
Pavitt science based: ProdOrg YES	1.24	1.33	0.3509	0.31	0.89	0.7269
Pavitt supplier dominated: ProcOrg YES	-0.54	0.54	0.3156	-0.72	0.36	0.0450*
Pavitt scale intensive: ProcOrg YES	0.40	0.82	0.6276	-0.03	0.57	0.9584
Pavitt specialized suppliers: ProcOrg YES	0.07	0.68	0.9139	0.10	0.48	0.8295
Pavitt science based: ProcOrg YES	-2.95	1.56	0.0591†	-0.42	1.41	0.7686
I (InnExp> 0)	-0.14	0.22	0.5355	0.10	0.15	0.4949
Pavitt supplier dominated: LogInnExp	0.54	0.39	0.1684	0.35	0.26	0.1771
Pavitt scale intensive: LogInnExp	0.34	0.68	0.6123	0.24	0.48	0.6108
Pavitt specialized suppliers: LogInnExp	-0.34	0.56	0.5488	-0.17	0.41	0.6859
Pavitt science based: LogInnExp	-1.03	1.49	0.4900	0.00	0.90	0.9981

Note: Significance values – \*\*\* $p < 0.001$ , \*\* $0.001 < p < 0.01$  (high significance), \* $0.01 < p < 0.05$  (significance), † $0.05 < p < 0.1$

With respect to innovation strategies, we find:

- (i) a negative effect of product innovation for specialized-supplier firms (−0.74%, significant);
- (ii) a positive effect of process innovation for supplier-dominated firms (+0.49%, significant);
- (iii) a positive effect of organizational innovation related to product innovation for supplier-dominated firms (+0.71%, significant);
- (iv) a negative effect of organizational innovation related to process innovation for supplier-dominated firms (−0.72%, significant).

Considering the significant relationship we have found between ROA and innovation, Hypothesis 1 is verified, though the weakness of the relationship implies that the effect of innovation on ROA is limited.

As for Hypothesis 2, the above-described effects show that the influence of innovation on ROA does depend on innovation types and Pavitt's taxonomy. This means that industry structures and different innovation variables interact in determining the sign and strength of their combined effect.

This stage of analysis does not allow us to say that these are managerial variables capable of directly influencing the performance in terms of ROA. However, this kind of information should be taken into consideration when an innovation strategy is introduced or implemented.

Conversely, Hypothesis 3 is not verified, even though we have some evidence of a positive effect of scaled innovation expenditures for supplier-dominated firms (+0.35% per 10-fold increase,  $p = 18\%$ ).

We would like to remark that we also tried models where the innovation expenditures were split according to their typology, but no significant relationship with ROA emerged. This could be due to the fact that a minority of firms incurred innovation expenditures, and even fewer if we focus on particular typologies. That is why we decided to present a model with total innovation expenditures only.

## CONCLUSIONS

Our analysis has shown that the performance of Italian manufacturing firms is weakly explained by the variables included in our linear model, which reflect innovation strategies at a firm level in the wide meaning explained in second section.

This does not allow this relationship to be considered as a “management tool” that could be inserted in a balanced scorecard perspective, where cause and effect relationship characterizes the strategy map.

Nevertheless, we found that Pavitt’s taxonomy and the different typologies of innovation are capable of influencing ROA. As already mentioned, this information could be useful for management when an innovation strategy is being planned.

In particular, a process innovation and an organizational related to process innovation have a positive and a negative effect, respectively, on the supplier-dominated group (mainly composed of traditional industries). The positive effect due to the process innovation finds a counterbalanced effect in terms of organization that should not be ignored.

A positive effect is also determined by organizational related to product innovation with reference to the same group.

Considering the specialized-supplier firms, product innovation exerts a negative effect. This is coherent with the fact that specialized firms reach higher levels of efficiency in the long run, as a result of their learning curve, thus the new product at the early stage of introduction does not perform like the other already consolidated specialized products.

Even if the results do not satisfy our expectations, with particular reference to the weak relationship between innovation and performance ratio, they are in some way consistent with previous studies that have highlighted the limited amount of innovation investments and poor productivity performance of European countries, compared to the United States, and how the contribution of innovation to productivity growth is almost nil for Italian firms until 2003 (Griffith, Huergo, Mairesse, & Peters, 2006; Hall, Lotti, & Mairesse, 2007, 2008).

One of the limits of our analysis is represented by the missing values coming from the financial reporting in short form. As we explained in the fifth section, this aggregate information does not allow the measurement of performance in terms of ROI. If we considered a subsample composed only by firms with detailed financial reporting, cutting off all the other SMEs, this would imply reducing the original sample size by at least 50%.

Another limit of our analysis is represented by the fact that we considered a short time period, the year 2006, with reference to the innovation expenditures. The Oslo Manual recommends that the length of the observation period for innovation surveys should not exceed three years nor be less than one year. However, we considered in our model the innovation expenditures in 2006 (the only data available) and we measured the performance for the same year. It is likely that the investments in 2006 will have a higher impact

on the performance in the following years, thus they could be used as a variable in a regression model together with an average performance measure that covers the period 2006–2008, if available.

The next survey conducted by Unicredit Group for the years 2007–2008 will give us the possibility of verifying the robustness of our results considering the years 2006–2008. In addition, the next survey will probably be extended to other European countries with the possibility of comparing data among different countries.

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## REFERENCES

- Afuah, A. (2003). *Innovation management*. Oxford: Oxford University Press.
- Alberici, A. (1987). *L'analisi di bilancio per i fidi bancari*. Milano, Italy: F. Angeli.
- Anthony, S. D., & Christensen, C. M. (2005). *Innovation handbook: A road map to disruptive growth*. Boston, MA: Harvard Business School Press.
- Archibugi, D., & Pianta, M. (1994). Aggregate convergence and sectoral specialization in innovation. *Journal of Evolutionary Economics*, 4(1), 17–33.
- Azzalini, A. (2009). R package 'sn': The skew-normal and skew-t distributions (version 0.4-12). Available at: <http://azzalini.stat.unipd.it/SN>
- Azzalini, A., & Capitanio, A. (2003). Distributions generated by perturbation of symmetry with emphasis on a multivariate skew-t distribution. *Journal of the Royal Statistical Society Series B*, 65(2), 367–389.
- Basile, R. (2001). Export behaviour of Italian manufacturing firms over the nineties: The role of innovation. *Research Policy*, 30(8), 1185–1201.
- Birkinshaw, J., Hamel, G., & Mol, M. (2008). Management innovation. *Academy of Management Review*, 33(4), 825–845.
- Bisbe, J., & Otley, D. (2004). The effects of the interactive use of management control systems on product innovation. *Accounting, Organizations and Society*, 29(8), 709–737.
- Boer, H., & Daring, W. E. (2001). Innovation, what innovation? A comparison between product, process and organizational innovation. *International Journal of Technology Management*, 22(1/2/3), 83–107.
- Brunsoni, S., Cefis, E., & Orsenigo, L. (2006). Innovate or Die? A critical review of the literature on innovation and performance. Available at: <http://ideas.repec.org/p/cri/cespri/wp179.html>
- Casper, S., & van Waarden, F. (2005). *Innovation and institutions*. Cheltenham, UK: Edward Elgar.

- Cefis, E. (2003). Is there persistence in innovative activities? *International Journal of Industrial Organization*, 21(4), 489–515.
- Cefis, E., & Ciccarelli, M. (2005). Profit differentials and innovation. *Economics of Innovation and New Technology*, 14(1/2), 43–61.
- Cefis, E., & Marsili, O. (2004). “A Matter of Life and Death: Innovation and Firm Survival”, ERIM Report Series Reference No. ERS-2004-109-ORG, Erasmus University, Rotterdam, (2004) and WP- LEM- 2005/01, Laboratory of Economics and Management, St. Anna School of Advanced Studies, Pisa, 2005. Available at: <http://ssrn.com/abstract=650832>
- Centrale dei bilanci. (2004). *Economia e finanza delle imprese italiane diciassettesimo rapporto*. Bancaria editrice.
- Damanpour, F., & Aravind, D. (2006). Product and process innovations: A review of organizational and environmental determinants. In: J. Hage & M. Meeus (Eds), *Innovation, science, and institutional change*. Oxford: Oxford University Press.
- Davenport, T. H., Leibold, M., & Woelpel, S. (2006). *Strategic management in the innovation economy*. New Jersey, NJ: Wiley.
- Davila, A. (2000). An empirical study on the drivers of management control systems’ design in new product development. *Accounting, Organizations and Society*, 25(4/5), 383–409.
- Davila, T., Epstein, M. J., & Matusik, S. F. (2004). Innovation strategy and the use of performance measures. In: M. J. Epstein & J. Y. Lee (Eds) *Advances in Management Accounting* (Vol. 13). Oxford: Elsevier.
- Davila, T., Epstein, M. J., & Shelton, R. (2006). *Making innovation work: How to manage it, measure it, and profit from it*. Pennsylvania, NJ: Wharton School Publishing.
- Davila, A., Foster, G., & Li, M. (2009). Reasons for management control systems adoption: Insights from product development systems choice by early-stage entrepreneurial companies. *Accounting, Organizations and Society*, 34(3/4), 322–347.
- Dyer, J. H. (1996). Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry. *Strategic Management Journal*, 17(4), 271–291.
- Epstein, M. J. (2007). Drivers and measures of innovation success. In: T. Davila, M. J. Epstein & R. Shelton (Eds), *The creative enterprise execution*. Santa Barbara, CA: Praeger.
- Fagerberg, J., Mowery, D. C., & Nelson, R. R. (2004). *The Oxford handbook of innovation*. Oxford: Oxford University Press.
- Fritsch, M., & Meschede, M. (2001). Product innovation, process innovation, and size. *Review of Industrial Organization*, 19(3), 335–350.
- Gallouj, F., & Weinstein, O. (1997). Innovation in services. *Research Policy*, 26, 537–566.
- Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: A literature review. *The Journal of Product Innovation Management*, 19(2), 110–132.
- Geroski, P. A., Van Reenen, J., & Walters, C. F. (1997). How persistently do firms innovate? *Research Policy*, 26(1), 33–48.
- Gourlay, A., & Seaton, J. (2004). Explaining the decision to export: Evidence from UK firms. *Applied Economics Letters*, 11(3), 153–158.
- Greenhalgh, C. (1990). Innovation and trade performance in the UK. *The Economic Journal*, 100(400), 5–118.
- Greenhalgh, C., Taylor, P., & Wilson, R. (1994). Innovation and export volumes and prices – A disaggregated study. *Oxford Economic Papers*, 46(1), 102.



- Griffith, R., Huergo, E., Mairesse, J., & Peters, B. (2006). Innovation and productivity across four European countries. *Oxford Review of Economic Policy*, 22(4), 483–498.
- Hall, B. H., Lotti, F., & Mairesse, J. (2007). *Employment, innovation, and productivity: Evidence from Italian Microdata*. NBER Working Paper No. W13296.
- Hall, B. H., Lotti, F., & Mairesse, J. (2008). *Innovation and productivity in SMEs: Empirical evidence for Italy*. NBER Working Paper No. W14594.
- Jansen, J. J. P., Van den Bosch, F. A. J., & Volberda, H. W. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management Science*, 52(11), 1661–1674.
- Kaufman, J. J., & Woodhead, R. (2006). *Stimulating innovation in products and services*. New York, NY: Wiley.
- Kimberly, J. R., & Evanisko, M. J. (1981). Organizational innovation: the influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal*, 24(4), 689–713.
- Kleinknecht, A., & Mohnen, P. (2002). *Innovation and firm performance: Econometric explorations of survey data*. New York, NY: Palgrave Macmillan.
- Klepper, S. (1996). Entry, exit, growth and innovation over the product life cycle. *American Economic Review*, 86(3), 562–582.
- Kotabe, M., & Murray, J. Y. (1990). Linking product and process innovation and modes of international sourcing in global competition: A case of foreign multinational firms. *Journal of International Business Studies*, 21(3), 383–408.
- Kumar, S., & Phrommathed, P. (2005). *New product development: An empirical study of the effects of innovation strategy, organization learning, and market conditions*. New York, NY: Springer.
- Lev, B. (2001). *Intangibles: Management, measurement and reporting*. Washington, DC: Brookings Institution Press.
- Lev, B., Nissim, D., & Thomas, J. (2005). On the informational usefulness of R&D capitalization and amortization. Available at: <http://pages.stern.nyu.edu/~blev/docs/On%20the%20informational%20usefulness%20of%20R&D%20capitalization%20and%20amortization%202005.04.17.pdf>
- Mairesse, J., & Mohnen, P. (2004). *The importance of R&D for innovation: A reassessment using French survey data*. NBER Working Paper No. W10897.
- Mairesse, J., & Mohnen, P. (2005). Accounting for innovation and measuring innovativeness: An illustrative framework and an application. *American Economic Review*, 92(2).
- Mairesse, J., Mohnen, P., & Dagenais, M. (2006). Innovativity: A comparison across seven European countries. *Economics of Innovation and New Technology*, 15(4/5), 391–413.
- Maital, S., & Seshadri, D. V. R. (2007). *Innovation management: Strategies, concepts and tools for growth and profit*. London: Sage Publications.
- Malerba, F., & Orsenigo, L. (1999). Technological entry, exit and survival. *Research Policy*, 28(6), 643–660.
- Meeus, M. T. H., & Edquist, C. (2006). Introduction to part I: Product and process innovation. In: J. Hage & M. Meeus (Eds), *Innovation, science, and institutional change* (pp. 23–37). Oxford: Oxford University Press.
- Miles, I. (2001). *Services innovation: A reconfiguration of innovation studies*. PREST Discussion Paper No. 01-05, University of Manchester.
- OECD. (1991). *Technology and productivity: The challenge for economic policy*. Paris: OECD.
- OECD. (2002). *Frascati manual*. Paris: OECD.

- OECD. (2005). *Oslo manual, guidelines for collecting and interpreting innovation data*. Paris: OECD.
- Patel, P., & Pavitt, K. (1994). National innovation systems: Why they are important and how they might be measured and compared. *Economics of Innovation and New Technology*, 3(1), 77–95.
- Patel, P., & Pavitt, K. (1996). Uneven technological development. In: X. Vence-Deza & J. S. Metcalfe (Eds), *Wealth from diversity* (pp. 39–75). Dordrecht: Kluwer.
- Pavitt, K. (1984). Sectoral patterns of technical change: Towards a taxonomy and a theory. *Research Policy* (13), 343–373.
- Porter, M. (1990). *The competitive advantage of nations*. London: Macmillan.
- Posner, M. V. (1961). International trade and technical change. *Oxford Economic Papers*, 13, 323–341.
- R Development Core Team. (2009). *R: A language and environment for statistical computing* (<http://www.R-project.org>). Vienna, Austria: R Foundation for Statistical Computing.
- Schumpeter, J. (1934). *The theory of economic development*. Boston, MA: Harvard University Press.
- Shavinina, L. V. (2003). *The international handbook on innovation*. Oxford: Elsevier.
- Silvi, R. (2006). *Analisi di bilancio: La prospettiva manageriale*. Italia: McGraw-Hill.
- Sterlacchini, A. (1999). Do innovative activities matter to small firms in Non-R&D-intensive industries? An application to export performance. *Research Policy*, 28(8), 819–932.
- Sujatha, B. (2006). *Innovation management: Concepts and cases*. Andhra Pradesh, India: Icfai University Press.
- Tornatzky, L., & Fleischer, M. (1990). *The processes of technological innovation*. New York, NY: Lexington Books.
- Unicredit Group. (2008). Rapporto corporate “Decima indagine sulle imprese manifatturiere italiane”, No. 1, December.
- Vernon, R. (1966). International investment and international trade in the product life cycle. *Quarterly Journal of Economics*, 80, 190–207. [Reprinted in Buckley, P. J., & Ghauri, P. N. (1999). *The internationalization of the firm: A reader* (2nd ed., pp.14–26). London: International Thomson Business Press.].
- Wakelin, K. (1998). Innovation and export behaviour at the firm level. *Research Policy*, 26(7–8), 829–841.
- Walton, R. (1987). *Innovating to compete: Lessons for dif using and managing change in the workplace*. San Francisco, CA: Jossey-Bass.

## APPENDIX A. PAVITT’S TAXONOMY

Pavitt’s taxonomy consists of four categories of industrial firms:

- (1) *Supplier dominated*: mostly includes firms from traditional manufacturing such as textiles, agriculture, building, services, printing, footwear, and food industries, which rely on sources of innovation external to the firm. The size of the firms is small and there are low entry barriers. The innovation type is characterized by cost reduction and the sources of learning are *learning by doing* and *learning by using*. This category has a low appropriability and a low propensity to patent.

- (2) *Scale intensive*: mainly characterized by large firms producing basic materials and consumer durables, e.g., automotive industry, with high entry barriers. Sources of innovation may be both internal and external to the firm.

The innovation types are cost reductions, product and process innovations alongside incremental changes. There is a medium level of appropriability characterized by patents for product innovations and secrecy for process innovations.

- (3) *Specialized suppliers*: smaller, more specialized firms producing technology to be sold into other firms, e.g., specialized machinery production and high-tech instruments. There is a high level of appropriability due to the tacit nature of the knowledge.

Innovation sources are both internal and external and the firms are small and specialized with medium entry barriers.

The innovation types are performance-improving innovations, product innovation for use by other sectors.

- (4) *Science based*: high-tech firms relying on R&D from both in-house sources and university research, including industries such as chemicals, pharmaceuticals, and electronics. Firms in this sector develop new products and processes.

Innovation sources are internal to the firm (R&D activities) and based on relationships with academic researchers.

The size of the firms is small, medium, and large with high entry barriers (due to knowledge content), including niches.

Innovation types are development of product innovations and new processes for these products.

They have a high level of appropriability in terms of patents, secrecy, tacit know-how, learning curve advantages, continuous innovation.

## APPENDIX B.

In the section of the questionnaire dedicated to innovation, we considered, in particular, the following questions:

- C2.1.1 During the period 2004–2006, did the firm introduce (multiple answers are possible):
1. product innovation
  2. process innovation

- 3. organizational-managerial innovation related to product innovation
- 4. organizational-managerial innovation related to process innovation
- 5. none of these

C2.1.2 If in 2006 the firm incurred expenditures for technological innovation, split them into:

- C2.1.2.1 internal R&D activity
- C2.1.2.2 external R&D activity
- C2.1.2.3 acquisition of plants, equipment, and hardware with the goal of introducing new products and/or new productivity processes.
- C2.1.2.4 acquisition of different technology (patents, other inventions not patented, licenses, know how, commercial brand) with the goal of introducing new products and/or new productivity processes
- C2.1.2.5 training of workforce due to the introduction of new products and/or new productivity processes
- C2.1.2.6 marketing of innovative products
- C2.1.2.7 project activity aiming at introducing new products and/or new productivity processes

Total amount.....



# THE INTERACTION BETWEEN INFORMATION AND TRUST IN THE CONTROL OF TRANSACTIONAL RELATIONSHIPS: THEORETICAL PERSPECTIVES AND EMPIRICAL SUPPORT

Rosa Alba Miraglia and Antonio Leotta

## ABSTRACT

*Purpose – This study attempts to explore further the relation between performance information and trust as the main control levers in inter-firm transactional relationships.*

*Design/methodology/approach – After discussing the interaction between information and trust from different theoretical perspectives, the study examines the case of a multinational company working in the pharmaceutical industry. Material has been collected through interviews with managers and documental analyses, focusing on the relations between the company and its partner suppliers.*

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*Findings – A theoretical systematisation is provided, distinguishing three main perspectives: (1) the transactional perspective, strictly derived from transaction cost economics assumptions, which denies any role to trust; (2) the relational perspective, which, in examining inter-firm trust, assumes similarities with inter-personal trust; (3) the institutional perspective, which, based on the sociological distinction of “trust in abstract systems” and “trust in persons”, is intended to identify institutional factors explaining management accounting changes. Case discussion shows that the institutional propositions fit the empirical evidence better, for both trust in persons and in systems are important as control levers, but their relevance differs along the value chain: while trust in persons is more relevant in the less-programmable phases, trust in systems is more developed in the more programmable one.*

*Research implications – The paper contributes to the literature on inter-organisational control by providing more insights into the interaction between information and trust as control levers.*

*Originality/value – The focus on value chain phases enables us to analyse how different control patterns or archetypes can be co-present in a given relationship.*

## INTRODUCTION

The spread of inter-firm transactional relationships has highlighted several control problems, such as information asymmetry and recognition of partner trustworthiness. This has stimulated a growing number of studies on inter-organisational control, which focus on two main control levers: information and trust. The sharing of information has been studied as a control lever that interacts with the level of reciprocal trust, but this interaction is still unclear. On the one hand, the sharing of information, such as operational and performance information, highlighting the economic effects of partners' cooperation, represents a signal that improves the relational atmosphere and positively impacts on partners' trust; on the other hand, the sharing of such information reduces the information asymmetry between the partners, thus containing the need for trust.

Several studies, drawing on different perspectives, have attempted to understand the interaction between information and trust better. Although the conclusions differ, there is agreement in recognising the degree of task

programmability and measurability as one of the main factors affecting the two control levers and their interaction. We assume this as the starting point for a case study through which, by adopting a static view, we analyse how information flows and inter-organisational trust interact along the different phases of the value chain, varying in the degree of task programmability and measurability. The case provides data to test the validity of each theoretical perspective in explaining the phenomenon.

The remainder of the paper is structured as follows: the second section provides a literature review of the theoretical perspectives useful for the study of information and trust as two control levers in inter-firm transactional relationships; the third section presents the case study; the fourth section analyses the case according to each of the theoretical perspective discussed earlier; and the final section provides some conclusions.

## **THE THEORETICAL PERSPECTIVES OF MANAGEMENT CONTROL IN INTER-FIRM TRANSACTIONAL RELATIONSHIPS**

In accordance with Tomkins (2001), we review the accounting studies that focus on the interaction between information and trust in inter-firm transactional relationships. In line with this purpose, we select the perspectives that provide emphasis on information and trust, so as to propose a comparative discussion.<sup>1</sup> We thus distinguish three main perspectives: (1) the transactional perspective, whose conclusions on inter-organisational control levers are strictly derived from transaction cost economics (TCE) assumptions; (2) the relational perspective, which integrates TCE assumptions with trust-based literature (Sako, 1992) and the relational-based view (Dyer & Sing, 1998); (3) the institutional perspective, which proposes a sociological view of the inter-organisational control levers, based on Giddens' (1990) sociology of modernity.

### *The Transactional Perspective of Management Control in Inter-Firm Transactional Relationships*

The transactional perspective of inter-organisational control is primarily depicted by Speklé (2001), who proposes the TCE framework to explain



management control archetypes in all the possible forms of transaction governance, i.e. hierarchy, market and hybrids. He defines a control archetype as “a characteristic, discrete configuration of control devices that is descriptively and theoretically representative of a significant group of observable management control structures and practices” (cf. p. 427). He distinguishes nine control archetypes, whose appropriateness depends on three dimensions of the task to be controlled: (1) uncertainty, i.e. *ex ante* programmability,<sup>2</sup> (2) asset specificity and (3) post hoc information impactedness. While programmability and asset specificity are directly derived from TCE, post hoc information impactedness stems from a link between TCE and management control literature; it measures “the extent to which the organisation is able to observe and to assess perceptively the true quality of actually delivered contributions” (cf. p. 431).<sup>3</sup> In accordance with [Langfield-Smith and Smith \(2003\)](#), we refer to this variable as “output measurability”, or task measurability.

Speklé indicates two control archetypes for inter-firm transactional relationships: “hybrid arms-length control” and “hybrid exploratory control”. Hybrid arms-length control suits transactions with high task programmability, high output measurability and moderate asset specificity. This control archetype is characterised by the fact that each contributor retains significant autonomy. The high degree of programmability–measurability allows us to formalise detailed contracts, which include reliance on hostage arrangements to correct asymmetric stakes between the parties and prevent possible opportunism. Further, the moderate asset specificity leaves room for outcome control based on market-derived standards, which can support task coordination. Hence, the features of this control archetype entail highly formalised information, on performance and tasks, as a control lever.

Hybrid exploratory control suits transactions with low task programmability, low output measurability and moderate asset specificity. Under such conditions, contracts must be of a general thrust nature and require subsequent operationalisation. Hence, this control archetype should provide remedies to the initial information limitation by encouraging contributors to share information as it emerges during the process ([Nicholson, Jones, & Espenlaub, 2006](#)). Information flows are quite informal and are embedded in the specific circumstances of task coordination. This may require the sharing of private information, whence the risk of opportunistic information spillover. The sole remedy recognised to avoid this is the transition to the hierarchical mode of control. In conclusion, this control archetype is based again only on information sharing, characterised by a low degree of formalisation.

Nicholson et al. (2006) conducted a multi-case study to give more insights into the features of information exchanged in Speklé's control archetypes. On arms-length control archetype, one case reports evidence on formal and informal information sharing "monitoring client needs and performance, and feeding back formal and informal control information to client, as required" (cf. p. 255). Exploratory control archetype refers to another case, in which the subjects "were undertaking management accounting and other non-standardised client processes such as ad hoc reporting" (cf. p. 254). In this case, "direct lines of communication between client and the India centre using telephone and an on-line discussion forum" (cf. p. 254) are noticed.

As can be seen, in Speklé's control archetypes, the role recognised for information as a control lever varies depending on its degree of formalisation, which, in turn, is positively related to the degree of task programmability and output measurability. In the arms-length control archetype, where information flows are both formal and informal, two roles are recognised for information: (1) supporting coordination requirements and (2) preventing opportunism.<sup>4</sup> In the exploratory control archetype, where information flows are mainly informal, information has the sole role of supporting coordination requirements. Given the low task programmability and output measurability assumed by this control archetype, the potential opportunism can be overcome only with the transition to the hierarchical mode of control. Hence, we derive the following proposition:

**Proposition 1.1.** The transactional perspective of control recognises task programmability and output measurability as relevant factors, as they influence the degree of formalisation of activity and/or performance information and, thereby, its role as a lever of control.

In summary, as argued by Vosselman (2002), the TCE perspective overcomes several limits of the neo-classical theory of the firm, and provides useful theoretical lenses through which to analyse control problems in inter-firm transactional relations, as: (1) it assumes transactions, rather than the whole firm, as the unit of analysis both in intra- and in inter-organisational settings; (2) more realistically than the neo-classical theory of the firm, TCE recognises limitations in human cognition by assuming bounded rationality, which is consistent with the motivations of management accounting research. However, TCE retains the neo-classical assumption of opportunism and self-interest as the main motive of human behaviour. This assumption is very critical for a TCE theory of management control, for it

leads us not to recognise any role for trust as a lever of control.<sup>5</sup> We synthesise this in the following proposition:

**Proposition 1.2.** In the transactional perspective of control, activity and/or performance information is recognised as the sole lever of control, while no role is assigned to trust.

*The Relational Perspective of Management Control  
in Inter-Firm Transactional Relationships*

While the transactional perspective of management control emphasises the role of information exchanges to manage opportunism and coordination requirements, other studies on inter-organisational control recognise trust as another relevant control lever, complementary to information. Van der Meer-Koistra and Vosselman (2000) sustain the importance of trust in situations characterised by uncertainty and strong dependencies between the parties owing to specific investments. In such situations, the impossibility to write comprehensive contracts entails the recourse to trust as an uncertainty absorption mechanism, as an alternative to information. Mentioning social embeddedness and network approaches, trust is viewed as stemming from previous contractual relationships between the parties or as growing during a certain relationship. This view emphasises what Rousseau, Sitkin, Burt, and Camerer (1998) calls “relational trust”: the form of trust that “derives from repeated interactions over time between trustor and trustee. Information available to the trustor from within the relationship itself forms the basis of relational trust” (cf. p. 399). Hence, in the relational view of trust,<sup>6</sup> information on past interactions has positive effects on the trust level, thus enhancing the likelihood of partners’ cooperation. In this sense, Vosselman and van der Meer-Koistra (2009) consider the sharing of accounting information as a means by which one partner signals to the other its willingness to cooperate in the relation, and thereby its trustworthiness.<sup>7</sup> Since this view considers both information and trust as factors reducing uncertainty in the other’s cooperation, we derive the following proposition:

**Proposition 2.1.** The relational perspective of control recognises both information and trust as levers of control.

The typology of trust mentioned by van der Meer-Koistra and Vosselman (2000), and by most of the inter-organisational control studies adopting this

relational perspective, is proposed by Sako (1992), who distinguishes contractual, competence and goodwill trust.

Contractual trust is based on moral standards of honesty and “keeping your word”.

Competence trust refers to the expectation that the seller has the necessary technical and managerial competences at his disposal. Besides the competences of persons, this form of trust may be found in the institutional environment of a transactional relationship, by means of product and service certifications and educational degree. It may also develop over time, during the relationship.

Goodwill trust refers to the expectation of the partner’s open commitment, in the sense of the readiness to do more than is formally required. Thus, reciprocal goodwill trust entails the willingness of the parties to be indebted to each other. This form of trust can arise and develop over time during the relationship.

Van der Meer-Koistra and Vosselman (2000) describe trust in its interaction with formal information. About contractual trust, they argue that, in an outsourcing relationship, “the more contractual trust, the less information the outsourcer wishes to gather for purposes of preventing or reducing opportunistic behaviour” (cf. p. 57). On competence trust, the authors specify that “it is greater according as there is less ex post inspection by the buyer of the goods or services supplied, for instance as a result of effective quality guarantees in the past” (cf. pp. 57–58). On goodwill trust, they argue that its presence decreases the need of the outsourcing party for ex post information gathering.<sup>8</sup> We thus derive the following proposition:

**Proposition 2.2.** The relational perspective of control claims that the presence of any type of trust reduces the need for formal information gathering.

Van der Meer-Koistra and Vosselman (2000) integrate the relational notion of trust with the TCE view, and propose a framework of control patterns in inter-firm transactional relationships. They distinguish: market-based, bureaucracy-based and trust-based control patterns. While the first two control patterns are quite related to the TCE assumptions, the trust-based pattern stems from the link between TCE and the social approach. Each of these patterns is a configuration of contingency factors, such as: (a) transaction characteristics; (b) transaction environment characteristics; (c) party characteristics. We summarise these patterns from van der Meer-Koistra and Vosselman (2000, p. 62) and Langfield-Smith and

Smith (2003), by emphasising the implications for information and trust as control levers.<sup>9</sup>

The market-based control pattern suits transactions characterised by high task programmability, low asset specificity, high repetition and high measurability of activities and outputs. The transaction environment is characterised by a high number of potential partners, which makes price a good index of the quality of the output to be exchanged. Since all the relevant information is concentrated in the price, no further institutional factor matters, and the possibility of substituting the partner makes party characteristics irrelevant. Hence, in this pattern no relevance is recognised for trust (Langfield-Smith & Smith, 2003).

The bureaucracy-based control pattern suits transactions characterised by high task programmability, medium to high asset specificity, low to medium repetition and high measurability of activity or output, based on contractual rules. The transaction environment is characterised by the possibility of foreseeing future contingencies, a medium to high market risk and a certain influence of external institutions on contractual rules. Relevant party characteristics are competence reputation, medium risk-sharing attitude and asymmetry in bargaining power. This pattern relies on detailed and formal ex ante and ex post information on activity and/or performance, based on the contractual rules. Moreover, when human knowledge and skills are important for the quality of the task, high relevance is accorded to contractual and competence trust.

The trust-based pattern refers to transactions characterised by low task programmability, high asset specificity, low repetition and low measurability of activities or output. Transaction environment is characterised by the difficulty to foresee future contingences, high market risk and influence of social embeddedness and external institutions on the relation. Relevant party characteristics are competence reputation, competence in network, experience with contracting parties, risk-sharing attitude and no asymmetry in bargaining power. A low degree of programmability and measurability of the activities or output reduces the possibility of using formal information to support coordination and to prevent opportunism. Ad hoc information is exchanged to face problems emerging during the execution of the tasks. Potential opportunism is overcome by developing reciprocal trust. Given the high level of uncertainty and the loose content of the contractual rules, parties should be ready to do more than is contractually required: as well as contractual and competence trust, goodwill trust is considered relevant in this pattern.

From the three control patterns we derive the following proposition:

**Proposition 2.3.** The relational perspective of control recognises a negative relation between task programmability and activity or output measurability, on the one hand, and the degree of formalisation of activity and/or performance information, on the other.

As well as van der Meer-Koistra and Vosselman (2000) and Langfield-Smith and Smith (2003), Donada and Nogatchewsky (2006), and Langfield-Smith (2008) provide evidence supporting the relational perspective and the related control patterns. Particularly, Langfield-Smith (2008) refers to Das and Teng's (1996, 2001) distinction between performance risk, i.e. "the risk of not achieving the partners' objectives when partners cooperate fully" (Das & Teng, 2001), and relational risk, i.e. "the probability of having a partner that does not cooperate" (Das & Teng, 1996). Given these two forms of risk, focusing on the start-up phase of a collaborative alliance, Langfield-Smith (2008) agrees with Das and Teng (2001) in sustaining that both competence and goodwill trust are useful sources of control for they reduce each partner's perception of performance and relational risk, respectively. In his model, Langfield-Smith (2008) holds that performance risk and relational risk are affected, on the one hand, by competence and goodwill trust, respectively; on the other hand, by transaction characteristics. Among the latter, we focus on behavioural and environmental uncertainty, which we refer to through the degree of task programmability and activity or output measurability. We thus derive the following proposition on the need for trust as a control lever:

**Proposition 2.4.** In the relational perspective of control, the lower the task programmability and activity or output measurability, the higher the perception of performance and relational risk, and the higher the need for competence and goodwill trust, respectively.

In summary, the relational perspective of management control integrates the TCE view with social literature on trust, thus taking into account social factors, like relational and institutional factors, in studying control levers. However, this perspective examines the formation and the use of inter-organisational trust by assuming similarities with inter-personal trust.<sup>10</sup> In fact, in examining the notion of trust, the relational perspective recognises both trustor and trustee as two interactive subjects. This does not mean that relational trust focuses on trust in persons and neglects trust in systems (Luhmann, 1979), but that it synthesises the features characterizing trust in

persons and in systems.<sup>11</sup> Hence, no relevance has been recognised to the difference the impact that trust in persons versus trust in systems may have on the need for information.

*The Institutional Perspective of Management Control  
in Inter-Firm Transactional Relationships*

While transactional and relational perspectives assume individual subjects and their interactions as the unit of analysis, the institutional perspective rejects this methodological individualism and, using methodological holism, seeks to develop a view of management accounting and control as organisational rules and routines (Burns & Scapens, 2000). In outlining this perspective, we integrate Old Institutional Economics (OIE) with the New Institutionalism of Giddens' (1990) sociology of modernity.

According to OIE, many of the decisions taken by individuals are institutionally<sup>12</sup> shaped. This means that the day-to-day decisions of organisational members are influenced by the rules and the habits they share and accept, i.e. by rules and routines.<sup>13</sup> In the context of management accounting, rules comprise the formal management accounting systems, as they are set out in the procedural manuals, routines are the accounting practices actually in use (Burns & Scapens, 2000).

Starting from the OIE framework of management accounting, recent inter-organisational control studies integrate this view with the constructionist view of Giddens (1990). In his analysis of modernity, Giddens recognises as one of the main features of modernity the process of "disembedding", meaning "the 'lifting out' of social relations from local contexts and their restructuring across almost indefinite spans of time-space" (Giddens, 1990, p. 21). Giddens identifies two main disembedding institutions: symbolic tokens and expert systems, which are referred to as "abstract systems". A symbolic token is "a means of bracketing time-space by coupling instantaneity and deferral, presence and absence" (Giddens, 1990, p. 25). In other words, it is a means to abstract values from time-space. One of the main symbolic tokens, especially important for accounting research, is money; it "provides for the enactment of transactions between agents widely separated in time and space" (Giddens, 1990, p. 24). As regards expert systems, Giddens describes them as "systems of technical accomplishment or professional expertise that organise large areas of the material and social environment in which we live today (...) an expert system disembeds by (...) providing "guarantees" of expectations across distanced time-space"

(Giddens, 1990, p. 27). Jones and Dugdale (2001) acknowledge accounting as a special disembedding mechanism for it is an expert system which uses money as a symbolic token, by representing other forms of data in terms of money (Moilanen, 2008).

The day-to-day life of a large part of people on the one hand is conditioned by disembedded institutions, while on the other hand it entails a process of reembedding, i.e. “the reappropriation of desembedded social relations so as to pin them down (however partially or transitorily) to local conditions of time and space” (Giddens, 1990, p. 79). While “faceless commitments” are typical of global interactions, at local levels of interaction, actors have “facework commitments”, in conditions of co-presence with other actors, and faceless commitments that relate them to the abstract systems. Hence, “reembedding refers to the process by means of which faceless commitments are sustained or transformed by facework” (1990, p. 88).

A sociology-based accounting literature has been developing recently, studying the power of accounting as an expert system: what Jones and Dugdale (2001) conceptualise as an “accounting regime”. Drawing on this concept, Moilanen (2008) reports a case of an intermediate subsidiary between an accounting-oriented Western parent and subsidiaries in the Baltic countries and Russia, to discuss how accounting can be used to link the divergent social systems of the different parts of a corporation. In an earlier study, Seal, Berry, and Cullen (2004) show how accounting can support the disembedding and reembedding of the relations through the interaction between local action and wider systems of abstract and expert knowledge. They also show how accounting can support the process of constant changes in the supply chain practices by monitoring a firm’s suppliers and customers; what Giddens calls “reflexivity”.

In the process of disembedding and reembedding, a central role is given to trust. Trust allows the distanciation of time–space relations, i.e. the disembedding process, and increasingly relies on a faith in “the correctness of abstract principles (technical knowledge)” (Giddens, 1990, p. 34). Thus, the disembedding process of modern society has been made possible by the increase of trust in abstract systems.

Quoting Luhman’s typology of trust, Giddens opposes trust in systems, as the form of trust emerging in the modern society, where social interactions are disembedded, to trust in persons, as the form of trust relevant in pre-modern societies, where social interactions were embedded in local contexts. However, he argues that in the modern society, both trust in systems and in persons are relevant, as they support the process of disembedding and reembedding, respectively.



By integrating OIE with Giddens' (1990) propositions, accounting studies have explored management accounting and control as organisational rules and routines and its contribution to the disembedding and reembedding process. Limiting our view to the static analyses, in line with the choice of the present study, we submit that management accounting can be interpreted as organisational rules and routines which, by producing formal information, provide the cooperating parties with symbolic tokens. The trust in systems created by accounting rules and routines disembeds social interactions. We then derive the following proposition:

**Proposition 3.1.** The institutional perspective recognises power to accounting as it produces formal information and trust in systems as control levers that disembed social interactions.

As Jones and Dugdale (2001) pointed out, several accounting studies have highlighted that the disembedding role of accounting, in replacing trust in persons with trust in systems, is pursued by the use of performance standards, such as standard costing and budgeting (Miller & O'Leary, 1987). Also in the principal-agent literature, accounting replaces trust in persons with trust in systems by monitoring contracts through the setting of targets and measurement of outcomes. These studies show that the disembedding power of accounting, and thus its impact on trust in systems, depends on the possibility to use standards and outcome measures to make managerial performance visible. To interpret this, we hold that accounting information is more (less) formalised in conditions of high (low) programmability and measurability, and thus it mainly interacts with trust in systems (in persons). We thus derive the following proposition:

**Proposition 3.2.** From the institutional perspective of control we state that: where task programmability and activity or outcome measurability are high, accounting information is more formalised and mainly interacts with trust in systems; where task programmability and activity or outcome measurability are low, accounting information is less formalised and mainly interacts with trust in persons.

### *Common and Differential Elements of the Three Perspectives*

In the three perspectives described above we acknowledge common and differential elements. As common elements we identify the programmability

of the task, the measurability of the related activities or outputs and their impact on the degree of formalisation of activity and/or performance information (see Propositions 1.1, 2.3 and 3.2). The role of formal information in supporting coordination and preventing opportunism is recognised by the transactional and the relational perspectives, while the institutional perspective emphasises the disembedding role of formal information through its reference to symbolic tokens (see Proposition 3.1).

Differential elements among the three perspectives can be recognised in the consequences stemming from the low degree of programmability–measurability,<sup>14</sup> and the subsequent low degree of formalisation of activity and/or performance information. The transactional perspective predicts that in conditions of low degree of programmability–measurability, while task coordination can be supported by informal information sharing, the low amount of formal information leaves room for opportunistic behaviours, which can be avoided only by a transition to a hierarchical form of governance, thus acknowledging no role to trust (see Proposition 1.2).

The relational perspective, instead, recognises an important role to trust, complementary to the information role (see Proposition 2.1). Especially in conditions of low programmability and measurability, relational trust can overcome the uncertainty stemming from information asymmetry (see Proposition 2.4). In explaining this role, the relational perspective suggests that the amount of formal information negatively interacts with the level of any type of trust (see Proposition 2.2). In so arguing, this perspective draws on Sako's (1992) typology of trust, and does not consider relevant the distinction between personal and system trust.

Personal and system trust distinction, instead, is considered relevant by the institutional perspective, which suggests studying information–trust interaction by referring information to its degree of formalisation, and trust to its subject, i.e. persons versus systems (see Proposition 3.2).

In summary, the three perspectives of control here discussed predict different consequences from the degree of task programmability and activity or output measurability. We thus perceive the need for field studies aimed at identifying the perspective that better explains the phenomenon.

Furthermore, a common approach of the aforementioned studies is to consider the transactional relationship as the unit of analysis, thus referring the degree of programmability–measurability to the relationship as a whole.<sup>15</sup> We question this methodological assumption by noting that, within a certain relationship, different degrees of programmability–measurability may refer to different phases of the value chain.

In what follows, we report a case study<sup>16</sup> in which the degree of programmability–measurability varies along the value chain referred to a given transactional relationship, observed at a certain point in time.

## CASE STUDY

In this section we describe a case of a multinational firm working in the pharmaceutical industry. Through this case we aim at observing the specific phenomena of a productive setting in order to identify the theoretical perspective that provides consistent arguments and useful explanations. The intensive relations with its suppliers, embracing the Negotiation, the Development, and the Industrial phases of the value chain, make the case relevant for our study. In fact, the three phases differ in the degree of programmability–measurability, which increases moving from the Negotiation to the Industrial phases. Our unit of analysis focuses on the different phases of the value chain within a given supply relationship, observed by the buyer side at a certain point in time (static analysis). Data were collected through interviews with managers and documental analyses. For confidentiality reasons, we refer to the firm by the pseudonym of Diagnostic Systems.

### *The Diagnostic Systems and its Supply Relations*

Diagnostic Systems (DS) is a multinational firm working in the pharmaceutical industry; it develops, produces, and distributes systems and immunoreagent kits for clinical diagnostics. The development of the diagnostic systems is realised in collaboration with strategic suppliers. The working of the diagnostic systems requires the employment of immunoreagent kits, the annual consumption of which is estimated on the basis of the productive capacity of the systems. Each kit is developed according to the diagnostic line (infectious diseases, oncology, etc.) for which it is distributed, and is composed of a container (cuvette) and a reagent.

Supply relationships are critical for DS. In the DS value chain, both the Development and the Industrial Supply phases are accomplished in strict collaboration with key suppliers, after a Negotiation phase. We thus describe DS's supply relations by distinguishing, within the DS value chain, Negotiation, Development and Industrial Supply phases.

*Managing the Negotiation Phase*

The Negotiation phase focuses on the preliminary definition of the conditions related to the Development and Industrial phases. Among the critical aspects of this phase, the contact manager emphasises the complementarities of partners' know-how, which, as heterogeneous, should be managed in an integrative fashion. The manager specifies: "For an effective development and industrial partnership, we have to identify the aspects characterised by strong homogeneities to use them as the bases for information flow and monitoring, both from the viewpoint of technical development and scheduling, and from the viewpoint of the contractual agreements to be formalised. This initial set up work is fundamental for the effectiveness of the subsequent information flow".

At the Negotiation phase, partners formalise the commercial agreement and prepare the development agreement. Thus, they specify the requisites for component development through preliminary studies aimed at supply quantification. The necessary conditions for the development of industrial plants are derived starting from prototypes.

This process requires frequent preliminary meetings between the process engineers of the partner firms, which terminate with the signing of component and prototype orders. At this phase, face-to-face communication is the sole approach by which engineers can better anticipate critical potential problems in the Development and the Industrial phases, which have to be considered in the development and supply agreement, respectively. As the contact manager points out: "At this phase we need to look each other in the eye, to better identify critical problem solutions". The principal documents supporting engineer meetings are:

- the "Draft with the estimation of annual volumes referred to the whole industrial package", an extract of which is reported in [Table 1](#);
- the "Cutline schedule of global project development with annual details".

These documents contain synthetic information as they embrace a long time horizon, i.e. the time period in which the new plants will be working. This entails high uncertainty in the forecasts on volumes and performance trends. Particularly, the document showed in [Table 1](#) enables the development of plants, "by searching for modular productive solutions, possibly characterised by scale-up flexibility" (the contact manager).

**Table 1.** Draft with the Estimation of Annual Volumes Referred to the Whole Industrial Package.

Product	Volumes/ Year	Price EUR per 100 (Solution A)	Price EUR per 100 (Solution A)	Minimum Order (Number of Parts)
Component 1				

### *Managing the Development Phase*

The Development phase, which approximately covers a five-year period, is accomplished in collaboration between DS and its partner suppliers, and is regulated by a specific development agreement. At this phase, partners share resources and knowledge, many of which are protected by industrial patents. Development focuses on three particular areas: (1) new product development, aimed at reinforcing the supply in several clinical areas; (2) process development, to generate the reagents to be used; (3) plant development.

According to the development agreement, in the component and plant development partners use prototype plants with periodic tests, which are intended to arrange the productive capacity for the Industrial phase. When all of these tests are passed, the order for the Industrial phase can be authorised.

The high interdependence between the Development and the subsequent Industrial phases forces designers to foresee the useful life period and the productive capacity required for the plants to be developed. This needs periodical meetings at the supplier site to evaluate work in progress and critical points. Further information is exchanged by conference calls and shared documents. The documents mentioned by the managers are:

- the “Semi-consolidated per component plan with annual details”, reported in [Table 2](#);
- the “Document on the installed capacity check for the first production year”;
- the “Work in progress per component document with synthesis of the critical phases and monthly-weekly details”.

**Table 2.** Semi-Consolidated per Component Plan with Annual Details.

Year	Component A Minimal Quantity (Millions of Pieces)	Component B Minimal Quantity (Millions of Pieces)
2008	4	3
2009	8	7
2010	15	14
2011	35	24
2012	45	29

The documents mentioned above support plant development as they offer synthetic forecasts on the production volumes required during the useful life of the plants (Table 2), and on the installed capacity for the first year of production. The data contained in these documents are drawn from the agreements signed at the previous phase.

### *Managing the Industrial Phase*

The Industrial phase is strongly influenced by the results of the Development phase. This can be particularly noticed from the content of the supply agreement, which regulates this phase. Drawing on a contract, we report the following principal points: (1) list of the plants; (2) variants; (3) guaranteed volumes; (4) minimal volumes; (5) exclusiveness and confidentiality of technologies; (6) agreement enclosures, such as: (a) product specifications and (b) process control specifications.

The agreement enclosures regulate the aspects more closely influenced by the Development phase. The product specifications refer to the raw materials, the production process, and the severity degree of tolerance margins. Thus, product specifications condition process control specifications. Agreement enclosures contain protocols supplier should respect in carrying out process control.

As can be noticed, the Industrial phase is strictly regulated by the agreement and relies on very detailed information flows. This allows partner firms to coordinate at a distance, by interacting through document exchanges. The supporting documentation is very rich, as it includes:

- the “Detailed per component plan”. It shows: (1) guaranteed, arranged and ordered capacities; (2) confirmed volumes and growth forecasts, as arranged in the draft of supply agreement;

- the “Detailed per component plan on production start up and weekly production flow”, which extract is reported in [Table 3](#). It codifies the various problems recorded during component inspection (first three columns) and the responsive actions proposed (last column), by specifying the partner who found the problem and who should take the action.

### *Further Aspects of Supply Relations*

Since the contact manager is responsible for supply relations, we talked to him on further aspects of the relations, such as the supplier selection criteria, the specificity of the investments, the managing of information flows.

Regarding the selection criteria, the manager points out: “they are predominantly based on trustworthiness. This is assessed through different parameters, depending on the phase involved in the relation: at the Development phase, supplier trustworthiness depends on its forecast and schedule capability; at the industrial phase, it depends, instead, on its aptitude to hold the guaranteed capacity”. The manager points out a further difference in the relevant typology of trust between the two phases: “at the development phase, where communication is less formalised and more based on face-to-face meetings, a partner’s trustworthiness is influenced by personal touches; instead, in the industrial phase, where communication is shaped by regular exchanges of codified information, thus more formalised and supported by electronic devices, inter-firm trust is not related to personal touches, but regards more the correctness of systems and procedures”.

Regarding investment specificity, it is recognised as high by both relationship parties, thus limiting the possibility to substitute the partner.

Finally, regarding the managing of information flows, and particularly the use of information infrastructures, such as SAP platforms or similar, the manager specifies: “At the development phase no standard platforms are used, because of their rigidity. Certain documents are electronically exchanged, for they are filled in by both the supplier and the buyer (schedule, work in progress, etc.). At the more operational phases, standard platforms are used: SAP enables an informative integration for accounting aspects, while, out of SAP, documents are shared whose records regard the quality and the reliability of deliveries. These pieces of information are exchanged especially at the most critical phases, and when inventory autonomy is limited”.

**Table 3.** Extract of “Detailed per Component Plan on Production Start Up and Weekly Production Flow”.

Number	Topic	Discussion	Responsive Action
1.	Cuvette 4 cavity mold	<p>(A) OQ cuvette samples have been inspected by DS with the following problems:</p> <p>(a) Scratches on cavity 1 in the measuring range (systematic)</p> <p>(b) Scratches on other cavities that were not found as systematic</p> <p>(c) Smears found on some cavities (all cavities) in the measuring area</p> <p>(d) The cuvettes retain a strong odour (stearic acid)</p> <p>(e) Rings found on the lower portion of the cuvettes (front area) but rugosity is found to be ok</p> <p>(B) OQ must be completed (ask to view the cuvette mold)</p> <p>(C) Still on schedule?</p> <p>(D) New raw material has arrived (1.1 ton)</p>	<p>(A) Actions are written to the corresponding id</p> <p>(a) Will be investigated at GW (these do not come from the cavity area but instead the head transition of the separation of the two parts</p> <p>(b) May be due to bulk packaging (this can be eliminated by normal packaging/200 cuvette (separately packed)</p> <p>(c) The next delivery of OQ part will be handled with gloves (in house) to ensure no residual evidence of oily substance on the cuvettes although the spectrum analysis showed an abnormality which derived from an overdose of additive of raw material in the previous production; in the future no material will be inserted in the machine (to be written in the supply agreement)</p> <p>(d) May be related to the residue of the internal portion of the cuvettes</p> <p>(e) Rings are also located on the older model of the cuvettes and therefore normal; no action required</p> <p>(B) OQ must be repeated for the pieces and should not have either the residual on the inside of the cuvettes produced to evidence the correction of these defects; new OQ is due in week 7; delivery to DS in week 8; 10,000 parts of lower tolerance should be produced new OQ and sent to SR to be tested</p> <p>(C) PQ has been postponed due to defects found in OQ pieces; OQ has been completed and PQ is currently in progress</p> <p>(D) JR on the new lot is currently ongoing; lot must be authorised by DS</p>



## CASE DISCUSSION

In this section we discuss the case by adopting the lenses of each of the theoretical perspectives of control, described in the second section. Our aim is to select the perspective that provides the most consistent and useful explanation of the case. We do so by starting with an examination of the degree of task programmability–measurability, which varies along the value chain. Hence, from each perspective, we recognise the different control patterns that can be linked to the different phases of the value chain. In so doing, we show how more control patterns can be co-present within the same relationship.

### *The Programmability and Measurability Degree at Each Phase of the Value Chain*

The manager interviewed distinguishes three phases in the value chain of DS: Negotiation, Development and Industrial phases. This distinction enables us to analyse the degree of task programmability and measurability of each phase. Let us remember that task programmability refers to the uncertainty in accomplishing the task, while task and output measurability refers to the availability of information on the activities or the output of the task.

At the Negotiation phase, commercial and development agreements are to be formalised by specifying the requisites for component development through preliminary studies. These studies have to deal with a high level of uncertainty of the forecasts, which is due to the long time horizon in which the new developing plants will be used, and to the fact that new plant productivity is still unknown at this phase. Hence, a low level of task programmability and measurability characterises the Negotiation phase.

The Development phase is accomplished under the conditions formalised in the development agreement. According to this agreement, plant and component development is undertaken by subjecting prototypes to periodical checks in order to program plant capacity for the Industrial phase. Hence, the decision processes at the Development phase follow contractual rules, but present a low degree of repetitiveness. We thus acknowledge to this phase a middle degree of programmability–measurability.

Finally, the Industrial phase is strictly regulated by the supply agreement, which formalises the protocols of product and process controls, and the product specifications defined at the Development phase. Both the tasks and

the performances of this phase can be appraised by referring to those rules and protocols. The degree of programmability–measurability of this phase is then considered high.

### *Case Discussion from the Transactional Perspective of Control*

The transactional perspective of control suggests to examine transactional relations by stressing the transaction characteristics and, strictly following the TCE assumptions, it holds: that the degree of task programmability and output measurability positively influences the amount of formal information flows (Proposition 1.1); that information is the sole lever of control (Proposition 1.2). The transactional perspective framework can be sketched as in Fig. 1.

Let us examine the extent to which these two propositions explain the case described earlier. Starting from Proposition 1.1, we focus on the relation between the amount of formal information flows and the degree of task programmability and output measurability at each phase of the DS value chain. For the sake of clarity, we discuss first the Negotiation and Industrial phases, respectively, characterised by low and high degrees of programmability–measurability. This allows us to connect each of these phases with the suitable control archetype. Then, we examine the Development phase, which presents the features of both the control archetypes described earlier.

At the Negotiation phase, while formal information exchanged is quite synthetic, as can be seen from the documents supporting engineer meetings (see Table 1), a great amount of information is informally exchanged through face-to-face communications. This is explained by the contact manager by noting: “At this phase we need to look each other in the eye, to better identify critical problem solutions”. We can thus argue that the low degree of programmability–measurability of this phase induces managers and engineers to exchange synthetic information on performance and volume forecasts in order to support informal communication and coordination. Given these features of partners’ interaction, we suggest representing the control approach followed at this phase by the archetype of “hybrid exploratory control” proposed by Speklé (2001). In fact, under



Fig. 1. The Transactional Perspective Framework.

conditions of low programmability–measurability, the Negotiation phase is aimed at defining contract of general thrust, whose requirements have to be operationalised in the downstream phases. This control approach should overcome the information limitations of the Negotiation phase by encouraging contributors to share information as it emerges during the Development and the Industrial phases. At the Negotiation phase, information flows are quite informal and embedded in the specific circumstances of task coordination that can be detected and anticipated only by face-to-face meetings.

At the Industrial phase, information exchanged is highly detailed, as can be seen from the rich documentation supporting this phase (see [Table 3](#)). These documental exchanges enable partner firms to manage coordination according to the requirements of the supply agreement, thus limiting personal interactions. Hence, we argue that, since this phase presents a high degree of programmability–measurability, it can be strictly regulated by the supply agreement, which avoids the need for personal interactions and makes formal information flows the main support for task coordination. As can be seen from the document reported in [Table 3](#), partner firms communicate by means of the document the requirements for reciprocal adjustments. In the document, in fact, problems are specified in respect of the contractual standards, and responsive actions are proposed. Given these characteristics, we suggest representing the control approach typical of this phase through the archetype of hybrid arms-length control, proposed by [Speklé \(2001\)](#). In fact, the high programmability–measurability of this phase allows partners to formalise a detailed contract through the supply agreement, which includes detailed requirements on volumes, exclusiveness and confidentiality of technology, and product and process control specifications. Further, the degree of repetitiveness of the tasks enables the adoption of outcome control, based on performance standards that can support task coordination.

At the Development phase, the information exchanged is richer than in the Negotiation phase, but is less detailed than in the Industrial phase. This is shown by the document reported in [Table 2](#), regarding forecasts with annual details. As argued earlier, the degree of programmability–measurability of the Development phase is intermediate. In fact, on the one hand, the tasks to be accomplished at this phase can be programmed according to the requirements of the development agreement signed on at the Negotiation phase; on the other hand, they do not have a high degree of repetitiveness, as the level of uncertainty is mainly due to the long time horizon of the forecasts. Because of this, the formal information flows are

not sufficient to support the process of this phase, but face-to-face communications are also needed. In this sense, we acknowledge a middle degree of formalisation to the information exchanged at this phase. The control approach followed at this phase is then a combination of the features of hybrid exploratory control and hybrid arms-length control archetypes, discussed above.

This discussion shows a positive relation between the degree of task programmability and measurability, and the degree of formalisation of information flows along the value chain, thus confirming Proposition 1.1.

With regard to Proposition 1.2, we need to verify whether at each phase of the DS value chain information is perceived as the sole lever of control. In this regard, while transactional perspective recognises to information the aptitude both to manage coordination requirements and to prevent potential opportunism, the case description limits the role of information in supporting coordination. In fact, in discussing further aspects of the relationships, the contact manager explicitly recognises the limits of information as a control tool, when he argues that partners' selection criteria "(...) are predominantly based on trustworthiness. This is assessed through different parameters, depending on the phase involved in the relation: at the Development phase, a supplier trustworthiness depends on its forecast and schedule capability; at the industrial phase, it depends, instead, on its aptitude to hold the guaranteed capacity". From this specification, we draw that a relevant role is acknowledged to trust as a control lever complementary to information, thus disconfirming Proposition 1.2.

In conclusion, transactional perspective falls in supporting case discussion for it neglects the relevance of trust as a lever of control.

#### *Case Discussion from the Relational Perspective of Control*

The relational perspective of control holds that both information and trust are relevant control levers as they reduce uncertainty (see Proposition 2.1). This proposition is supported by the argument concluding the previous section, which highlights partner's trustworthiness as a relevant selection criteria. More specifically, drawing on the manager's explanation, a partner's trustworthiness is related to the behaviour the partner has adopted in the past interactions, since: "(...) at the Development phase, supplier trustworthiness depends on its forecast and schedule capability; at the industrial phase, it depends, instead, on its aptitude to hold the

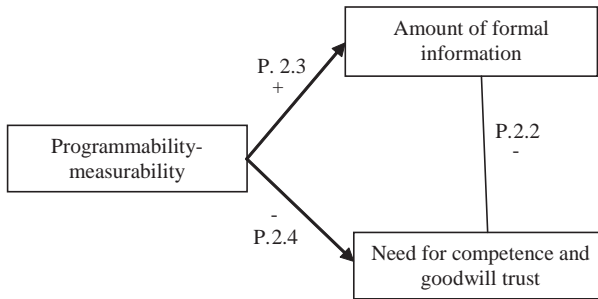


Fig. 2. The Relational Perspective Framework.

guaranteed capacity”. We can thus recognise the relational nature of the perceived partner’s trustworthiness, being trustworthiness derived from repeated interactions over time between trustor and trustee. In respect of the other propositions, further analysis is needed to discuss the case. The framework of the relational perspective can be depicted as in Fig. 2.

While the support for Proposition 2.3 emerged in the previous section, we focus on Propositions 2.2 and 2.4. They hold that the degree of programmability–measurability reduces the need for competence and goodwill trust, which negatively interacts with the amount of formal information. Drawing on these propositions, we represent the control approach followed at each phase through the different control patterns proposed by *van der Meer-Koistra and Vosselman (2000)*, and particularly through bureaucracy- and trust-based control patterns.

Bureaucracy-based control pattern, being characterised, among other things, by a high degree of task programmability and measurability, should better suit the Industrial phase. At this phase, the high degree of programmability–measurability enables formal information to be an effective control lever, while, as human knowledge and skills are important for the quality of the task, relevance is attached to competence trust.

Trust-based control patterns, being characterised, among other things, by low degree of task programmability and measurability, should better suit Negotiation and Development phases. At these phases, the low–middle degree of programmability–measurability reduces the effectiveness of formal information as a lever of control, thus increasing the performance and relational risk, and thereby the need for competence and goodwill trust, especially to overcome potential opportunism.

Thus, in line with Propositions 2.2 and 2.4, we expect that the higher the degree of programmability–measurability of a given phase, the lower the

need for competence and goodwill trust (Proposition 2.4), and the higher the amount of formal information exchanged (Propositions 2.2, 2.3).

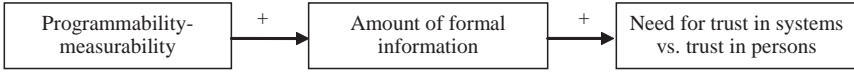
However, from the case evidence, while the degree of programmability–measurability is found to be positively related to the amount of formal information exchanged along the DS value chain (Proposition 2.3), no evidence can be seen on the relations stated by Propositions 2.2 and 2.4. Particularly, we found no evidence on a different intensity of the need for trust along the DS value chain.

On this point, the contact manager noted that the critical aspect of trust relies on a partner’s aptitude to fulfil the coordination requirements at each given phase of the value chain, such as forecast and schedule capability, at the Development phase, and respecting the guaranteed capacity, at the Industrial phase. Moreover, the manager specifies: “at the development phase, as communication is less formalised and more based on face-to-face meetings, partner’s trustworthiness is influenced by personal touches; instead, at the industrial phase, as communication is shaped by regular exchanges of codified information, thus more formalised and supported by electronic devices, inter-firm trust is not related to personal touches, but regards more the correctness of systems and procedures”. We thus claim that between the phases the need for trust varies not in the intensity but in the subject, i.e. in the source of trust, which at the Development phase is referred to the personal touches, while at the Industrial phase is referred to the correctness of systems and procedures.

In summary, the relational perspective falls in supporting case discussion for it neglects the source of trust as a criteria to analyse this lever of control.

#### *Case Discussion from the Institutional Perspective of Control*

The institutional perspective gives more insights into the different sources of trust as it adopts the trust typology proposed by Luhmann (1979) and Giddens (1990), based on the distinction between trust in persons and trust in systems. This perspective claims that management accounting is an abstract system which, by producing formal information, impacts on trust in systems, thus disembedding social interactions (Proposition 3.1); that where task programmability and measurability are high (low), accounting information is more (less) formalised and mainly interacts with trust in systems (in persons) (Proposition 3.2). Since Proposition 3.1 is contained in Proposition 3.2, we focus on the latter. The institutional perspective framework can be depicted as in Fig. 3.<sup>17</sup>



*Fig. 3.* The Institutional Perspective Framework: Proposition 3.2.

Let us discuss the institutional-based framework by analysing the three variables at each phase of the DS value chain. In so doing we discuss each value chain phase by referring Proposition 3.2 to the manager’s claim reported in the conclusion of the previous section.

As argued before, the Negotiation phase is characterised by a low degree of programmability–measurability. This is an important point for it makes the results of this phase critical for those of the downstream phases. In this regard, the contact manager specifies: “For an effective development and industrial partnership, we have to identify the aspects characterised by strong homogeneities to use them as the bases for information flow and monitoring, both from the view-point of technical development and scheduling, and from the view-point of the contractual agreements to be formalised. This initial set up work is fundamental for the effectiveness of the subsequent information flow”. This claim requires that each manager be willing to share “aspects characterised by strong homogeneities”, which entails a high number of informal interactions. At this phase, documental information exchanged is very synthetic. The document shown in [Table 1](#) is an example of a report directed to support face-to-face interactions. It proposes different price solutions, the choice of which will be the result of iterative interactions through facework commitments. Further, as the manager notes: “At this phase we need to look each other in the eye, to better identify critical problem solutions”. We thus hold that trust in persons is the type of trust predominant at this phase.

The Development phase presents a middle degree of programmability–measurability. The amount of formal information exchanged is richer than in the Negotiation phase, being based on more detailed documents, as is shown in [Table 2](#). These documents support engineer meetings for they provide data on volume and performance forecasts needed for the arrangement of the guaranteed capacity. The search for design solutions and the arrangement for product and process control specifications, to be formalised in the supply agreement, need periodical face-to-face meetings between engineers, whose decisions are partly constrained by the development agreement signed on at the previous phase. Moreover, as the manager points out: “At the development phase no standard platforms are used,

because of their rigidity. Certain documents are electronically exchanged, for they are filled in by both the supplier and the buyer (schedule, work in progress, etc.)”. We thus claim that, at the Development phase, where the degree of programmability–measurability and of formalisation of the information exchanged is intermediate, both facework and faceless commitments shape engineer interactions, thus making trust in persons and trust in systems both relevant.

Finally, the industrial phase, being characterised by a high level of programmability–measurability, presents a high amount of formal information exchanged. As shown in [Table 3](#), the exchanged documents contain details on problems and responsive actions to be taken, thus acting as media in workers’ interactions. The product and process control specifications, formalised in the supply agreement, constitute the basis for documental information that regulates task execution. As this phase is very operational, “(...) standard platforms are used: (...) documents are shared whose records regard the quality and the reliability of deliveries (...)”. Hence, as the manager claims: “(...) at the industrial phase, as communication is shaped by regular exchanges of codified information, thus more formalised and supported by electronic devices, inter-firm trust is not related to personal touches, but regards more the correctness of systems and procedures”. We thus recognise trust in systems predominant at the Industrial phase.

We can summarise the above discussion by arguing that along the DS value chain the higher the degree of task programmability and measurability, the higher the amount of formal information exchanged, and the higher the relevance of trust in systems versus trust in persons, thus confirming Proposition 3.2.

A further aspect, ignored by the other perspectives, concerns the interdependence among the phases of the value chain. We showed how the Negotiation phase, in which commercial and development agreements are formalised, defines constraints for both the downstream phases, and how the Development phase, in which supply agreement is formalised, introduces further technical constraints for the Industrial phase. The links between the phases are perceived both at the Negotiation and at the Development phase. In the former, this perception can be noticed in the manager’s specification, mentioned above, on the search for aspects characterised by strong homogeneities, important for “an effective development and industrial partnership”. With respect to the Development phase, its influence on the Industrial phase is recognised as the main reason inducing engineers to develop plants “by searching for modular productive solutions, possibly characterised by scale up flexibility”. At both the



Negotiation and the Development phases, forecasts and decisions are strongly supported by data drawn from the operational phase and from market trends. Hence, both the Negotiation and Development phases rely on documents that provide data necessary for a systematic examination of practices and procedures followed at the downstream phases, at the end to continuously revise them. This is what Giddens calls reflexivity of knowledge and social relations, which enacts the disembedding–reembedding process, “by means of which faceless commitments are sustained or transformed by facework” (Giddens, 1990, p. 88).

*Common and Differential Elements of the Three  
Perspectives in Explaining the Case*

The above discussion showed the aptitude of each perspective to explain the case reported earlier. In so doing, as seen in Common and Differential Elements of the Three Perspectives section, the three perspectives agree in identifying the degree of programmability–measurability as a relevant variable positively related to the amount of formal information. From the case evidence we can confirm this prediction.

On the other hand, when the degree of programmability–measurability and the amount of formal information are low, the three perspectives differ in the role recognised to trust. While the transactional perspective attaches no role to trust (Proposition 1.2), the relational perspective recognises relevant the level of trust, which should be high when the amount of formal information is low (Proposition 2.1). Finally, the institutional perspective agrees with the relational one in recognising relevance to trust but, differently, it claims that the amount of formal information does not have implications on the level of trust but on the relevance of person versus system trust (Proposition 3.1).

The case provides evidence on the relevance of trust as a control lever, thus disconfirming the transactional perspective Proposition (1.2). More specifically, on the interaction between trust and formal information, the case evidence does not support the relational perspective Proposition (2.1), according to which the higher the need for trust, the lower the need for formal information gathering. In fact, in line with the static approach followed here, no relevance can be recognised to the level of trust, as what differs along the value chain is not the level but the type of trust, in terms of trust in persons versus trust in systems. These different sources of trust emphasise the relevance recognised to rules and procedures, of which

management accounting systems and practices are part. Thus, the institutional perspective seems to provide the most appropriate explanation of the observed phenomenon, as it highlights the impact formal information has in replacing trust in persons with trust in systems, and thus disembedding social interactions (Proposition 3.1).

Differently from previous case studies, the present work gives insights on the use of information and trust at the different phases of the value chain by distinguishing the phases where personal knowledge and skills are critical for task performance, which are the phases with a lower degree of task programmability–measurability, from the phases where attention should be paid on systems and procedures, where the degree of programmability–measurability is higher. In this context, by referring to the concept of social reflexivity, an additional element of the institutional perspective is to highlight how the two control levers can be used to manage the interdependence among the value chain phases. In fact, the case discussion showed how documental information gathered at the operational phases (Industrial phase) constitutes input for personal interactions aimed at problem solving and strategic decisions at the most strategic phases (Negotiation and Development).

## **CONCLUSIONS AND FUTURE DIRECTIONS**

This paper is an attempt to analyse the interaction between information and trust in inter-firm transactional relationships, studied at a given point in time. In so doing, different theoretical perspectives are outlined, the transactional, the relational and the institutional perspectives, from which common and different points are highlighted. From the case evidence and discussion we submit that the degree of task programmability and measurability is a relevant factor as it influences the amount of formal information exchanged between the partner firms. This first result supports a prediction agreed by the three perspectives. Further, from the case evidence we acknowledge a relevant role to trust, which varies along the value chain according to the different degree of programmability–measurability. This role consists of a positive expectation of persons' behaviour, mostly relevant where programmability and measurability are low, and of a positive expectation of system correctness, whose importance prevails where programmability and measurability are high. Hence, the case evidence is better explained by the institutional perspective, which views

management control as routines and procedures that enact a disembedding–reembedding process.

As well as the theoretical systematisation on the interaction between information and trust, the main contribution of the present study is the focus on value chain phases. This enables us to observe how different control patterns or archetypes can be co-present in a given relationship. Further, this focus better emphasises the empirical settings for which the institutional perspective provides a more appropriate explanation.

The main limit of the study has to be recognised in its static and partial approach, being inter-firm relationship observed at a given point in time and from the buyer side alone. Further studies can extend the value chain analysis to a certain period of observation, embracing the life cycle of a relationship, and from the point of view of both the partners. This can shed more light on how the interaction between information and trust may vary along the different stages of a relationship, considering the different phases of the value chain.

## NOTES

1. From the growing number of studies on inter-organisational control we acknowledge several theoretical perspectives, based on: transaction cost economics (TCE) (Speklé, 2001; Vosselman, 2002; Nicholson et al., 2006); TCE, trust-based and relational view (van der Meer-Koistra & Vosselman, 2000; Langfield-Smith & Smith, 2003; Donada & Nogatchewsky, 2006; Langfield-Smith, 2008; Vosselman & van der Meer-Koistra, 2009); institutional economics and organisational theory (Håkansson & Lind, 2004; Dekker, 2004; Cäker, 2008); incentive theory (Baiman & Rajan, 2002); evolutionary theory (Coad & Cullen, 2006) and the new-institutional sociology, like structuration (Seal, Berry, & Cullen, 2004; Busco, Riccaboni, & Scapens, 2006; Moilanen, 2008; Free, 2008) and actor network theory (Mouritsen & Thrane, 2006).

2. As specified by Speklé: “In TCE uncertainty is a condition that can arise from many sources, including market dynamics, disturbances in the external environment, environmental complexity, and unfamiliarity. However, whatever the sources, the effects are similar: transactions are not amenable to up front programming, and maintaining flexibility to allow adaptation to events as they unfold and to information as it accrues becomes imperative” (Speklé, 2001, p. 428). In accordance with Speklé, in the present study we use the expression “task programmability” to refer to uncertainty.

3. More precisely, by mentioning Williamson (1996), Speklé specifies: “Information impactedness refers to a situation in which either: (1) information is asymmetrically distributed between contracting parties and can be equalized only at great cost, or (2) it is costly to apprise an arbiter of the true information condition should a dispute arise between parties who have identical knowledge of the

underlying circumstances” (Speklé, 2001, p. 421). In the present paper with task or output measurability, we refer to what we specified above.

4. This distinction is consistent with the distinction between mundane and opportunistic transaction cost, which is stressed by Richardson and Kilfoyle (2009), in examining the role of accounting information in supporting inter-firm transactions.

5. This conclusion is explicitly acknowledged by Williamson, who emphasises the role of social embeddedness as part of the institutional environment of the transaction, in preventing opportunism, and thus denies any role to trust (see Williamson, 1993).

6. This view of trust is in fact consistent with the relational view proposed by Dyer and Singh (1998) in strategic studies.

7. Quoting Chaserant (2003), the authors call this relational signaling, which refers to “all the signs that an individual transmits to his interaction partner. They are positive when they reveal a disposition to cooperate” (cf. p. 173).

8. This way to describe the trust–information interaction relies on a static view, which is adopted in this study. A dynamic analysis is proposed by Tomkins (2001), who argues that the trust–information interaction is positive in the beginning stages of a relationship; negative in the latter stages.

9. The authors describe the control patterns by distinguishing three temporal phases in the transactional relation: the contact, the contract, and the execution phases. In accordance with the static view of the present study, we do not consider this distinction.

10. This is explicitly argued by Tomkins, by noting that “trust in manufactured things is really trust in the persons who made them performing his her job properly and so trust in man-made things and people may not fundamentally different” (2001, p. 165). A further argument can be found in van der Meer-Koistra and Vosselman (2000), where they specify: “For example, when specific investments in human knowledge are very important for the quality of the work to be done, a lot of attention will be paid to the quality of the persons deployed to carry out the activities. In this situation the parties must perceive high contractual and competence trust” (pp. 61–62).

11. This can be drawn from Tomkins’ argument, according to which, although trust presupposes an intention of the trustee, expected by the trustor, the trustee can be either a person or a mechanical or social system, which is expected to operate as intended (2001, p. 165).

12. An institution is defined by Hamilton as “a way of thought or action of some prevalence and permanence, which is embedded in the habits of a group or the custom of a people” (1932, p. 84).

13. We agree with Burns and Scapens in defining rules as “the formally recognised way in which things should be done”, and routines as “the way in which things are actually done” (2000, p. 6). Thus, it is the degree of formalisation that distinguishes rules from routines: while rules are formally recognised, routines are not.

14. A further difference can be noticed between transactional and relational perspectives about the level of asset specificity. Unlike the relational perspective, the transactional one does not admit a high level of asset specificity for hybrid forms of governance because, as noticed by Langfield-Smith and Smith (2003), according to TCE assumptions, “high asset specificity cannot be tolerated in an outsourcing

situation as it increases the potential for opportunistic behavior and information leakage, requiring the outsourcing function to be taken in-house” (p. 287). We do not argue further around this difference, as it is not relevant for the purpose of our discussion.

15. Other studies focus on supply networks, as the unit of analysis: [Kajüter and Kulmala \(2005\)](#); [Miraglia \(2006\)](#).

16. The purpose of our case study is to give insights into the theoretical perspective that better explains the empirical observations (see [Yin, 1994](#)).

17. As can be seen, [Fig. 3](#) sketches the institutional framework through a chain of deterministic relations between the relevant variables. This simplification is the result of a methodological choice followed in the present paper, i.e. the analysis of the control approaches along the value chain at a given point in time (static view).

## REFERENCES

- Baiman, S., & Rajan, M. V. (2002). Incentive issues in inter-firm relationships. *Accounting, Organisations and Society*, 27, 213–238.
- Burns, J., & Scapens, R. W. (2000). Conceptualizing management accounting change: An institutional framework. *Management Accounting Research*, 11, 3–25.
- Busco, C., Riccaboni, A., & Scapens, R. W. (2006). Trust for accounting and accounting for trust. *Management Accounting Research*, 17, 11–41.
- Cäker, M. (2008). Intertwined coordination mechanisms in interorganizational relationships with dominated suppliers. *Management Accounting Research*, 19, 231–251.
- Chaserant, C. (2003). Cooperation, contracts and social networks: From a bounded to a procedural rationality approach. *Journal of Management and Governance*, 7, 163–186.
- Coad, A., & Cullen, J. (2006). Inter-organisational cost management: Towards an evolutionary perspective. *Management Accounting Research*, 17, 342–369.
- Das, T., & Teng, B. (1996). Risk types and inter-firm alliance structures. *Journal of Management Studies*, 33, 827–843.
- Das, T., & Teng, B. (2001). Trust, control and risk in strategic alliances: An integrated framework. *Organization Studies*, 22(2), 251–283.
- Dekker, H. C. (2004). Control of inter-organisational relationships: Evidence on appropriation concerns and coordination requirements. *Accounting, Organisation and Society*, 29, 27–49.
- Donada, C., & Nogatchewsky, G. (2006). Vassal or lord buyers: How to exert management control in asymmetric interfirm transactional relationships? *Management Accounting Research*, 17, 257–259.
- Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganisational competitive advantage. *The Academy of Management Review*, 23(4), 660–679.
- Free, C. (2008). Walking the talk? Supply chain accounting and trust among UK supermarkets and suppliers. *Accounting, Organisations and Society*, 33, 629–662.
- Giddens, A. (1990). *The consequences of modernity*. Cambridge: Polity Press.
- Jones, T. C., & Dugdale, D. (2001). The concept of an accounting regime. *Critical Perspectives on Accounting*, 12, 35–63.
- Håkansson, H., & Lind, J. (2004). Accounting and network coordination. *Accounting, Organisations and Society*, 29, 51–72.

- Hamilton, W. H. (1932). Institution. In: E. R. A. Seligman & A. Johnson (Eds), *Encyclopedia of the social sciences* (Vol. 8, pp. 84–89). New York: Macmillan.
- Kajüter, P., & Kulmala, H. (2005). Open-book accounting in networks. Potential achievements and reasons for failures. *Management Accounting Research*, 16, 179–204.
- Langfield-Smith, K. (2008). The relations between transactional characteristics, trust and risk in the start-up phase of collaborative alliance. *Management Accounting Research*, 19, 344–364.
- Langfield-Smith, K., & Smith, D. (2003). Management control systems and trust in outsourcing relationships. *Management Accounting Research*, 14, 281–307.
- Luhmann, N. (1979). *Trust and power*. Chichester, UK: Wiley.
- Miller, P., & O’Leary, T. (1987). Accounting and the construction of the governable person. *Accounting, Organizations and Society*, 12(3), 235–265.
- Miraglia, R. A. (2006). *Reti di imprese e sistema informative interorganizzativo*. Torino: Giappichelli.
- Moilanen, S. (2008). The role of accounting and an intermediate subsidiary in the management control system. *Management Accounting Research*, 19, 252–269.
- Mouritsen, J., & Thrane, S. (2006). Accounting, network complementarities and the development of inter-organisational relations. *Accounting, Organisation and Society*, 31, 241–275.
- Nicholson, B., Jones, J., & Espenlaub, S. (2006). Transaction costs and control of outsourced accounting: Case evidence from India. *Management Accounting Research*, 17, 238–258.
- Richardson, A. J., & Kilfoyle, E. (2009). Accounting in markets, hierarchies and networks: The role of accounting in the transnational governance of postal transactions. *Accounting, Organization and Society*, 34, 939–956.
- Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, 3, 393–404.
- Sako, M. (1992). *Prices, quality and trust: Inter-firm relationships in Britain and Japan*. Cambridge: Cambridge University Press.
- Seal, W., Berry, A., & Cullen, J. (2004). Disembedding the supply chain: Institutionalized reflexivity and inter-firm accounting. *Accounting, Organisations and Society*, 29, 73–92.
- Speklé, R. F. (2001). Explaining management control structure variety: A transaction cost economics perspective. *Accounting, Organisations and Society*, 26, 419–441.
- Tomkins, C. (2001). Interdependencies, trust and information in relationships, alliances and networks. *Accounting, Organisations and Society*, 26, 161–191.
- van der Meer-Koistra, J., & Vosselman, E. G. J. (2000). Management control of interfirm transactional relationships: The case of industrial renovation and maintenance. *Accounting, Organisation and Society*, 25, 51–77.
- Vosselman, E. G. J. (2002). Towards horizontal archetypes of management control: A transaction cost economics perspective. *Management Accounting Research*, 13, 131–148.
- Vosselman, E. G. J., & van der Meer-Koistra, J. (2009). Accounting for control and trust building in interfirm transactional relationships. *Accounting, Organisations and Society*, 14, 267–283.
- Williamson, O. E. (1993). Opportunism and its critics. *Managerial and Decision Economics*, 14, 97–107.
- Williamson, O. E. (1996). *The mechanisms of governance*. New York: Oxford University Press.
- Yin, R. K. (1994). *Case study research. Design and methods*. London: Sage Publications Inc.



# SHOULD ROLLING FORECASTS REPLACE BUDGETS IN UNCERTAIN ENVIRONMENTS?

Marie-Anne Lorain

## ABSTRACT

*Budgeting process has been largely criticized in the recent accounting literature. The responsiveness of budgets to fast-moving environments is now questioned. The purpose of this paper is to address this issue by suggesting that companies use rolling forecasts as an interactive and flexible tool to cope with turbulence.*

*We designed a web-based survey directed to Spanish companies operating in an uncertain environment. Statistical results of the survey reveal that more than 60% of the respondents consider that changes in the environment makes it very difficult to establish accurate budgets. Respondents also mentioned that with the economic down cycle the establishment of reliable financial forecasts is requiring a great effort. At the same time, qualitative interviews have been conducted with companies already using rolling forecasts to test and further develop the use of this interactive tool.*

*We found that the rolling forecasts are considered to be a dynamic strategic planning tool, very useful for cash management and day-to-day decision-making process, but that they cannot replace budget for evaluation and motivation purposes.*

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*The study has its limitations as the findings rely on a small number of survey respondents and interviewed organizations. Nevertheless the results have been compared, when possible, to those of similar surveys in order to validate them.*

*The article supplies actualized information about budgeting practices in a turbulent environment and more specifically in the Spanish context.*

## INTRODUCTION

Even if traditional budgeting has been questioned in the past decades, we can observe that for many companies it is still a key element of their management control system. Due to environmental uncertainty, the budget is being subject to considerable criticism and debate (Hope & Fraser, 2000, 2003a, 2003b; Jensen, 2001, 2003; Bogsnes, 2009). In rapidly changing, unpredictable economic environments, it is difficult to set realistic objectives (Berland, 1999, 2001; Chapmann, 1997), and achieve a fair performance evaluation when results have been affected by unforeseen events. Recent budget process developments have focused on two practices: improving the budgeting system or abandoning it (Hansen, Otley, & Van der Stede, 2003, p. 95). The first type aims at maintaining the process, improving it with complementary techniques such as activity-based budgeting, balanced scorecard or rolling forecasts (Rickards, 2006). The second category is more radical and advocates for the complete elimination of the budgetary process, to enable firms to respond faster and therefore, cope better with uncertainty (Hope & Fraser, 2001, p. 23). As a matter of fact, some European companies, such as Svenska Handelsbanken, Volvo, Rhodia, Borealis, have already dismantled their budgeting process (Hope & Fraser, 2003a).

In rapidly changing and unstable environments, management control systems need to provide managers with accurate and reliable data on a regular basis so they are able to continuously adjust operations, assess resource availability and make the appropriate decisions. Rolling forecasts (RFs) provide frequently updated indicators, which contribute to making more adaptable and flexible organizations that are able to cope with new environmental scenarios (Gracia, 2008b).

The purpose of this study is to explore the implementation and the use of RFs and budgets in Spanish companies operating in uncertain environments. The study presents data collected from a web-based survey of Spanish companies and transcript information from qualitative interviews conducted with companies already using RFs. Our findings reveal that RFs

are considered to be a dynamic strategic planning tool, which is action oriented and very useful for cash management and day-to-day decision-making processes, but they cannot replace budgeting for evaluation and motivation purposes.

The first section presents the literature focus, which guided the investigation and the research objectives. Section two outlines the research method employed to conduct the survey and the interviews, as well as data analysis. Section three reports and discusses web-based survey results and qualitative interviews content. The final section of the paper summarizes the investigation findings and offers some directions for future research.

## LITERATURE AND RESEARCH FOCUS

Under volatile conditions, when economic forecasts change rapidly, organizations experiment difficulties in developing reliable budgetary information to coordinate business units and track performance for the entire year (Akten, Giordano, & Schieffele, 2009, p. 6). Competitive firms should continuously perceive market changes, adapt themselves to new environment conditions and be flexible to adjust and coordinate their action plans (Gahagan, 2005). In this context, budget process should be reengineered, and RFs are presented as one of the main alternatives to budget (Arterian, 1997; Ekholm & Wallin, 2000; Bunce, 2007). From the literature review (Table 1) we observe that companies are implementing RFs in order to cope with the weaknesses of traditional budgeting (data obsolescence, too long to process), to improve financial management, to get a better operational management (flexibility, innovation, productivity), to accelerate the decision-making process and to devote more time to value-added activities (data analysis, link with strategy).

RF technique permits companies to frequently revise their financial indicators, to link planning with strategy and to make appropriate decisions. Some organizations conduct projections of year-end values on a regular basis, and more advanced companies establish projections going beyond the fiscal year and covering a rolling 12- to 18-month period forecast (Hope, 2007, p. 3). The periodicity of RF strategic reviews might be on a regular basis (monthly or quarterly) or driven by some significant events such as the introduction of new products and services, or reactions to supply chain disruptions. Organizations such as Borealis and Statoil (Bogsnes, 2009) elaborate a five-quarter RFs; the last forecast of the year is used as a budget

**Table 1.** Reasons for Implementing Rolling Forecasts.

Reasons	Company	Reference
Budget weaknesses	Fujitsu	Banham (2000, p. 39)
	Flowserve	Player (2009)
	Sprint	Arterian (1997, p. 1)
	Borealis	Bogsnes (2009, p. 69)
	Millipore	Johnson (2007, p. 4)
Improve financial management	Borealis	Bogsnes (2009, p. 69)
	Spare Bank1	Aune (2009)
Better operational management	Park Nicollet	Hall (2007, p. 21)
	Hon	Drtina et al. (1996, p. 20)
	Sprint	Arterian (1997, p. 1)
	Statoil	Bogsnes (2009, p. 123)
	Tomkins	Bunce (2007, p. 10)
Boost the decision process	Millipore	Johnson (2007, p. 3)
	Tomkins	Bunce (2007, p. 10)
Promote value-added activities	Fujitsu	Banham (2000, p. 39)
	Sprint	Drtina et al. (1996, p. 20)
	Borealis	Bogsnes (2009, p. 69)

and transmitted to the owners of the company, who are still using a traditional budgeting system.

To be efficient, forecasts need to be prepared in a few days, which means focusing only on a few key value indicators rather than lots of detail (Bunce, 2007, p. 7). A recent investigation confirms that “keeping forecasts focused on key performance indicators and line items will allow for quicker turnaround and more value-added analysis and insight from finance” (Apanaschik, 2007, p. 42). As a matter of fact, we can say that most of the businesses only need to focus on 3–5 key indicators to measure their long-term value creation potential (Rappaport, 2006, p. 74). For instance, American Express is using three key metrics to run its core business: average card member spending, card attrition and average assets per financial clients (Chenault, 2004). Some financial ratios could also be used, such as the return on capital employed (ROCE), which is the main key performance indicator for Borealis (Bogsnes, 2009, p. 75). The ROCE summarizes all the performance of the company. To improve ROCE, budget units can activate the following levers: investing in profitable projects, optimizing working capital, controlling fixed and variable costs, and increasing volume and operating margins.

RF system gives companies the agility and ability to follow changes in market scenarios, and to cope with environment uncertainty while keeping an eye on strategic objectives. The main functions of continuous financial planning (Gracia, 2008a, p. 26):

- to constantly adjust action plans, taking into account economic and financial risks, as well as market changes;
- to take advantage of operational and financial resources needed for business development;
- to meet shareholder requirements and expectations (profitability, value creation);
- to ensure continuity and sustainable growth for the companies.

Regarding shareholder expectations we can add that three main factors affect share price: management credibility, communication with investors and strategy formulation and execution (Neely, Bourne, & Heyns, 2001, p. 14). Many financial analysts believe that corporate strategic planning and planning systems are essential to evaluate shareholder value creation. They especially pay attention to the reliability and accuracy of financial forecasts (Mikhail, Walther, & Willis, 1999, p. 185).

Overall, RFs are a “just-in-time” process that focuses on strategy, on threats and opportunities and that allows the firms to allocate or withhold resources quickly and efficiently. RFs present a vision of what will happen in the short and medium term while the budget gives a single view of the future to implement strategy and to control operational measures. A Millipore executive mentioned that “the forecast is our best guess of what the reality will be that far down the road, based on our analysis of trends and changes in the business landscape, such as potential acquisitions” (Johnson, 2007, p. 4).

Hope (2007, p. 4) affirms that forecasts based on RFs are different from budgets in that they are based on a few key drivers, they take only a few days to prepare; thus they are performed in a continuous way and are not prepared under the umbrella of fixed targets. Ekholm and Wallin (2000, p. 521) argue that RFs are more flexible than budgets and do not appear to be so mandatory nor strict.

The objective of the research is to study the implementation and use of RF technique in Spanish companies. The first part of the research intends to investigate why companies are implementing RFs. We made the assumption that the operating environment is becoming increasingly unpredictable and that in this context, budget data are difficult to predict and become rapidly obsolete. Therefore, to manage their activities organizations need more

**Table 2.** Traditional Budget Functions.

Function	Reference
Planning	Baudet (1941), Hopwood (1974), Barrett and Fraser (1977), Hofstede (1977), Otley (1977), Samuelson (1986), Lyne (1988), Bunce, Fraser, and Woodcok (1995), and Bouquin (2001)
Management control and resource allocation	Baudet (1941), Hofstede (1977), Otley (1977), Samuelson (1986), Lyne (1988), and Bunce et al. (1995)
Evaluation	Baudet (1941), Barrett and Fraser (1977), Otley (1977), Samuelson (1986), Lyne (1988), and Bunce et al. (1995)
Motivation	Hopwood (1974), Barrett and Fraser (1977), Otley (1977), Samuelson (1986), Lyne (1988), and Bouquin (2001)
Commitment	Samuelson (1986)
Delegation	Hopwood (1974) and Bouquin (2001)
Coordination	Baudet (1941), Hopwood (1974), Barrett and Fraser (1977), Samuelson (1986), Lyne (1988), and Bouquin (2001)
Communication	Otley (1977), Lyne (1988), Bunce et al. (1995), and Bouquin (2001)

*Source:* Adapted from Berland (1999, p. 7).

flexible tools such as RFs. The second part of the investigation focuses on RFs use and functions. Based on the summary of traditional budget functions (Table 2), we explore the assumption that RFs might replace budget for planning and resource allocation functions.

RFs provide an actualized vision of the business that permits to continuously maintain the link between plans and strategy, to allocate resources appropriately, to forecast accurate cash flow, to obtain useful information for the decision-making process and to react rapidly to environmental changes.

The last assumption we made is that RFs do not fulfil evaluation and motivation functions, and therefore it cannot replace budgeting. Action plans established during the budgeting process are the result of a nourished dialog and sustained coordination throughout the organization. Budgets are usually considered to be a motivation tool, as managers are committed to deliver their action-plan objectives, and are rewarded for doing so. Besides, both action plan follow-up, and the analysis of actual results versus preset objectives, provide better knowledge of the business. As they are periodically revised, RFs cannot be considered as a standard reference for control and performance measurement.

Thanks to a survey addressed to companies operating in an uncertain environment, the investigation aims to demonstrate that budget data is not reliable. Through qualitative interviews, it seeks to understand

complementarities between RFs and budgeting. Finally, we aim to validate that RFs could be considered to be an interactive management system following Simons' conceptual framework.

## SURVEY AND QUALITATIVE INTERVIEW METHOD

We designed a web-based survey directed to Spanish companies operating in an uncertain environment. Then, we conducted qualitative interviews addressed to companies already using RFs to test and further develop the use of this interactive tool. The survey method is presented hereafter and summarized in Table 3.

### *Objectives of the Survey*

The objective of the study was to assess the degree to which companies think that budgeting is an inappropriate tool in an uncertain environment and to analyse the use of RFs as a flexible and interactive tool to cope with uncertainty and with frequent changes.

**Table 3.** Study Features.

	Questionnaire	Interviews
Respondent	45	10
Survey method	Web-based survey	Semi-structured interviews
Data analysis methodology	SPSS statistical analysis	Analysis of interviews in the light of practice and theory literature
Running period	December 2008 to January 2009	January to June 2009
Companies activity field	Companies operating in an uncertain environment	Companies operating in an uncertain environment
Objectives	Investigate: <ul style="list-style-type: none"> <li>• Environment uncertainty and budget process,</li> <li>• Budget data accuracy,</li> <li>• Budget adaptability,</li> <li>• Changes planned in budgetary process.</li> </ul>	Investigate: <ul style="list-style-type: none"> <li>• Reasons for implementing rolling forecasts (RFs),</li> <li>• RF process,</li> <li>• RF functions,</li> <li>• RF implementation key success factors and barriers.</li> </ul>

### *Sample Selection*

The sample was drawn from the 2008 “Who is who” directory of *Actualidad Económica*, a Spanish weekly financial magazine. To be included in the sample, individuals must belong to a company operating in an uncertain environment. To be defined as such, the environment must include five external components: customers, competitors, suppliers, regulatory groups and technological requirements of industry that can be submitted to changes and discontinuities (Duncan, 1972, p. 315). Markets in which technology standards are changing, competitors are continuously entering and exiting and customers are constantly changing their preferences can be considered as belonging to a highly uncertain environment (Courtney, 2008). We have defined an uncertain environment as an economic sector where changes and unpredictable discontinuities occur frequently. For the Spanish market we have taken into account changes in external factors such as political and legal regulations (privatization, deregulation), economic factors, technology evolution and socio-cultural factors. That led us to select several economic sectors such as automobiles, distribution, energy, real estate, internet, pharmaceuticals and services.

In addition, targeted respondents were selected among those holding the position of Chief Executive Officer (CEO), Chief Financial Officer (CFO), Business Controller, Director of Planning and Budgeting, and Accounting Manager.

This selection resulted in a final sample of 395 organizations.

### *Survey Design and Distribution*

The survey was composed of 22 questions (Appendix) about environment uncertainty and budgetary process, budget data accuracy, budget adaptability and changes on budgetary process. When possible, all the questions were designed or adapted from previously published studies (Ekholm & Wallin, 2000; Apanaschik, 2007; Libby & Lindsay, 2008). New measures were developed as required.

A preliminary version of the survey was first analysed with the marketing department of the ICADE (Facultad de Ciencias Económicas y Empresariales, Universidad Pontificia Comillas de Madrid) and then tested using five individuals with a similar profile to potential survey respondents. The pre-test feedback helped us to clarify some questions or reword terminology in order to better reflect usage of some managerial terms.

The survey respondents were contacted via an e-mail, which included a description of survey objectives and invited them to contact us if they wished to participate in an in-depth interview to be conducted at a later date. The link to access the survey was included in the e-mail. The survey was anonymous, took approximately 10 to 15 min to complete, and was conducted from December 2008 to January 2009.

### *Sample Statistics*

A total of 45 surveys were submitted through the web-based system, which represents a response rate of 11.4%. Descriptive statistics for survey respondents is shown in [Table 4](#).

### *Qualitative Interviews*

During first semester in 2009, we conducted semi-structured interviews, which lasted 1–2 h on average, addressed to Chief Financial Officers of

**Table 4.** Descriptive Statistics for Survey Respondents.

	Number	Frequency (%)
Employees:		
Less than 500 people	16	35.6
More than 500 people	29	64.4
Divisional revenues:		
Less than € 10 million	10	22.2
From € 10–500 million	18	40.0
More than € 500 million	17	37.8
Corporate structure:		
Stand-alone unit	19	42.2
Division of a larger organization	26	57.8
Economic sector:		
Uncertain environment	27	60.0
Services and other	18	40.0
Job titles:		
CEO/CFO	22	48.9
Business controller	19	42.2
Accounting manager and other	4	8.9



10 companies from the initial survey sample. We can rely on the consistency and the comparability of the data collected, since the group is homogeneous in terms of nature and level of responsibility. We prepared an interview scenario covering the following topics: the need to introduce RFs, RF functions, RF success factors and barriers to implementation. Our aim was to capture the actual experience and perception of CFOs regarding uncertainty and the need for flexible budgeting. Fully transcribed interviews provided abundant data that was analysed in the light of practice and theory literature. The interview content was also compared in order to identify similarities and patterns across companies.

## RESULTS

The web survey allowed us to analyse the budget process in the light of environmental uncertainty and the in-depth interviews provide us with data about the use of RFs.

### *Web-Based Survey*

One of the main criticisms of traditional budgeting is that it ties the company to a 12-month fixed performance contract, which can be inappropriate in an uncertain business environment (Prendergast, 2000, p. 14). In dynamic, rapidly changing markets the formulation of budgets 12 months in advance makes little or no sense (Rickards, 2006, p. 64). The aim of these web-based surveys was to examine these concerns.

### *Environment Uncertainty and Budget Process*

In this section, we tried to determine how the organizations perceive the environment and how difficult it is to predict factors when constructing the budget.

The survey examined the assumption that the environment in which businesses operate today is extremely unpredictable.

The companies were asked to rate different factors of unpredictability, selected from Govindarajan (1984), Gul (1991), and Libby and Lindsay (2008). We asked respondents the extent to which they were able to predict (1 = highly predictable to 5 = highly unpredictable) the effects of 10 items characteristic of the external environment: changes in customer demand, evolution of customer preferences, changes in products offered by competitors,

technical developments impacting design, technical developments impacting production, changes to laws and regulations, actions of labour unions, availability of suitable employees and availability and price of raw materials. The average response rate to the 10 items can be used as an index of perceived environmental uncertainty (Govindarajan, 1984, p. 130). The average of 2.8 indicates that the environment is somewhat predictable. But, 6.4% of the respondents rated their environment as very difficult to predict (Table 5). The most difficult items to predict are regulatory environment (average 3.3) and price of raw materials (average 3.0).

After having analysed the uncertainty of the environment and the difficulty in anticipating or predicting external factors, we asked the respondents to report their degree of agreement (1 = strongly disagree to 5 = strongly agree) with the following assessments: “The unpredictability of the environment doesn’t allow us to establish accurate budgets” and “Once the budget is approved it becomes obsolete” (Table 6).

The mean response for the question regarding environment unpredictability was 3.1 and the median was 3, which means that 68.9% of the respondents agreed with the argument. When we asked the respondents to explain their answer, they mentioned that in the current economic down

**Table 5.** How Difficult is it to Predict the Following Factors.

	Mean	Highly Predictable	Somewhat Predictable	Predictable	Somewhat Unpredictable	Highly Unpredictable
How difficult is to predict budgetary factors	2.8	8.9%	32.4%	33.2%	18.9%	6.5%
Cronbach $\alpha = 0.68$						
	Mean	Median	S.D.			
Changes in customer demand	2.89	3	0.97			
Evolution of customer preferences	2.64	2	1.07			
Changes in product offered by competitors	2.96	3	1.01			
Technical developments impacting design	2.67	3	0.84			
Technical developments impacting production	2.53	3	0.91			
Governmental changes to law and regulations	3.29	4	1.24			
Actions of labour unions	2.71	3	1.13			
Availability of suitable employees	2.91	3	0.98			
Availability of raw materials	2.58	3	1.02			
Price of raw materials	3.00	3	1.20			

**Table 6.** Agreement with Budget Accuracy.

	Mean	Median	S.D.
The unpredictability of the environment does not allow establishing accurate budgets	3.15	3	1.17
Once the budget is approved it becomes obsolete	2.68	2	1.20

cycle it is difficult to predict what will happen in the coming months, that historical references can no longer be used for planning, and that it is not easy to anticipate changes in customer demand and to foresee the evolution of raw material prices.

The average response rate for the obsolescence factor was 2.7 and the median was 2, which means that the respondents disagree with the argument that budget is quickly outdated. As 97% of the respondents are producing an annual budget, which is quite formalized (94.5% of the respondents) and linked to a strategic plan (75% of the respondents), we can assume that even if it is not easy to elaborate the data, a lot of work is invested in publishing reliable data. Some respondents mentioned that even though the environment is unstable, the budget should be carefully established in order to set a direction and plan of action linked to the firm's strategy. They also add that the budget can become obsolete at the level of detailed items, but the main financial targets remain reliable and companies should adapt their plans in order to cope with these high-level objectives. Besides, they mentioned that budget is not only a set of financial data but it is also a detailed action plan to reach a strategic objective.

Some respondents (60%) agreed with the fact that it is difficult to establish accurate data for budgeting and that with the economic crisis, budget data can be obsolete even before being approved. However, the unpredictability argument cannot be generalized to all the companies as 40.9% of the respondents find it relatively easy to predict their environmental factors. These results are comparable to the survey conducted by Libby and Lindsay (2008, p. 7) that led them to the conclusion that "the unpredictability argument has been over generalized in its application to the average firm".

#### *Budget Data Accuracy*

Following the first set of questions, we examined the accuracy of planning and budgeting by asking the respondents if they reached their strategic plan

**Table 7.** Absolute Variance between Actual Data and Budget.

	0–5%	5–10%	10–20%	More than 20%
Total budget (%)	31.1	24.4	24.4	20.1
Sales budget (%)	35.6	26.7	15.6	22.1
Costs of goods sold (%)	33.3	33.3	17.8	15.6
Administrative and general expenses (%)	40.0	44.4	8.9	6.7
Capital expenditure (%)	46.7	31.1	15.6	6.6

objectives in the past two years, and inviting them to report the previous year's variance between actual results and budget data.

Regarding strategic planning, nearly 70% of the respondents said that they met plan on very few occasions, or even never fulfilled their strategic objectives in the past two years. This reply validates the fact that in a fast-changing environment, it is not easy to anticipate competitive actions and market demand, making it difficult to set accurate plans for medium and long-term planning.

The respondents were also asked to report the variance between actual results and budget during the past year. Following the Hackett group definition: "an accurate forecast is one that falls within 5 percent of actual results" (Cummings, 2008), only one-third of the respondents are producing accurate budget forecasts (Table 7). This figure is in line with the Hackett group who reports that only one in three companies have variances between actual and budget below the 5% level.

The data collected suggest that sales and costs of goods sold are the most difficult items to predict as they depend more on external factors such as market demand and raw material prices. It seems easiest to forecast administrative expenses and capital expenditure, probably because these items can be reduced or postponed if actual results are not in line with the budget.

We also examined the causes of variances, asking the respondents to rank from 1 (of very little importance) to 5 (very important) a set of factors including lack of target clarity, weakness of action plans, poor prediction reliability, lack of environment information, unexpected events, technical problems, action of employees, customers, competitors, suppliers and government (laws and regulations). It appears that the most important factor causing variance is an unexpected event: for 62% of the respondents it is a "quite to very important" factor that could have a strong impact on actual results (Table 8). We can also highlight two other factors, lack of

**Table 8.** Factors Causing Variances between Actual Data and Budget.

	Mean	Median	S.D.	Not Important (%)	Important (%)	Very Important (%)
Lack of target clarity	2.1	2	1.3	73.3	6.7	20.0
Weakness of action plans	2.2	2	1.1	68.9	13.3	17.8
Poor prediction reliability	2.9	3	1.1	31.1	35.6	33.3
Lack of environment information	3.0	3	1.3	35.6	26.7	37.8
Unexpected events	3.6	4	1.3	22.2	15.6	62.2
Technical problems	2.3	2	1.2	64.4	15.6	20.0
Employees action	2.0	2	0.9	75.6	15.6	8.9
Customers action	3.2	3	1.0	22.2	33.3	44.4
Competitors action	2.9	3	1.3	37.8	28.9	33.3
Suppliers action	2.2	2	1.1	68.9	17.8	13.3
Government actions	2.3	2	1.3	68.9	11.1	20.0

environment information and the customer actions, which 44 and 38% of the respondents, respectively, classified as an important cause of variance. Reliability of predictions is somewhat important for 35.6% of the respondents, and is “quite to very important” for 33% of them.

In addition to these causes of variance, respondents mentioned the actual economic crisis, which is characterized by an unpredictable and rapidly changing environment, including market instability due to fluctuations of raw material prices and changes in customer demand.

Overall, it appears that it is rather difficult to establish accurate data for budgetary predictions, especially when unexpected events may occur and when customer preferences are changing.

#### *Budget Adaptability*

Hope and Fraser (2003a) raised the issue of adaptability, given that the budget is a fixed performance contract that is not changed until the next annual budgeting cycle. To examine this issue, we asked the respondents if they agree with the following sentences: “Once the budget is approved, the objectives cannot be changed” and “If it is not in the budget, we cannot obtain new resources to react to unexpected events”.

Regarding the possibility of modifying their forecasts, 58% of the respondents indicated that once accepted no changes could be made to the budget. For the others, budget could be used in a more flexible way and changes were admitted.

**Table 9.** Budget Review Periodicity.

	Frequency (%)
Month	31.1
Quarter	42.2
Every four months	6.7
Semester	15.6
Never	4.4

**Table 10.** Relevance of Recent Management Accounting Tools.

	Strongly Agree (%)	Agree (%)	Disagree (%)
Activity-based budgeting	57.8	24.4	17.8
Rolling forecasts	84.4	6.7	8.9
Balanced scorecard	53.3	33.3	13.3
Economic value added	31.1	35.6	33.3
Relative aspirational goals	33.3	33.3	33.3
Beyond budgeting	28.9	22.2	48.9

Concerning the possibility of obtaining new resources outside the budgeting process, it seems that companies are more flexible, as 51% of them allow new resources to accommodate unforeseen events.

The survey reveals that, even if budgeting seems to be an inflexible tool, it is submitted to periodical reviews in 96% of the companies (Table 9). More than 40% of the companies review their budgets quarterly, and 31.1% do it on a monthly basis.

We can say that the argument about the budget process being unresponsive to changes can be validated for almost 50% of the organizations.

#### *Changes Planned in Budgetary Process*

In this section, we asked the respondents whether they find new management accounting tools relevant, and if they intend to change their budgeting approach in the near future.

The survey reveals that for more than 84% of the respondents the most up-to-date tool is the RFs (Table 10). RF is followed by activity-based budgeting and balanced scorecard, which means to be relevant for more than 50% of the respondents. As a matter of fact, beyond budgeting is not considered to be a significant tool for 49% of respondents. This could be because Spanish companies have recently invested in their budgetary

**Table 11.** Budgetary Process Changes Planned.

	No We Do Not Intend to Do It (%)	We Already Have Implemented this Practice (%)	Not Yet, We Are Thinking about it (%)	Yes We Intend to Do It in the Next Two Years (%)
Process automatization	22.2	37.8	26.7	13.3
Use of an ERP system	22.2	51.1	15.6	11.1
Use of key performance indicators	13.3	60.0	15.6	11.1
Changes in the information workflow	20.0	60.0	11.1	8.9
Relative objectives (external references)	37.8	33.3	24.4	4.4
Process reengineering	40.0	11.1	33.3	15.6
Use of rolling forecasts	20.0	35.6	22.2	22.2
Use of trend reports	35.6	26.7	26.7	11.1

processes and therefore would prefer to improve it rather than move away from it.

Regarding changes to budgetary process, the survey reveals that more than 50% of the respondents are already using an ERP system and that 60% of them are using key performance indicators (Table 11).

Regarding the RF practice, 35% of the respondents have already implemented it, and almost 45% of them are intending to implement it in the near future. The use of relative objectives, which is one of the beyond budgeting principles, is not envisaged by 38% of the respondents: this result reflects the lack of relevance of the beyond budgeting process as perceived by the respondents.

### *Qualitative Interviews*

A pre-interview was conducted with an Ernst & Young manager who was running a financial management reflection workshop dealing with topics like strategic planning, RFs, and new dimensions for CFOs. This interview helped us to clarify the main objectives for the qualitative research and was very useful in establishing an interview scenario. The main idea is that RF is a vision of the future that permits the frequent review of the main financial performance indicators and the linking of short-term forecasting with strategic planning. This enables companies to deal with rapidly changing environments, and to improve the decision-making process.

Among the 10 companies interviewed, 2 were doing RFs with a rolling 12–15 months horizon, 7 hold regular quarterly reviews that focus on fiscal year-end results and 1 does not establish any RFs at all (Table 12).

All the companies visited belong to a larger organization. We can notice that all the firms from the sample are still using the traditional budgeting process, except company “H”, which had gone beyond budgeting in 2000. Traditional budgeting is considered by the interviewees as very important, which is in line with the argument developed by Ekholm and Wallin (2000, p. 535) “the annual budget is needed in order to uphold internal effectiveness”. The argument is also in line with that of Libby and Lindsay who assert that budgeting is value added and it continues to be used for control purposes in many firms, even though it has been modified: “while there are problems with budgeting, those organizations still using budget for control appear to be adapting the budget to account for these problems rather than abandoning budgets all together” (Libby & Lindsay, 2008, p. 15).

To ensure the confidentiality of the data collected, the name of the companies interviewed has been replaced by a letter.

#### *Reasons for Implementing Rolling Forecasts*

The interviews reveal that companies have implemented RFs for financial management reasons (stock market communication, cash-flow forecasts and fund allocation) and also for operational management motives (supply chain management, relationship with suppliers). Besides, they mentioned that RFs offer a better vision of what will happen at the year end, thus helping to keep on track towards meeting strategic objectives. Budget has been compared to a static picture while RFs are seen as a video presenting a dynamic view of the near future (company “D”). Implementing RFs has also being compared to turning on the headlights of a car (company “F”). The environment is changing faster than the budgetary process and the companies feel the need to periodically review the key performance indicators and develop action plans in order to meet the budgeted targets. Company “B” CFO insisted on the fact that the budget should be considered as an objective rather than a prediction. As an objective it should be communicated inside and outside the company, and it should be reached through any means, using different tactics than the ones that were conceived months earlier for the budget. From the interviews, we observe that organizations are implementing RFs to gain better knowledge, thanks to the regular reviews that feed a continuous learning loop.

Company “H”, which had gone beyond budgeting, did it principally because budgetary process was disconnected from the strategy and was



**Table 12.** Interviewee Main Features.

Company	Economic Sector	2008 Divisional Sales (€ Millions)	Budget	Rolling Forecasts	Horizon
A	Renewable energy	208	Yes	Yes – quarter review	Rolling 15 months
B	Energy	5.900	Yes	Yes – quarter review	12 months ending with fiscal year
C	Energy (gas and petrol)	18.000	Yes	Yes – quarter review	12 months ending with fiscal year
D	Real estate	100	Yes	Yes – quarter review	12 months ending with fiscal year
E	Construction	160	Yes	No	–
F	Construction	2.622	Yes	Yes – quarter review	12 months ending with fiscal year
G	Services	441	Yes	Yes – quarter review	12 months ending with fiscal year
H	Chemical specialities	4.700	No	Yes – semester review	Rolling 12 months
I	Health	40	Yes	Yes – quarter review	12 months ending with fiscal year
J	Distribution	840	Yes	Yes – quarter review	12 months ending with fiscal year

characterized by incremental thinking and extrapolations from the past. The main objectives of the newly implemented management system were to focus on strategy, improve group performance, create value for the company and its stakeholders (employees, customers, shareholders) and develop a results-based culture. This culture consists in stimulating employee commitment and in reaching the objectives despite the environmental difficulties.

Company “E”, which did not implement RFs, considers that its environment is quite stable – its customers are mainly from public administration – and allows for the preparation of accurate budgets. As a matter of fact, the variance between actual and budget is lower than 5% and therefore can be considered to be accurate (see section Budget Data Accuracy). In this context, the CFO argued that the cost of implementing RFs and the workload produced would not be justified.

In an uncertain environment, organizations are integrating RFs in their management processes in order to improve visibility, to keep on track towards meeting the budget objectives and to respond rapidly to new environmental configurations.

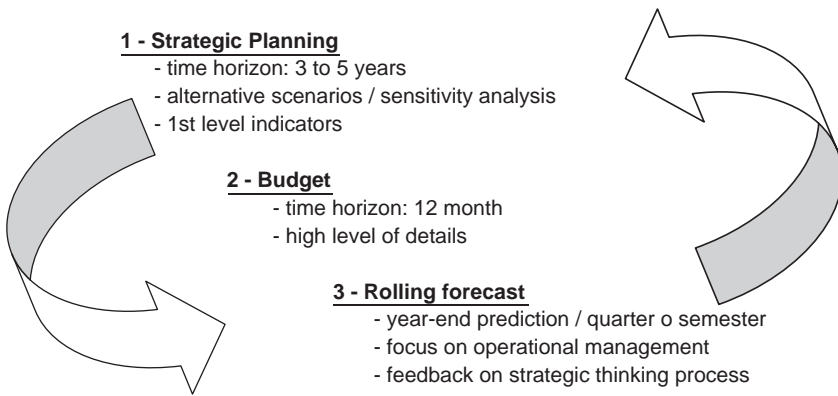
#### *Rolling Forecasts process*

The nine companies, that have implemented RFs, have a quite similar process that integrates forecasts in the planning cycle (Fig. 1). The budget is considered to be a simple stage in the planning loop, and the RFs as a stage that goes beyond the budget providing an outlook for the year-end results and feedback for the strategic thinking process. Forecasts generally cover the entire planning cycle, but the time horizon and the level of details vary at each stage.

In general, the organizations interviewed are doing quarterly reviews (Table 12). The first review, made usually in February/March, allows the budget to be reassessed in the light of the previous exercise’s year-end results, and the balance sheet to be updated in order to validate the cash-flow figures. The second review is normally carried out in June, and it permits a forecast for the second part of the year, which assists in developing action plans in order to meet budget objectives. The last review is held in September/October, and it is used as a basis for the elaboration of the next year’s budget.

When we asked this group of companies why they were not considering a rolling horizon, they argued that they find it rather difficult to predict their short-term financial indicators and they prefer to focus on delivering year-end budgetary objectives.

Companies “A” and “H”, which produce RFs based on a rolling horizon are periodically looking four quarters ahead. Company “H” was doing a



*Fig. 1.* Forecasts and Planning Cycle.

five-quarter forecast, at the beginning of the beyond budgeting project, but has come down to a 12-month horizon and a frequency of two reviews per year in order to reduce time spent and administrative costs.

Six out of ten interviewees (“A”, “D”, “E”, “G”, “I”, “J”) depend on excel spreadsheets for their financial projections. The level of automation can be compared to the 70% dependency on spreadsheets, which was reported in a recent study on budgeting and forecasting (Apanaschik, 2007, p. 18). Spreadsheets seem to be a key component in the process because they are extremely flexible, easy to use and adaptable to different business situations. The other companies are using enterprise resource planning (“H”), software such as SAP (“F”) or in-house customize planning systems (“B”). They believe that technology makes their process less risky and complex. They also report that eliminating data re-entry allows for delivery of better reporting, and frees up more time for data analysis.

Most of the interviewees (“A”, “F”, “G”, “H”, “I”, “J”) rely on key performance indicators or critical success factors for their forecasts. The emphasis is made on a set of key value drivers (KVD), usually coupled with an exception-based monitoring system. The main indicators of P&L are sales, operating expenses, general expenses, operating margin and EBITDA. The balance sheet, cash-flow and working capital are also updated with capital expenditures, inventories, debtors and accounts receivable. Company “F” is using seven to eight KVD adapted to each business line. In order to define its KVDs, company “H” uses a methodology based on the four perspectives of the balanced scorecard (i.e. financial, customers, internal business processes and learning and growth). KVDs are linked to the business unit’s strategy and

represent the main development axes to meet value creation targets and assure long-term profitability for the organization.

For all the interviewees, except company “H”, the budget remains the unique reference for variance analysis and incentive reward. They all insisted on the fact that there is no confusion between the two references, the budget and the RFs. The actual figures are always compared to budget data and last year’s performance. The RF is used in a more active way and helps the operational decision-making process (resource allocation, supply chain management, production planning). Regarding variance analysis and forecasts, company “J” has a more flexible approach and uses a special rule: if business unit’s sales are more than 10% above the objective, then they are authorized to spend up to 30% additional operating costs (salaries, general expenses), but if the sales are 10% below the objective, then they have to cut operating costs by 30%.

We have observed that the processes of budgeting and forecasting are always linked to strategic planning. The companies interviewed develop a three- to five-year plan that is revised every year in the light of RF trends (Fig. 1). RFs are not as detailed as the budget, and data is usually expressed with a mere 8–10 indicators.

What appears to be the more relevant fact is that for all the interviewees, except company “H”, the budget is a reference that cannot be changed. The budget gives short-term strategy orientation in terms of product ranges, customer relationship and management operations. RFs are used to foresee the year-end financial results, to take operational decisions and to develop action plans in order to reach the budget target.

#### *Rolling Forecasts Functions*

Through RFs, companies intend to improve their performances and to adapt themselves to the environmental changes. The main functions listed by the interviewees are planning, financial management, operational management and learning (Table 13).

Most of the interviewees mentioned that the RF planning function allows the company to continuously coordinate and integrate its activities with its strategy. The periodical review of operations brings up questions like: Why did the forecast change? – Why is the result different from what was forecasted last quarter? – Have any of the assumptions changed? – What actions can we take? This analysis permits managers to rapidly take the right decisions, ones that are aligned with strategy, to develop new products and services, to organize the company and to improve productivity and customer service. Besides, quarterly reassessment reveals the financial gaps

**Table 13.** Rolling Forecasts Main Functions.

Function	Objective	Listed by Companies
Planning	Link operations to company strategy Reach budget targets Development of new products and services	B, C, D, J, H
Financial management	Continuous cash-flow update Shareholders communication Financial communication	A, B, C, F, G, I, J
Operational management	Resource allocation or freeze Operational planning (production capacity) Supply chain coordination Providers relationship Cost control	B, C, F, G, H, I, J
Learning and knowledge	Better visibility Environment understanding Faster decision cycle Results-based culture Internal communication and discussion	B, D, H

before they happen and gives a longer view into the future. Therefore, managers can react and adapt their action plans in order to reach the budget targets they committed to deliver. Interviewees have insisted on the importance of the financial management function and especially on the cash-flow updates. RFs provide accurate cash-flow projections allowing for effective debt management, the assessment of resource funding and the validation of capital expenditures. Furthermore, companies need reliable forecasts for high level financial communication and tax planning. Organizations “B”, “C”, “F”, “G”, “H” and “I” must report accurate financial perspectives to their shareholders every quarter. They all mentioned that they support strong pressure from the stock market in order to deliver the forecasted results.

RFs help to render organizations more dynamic, allow their leaders to focus on executing strategy and to deal with threat and opportunities as they arise. Therefore, RFs represent a powerful tool for operational management. With RFs, organizations are continuously monitoring and controlling operating costs and general expenses, and allocating or freezing resources when needed. For manufacturing companies (“C”, “F”, “G”, “I”, “J”), RFs have an important role to play because managers have to ensure that they will have sufficient capacity for an expected level of sales. They also

have to manage and coordinate the supply chain and to revise agreements with the suppliers. Company “J” develops long-term contracts with its suppliers in order to reduce production costs. If customer demand is not meeting established targets, they need to quickly inform suppliers so they can adjust production levels. The ability to act rapidly is essential to preserve operational efficiency.

Learning and knowledge is also a dimension covered by RFs. RFs offer better visibility and provide continuous feedback for reviews, allowing for the adjustment of long-term strategy. Company “H” mentioned that the RF system is a tool to strengthen a results-based culture by being more explicit about individual delivery expectations, the ultimate purpose being to improve the performance of the company. This argument can be compared to the appreciation made by the Hon company that RFs contribute to developing a “committed corporate culture, corporate vision, empowering employees to act on vision and targeting and tracking short-term wins” (Drtina, Hoeger, & Schaub, 1996, p. 24).

The interviewees think that RFs allow the decision cycle to be shortened from once a year (budget cycle) to the interval between forecasts (monthly, quarterly, every six months). The process helps them to respond much more quickly to whatever comes up.

Continuous planning allows businesses to be flexible and innovative, to improve efficiency and to rapidly adapt themselves to new operating conditions. RFs are a vision of the future, which constitutes the basis for communication inside and outside the company.

Some of the RF functions, such as planning, management control, communication and coordination are similar to the traditional budget functions (Table 2).

If we compare Tables 2 and 13, we can observe that RFs are not covering the delegation, motivation and evaluation functions. As a matter of fact, all the respondents mentioned that performance evaluation and incentive rewards are based on the comparison between actual results and budgets. RFs are seen more as an action-oriented management tool that allows a company to keep on budget and to communicate financial information to shareholders. Budget process encourages commitment and gives a reference to which to hold managers accountable.

#### *Rolling Forecasts Key Success Factors and Barriers to Implementation*

The main success factors mentioned by the interviewees are managers’ involvement, communication of objectives, links to strategy and IT support.

Barriers deal with schedules, costs, complexity and pressure from shareholders.

Top management involvement and strong support from both the CEO and the CFO are key to successful implementation of the RF management tool (company “H” and “A”). Also, the integration and involvement of frontline units contributes to deliver more reliable projections. Business units have a better knowledge of the activities they are running and deeply understand their own environment. Communication and dialog are also reported as crucial factors. They permit one to understand what drives the business and provide a better vision of what will happen in the near future. Company “B” mentioned that it has a highly integrated process: the planning department prepares scenarios, analyses alternative plans and continuously dialogs with business lines to validate final strategic targets.

The information flow needs to be extremely fluid (company “A”, “G”, “H”, “I”). Top management should communicate very clear, concrete and transparent strategic objectives based on a very few indicators. Frontline units should also transmit concise information that is aligned with strategic objectives. The reports of business units must be delivered on time to allow company financial data to be consolidated on schedule. To meet targeted schedules IT support is essential. The RF process must be highly integrated (company “A”, “B”, “F”) to save time in the elaboration phase (“less number crunching”) and therefore free up more time for value-added activities such as data analysis, business knowledge, the understanding of strategic product lines and action plan implementation. Respondents defined standardized and automated tools such as ERP or data warehousing as key elements to shortening cycle times, allowing greater flexibility and the delivery of an efficient and value-added RF process.

One of the main criticisms of RF process is that it can be costly and time consuming if it is not completely automated. The company “A” CFO declared that financial departments were spending a lot of time producing RFs (up to three weeks workload), and devoting very little time to analysis, even though they were improving their forecasting skills. This comment is aligned with recent research that reveals that only 44% of the budgeting and forecasting process is spent on analysis, strategy development and setting target figures; most of the business resources are consumed by non-strategic tasks such as data collection and consolidation, review and approval, and report preparation (Apanaschik, 2007, p. 15). For cost reasons, company “H” simplified its RF process by reducing forecast horizons from 5 to 4 quarters, and by conducting its reviews on a semi-annual rather than a quarterly basis.

Complexity has also been mentioned as a barrier to successful implementation. To simplify the process, a few KVDs should be selected and the supporting software should be easy to use.

Interviewees (“A”, “C”, “F”, “G”, “I”) considered that the biggest barrier to RFs was the expectation on behalf of shareholders, that unrealistic objectives could be reached. Company “A” revealed that in the end the forecasts presented by the business units were changed by the board of directors to be aligned with the objectives of the shareholders. Company “C” mentioned that in the past, this high level of pressure led managers to adopt unethical and gaming behaviours.

To be effective RFs should be prepared honestly, and without number gaming, taking into account actual trends, and not on the basis of giving senior managers “what they want to see” (Hope, 2007, p. 14). RF process must encourage dialog, debate and learning throughout the organization. RFs should be automated to quickly assemble and consolidate forecasts from different units to enable managers to analyse the current situation and make the appropriate decisions. Data process must be simple, standardized, capable of supporting the changes on the environment, and flexible enough to accommodate changes in organizational structure such as realignments, divestures and acquisition activities.

## **DISCUSSION AND CONCLUSION**

Overall the survey reveals that the accuracy of planning and budgeting still have to be improved. Even if 41% of the respondents find it relatively easy to predict their environmental factors, only 30% of them produce accurate data (less than 5% variance). It appears to be rather difficult to establish reliable predictions, as market changes are not that easy to anticipate and the evolution of raw material prices is difficult to estimate. The traditional budgeting approach also lacks flexibility. No changes could be made to the budget once it is approved for 58% of the respondents. In this context, respondents are very interested in RFs: more than 80% find it to be a relevant practice and almost 45% intend to implement it in the near future. As a conclusion, we can affirm that RFs will play a bigger role in the future.

Besides, the analysis suggests that a fast-changing and competitive environment is driving the implementation of RFs. RFs offer a vision of the future whereas budget is a more static, less flexible tool. Respondent organizations have implemented RFs in order to cope with the changing environment. Through regular monitoring of financial indicators and KVDs



companies can continuously check to see if they are on the right track or not, follow cash flow and investment levels, and validate resource availability. RFs are considered to be action oriented; they play a steering mechanism role and contribute to operational decision-making processes. For all the interviewees, budgeting still plays an important role for performance evaluation, motivation and business control. In a fast-moving environment it is considered as a reference, actual results are compared against budget and incentive policies are tightly linked to the achievement of budgetary targets. Therefore, from the qualitative interviews we can deduct that RFs are a good complement to the traditional budgeting process, but they cannot replace it. RF functions do not cover the evaluation and motivation functions, which are essential for management effectiveness. The use of RFs should be considered as an adaptation of the budget practice in order to bring more flexibility to the process.

The analysis of the technique used by the interviewees – i.e. the annual budget coupled with RFs – led us to consider that the respondent organizations are running interactive management control systems based on Simons' conceptual framework (Simons, 1990, 1991, 1995). According to Simons, some management control processes can be used as interactive control systems, and enhance manager's abilities to anticipate and effectively manage strategic uncertainties. Simons classifies a management control process as interactive when the information provided by the system constitutes an important and recurring agenda addressed to top level management, when data are interpreted and discussed in meetings with different hierarchical levels (superiors, subordinates and peers) and when the process relies on continuous challenge and debate of actual data, assumptions and action plans (Simons, 1991, p. 50). Through regular monthly or quarterly reviews, RF system constitutes a platform for continuous dialog and debate between top-level management and frontline units, and for ongoing monitoring of performance trends, tactical decisions and action plans (new marketing ideas, new products introduction). Besides, RFs cover the three functions cited by Simons (Simons, 1990, p. 136): "signalling" which means the use of information to reveal top managers values and preferences; "surveillance" which is the analysis of new alternatives, new possible preferences or new significant environmental changes; "decision ratification" which is necessary when strategic decisions commit the organization and its resources. RF system facilitates organizational learning, which is essential for interactive management. In sum, budget and its complementary technique RFs are used as a management interactive device to collect information about strategic uncertainties, and to help ongoing dialog and debate through the organization.

The study has its limitations, as the findings rely on a small number of survey respondents and interviewed organizations. The reasons underlying the relatively low response rate was the difficulty in obtaining the e-mail address of financial managers in the companies selected, because of the data protection law. Given the response rate, we cannot be sure that the findings are representative. Nevertheless the results have been compared, when possible, to similar surveys in order to validate them.

Our survey and field analysis contributes to the literature in two main ways. First, we collect and analyse information related to environment and budgeting practices in Spanish companies and subsequently, we examine the way RFs are implemented and used in the Spanish context. We find out that the budget is still at the centre of the management process, and that companies are adapting it through the use of complementary techniques. More research should be made on how to adapt the budget to the use of complementary techniques such as balanced scorecard or activity-based budgeting. It will be interesting to explore to what extent companies combine complementary techniques to improve their budgeting process, and then test, which could be the best combination in function of environment stability and business complexity.

## REFERENCES

- Akten, M., Giordano, M., & Schieffele, M. (2009). Just-in-time budgeting for a volatile economy. *McKinsey on Finance* (31), 6–10.
- Apanaschik, G. (2007). *2007 Budgeting and forecasting study*. PwC Advisory – Performance Improvement.
- Arterian, S. (1997). Sprint retools the budget process. *CFO Magazine* (September), 88–91.
- Aune, S. (2009). Presentation and case on beyond budgeting in London April 29th 2009 by Sigurd Aune CFO SpareBank 1 Gruppen. Available at: <http://www.slideshare.net/SpareBank1>
- Banham, R. (2000). Better budgets. *Journal of Accountancy*, 189, 7–11.
- Barrett, E., & Fraser, L. B. (1977). Conflicting roles in budgeting for operations. *Harvard Business Review* (July–August), 137–146.
- Baudet, R. (1941). Les fonctions du budget. In: N. Berland, (2004), *Mesurer et piloter la performance*, Ed La Performance, Paris, pp. 96–97.
- Berland, N. (1999). A quoi sert le contrôle budgétaire? Les rôles du budget. *Finance, Contrôle, Stratégie*, 2(3), 5–24.
- Berland, N. (2001). Les rôles du contrôle budgétaire: un modèle d'interprétation. *Revue Française de Gestion*, 135, 111–120.
- Bogsnes, B. (2009). *Implementing beyond budgeting – unlocking the performance potential*. New Jersey: Wiley.
- Bouquin, H. (2001). *Le contrôle de gestion*. PUF, 5ème ed., Paris.

- Bunce, P. (2007). Transforming financial planning in small and medium size companies. BBRT 2007. Available at: [www.bbrt.org](http://www.bbrt.org)
- Bunce, P., Fraser, R., & Woodcok, L. (1995). Advanced budgeting: A journey to advanced management system. *Management Accounting Research*, 6, 253–265.
- Chapmann, C. S. (1997). Reflections on a contingent view of accounting. *Accounting, Organizations and Society*, 22, 189–205.
- Chenault, K. (2004). Ken Chenault speech, June 2004. Available at: [http://library.corporate-ir.net/library/64/644/64467/items/173911/040603\\_text.pdf](http://library.corporate-ir.net/library/64/644/64467/items/173911/040603_text.pdf)
- Courtney, H. (2008). A fresh look at strategy under uncertainty: An interview. *The Mc Kinsey Quarterly* (December), 1–8.
- Cummings, J. (2008). What's wrong with forecasting – and how to fix it. *Business Finance Magazine*, February 6.
- Drtina, R., Hoeger, S., & Schaub, J. (1996). Continuous budgeting at HON company. *Management Accounting*, LXXVII(7), 20–24.
- Duncan, R. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly*, 17(3), 313–327.
- Eklholm, B., & Wallin, J. (2000). Is the annual budget really dead? *The European Accounting Review*, 9(4), 519–539.
- Gahagan, J. (2005). Planificación financiera y presupuestos como herramienta de gestión. *Harvard-Deusto Finanzas y Contabilidad*, 63, 4–8.
- Govindarajan, V. (1984). Appropriateness of accounting data in performance evaluation: An empirical examination of environmental uncertainty as an intervening variable. *Accounting, Organizations and Society*, 9(2), 125–135.
- Gracia, A. (2008a). La importancia de la planificación estratégica. *Expansión*, 3 de Marzo 2008, pp. 26–27.
- Gracia, A. (2008b). Los presupuestos deberían convivir con herramientas que planifiquen el futuro. *Expansión*, 5 de Junio 2008, pp. 16–17.
- Gul, F. (1991). The effects of management accounting systems and environmental uncertainty on small business managers' performance. *Accounting and Business Research*, 22(85), 57–81.
- Hall, R. (2007). Eliminating the budget: Park Nicollet Health Services. *AME Target Magazine*, 23(5).
- Hansen, S. C., Otley, D., & Van der Stede, W. A. (2003). Practice developments in budgeting: An overview and research perspective. *Journal of Management Accounting Research*, 15, 95–116.
- Hofstede, G. (1977). *Contrôle budgétaire: les règles du jeu*. Editions Hommes et Techniques, Paris.
- Hope, J. (2007). *Why rolling forecasts should be at the centre of the management process*. Performance Management Insights Research Series, No. 21, BBRT.
- Hope, J., & Fraser, R. (2000). Beyond budgeting. *Strategic Finance*, 82(4), 30–35.
- Hope, J., & Fraser, R. (2001). Figures of hate. Traditional budgets hold companies back, restrict staff creativity and prevent them from responding to customers. *Financial Management* (February), 22–25.
- Hope, J., & Fraser, R. (2003a). *Beyond budgeting – how managers can break free from the Annual Performance Trap*. Boston, MA: Harvard Business School Press.
- Hope, J., & Fraser, R. (2003b). Who needs budgets? *Harvard Business Review*, 81(2).
- Hopwood, A. G. (1974). Leadership climate and the use of accounting data in performance evaluation. *The Accounting Review* (49), 485–495.

- Jensen, M. C. (2001). Corporate budgeting is broken – Let's fix it. *Harvard Business Review* (November), 95–101.
- Jensen, M. C. (2003). Paying people to lie: The truth about the budgeting system. *European Financial Management*, 9(3), 379–406.
- Johnson, L. K. (2007). Linking strategic planning and the rolling financial forecast at Millipore. Balanced scorecard report. Available at: [www.bbrt.org](http://www.bbrt.org)
- Libby, T., & Lindsay, M. (2008). *Beyond budgeting or budgeting reconsidered? A comprehensive survey of North-American Managers' views*. EAA Congress 2008, Rotterdam.
- Lyne, S. R. (1988). The role of budget in medium and large U.K. companies and the relation with budget pressure and participation. *Accounting and Business Research*, 18(71), 195–212.
- Mikhail, M., Walther, B., & Willis, R. (1999). Does forecast accuracy matter to security analysis? *The Accounting Review*, 74(2), 185–200.
- Neely, A., Bourne, M., & Heyns, H. (2001). *Driving value through strategic planning and budgeting*. A Research Report from Cranfield School of Management and Accenture.
- Otley, D. (1977). Behavioural aspects of budgeting. *Accountant's Digest* (49), 1–32.
- Player, S. (2009). Interview of Flowserve CFO – Mark Blinn. Available at: <http://bigfatfinanceblog.com/2009/02/24>
- Prendergast, P. (2000). Budgets hit back. *Management Accounting*, 78, 14–16.
- Rappaport, A. (2006). 10 ways to create shareholder value. *Harvard Business Review* (September) 66–77.
- Rickards, R. (2006). Beyond budgeting: Boon or boondoggle?. *Investment Management and Financial Innovations*, 3(2), 62–76.
- Samuelson, L. A. (1986). Discrepancies between the roles of budgeting. *Accounting, Organizations and Society*, 11(1), 35–45.
- Simons, R. (1990). The role of management control system in creating competitive advantage: New perspectives. *Accounting, Organizations and Society*, 15(1/2), 127–143.
- Simons, R. (1991). Strategic orientation and top management attention to control systems. *Strategic Management Journal*, 12, 49–62.
- Simons, R. (1995). *Levers of control*. Boston, MA: Harvard Business School Press.

## APPENDIX

Surveyed questions about environment uncertainty and budgetary process.

Q1 – What type of financial management tool do you use in your company?

Response: Yes or No

- Analytical accountancy
- Cost analysis
- Balanced scorecard
- Annual budgeting
- Strategic planning (2–5 years)
- Rolling forecasts

Q2 – Define how you perceive your environment:

*Scale: 1 (very stable), 2 (somewhat stable), 3 (stable), 4 (somewhat unstable), 5 (very unstable)*

Please specify why you think so.

Q3 – How difficult is to predict the following factors:

*Scale: 1 (highly predictable), 2 (somewhat predictable), 3 (predictable), 4 (somewhat unpredictable), 5 (highly unpredictable)*

- Changes in customer demand
- Evolution of customer preferences
- Changes in product offered by competitors
- Technical developments impacting design
- Technical developments impacting production
- Governmental changes to laws and regulations
- Actions of labour unions
- Availability of suitable employees
- Availability of raw materials
- Price of raw materials

Q4 – Please specify if you agree with the following assessments:

*Scale: 1 (strongly disagree), 2 (somewhat disagree), 3 (agree), 4 (highly agree), 5 (strongly agree)*

- The unpredictability of the environment doesn't allow to establish accurate budgets.
- Once the budget is approved it becomes obsolete.

Please specify why you think so.

Q5 – Define the level of formalization of your budget and strategic planning

*Scale: 1 (highly formalized), 2 (somewhat formalized), 3 (not very formalized), 4 (not formalized at all).*

- Strategic planning
- Budget

Q6 – When do you establish your action plans?

- Before the annual budget
- After the annual budget
- We do not have any formalized action plan.

Q7 – The budgetary process is closely linked to the strategic planning:

- Always
- Never
- In some occasion

Q8 – Do you reached your strategic planning in the past two years?

- Always
- Never
- In some occasion

Q9 – During the last year the variance between actual results and budget was

*Scale: 1 (0–5%), 2 (5–10%), 3 (10–20%), 4 (20–30%), 5 (+30%)*

- Total budget
- Sales budget
- Costs of goods sold
- Administrative and general expenses
- Capital expenditure

Q10 – The factors causing variances between actual and budget are

*Scale: 1 (very little importance), 2 (little importance), 3 (average importance), 4 (high importance), 5 (extreme importance)*

- Lack of target clarity
- Weakness of action plans
- Poor prediction reliability
- Lack of environment information
- Unexpected events
- Technical problems
- Employees actions
- Customers actions
- Competitors actions
- Suppliers actions
- Government actions

Q11 – If variances are caused by other factors, please list them below

Q12 – In your company:

*Response: Yes or No*

- Once the budget is approved, the objectives cannot be changed.

Q13 – In your company:

*Response: Yes or No*

- If it is not in the budget, we cannot obtain new resources to react to unexpected events.

Q14 – The frequency of the budgetary reviews is

- Monthly
- Quarterly
- Twice a year

- Never
- Other, please specify

Q15 – In your opinion, the most relevant management accounting tools are  
*Scale: 1 (strongly agree), 2 (agree), 3 (disagree).*

- Activity-based budgeting
- Rolling forecast
- Balanced scorecard
- Relative aspirational goals
- Beyond budgeting

Q16 – What changes to your budgetary process do you intend to implement?  
*Scale: 1 (no we do not intend to do it), 2 (we already have implemented it), 3 (not yet, but we are thinking about it), 4 (yes we intend to do it in the next two years)*

- Process automatization
- Use of an ERP system
- Use of key performance indicators
- Changes in the workflow information, for instance bottom-up
- Relative objectives with external references (market, competitors)
- Reengineer the process to gain time in the elaboration
- Use of rolling forecasts
- Use of trends reports

Q17 – Please specify if you intend to implement some other modification to your budgetary process

Questions Q18 to Q22 were related to description of survey respondent characteristics: corporate structure, number of employees, divisional revenues, economic sector and respondent's Job title.

**PART III**  
**INNOVATION AND PERFORMANCE**  
**MEASUREMENT**





# STRATEGY AND INTEGRATED FINANCIAL RATIO PERFORMANCE MEASURES: A LONGITUDINAL MULTI-COUNTRY STUDY OF HIGH PERFORMANCE COMPANIES

Belverd E. Needles, Jr., Anton Shigaev,  
Marian Powers and Mark L. Frigo

## ABSTRACT

*Purpose – This study investigates the links between strategy, execution, and financial performance with particular attention to the underlying performance drivers that describe how a company executes strategy to create financial value.*

*Methodology – This study empirically investigates companies in the United States and 22 other countries over a 20-year period (11 successive 10n-year periods: 1988–2007): (1) to compare financial performance characteristics of HPC versus non-HPC; (2) to study the sustainability of performance in HPC; and (3) to identify the companies that exit or*

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*enter the HPC classification and the performance drivers and performance measures that characterized the change in HPC classification.*

*Findings – The 20-year longitudinal results confirm the results of prior studies as to the long-term superior performance of HPC over other companies (Objective 1). For sustaining HPC, results were consistent as to total asset management, profitability, financial risk, and liquidity (Objective 2). Declining HPC companies fail at total asset management, profitability, and operating asset management and significantly increase their financial risk. Emerging HPC companies improve liquidity through improved operating asset management and cash flows (Objective 3).*

*Practical implications – To become a HPC management must generate increased cash flows from income, manage receivables and inventory vigorously, and reduce its debt in relation to equity. Thereafter, management must concentrate on maintaining its asset turnover and growth in revenues while maintaining its profit margin and not increasing its debt to equity.*

*Value of the paper – The results provide direction for management of companies that aspire to HPC status and to maintain HPC status.*

## INTRODUCTION

A recent article published by a Big-Four accounting firm questioned the ability of companies to sustain or even have predictable high performance. The authors maintain that total stockholder return (TSR) at any time may be rising, falling, flat-high, flat-low, or random (no distinguishable pattern). The latter characteristic is most common, as represented by the following quote:

Few firms ... ever change their performance enough to be distinguishable from the roar of white noise arising from the volatility endemic in a dynamic and unpredictable marketplace. (Raynor, Ahmed, & Henderson, 2009)

These authors assert that high performance is mainly a result of random occurrence. However, prior research has shown that a small percentage of companies can sustain high performance over extended periods of time (Frigo, Needles, & Powers, 2002; Needles, Frigo, & Powers, 2004, 2006, 2008; Needles, Powers, Shigaev, & Frigo, 2007; Frigo & Litman, 2008). These studies link strategy, execution, and financial performance with

particular attention to the sustainability of high-performance companies (HPC). They identify the performance drivers associated with five key performance objectives and link them to the performance drives and to common performance measures in the financial performance scorecard (FPS). Further, patterns of these variables for HPC versus other companies in contrasting economies and economic periods were studied.

The present study turns attention to the question of what factors do companies improve upon to become HPC and what variables tend to deteriorate when companies cease to be HPC. Specifically, HPC and integrated financial ratio analysis are empirically investigated for companies in the United States and 22 other countries over a 20-year period (1989–2007) in successive 10-year performance periods with the following objectives: (1) to compare financial performance characteristics of HPC versus non-HPC over 11 successive 10-year periods, (2) to study the sustainability of performance in HPC over multiple 10-year periods, and (3) to identify the companies that exit or enter the HPC classification and the performance drivers and performance measures that characterized the change in HPC classification. The results provide direction for management of companies that aspire the HPC status and for those that want to maintain HPC status.

## **PREVIOUS RESEARCH**

Financial statements provide important information about a company's ability to achieve the strategic objective of creating value for its owners. The intelligent user of financial statements will be able to discern how well the company has performed in achieving this objective. Financial analysis provides the techniques to assist the user in this task. In short, the financial statements reflect how well a company's management has carried out the strategic and operating plans of the business. The marketplace, in turn, evaluates this performance, and a value is placed on the company. Analysts have traditionally conducted ratio analysis by examining ratios related to various aspects of a business's operations. Previous research related to financial statements, financial analysis, and ratio analysis has been conducted by, among others, Nissim and Penman (1999, 2001), Brief and Lawson (1992), Fairfield and Yohn (1999), Feltham and Olsson (1995), Fera (1997), Jansen and Yohn (2002), Lev and Thiagarajan (1993), Ohlson (1995), Penman (1991), Piotroski (2000), Selling and Stickney (1989), and Burns, Sale, and Stephan (2008). Soliman (2008) provides a thorough review of financial statement analysis literature.

Initial research into the link between strategy and value creation began with an examination of the relation between three contrasting strategies: efficiency, innovation, and customer service by [Needles, Frigo, and Powers \(2002a\)](#), which the authors ([2002b](#)) then extended to the emerging economy of India. These studies found that different strategies are characterized by exceptional performance on different measures, that efficiency and innovation are better differentiators of high performance than customer service, and finally that developing and the emerging economy of India displays similar links among strategies and performance.

These early studies were followed by a more comprehensive examination of the links between strategy and integrated financial performance measurement by [Needles et al. \(2004\)](#). The objectives of this study were first to identify the financial characteristics of HPC over a test period (1990–1999) and then to observe the sustainability of these measures over contrasting test periods (1997–2000 and 2001–2003). Selection of HPC relied on a decade of research by [Frigo and Litman \(2002, 2008\)](#) that emphasized and defined a “Return Driven Strategy” framework under which business activities are highly aligned with ethically achieving maximum financial performance and shareholder wealth creation. According to Return Driven Strategy ([Frigo & Litman, 2002, 2008; Frigo, 2003a, 2003b; Litman & Frigo, 2004](#)), the pathway to superior financial value creation is through the customer, by fulfilling unmet needs in increasing market segments. The Return Driven Strategy framework describes the strategic activities of HPC in various industries. It describes the underlying “strategic performance drivers” that have been shown to lead to sustainable shareholder wealth creation. It is robust in its ability to also explain the decline of companies where by charting how the tenets of Return Driven Strategy were neglected or could not be executed. Meanwhile, the rise of these companies’ performance and the sustainability of high performance can be attributed to attention to these tenets. Companies with mediocre or poor performance demonstrate significant gaps in their business models when viewed through the lens of Return Driven Strategy. This work provided the strategic underpinnings of our research.

Selected companies determined by [Frigo \(2002, 2003a, 2003b\)](#) according to the following three criteria during the period 1990–1999:

- Cash flow return on investment ([Madden, 1999](#)) at twice or more the cost of capital
- Growth rates in assets exceeding average gross domestic product growth
- Relative total shareholder returns above the S&P 500 average or other relevant indices.

Also included in the HPC group were 10 additional companies identified by Collins (2001), for a total of 48 companies that demonstrated superior performance in returns and growth over a sustained period.

Comparisons of HPC and other companies served to identify a set of ratios that were statistically independent of each other and a set of ratios that interact in integrated financial ratio analysis (Appendices A–C). This research resulted in the development of the FPS. The FPS is a structure or framework for considering the interaction of financial ratios, with particular emphasis on the drivers of performance and their relationship to performance measures. These performance measures are reflected ultimately in a return that is compared with a benchmark cost of capital. If the return exceeds cost of capital, value has been created. If the return is less than cost of capital, value has been destroyed. The “spread” between return on investment and the cost of capital was used as a criterion for selecting the leading companies; however, for purposes of evaluating the FPS, it is assumed that the cost of capital is determinable and given (Adman & Haight, 2002; Gebhardt, Lee, & Swaminathan, 2001).

The FPS is based on the premise that management must achieve certain financial objectives in order to create value and that these financial objectives are interrelated. Further, underlying the performance measures that analysts and the financial press commonly use to assess a company’s financial performance are certain independent financial ratios, called performance drivers, that are critical to achieving the interrelated performance measures. While HPC uniformly excel on the basis of performance measures, they will not display uniform characteristics when it comes to performance drivers, because these measures are more a function of the various strategies that the companies may employ to achieve high performance (Needles et al., 2004).

Specifically, the previous research investigated (1) evidence with regard to the components of the FPS – in particular, the relationships between the performance drivers and the performance measures and (2) the relationships between the performance of the HPC and that of their respective industries. The empirical results confirmed the basic propositions of the FPS and the criteria for choosing HPC. These results are summarized as follows:

1. The performance drivers and performance measures are independent of each other, as shown by low correlation among each other or low rank correlation. This proposition held true for all companies, for selected industries, and for industry leaders, all of which show independence among the ratios, with low correlations among performance drivers (except asset turnover and profit margin) and performance measures.

2. The criteria for choosing HPC were validated by the performance measures in the FPS model. The HPC exceed the industry averages across all performance measures and across all industries.
3. The HPC show mixed results with regard to performance drivers when compared with industry drivers. HPC excel on profit margin, are lower on cash flow yield, have lower financial risk, and have variable results for asset turnover. These results are due in part to the different strategies that companies may employ.

Subsequently, Needles et al. (2006) replicated the above study with refinements that focused on the sustainability of performance by HPC and on operating asset management performance drivers and measures. The goal of liquidity is closely related to the goal of operating asset management. Operating asset management is oriented toward the management control of the cash conversion cycle, which is the time required to make or buy products, finance the products, and sell and collect for them. Operating asset management is the ability to utilize current assets and liabilities in a way that supports growth in revenues with minimum investment. The drivers of operating asset management are the turnover ratios, and the performance measures are the days represented by each turnover measure. Taken together, the performance measures give an indication of the net cash cycle or financing period. The financing period represents the amount of time during which a company must provide financing for its operating activities. (Financing period = days' receivable + days' inventory on hand – days' payable).

The hypothesis was that HPC would have a shorter financing period than S&P companies because their superior financial performance would be a reflection of their operating efficiency. The results confirmed this expectation, as follows:

1. The financing period for HPC compared to S&P companies was shorter in almost all cases by about 28 days for the 1997–2001 period and 30 days for the 2002–2003 period, which equates to fewer days that need financing, thus lowering the financing costs for HPC relative to S&P companies.
2. The operating asset turnover ratios, however, showed more variability among industries and between HPC and S&P companies. We expected HPC to outperform S&P companies on receivables turnover, and this was generally the case; however, overall, the HPC advantage was non-significant. This result could be accounted for by the fact that HPC have less need to sell receivables and take advantage of off-balance-sheet financing than S&P companies. Further, HPC are better able to take advantage of trade creditors.

3. Inventory turnover ratios were in line with our expectations that the HPC would outperform the S&P companies. Inventory turnover for HPC exceeded that of S&P, which represents fewer days of financing needed, more than offsetting the shortfall from receivables.

HPC had a slightly lower payable turnover than S&P companies. Strong operating results and low debt loads of HPC enable these companies to obtain longer terms than average from their trade creditors, which accounted for most of the difference. Thus, the HPC' deficiencies noted above in receivables and inventory are overcome, so that these companies outperform their industry on the financing period.

In an extension of HPC research to the developing country of India and to the natural resource-rich country of Australia (Needles et al., 2007), the relationships among performance drivers and performance measures observed in the Western economies were found to hold with the exception of asset turnover in India and payables turnover in both countries. The low asset turnover ratios in Indian companies were attributed to the preponderance of asset-intensive infrastructure companies among the HPC. The existence of higher payables turnover in Western developed countries reflects more willingness to rely on the credit of suppliers in these countries.

## **RESEARCH QUESTIONS**

As noted above, previous research addressed issues of on what measures do HPC excel and can they sustain high performance over contrasting future periods. This study focuses first in the long-term nature and sustainability of high performance as represented by the variables in the FPS and then on the issue of which performance drivers and measures are most important when a company attains HPC status and which are most likely to lead falling from HPC status. Specifically, this investigation of HPC and integrated financial ratio analysis by empirically investigating companies in the United States and 22 other countries over a 20-year period (1988–2007) in successive 10-year performance periods with the following objectives:

Objective 1: To compare financial performance characteristics of HPC versus non-HPC over 11 successive 10-year periods.

Objective 2: To study the sustainability of performance in HPC over multiple 10-year periods.



Objective 3a, 3b: To identify the companies that exit or enter the HPC classification and the performance drivers and performance measures that characterized the change in HPC classification.

The long period of study from 1988 to 2007 provides contrasting economic conditions in which the companies operate. The period reflects a period of global growth in the 1990s and a period of great volatility after 2000.

## EMPIRICAL SAMPLE

Data for this study came from the CompuStat database. The analysis focuses on two groups of companies: companies in the MSCI World index, and HPC. In the benchmark group, we started with companies in the MSCI World index for which data exist consecutively from 1987 to 2007. Based on this condition, data for 1,446 companies existed (589 companies from USA and 857 companies from other countries). The current countries and industries that make the MSCI World Index are shown in [Appendix D](#).

The following adjustment was made to the benchmark group of MSCI World companies: we excluded several industries whose financial structures typically depart from industrial, retail, and service businesses. These industries are banks, savings institutions, credit institutions, other financial institutions, financial services (broker) companies, insurance companies, real estate agents and operators of buildings, real estate investments trusts, hotels, personal services, miscellaneous recreation services, health services, hospitals, educational services, and child day-care services. In total, 172 companies (144 companies from USA and 28 companies from other countries) were excluded from the benchmark group. This adjustment improved the comparability of the benchmark group with the HPC. After that screen, our sample had 1,287 MSCI World companies (446 companies from USA and 841 companies from other countries).

Companies included in the HPC group were removed from the MSCI World sample in each of the 11 ten-year periods. After all screens, the largest size of the benchmark group (1,235 companies) was in 1997–2006 time period, the smallest size of the benchmark group (1,087 companies) was in the first test period 1988–1997.

HPC were identified from the HOLT database from Credit Suisse. In determining Global HPC, we identified 11 samples of HPC for 11 consecutive

10-year periods (from 1988–1997 to 1998–2007) where data were available from 1987 to 2007 according to the following criteria:

- Cash flow return on investment (CFROI) at twice or more the cost of capital or greater than 5% discount rate for 10 consecutive years
- Cumulative growth rate in total assets over 10-year period exceeds cumulative growth rate of World GDP over the same 10-year period
- Cumulative TSRs over 10-year period above the MSCI World cumulative return over the same 10-year period

## METHODOLOGY

The performance of the HPC was compared to that of their respective industries and were expected to excel above their industry peers on performance drivers and measures which are overall indicators of success or failure in achieving the financial objectives of total asset management, profitability, financial risk, liquidity, and operating asset management.

Appendix C contains the formulas used to calculate ratios in this study. Ratios were calculated for each company for each year for years 1988–2007 (Year 1987 was used to calculate averages that were used in the formulas). The next parts of the study examined the performance of sustaining, declining, and emerging HPC.

In the analyses, HPC were grouped in three categories:

- Sustaining: Companies that appeared in four or more 10-year periods for years 1988–2007 including both early (first three 10-year time periods) and late (last three 10-year periods) periods.
- Declining: Companies that appeared in at least three of the first eight 10-year periods but did not appear at all in the last three 10-year periods.
- Emerging: Companies that did not appear at all in the first three 10-year periods but appeared in at least three of the last eight 10-year periods.

Companies were also grouped by the first two digits of the SIC code. In the benchmark sample, 51 industries were identified based on this grouping. In some industries, there were not enough HPC to derive reliable industry averages and discuss industry-specific results. We provide test data for industries in which we had at least three HPC (with two-digit SIC indicator).

For sustaining HPC, the means for each ratio were calculated for the entire period 1988–2007. For declining HPC, the means for each ratio were calculated for two periods: 1988–2004 and 1996–2007. The first period

(1988–2004) is the period in which certain companies were HPC, and the second period (1996–2007) is the one in which these companies were not HPC. For emerging HPC, the means for each ratio were calculated for the following two periods: 1988–1999 and 1991–2007. No one emerging HPC held the HPC status in the first period, but all emerging HPC were HPC in at least three 10-year periods during 1991–2007.

The next part of the study examined the relative performance of the HPC in relation to the mean performance of their peers among MSCI World index constituents for each of the abovementioned test periods (1988–2007 for sustaining HPC, 1988–2004 and 1996–2007 for declining HPC, and 1988–1999 and 1991–2007 for emerging HPC). We expect “high-performance” companies to excel above their industry peers on performance drivers and measures in periods when they held the HPC status. As to the periods when declining and emerging HPC did not hold the HPC status, we expect more variation in their performance.

The results are shown both with and without outliers. In order to detect and eliminate outliers in the samples, we applied the Grubbs’ test (NIST/SEMATECH). The Grubbs’ test detects one outlier at a time. The outlier is expunged from the dataset and the test is iterated until no outliers are detected. There are no outliers at the specific significance level if the Grubbs’ test statistic is less than the upper critical value for the Grubbs’ test statistic distribution corresponding to that specific level. To get better results on the *t*-test, we eliminated outliers for various ratios. In all cases, outliers represent less than 5% of the sample, usually much less than 5%. The elimination of outliers did not change the conclusions reached in examining the full set of data, but did affect the significance level on some ratios. In most cases, the results improved with the elimination of outliers. In the following sections, we will discuss the results with outliers eliminated, unless otherwise noted.

## FINDINGS

### *Descriptive Data*

Tables 1 and 2 display descriptive data on HPC for the 11 ten-year periods from 1988–1997 to 1998–2007. Table 1 shows the three screens for HPC beginning with CFROI and followed by asset growth and TSR. The number of HPC generally increased over time and ranged from 13 in the 1988–1997 period to 84 in 1996–2005. Table 2 shows countries from which the HPC come. While USA companies dominated each of the 10-year periods, all

**Table 1.** The Number of Companies Selected by the Consecutive Application of Each Screen.

Time Period	1988– 1997	1989– 1998	1990– 1999	1991– 2000	1992– 2001	1993– 2002	1994– 2003	1995– 2004	1996– 2005	1997– 2006	1998– 2007
CFROI screen	115	135	154	192	193	182	189	222	267	286	279
Asset growth screen	35	50	58	87	104	101	109	133	181	192	191
TSR screen	13	17	19	29	42	54	56	66	84	77	76

periods had firms from other countries. The number of countries containing HPC generally increased over time. The fewest countries other than the USA were in 1991–2000 with two from France and four from Germany. The 1988–1997 period was represented by the fewest non-USA companies with one each from France, Germany, Japan. The 1996–2005 period was represented by the most non-USA companies and countries. This period had companies from Australia, Canada, Denmark, Spain, Finland, France, Germany, Ireland, Japan, and Sweden. One company represented each of these countries except Germany (11) and Ireland (2). The distributions of HPC by industry for each 10-year period, which are shown in [Appendix E](#), display distributions' considerable diversity among industries. As noted above, industries represented by more than three HPC are tested in analyses below.

#### *Objective 1: HPC Compared: 1988–2007*

[Table 3a](#) addresses the first objective of this paper, to compare financial performance characteristics of HPC versus non-HPC over 11 successive 10-year periods. It provides an overview of HPC performance versus other MSCI companies on performance drivers and performance measures. Columns in [Table 3a](#) compare performance drivers and performance measures for all 11 ten-year year periods from 1988 to 2007. These 20-year longitudinal results confirm that the results of prior studies as to the long-term superior performance of HPC over other companies. In achieving the objectives of total asset management, profitability, and financial risk, HPC exceed other MSCI companies the significance differences at the 0.05 level or better in more than 98% of the cases for both performance drivers and performance measures. All differences in performance drivers for total asset management, profit margin, financial risk, and liquidity were significant at the 0.0001 level. This robust result enables HPC to produce growth in

**Table 2.** Distribution of HPC by Country for Each 10-Year Period:  
MSCI World.

1988–1997		1989–1998		1990–1999		1991–2000	
Country	Quantity of companies	Country	Quantity of companies	Country	Quantity of companies	Country	Quantity of companies
FRA	1	GBR	3	FRA	1	FRA	2
GBR	1	JPN	1	GBR	3	GBR	4
JPN	1	SGP	1	JPN	1	USA	18
USA	7	USA	9	SGP	1		
				USA	10		
Total	10	Total	14	Total	16	Total	24
1992–2001		1993–2002		1994–2003		1995–2004	
Country	Quantity of companies	Country	Quantity of companies	Country	Quantity of companies	Country	Quantity of companies
FRA	3	DEU	1	CHE	1	DEU	1
GBR	6	FRA	4	DEU	1	DNK	1
JPN	1	GBR	7	ESP	1	ESP	1
SGP	2	SGP	1	FIN	1	FRA	1
USA	24	USA	33	FRA	3	GBR	6
				GBR	6	SGP	1
				SGP	1	SWE	1
				USA	31	USA	34
Total	36	Total	46	Total	45	Total	46
1996–2005		1997–2006		1998–2007			
Country	Quantity of companies	Country	Quantity of companies	Country	Quantity of companies		
DNK	1	AUS	1	AUS	1		
ESP	1	BEL	1	BEL	1		
FIN	1	DNK	1	CHE	3		
FRA	1	GBR	6	DNK	1		
GBR	6	IRL	1	FIN	1		
IRL	1	JPN	1	FRA	1		
JPN	1	SWE	1	GBR	7		
SWE	1	USA	40	HKG	1		
USA	44			IRL	1		
				JPN	1		
				SWE	1		
				USA	40		
Total	57	Total	52	Total	59		

**Table 3.** Global HPC Performance Compared with MSCI World – All 10-Year Periods.

(a) Global HPC: 1988–2007 – Total asset management, profitability, and financial risk

Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
1988–1997	28.35%	68.60%	–175.19%	50.61%	71.42%	62.91%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1989–1998	23.42%	75.82%	–62.25%	55.32%	73.13%	70.71%
<i>T</i> -test	0.000000	0.000000	0.001688	0.000000	0.000000	0.000000
1990–1999	17.66%	78.30%	–81.45%	74.11%	74.34%	69.01%
<i>T</i> -test	0.000039	0.000000	0.000000	0.000000	0.000000	0.000001
1991–2000	21.05%	70.81%	–90.04%	82.34%	73.04%	62.41%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1992–2001	26.14%	63.10%	–69.86%	73.43%	68.87%	57.62%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1993–2002	24.75%	63.48%	–32.98%	74.49%	67.77%	60.10%
<i>T</i> -test	0.000000	0.000000	0.000021	0.000000	0.000000	0.000000
1994–2003	21.43%	65.87%	–58.30%	77.24%	66.10%	55.85%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1995–2004	29.28%	63.23%	–71.95%	76.62%	66.07%	58.98%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1996–2005	33.13%	59.80%	–52.29%	75.63%	62.17%	60.31%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1997–2006	32.96%	54.86%	–48.18%	75.57%	60.86%	59.53%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1998–2007	33.24%	49.86%	–42.64%	72.42%	59.29%	58.81%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

(b) Global HPC: 1988–2007 – Liquidity

Industry	Performance Driver		Performance Measures	
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow
1988–1997	–127.16%	49.36%	27.96%	88.76%
<i>T</i> -test	0.000000	0.000000	0.001021	0.000000
1989–1998	–91.05%	53.82%	50.06%	87.98%
<i>T</i> -test	0.000000	0.000000	0.049298	0.000000
1990–1999	–77.58%	60.36%	45.93%	90.55%
<i>T</i> -test	0.000000	0.000000	0.007932	0.000000
1991–2000	–91.28%	55.61%	37.59%	87.68%
<i>T</i> -test	0.000000	0.000000	0.006334	0.000000
1992–2001	–76.48%	48.51%	28.51%	79.59%
<i>T</i> -test	0.000000	0.000000	0.000880	0.000000
1993–2002	–86.73%	46.97%	21.42%	80.37%
<i>T</i> -test	0.000000	0.000000	0.003469	0.000000

*Table 3. (Continued)*

(b) Global HPC: 1988–2007 – Liquidity							
Industry	Performance Driver		Performance Measures				
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow			
1994–2003	–93.96%	44.64%	18.34%	79.16%			
<i>T</i> -test	0.000000	0.000000	0.000116	0.000000			
1995–2004	–95.72%	45.16%	24.57%	78.59%			
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000			
1996–2005	–87.79%	41.94%	24.42%	76.35%			
<i>T</i> -test	0.000000	0.000000	0.000288	0.000000			
1997–2006	–81.14%	42.39%	35.80%	71.64%			
<i>T</i> -test	0.000000	0.000000	0.000475	0.000000			
1998–2007	–83.67%	39.37%	28.99%	68.61%			
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000			

(c) Global HPC: 1988–2007 – Operating asset management							
Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
1988–1997	13.07%	4.23%	12.72%	–15.04%	–4.42%	–14.58%	–5.25%
<i>T</i> -test	0.000485	0.296459	0.086716				
1989–1998	10.06%	8.94%	15.96%	–11.19%	–9.82%	–18.99%	–4.23%
<i>T</i> -test	0.000162	0.106696	0.017797				
1990–1999	26.62%	29.48%	–10.68%	–36.28%	–41.79%	9.65%	–318.63%
<i>T</i> -test	0.031139	0.008284	0.043212				
1991–2000	9.85%	18.85%	11.27%	–10.92%	–23.23%	–12.70%	–21.39%
<i>T</i> -test	0.028273	0.021447	0.007793				
1992–2001	40.38%	15.04%	18.40%	–67.72%	–17.70%	–22.55%	–47.35%
<i>T</i> -test	0.007602	0.008665	0.000001				
1993–2002	37.02%	20.32%	11.39%	–58.77%	–25.51%	–12.85%	–83.27%
<i>T</i> -test	0.009208	0.009351	0.000526				
1994–2003	–5.10%	25.09%	11.59%	4.85%	–33.49%	–13.11%	–10.91%
<i>T</i> -test	0.009795	0.008217	0.007955				
1995–2004	32.40%	35.23%	16.94%	–47.94%	–54.40%	–20.39%	–127.79%
<i>T</i> -test	0.008145	0.001329	0.000003				
1996–2005	44.75%	19.96%	19.53%	–81.00%	–24.93%	–24.27%	–106.24%
<i>T</i> -test	0.000000	0.009709	0.000000				
1997–2006	63.35%	–16.97%	21.56%	–172.84%	14.51%	–27.48%	–26.04%
<i>T</i> -test	0.000000	0.009255	0.000000				
1998–2007	48.75%	–31.19%	15.44%	–95.12%	23.77%	–18.27%	–14.37%
<i>T</i> -test	0.000000	0.009887	0.000000				

revenues, return on assets, cash flow return on assets, and free cash flow at significant levels above other MSCI companies. Further, HPC are able to accomplish these results with significantly lower financial risk as represented by the debt to equity ratio. The importance of both asset turnover and profit margin to achieving high performance was recently confirmed by Soliman (2008). The only performance driver or performance measure that does not show significant differences at the 0.05 level is cash flow return on stockholder's equity. This result results from the lower level of stockholders' equity by non-HPC companies generally due to lower profitability and higher debt to equity.

Table 3b displays mixed results for operating asset management. Generally, HPC excel on receivables and inventory management with differences at the 0.05 level or better over other MSCI companies in over 80% of the cells. This result is in line with prior studies. However, payables management generally does not show significantly better performance by HPC. Prior studies of USA companies showed superior (lower) payables turnovers for HPC but showed the opposite effect in India and Australia. These differences were attributed to different approaches to supplier financing in the USA compared to other countries (Needles et al., 2007; Needles, Powers, & Shigaev, 2009).

#### *Objective 2: Sustainability of HPC: Multiple 10-Year Periods*

Turning to the next objectives of this paper, Table 4 addresses the sustainability of performance in HPC over multiple 10-year periods. Table 4a-c shows the performance of sustaining HPC. As noted above, these are HPC that appear in a majority, or at least 6 of the 11 time periods including both early and late periods. The tests were conducted for all time periods to test the sustainability of performance even for periods in which the companies do not qualify for HPC status. Industry statistics are shown when an industry (based on the first two SIC classification digits) is represented by more than three HPC. The following observations may be made:

Total asset management, profitability, and financial risk: All performance drivers and performance measures are significant at the 0.05 level, except profit margin (very close – 0.053885). These companies are very strong on asset turnover, growth in revenues, and return on assets with much less debt. These results also reflect the performance in the four industry groups. Return on equity shows consistent results as in Table 3.



**Table 4.** Sustaining HPC Performance Compared with MSCI World: 1988–2007.

(a) Sustaining HPC: 1988–2007 – Total asset management, profitability, and financial risk						
Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
28	33.54%	105.88%	25.24%	76.43%	64.31%	72.59%
<i>T</i> -test	0.000003	0.000000	0.082269	0.000001	0.000000	0.000002
36	–8.74%	81.24%	–116.52%	64.31%	72.91%	72.29%
<i>T</i> -test	0.018438	0.000000	0.000024	0.000000	0.000000	0.000000
38	4.84%	47.44%	–83.68%	85.38%	46.58%	34.12%
<i>T</i> -test	0.091846	0.000000	0.000000	0.000000	0.000000	0.000000
73	–3.39%	73.43%	–39.34%	61.10%	64.97%	56.34%
<i>T</i> -test	0.292957	0.000000	0.005188	0.000000	0.000000	0.000514
All	22.34%	67.80%	–76.73%	79.02%	69.01%	61.51%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
With outliers						
All	21.07%	394.27%	–95.47%	1016.22%	70.87%	48.20%
<i>T</i> -test	0.000000	0.053885	0.000016	0.000000	0.000000	0.043067
(b) Sustaining HPC: 1988–2007 – Liquidity						
Industry	Performance Driver		Performance Measures			
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow		
28	–64.82%	47.14%	52.79%	78.44%		
<i>T</i> -test	0.000000	0.000000	0.000077	0.000103		
36	–93.57%	55.76%	41.41%	86.31%		
<i>T</i> -test	0.000000	0.000000	0.000012	0.000000		
38	–59.80%	31.71%	11.22%	58.07%		
<i>T</i> -test	0.000000	0.000000	0.014918	0.000000		
73	–54.71%	45.68%	26.00%	63.70%		
<i>T</i> -test	0.000000	0.000000	0.000268	0.000000		
All	–86.23%	49.89%	29.28%	80.84%		
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000		
With outliers						
All	–177.29%	52.18%	6.68%	83.63%		
<i>T</i> -test	0.000000	0.000000	0.442002	0.000000		

**Table 4.** (Continued).

(c) Sustaining HPC: 1988–2007 – Operating asset management

Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
28	37.40%	−17.97%	−19.56%	−59.75%	15.23%	16.36%	−26.33%
<i>T</i> -test	0.000000	0.006416	0.000246				
36	33.24%	−10.57%	23.26%	−49.79%	9.56%	−30.31%	−1.13%
<i>T</i> -test	0.000000	0.017200	0.000007				
38	7.06%	15.73%	29.91%	−7.60%	−18.66%	−42.66%	−5.18%
<i>T</i> -test	0.028375	0.013916	0.000000				
73	24.34%	38.49%	−134.33%	−32.17%	−62.57%	57.33%	−716.87%
<i>T</i> -test	0.000020	0.000033	0.000000				
All	6.25%	16.38%	18.64%	−6.67%	−19.59%	−22.91%	−4.64%
<i>T</i> -test	0.001033	0.003643	0.000000				
With outliers							
All	13.92%	−179.41%	−11.65%	−16.18%	64.21%	10.44%	69.88%
<i>T</i> -test	0.386981	0.010381	0.303432				

Liquidity: A prior study (Needles et al., 2006) examined the apparent anomaly of generally lower cash flow yields for HPC. This analysis showed that weak companies tend to have lower incomes and more non-cash adjustments such as restructurings and losses on sales of assets that produce very high artificial cash flow yields. HPC tend to have very consistent cash flow yields in the range of 1.0–3.0. The results in Table 4b are consistent with these prior findings. HPC had lower cash flows yields than other companies and the differences are significant. HPC exceed other MSCI companies by significant amounts (0.0001 level) in cash flow return on assets and free cash flow.

Operating asset management: Contrary to prior research, sustaining HPC do not have significant differences when compared to other MSCI companies on the performance drivers related to operating asset management. The differences in receivable turnover and payables turnover are not significant and inventory turnover is lower. There are some exceptions to this generalization among the industries, especially in receivables turnover and payables turnover.

*Objective 3a: Characteristics of Companies that Exit HPC Status  
(Declining HPC)*

The third objective of this paper examines companies that enter or exit the HPC classification. This section examines declining HPC (Tables 5 and 6), which are defined as HPC that appear in at least three of the first eight 10-year periods but did not appear at all in the last three 10-year periods.

Total asset management, profitability, and financial risk: During the period 1988 to 2004, declining HPC showed expected results by excelling across all performance drivers and performance measures for this objective. In the three following periods when none of these companies were HPC (Table 5b), the former HPC did not achieve significant differences from other HPC on any of the performance drivers or performance measures (except return on assets). Asset turnover fell to a level almost equal (+4.23%) to other MSCI companies, which led to significantly lower growth in revenues (-67.11%) as compared to the other MSCI companies. Further, they increased debt to a level that now exceeds the debt to equity level of other MSCI companies by 28.34%.

Liquidity: In Table 5c, cash flow yield for HPC in the HPC period 1988–2004 was as expected – less than other MSCI companies. Also, cash flow return on total assets and free cash flow continued to exceed those of the other companies. In the following period 1996–2007 (Table 5d), the same relationships continued to hold even though the declining HPC no longer qualified as HPC.

Operating asset management: Declining HPC excelled over other MSCI companies in the 1988–2004 period (Table 5e) on receivable turnover but had a lower inventory turnover. Payable turnover for declining HPC had a slight edge (+8.35%). Overall, the declining HPC had a longer financing period by 63.54% indicating good operating asset management during this period. In the subsequent 2005–2007 period (Table 5f), both receivables turnover and payables turnover turned negative lowering the financing to only a 16.96% advantage over the other MSCI companies.

To summarize, Table 6 compares declining HPC in their HPC period to their non-HPC period across all performance drivers and performance measures. When HPC began to fail to achieve HPC status the objectives of total asset management, profitability, and operating asset management suffered relative to other MSCI firms. The declines in asset turnover and growth in revenues may be seen in Table 6a and in receivable and payables turnover in Table 6c. Further, these companies significantly increased their

**Table 5.** Declining HPC Performance Compared with MSCI World: 1988–2004 and 2005–2007.

(a) Declining HPC: 1988–2004 – Total asset management, profitability, and financial risk						
Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
36	9.91%	88.03%	–366.03%	72.76%	78.14%	75.00%
<i>T</i> -test	0.143812	0.000000	0.000000	0.000003	0.000000	0.000000
73	35.18%	67.92%	–121.17%	66.93%	69.37%	59.90%
<i>T</i> -test	0.000008	0.000000	0.000002	0.000023	0.000000	0.007373
All	14.30%	73.35%	–182.97%	84.87%	70.90%	54.88%
<i>T</i> -test	0.001003	0.000000	0.000000	0.000000	0.000000	0.000000
With outliers						
All	12.82%	150.86%	–171.51%	2,587.59%	73.25%	62.47%
<i>T</i> -test	0.002768	0.000001	0.000001	0.000001	0.000000	0.000007

(b) Declining HPC: 1996–2007 – Total asset management, profitability, and financial risk						
Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
36	–2.88%	85.52%	–304.79%	–32.79%	69.43%	69.27%
<i>T</i> -test	0.424316	0.002355	0.000000	0.303925	0.000167	0.006055
73	15.90%	–3.58%	–120.41%	–311.58%	–2.90%	–228.12%
<i>T</i> -test	0.161063	0.464609	0.000011	0.006939	0.462993	0.061167
All	–8.42%	66.92%	–179.23%	–124.15%	49.47%	20.67%
<i>T</i> -test	0.181817	0.000001	0.000000	0.001166	0.000000	0.075614
With outliers						
All	–5.72%	475.98%	–20.31%	7,385.32%	55.17%	57.52%
<i>T</i> -test	0.278002	0.068450	0.387008	0.000001	0.000000	0.160190

(c) Declining HPC: 1988–2004 – Liquidity				
Industry	Performance Driver		Performance Measures	
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow
36	–176.15%	53.94%	27.53%	89.71%
<i>T</i> -test	0.000000	0.000000	0.000252	0.000000
73	–70.60%	53.10%	20.12%	69.00%
<i>T</i> -test	0.000000	0.000000	0.252205	0.000008

*Table 5. (Continued)*

(c) Declining HPC: 1988–2004 – Liquidity							
Industry	Performance Driver			Performance Measures			
	Cash flow yield	Cash flow return on total assets		Cash flow return on stockholders' equity		Free cash flow	
All	–115.04%	49.74%		9.91%		82.23%	
<i>T</i> -test	0.000000	0.000000		0.151154		0.000000	
With outliers							
All	–234.61%	52.81%		25.20%		85.24%	
<i>T</i> -test	0.000000	0.000000		0.122561		0.000000	
(d) Declining HPC: 1996–2007 – Liquidity							
Industry	Performance Driver			Performance Measures			
	Cash flow yield	Cash flow return on total assets		Cash flow return on stockholders' equity		Free cash flow	
36	–132.64%	42.78%		20.56%		75.84%	
<i>T</i> -test	0.000000	0.029210		0.210261		0.020126	
73	39.88%	31.55%		–55.43%		55.03%	
<i>T</i> -test	0.067484	0.000101		0.157374		0.000014	
All	–30.17%	23.47%		–47.54%		67.57%	
<i>T</i> -test	0.047270	0.002417		0.003151		0.000001	
With outliers							
All	–16.45%	24.53%		59.60%		70.36%	
<i>T</i> -test	0.342193	0.001671		0.224105		0.000000	
(e) Declining HPC: 1988–2004 – Operating asset management							
Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
36	31.36%	–0.63%	24.56%	–45.69%	0.63%	–32.56%	–8.66%
<i>T</i> -test	0.000000	0.471736	0.007070				
73	31.13%	17.07%	23.98%	–45.21%	–20.58%	–31.54%	–40.54%
<i>T</i> -test	0.000031	0.234730	0.073140				
All	–6.82%	–29.85%	17.18%	6.39%	22.99%	–20.74%	38.31%
<i>T</i> -test	0.009095	0.009525	0.045772				
With outliers							
All	–72.30%	–121.78%	9.52%	41.96%	54.91%	–10.52%	82.54%
<i>T</i> -test	0.000000	0.000000	0.208238				

**Table 5.** (Continued).

(f) Declining HPC: 1996–2007 – Operating asset management							
Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
36	35.20%	−48.15%	17.96%	−54.32%	32.50%	−21.89%	22.54%
<i>T</i> -test	0.007738	0.023912	0.248667				
73	18.25%	81.26%	35.45%	−22.33%	−433.58%	−54.92%	−65.95%
<i>T</i> -test	0.060075	0.005619	0.013646				
All	−14.14%	49.21%	26.80%	12.39%	−96.88%	−36.61%	−11.92%
<i>T</i> -test	0.008343	0.049997	0.030252				
With outliers							
All	−75.66%	−21.92%	−21.91%	43.07%	17.98%	17.98%	67.63%
<i>T</i> -test	0.000003	0.355733	0.260270				

financial risk as represented by the increase in debt to equity (Table 6a). Liquidity in the form of cash flow yield declined but not significantly (Table 6b). As a result, cash flow return on assets, and free cash were not as strongly affected.

*Objective 3b: Characteristics of Companies that Enter HPC Status  
(Emerging HPC)*

This section examines emerging HPC (Tables 7 and 8), which are defined as companies that did not appear at all in the first three 10-year periods but appeared in at least three of the last eight 10-year periods.

Total asset management, profitability, and financial risk: During the period 1988–1999, emerging HPC showed results that would be expected of HPC by excelling across all performance drivers and performance measures for this objective except for debt to equity. This was true across the six industries except that five of the six industries did not have a significant difference in asset turnover and five did not in growth in revenues (Table 7a). In the following period 1991–2007 when these companies achieved HPC status (Table 7b), the HPC increased its advantage across all performance drivers and performance measures including debt to equity, which decreased their financial risk.

**Table 6.** Declining HPC Performance: 1988–2004  
Compared to 1996–2007.

(a) Declining HPC: 1988–2004 to 1996–2007 – Total asset management, profitability, and financial risk						
Time period	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
1988–2004	1.17	0.16	0.82	0.15	0.15	0.22
1996–2007	0.88	0.16	0.80	0.04	0.10	0.15
Difference	–0.2861	–0.0039	–0.0183	–0.1091	–0.0501	–0.0682
% Difference	–24.45%	–2.43%	–2.23%	–75.22%	–34.11%	–31.57%
T-test	0.001943	0.426542	0.437614	0.000000	0.000002	0.002160

(b) Declining HPC: 1988–2004 to 1996–2007 – Liquidity				
Time period	Performance Driver	Performance Measures		
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow
1988–2004	1.38	0.20	0.30	0.10
1996–2007	2.12	0.13	0.18	0.07
Difference	0.7388	–0.0676	–0.1108	–0.0300
% Difference	53.41%	–33.90%	–37.46%	–28.55%
T-test	0.027805	0.000006	0.004493	0.014698

(c) Declining HPC: 1988–2004 to 1996–2007 – Operating asset management							
Time period	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
1988–2004	7.63	6.00	8.76	47.85	60.86	41.67	67.05
1996–2007	8.07	15.54	10.06	45.25	23.49	36.28	32.46
Difference	0.4392	9.5402	1.2999	–2.6053	–37.3724	–5.3838	–34.5940
% Difference	5.76%	159.09%	14.84%	–5.44%	–61.40%	–12.92%	–51.59%
T-test	0.191187	0.022151	0.217587				

Liquidity: In Table 7c, cash flow yield for HPC in the non-HPC period 1988–1999 was as expected – not significantly different from other MSCI companies. Only free cash flow showed an advantage for emerging HPC. These conclusions hold for all six industries with the exception of industry 56.

**Table 7.** Emerging HPC Performance Compared with MSCI World: 1988–1999 and 1991–2007.

(a) Emerging HPC: 1988–1999 – Total asset management, profitability, and financial risk						
Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
28	34.26%	229.05%	42.48%	65.66%	39.35%	64.15%
<i>T</i> -test	0.001907	0.000182	0.061189	0.001068	0.012035	0.013347
35	39.35%	14.46%	–33.94%	76.40%	33.23%	72.85%
<i>T</i> -test	0.003258	0.358477	0.009454	0.013437	0.200397	0.057933
36	–0.05%	–20.46%	38.98%	55.81%	32.61%	10.54%
<i>T</i> -test	0.498268	0.342434	0.104764	0.020335	0.130826	0.418015
38	23.04%	50.84%	–51.74%	62.98%	60.17%	50.72%
<i>T</i> -test	0.000001	0.000186	0.000447	0.000180	0.000000	0.000000
56	–15.79%	31.10%	18.59%	4.65%	30.41%	–61.28%
<i>T</i> -test	0.101198	0.088767	0.305533	0.477096	0.065961	0.291412
73	–29.21%	73.31%	–9.99%	66.97%	36.19%	40.32%
<i>T</i> -test	0.020933	0.000175	0.314582	0.000266	0.066274	0.021074
All	28.00%	44.50%	–31.00%	64.77%	53.04%	48.04%
<i>T</i> -test	0.000000	0.000003	0.001503	0.000000	0.000000	0.000000
With outliers						
All	29.03%	115.67%	14.73%	608.18%	53.33%	54.73%
<i>T</i> -test	0.000000	0.000002	0.263174	0.009646	0.000000	0.154259
(b) Emerging HPC: 1991–2007 – Total asset management, profitability, and financial risk						
Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
28	36.80%	98.26%	–25.91%	63.89%	59.02%	68.88%
<i>T</i> -test	0.000000	0.000000	0.001263	0.000038	0.000000	0.000135
35	45.64%	43.16%	31.74%	63.53%	60.84%	70.72%
<i>T</i> -test	0.000000	0.002158	0.002877	0.000098	0.000008	0.001071
36	16.03%	77.59%	–105.49%	63.59%	72.53%	73.34%
<i>T</i> -test	0.001445	0.000000	0.000000	0.000096	0.000000	0.000000
38	14.30%	42.08%	–35.43%	77.49%	49.56%	54.96%
<i>T</i> -test	0.000005	0.000000	0.000128	0.000000	0.000000	0.000007
56	–3.77%	45.52%	–29.62%	28.83%	45.30%	52.87%
<i>T</i> -test	0.237880	0.000000	0.063096	0.003591	0.000000	0.000063
73	–3.34%	63.32%	–69.26%	60.00%	49.50%	53.01%
<i>T</i> -test	0.266246	0.000000	0.000000	0.000150	0.000000	0.000075
All	34.33%	56.56%	–82.53%	76.68%	64.56%	62.21%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
With outliers						
All	34.97%	504.76%	–67.63%	1,168.27%	67.10%	56.41%
<i>T</i> -test	0.000000	0.068641	0.001361	0.000276	0.000000	0.000000



*Table 7. (Continued).*

(c) Emerging HPC: 1988–1999 – Liquidity

Industry	Performance Driver		Performance Measures	
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow
28	18.88%	14.09%	57.47%	170.77%
<i>T</i> -test	0.181282	0.192206	0.037864	0.008682
35	7.22%	−3.33%	−109.59%	66.39%
<i>T</i> -test	0.463555	0.468291	0.350863	0.287761
36	−113.78%	2.43%	7.38%	−89.08%
<i>T</i> -test	0.000017	0.462263	0.383580	0.293030
38	−69.70%	42.69%	14.44%	79.97%
<i>T</i> -test	0.000047	0.000003	0.077093	0.000004
56	–	–	–	–
<i>T</i> -test	–	–	–	–
73	−56.92%	−80.24%	−41.52%	−225.20%
<i>T</i> -test	0.008531	0.003971	0.022947	0.061612
All	−62.57%	14.68%	−0.41%	84.85%
<i>T</i> -test	0.000000	0.015313	0.486649	0.000010
With outliers				
All	−52.26%	13.29%	−302.66%	95.53%
<i>T</i> -test	0.016231	0.057724	0.118328	0.000251

(d) Emerging HPC: 1991–2007 – Liquidity

Industry	Performance Driver		Performance Measures	
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow
28	−66.49%	36.81%	50.99%	60.88%
<i>T</i> -test	0.000000	0.000000	0.000111	0.000000
35	−34.43%	56.80%	66.97%	79.52%
<i>T</i> -test	0.001668	0.000071	0.001262	0.000046
36	−128.84%	49.82%	35.61%	85.16%
<i>T</i> -test	0.000000	0.000000	0.000029	0.000000
38	−64.36%	31.98%	31.06%	57.31%
<i>T</i> -test	0.000000	0.000000	0.000298	0.000000
56	−16.64%	41.57%	54.67%	57.97%
<i>T</i> -test	0.009793	0.000000	0.000236	0.004390
73	−74.39%	23.05%	15.35%	48.96%
<i>T</i> -test	0.000000	0.000670	0.017206	0.000050
All	−90.78%	42.52%	32.10%	76.72%
<i>T</i> -test	0.000000	0.000000	0.000000	0.000000
With outliers				
All	−184.58%	43.93%	28.91%	80.51%
<i>T</i> -test	0.000000	0.000000	0.009931	0.000000

**Table 7. (Continued).**

(e) Emerging HPC: 1988–1999 – Operating asset management							
Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
28	35.64%	−21.47%	−9.24%	−55.37%	17.67%	8.46%	−14.13%
<i>T</i> -test	0.001860	0.111564	0.222846				
35	34.35%	−0.06%	11.62%	−52.31%	0.06%	−13.15%	−22.78%
<i>T</i> -test	0.000765	0.498630	0.227239				
36	8.61%	−87.23%	−2.53%	−9.42%	46.59%	2.47%	39.24%
<i>T</i> -test	0.057223	0.000837	0.455240				
38	22.24%	−17.54%	38.46%	−28.60%	14.92%	−62.50%	16.52%
<i>T</i> -test	0.000000	0.012931	0.000002				
56	−1267.93%	−2.67%	−66.45%	92.69%	2.60%	39.92%	58.89%
<i>T</i> -test	0.000000	0.373327	0.000000				
73	−32.55%	−	49.18%	24.55%	−	−96.78%	−
<i>T</i> -test	0.002989	−	0.027964				
All	−28.39%	−113.63%	24.47%	22.11%	53.19%	−32.39%	68.14%
<i>T</i> -test	0.000000	0.000000	0.000019				
With outliers							
All	−15.12%	−218.85%	16.47%	13.13%	68.64%	−19.72%	84.56%
<i>T</i> -test	0.144357	0.000000	0.004374				
(f) Emerging HPC: 1991–2007 – Operating asset management							
Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
28	26.35%	−21.88%	−57.83%	−35.77%	17.95%	36.64%	−51.00%
<i>T</i> -test	0.000001	0.006062	0.000000				
35	34.99%	79.58%	−10.00%	−53.83%	−389.82%	9.09%	
					−3,054.20%	<i>T</i> -test	0.000027
0.000132	0.200496						
36	30.42%	7.82%	17.72%	−43.72%	−8.48%	−21.53%	−23.67%
<i>T</i> -test	0.000000	0.139892	0.000854				
38	13.05%	−7.15%	18.39%	−15.01%	6.67%	−22.53%	6.50%
<i>T</i> -test	0.000000	0.100099	0.000007				
56	50.92%	19.43%	36.06%	−103.75%	−24.12%	−56.41%	−17.28%
<i>T</i> -test	0.001949	0.000952	0.000000				
73	−10.28%	55.13%	−56.41%	9.32%	−122.86%	36.07%	−117.49%
<i>T</i> -test	0.111622	0.007822	0.000002				
All	52.80%	−20.42%	17.04%	−111.87%	16.96%	−20.53%	−42.78%
<i>T</i> -test	0.000015	0.032518	0.000000				
With outliers							
All	48.74%	−82.44%	−10.12%	−95.09%	45.19%	9.19%	−231.32%
<i>T</i> -test	0.022442	0.071466	0.335232				

**Table 8.** Emerging HPC Performance: 1988–1999  
Compared to 1991–2007.

(a) Emerging HPC: 1988–1999 to 1991–2007 – Total asset management, profitability, and financial risk						
Time period	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to equity	Growth in revenues	Return on assets	Return on equity
1988–1999	1.44	0.06	1.82	0.14	0.09	0.20
1991–2007	1.50	0.11	1.24	0.14	0.13	0.30
Difference	0.0539	0.0438	−0.5795	0.0064	0.0385	0.0983
% Difference	3.73%	69.18%	−31.91%	4.76%	41.15%	49.50%
T-test	0.232970	0.000000	0.001409	0.303765	0.000000	0.000001

(b) Emerging HPC: 1988–1999 to 1991–2007 – Liquidity				
Time period	Performance Driver	Performance Measures		
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free cash flow
1988–1999	1.68	0.12	0.26	0.05
1991–2007	1.45	0.18	0.40	0.10
Difference	−0.2337	0.0548	0.1404	0.0523
% Difference	−13.92%	44.96%	53.41%	111.44%
T-test	0.053853	0.000000	0.000064	0.000000

(c) Emerging HPC: 1988–1999 to 1991–2007 – Operating asset management							
Time period	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
1988–1999	6.68	3.94	9.41	54.61	92.65	38.78	108.48
1991–2007	17.99	9.38	8.79	20.29	38.93	41.54	17.68
Difference	11.3071	5.4358	−0.6253	−34.3247	−53.7164	2.7593	−90.8004
% Difference	169.18%	137.98%	−6.64%	−62.85%	−57.98%	7.12%	−83.70%
T-test	0.000000	0.000000	0.141631				

In the following HPC period 1991–2007 (Table 7d), all measures of cash flows for HPC are strongly differentiated from non-HPC. Cash flow yield is lower, as is now expected (see discussion above), and cash return on total assets and free cash flows are strongly positive. Further, all industry groups

are differentiated on cash flow measures with one exception (cash flow yield for industry 56). As noted earlier, cash flow return on stockholders' equity is not a differentiator.

Operating asset management: In the 1988–1999 period when they did not have HPC status (Table 7e), the emerging HPC scored significantly less on receivables and inventory turnover but had a greater payables turnover than other MSCI companies in the 1988–1999 period. There were few significant differences among the industry groups. In the HPC period 1991–2007 (Table 7f), the HPC improved both in receivable turnover and payables turnover but still fell short in inventory turnover. More significant differences showed up in the industry groupings.

To summarize, Table 8 compares emerging HPC in their HPC period to their non-HPC period across all performance drivers and performance measures. When HPC began to achieve HPC status, the objectives of total asset management, profitability, and operating asset management improved relative to other MSCI firms. The increases in asset turnover and profit margin and the decrease in debt to equity may be seen in Table 8a. All cash flow performance measures showed increases with cash flow return on total assets, cash flow return on equity, and free cash flow, as usual, being at a significant level. Cash flow yield declined in the latter period but was not significantly different from the earlier period when they were non-HPC companies. Operating asset management (Table 8c), especially receivables turnover and inventory turnover improved dramatically when HPC status was achieved, increasing 169.18 and 137.98%, respectively.

## CONCLUSION

This paper began with three objectives:

Objective 1: To compare financial performance characteristics of HPC versus non-HPC over 11 successive 10-year periods.

Objective 2: To study the sustainability of performance in HPC over multiple 10-year periods.

Objective 3a, 3b: To identify the companies that exit or enter the HPC classification and the performance drivers and performance measures that characterized the change in HPC classification.

It investigated these issues by studying HPC and integrated financial ratio analysis empirically for companies in the United States and 22 other

countries (represented by the MSCI Index) over a 20-year period (1988–2007) in 11 successive 10-year performance periods by quoting an article that suggests that much high performance is achieved randomly.

With regard to objective 1, the 20-year longitudinal results confirm with few exceptions the results of prior studies as to the long-term superior performance of HPC over other companies. With regard to objective 2, companies that were sustaining HPC over at least 6 of the 11 ten-year periods, results were consistent for measures related to total asset management, profitability, financial risk, and liquidity. Operating asset measures were not consistent with prior research. With regard to objective 3a, companies who fail to maintain HPC status fail at total asset management, profitability, and operating asset management. Further, they significantly increase their financial risk. With regard to objective 3b, companies achieving HPC status usually have previously improved profitability but they significantly improve liquidity and cash flows when they become HPC. Further, they improve operating asset management and lower financial risk.

The implications for management are clear. In short, when a company becomes highly profitable, to become a HPC management must concentrate on generating cash flows from income, manage receivables and inventory vigorously, and reduce debt in relation to equity. When a company achieves HPC status, management must concentrate on maintaining asset turnover and growth in revenues while maintaining profit margin while not increasing debt in relation to equity.

## LIMITATIONS AND FUTURE RESEARCH

Although it is intended to be broadly representative of global financial markets, the MSCI Index used in this study is weighted toward large companies in developed countries. We have not taken into account the effects of many countries that adopted IFRS or a variation thereof during the past five years. Future studies can address a broader population and examine the effects of IFRS.

## REFERENCES

- Adman, M. A., & Haight, G. T. (2002). A fresh look at economic value added: Empirical study of the fortune five-hundred companies. *The Journal of Applied Business Research*, 18(2), 27–36.

- Brief, R. P., & Lawson, R. A. (1992). The role of the accounting rate of return in financial statement analysis. *The Accounting Review*, 67, 411–426.
- Burns, D. C., Sale, J. T., & Stephan, J. A. (2008). A better way to gauge profitability. *Journal of Accountancy*, 208(August), 38–42.
- Collins, J. (2001). *Good to great: Why some companies make the leap and others don't*. New York: HarperBusiness.
- Fairfield, P. M., & Yohn, T. L. (1999). *Changes in asset turnover signal changes in profitability*. Washington, DC: Georgetown University, McDonough School of Business.
- Feltham, G. A., & Olsson, J. A. (1995). Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research*, 11, 689–731.
- Fera, N. (1997). Using shareholder value to evaluate strategic choices. *Management Accounting*, 28(November), 45–55.
- Frigo, M. L. (2002). Strategic competencies of return driven strategy. *Strategic Finance*, 33(June), 6–9.
- Frigo, M. L. (2003a). Performance measures that drive the first tenet of business strategy. *Strategic Finance*, 34(September), 8–11.
- Frigo, M. L. (2003b). Performance measures that drive the goal tenets of strategy. *Strategic Finance*, 34(October), 8–11.
- Frigo, M. L., & Litman, J. (2002). What is return driven strategy? *Strategic Finance*, 33(February), 11–13.
- Frigo, M. L., & Litman, J. (2008). *Driven: Business strategy, human actions and the creation of wealth*. Chicago: Strategy and Execution.
- Frigo, M. L., Needles, B. E., & Powers, M. (2002). Strategy and financial ratio performance measures. In: M. Epstein & J. Manzoni (Eds), *Performance measurement and management control*. London: JAI.
- Gebhardt, W. R., Lee, C. M., & Swaminathan, B. (2001). Toward an implied cost of capital. *Journal of Accounting Research*, 39, 135–176.
- Jansen, I., & Yohn, T. L. (2002). *Using changes in asset turnover as signal of potential earnings management*. Washington, DC: Georgetown University, McDonough School of Business.
- Lev, B., & Thiagarajan, S. R. (1993). Fundamental information analysis. *Journal of Accounting Research*, 31, 190–215.
- Litman, J., & Frigo, M. L. (2004). When strategy and valuation meet –Five lessons from return driven strategy. *Strategic Finance*, 36(August), 31–39.
- Madden, B. J. (1999). *CFROI valuation*. Oxford: Butterworth Heinemann.
- Needles, B. E., Frigo, M., & Powers, M. (2002a). Strategy and financial ratio performance measures. In: M. Epstein & J.-F. Manzoni (Eds), *Studies in financial and managerial accounting* (Vol. 13, pp. 341–359). London: JAI.
- Needles, B. E., Frigo, M. L., & Powers, M. (2002b). Strategy and financial ratio performance measures: The case of an emerging economy. *Indian Accounting Review*, 6(2), 1–15.
- Needles, B. E., Frigo, M. L., & Powers, M. (2004). Strategy and integrated financial ratio performance measures: Empirical evidence of the financial performance scorecard and high-performance companies. In: M. Epstein & J. Manzoni (Eds), *Performance measurement and management control: A compendium of research* (Vol. 15, pp. 115–151). London: JAI.
- Needles, B. E., Powers, M., & Frigo, M. (2006). Strategy and integrated financial ratio performance measures: Further evidence of the financial performance scorecard and

- high-performance companies. In: M. Eptstein & J.-F. Manzoni (Eds), *Studies in financial and managerial accounting* (Vol. 16, pp. 241–267). London: JAI.
- Needles, B. E., Powers, M., & Frigo, M. (2008). Performance measurement and executive compensation: Practices of high performance companies. In: M. Eptstein & J.-F. Manzoni (Eds), *Studies in financial and managerial accounting* (Vol. 16). London: JAI.
- Needles, B. E., Powers, M., & Shigaev, A. (2009). *Financial characteristics of high performance companies in Australia*. Working paper presented at the Sydney University Accounting Research Foundation, Sydney.
- Needles, B. E., Powers, M., Shigaev, A., & Frigo, M. L. (2007). Financial characteristics of high performance companies in India. *Indian Accounting Review*, 11(1), 1–17.
- Nissim, D., & Penman, S. H. (1999). *Ratio analysis and equity valuation*. Working Paper. Columbia University.
- Nissim, D., & Penman, S. H. (2001). Ratio analysis and equity valuation: From research to practice. *Review of Accounting Studies*, 6, 109–154.
- Ohlson, J. A. (1995). Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research*, 11, 661–867.
- Penman, S. H. (1991). An evaluation of accounting rate-of-return. *Journal of Accounting, Auditing and Finance*, 6, 233–255.
- Piotroski, J. D. (2000). Value investing: The use of historical financial statement information to separate winners from losers. *Journal of Accounting Research*, 38(Suppl.), 346–376.
- Raynor, M. E., Ahmed, M., & Henderson, A. D. (2009). *A random search for excellence: Way 'great companies' research delivers fables and not facts*. Deloitte.
- Selling, T. I., & Stickney, C. P. (1989). The effects of business environment and strategy on a firm's rate of return on assets. *Financial Analysts Journal*, 45(January–February), 38–52.
- Soliman, M. T. (2008). The use of DuPont analysis by market participants. *The Accounting Review*, 83(3), 823–853.

## APPENDIX A. EXPANDED VIEW OF FINANCIAL PERFORMANCE OBJECTIVES

Financial Performance Objectives	Links to Financial Performance
Total asset management	Ability to utilize all the assets of a company in a way that maximizes revenue while minimizing investment
Profitability	Ability to earn a satisfactory net income
Financial risk	Ability to use debt effectively without jeopardizing the future of the company
Liquidity	Ability to generate sufficient cash to pay bills when they are due and to meet unexpected needs for cash
Operating asset management	Ability to utilize current assets and liabilities to support growth in revenues with minimum investment

## APPENDIX B. COMPONENTS OF THE FINANCIAL PERFORMANCE SCORECARD

Financial Performance Objectives	Performance Drivers	Performance Measures
Total asset management	Asset turnover	Growth in revenues
Profitability	Profit margin	Return on assets
Financial risk	Debt to equity	Return on equity
Liquidity	Cash flow yield	Cash flow returns
		Free cash flows
Operating asset management	Turnover ratios:	Cash cycle:
	Receivables turnover	Days' sales uncollectible
	Inventory turnover	Days' inventory on hand
	Payables turnover	Days' payable
		Financing period

## APPENDIX C. FORMULAS FOR RATIO COMPUTATIONS IN THE FINANCIAL PERFORMANCE SCORECARD

### *Performance Drivers*

$$\text{Asset turnover} = \frac{\text{Net sales}}{\text{Average total asset}}, \quad \text{Profit margin} = \frac{\text{Net income}}{\text{Net sales}}$$

$$\text{Debt to equity} = \frac{\text{Cash flows from operating activities}}{\text{Stockholder's equity}}$$

$$\text{Cash flow yield} = \frac{\text{Cash flows from operating activities}}{\text{Net income}}$$

In the analysis, if either the numerator or denominator of the cash flow yield was negative, the ratio was excluded.



*Valuation Performance Measures*

$$\text{Growth in revenues} = \frac{\text{Changes in net sales}}{\text{Net sales}},$$

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Average stockholder's equity}}$$

$$\text{Return on assets} = \frac{\text{Net income}}{\text{Average total assets}}$$

$$\text{Cash flow returns} = \frac{\text{Cash flows from operating activities}}{\text{Average total assets}}$$

$$\text{Cash flow returns} = \frac{\text{Cash flows from operating activities}}{\text{Average stockholder's equity}}$$

$$\begin{aligned} \text{Free cash flow} = & \text{Cash flows from operating activities} - \text{Dividends} \\ & + \text{Sales of capital assets} - \text{Purchase of capital assets} \end{aligned}$$

In the analysis, to adjust for size of company, free cash flow was divided by average total assets.

*Operating Asset and Financing Ratios*

$$\text{Receivables turnover} = \frac{\text{Net sales}}{\text{Average accounts receivable}}$$

$$\text{Average days' sales uncollected} = \frac{365}{\text{Receivables turnover}}$$

$$\text{Inventory turnover} = \frac{\text{Cost of sales}}{\text{Average accounts inventory}}$$

$$\text{Average days' inventory on hand} = \frac{365}{\text{Inventory turnover}}$$

$$\text{Payables turnover} = \frac{\text{Cost of sales} \pm \text{Change in inventory}}{\text{Average accounts payable}}$$

$$\text{Average days' payable} = \frac{365}{\text{Payables turnover}}$$

$$\begin{aligned} \text{Financing period} &= \text{Average days' sales uncollected} \\ &+ \text{Average days' inventory on hand} \\ &- \text{Average days' payable} \end{aligned}$$

**APPENDIX D. MSCI INDEX – 2008 COMPOSITION**

MSCI World Countries		MSCI World Industries	
Country	Quantity of companies	Industry group	Quantity of companies
AUS	51	13	41
AUT	10	15	31
BEL	15	16	17
CHE	26	20	67
DEU	40	26	21
DNK	16	27	26
ESP	25	28	109
FIN	21	29	23
FRA	52	32	21
GBR	107	33	33
GRC	11	34	17
HKG	28	35	91
IRL	11	36	93
ITA	18	37	54

**APPENDIX D. (Continued)**

MSCI World Countries		MSCI World Industries	
Country	Quantity of companies	Industry group	Quantity of companies
JPN	316	38	62
NLD	18	44	17
NOR	21	45	18
NZL	7	48	69
PRT	8	49	79
SGP	22	50	24
SWE	34	53	17
USA	589	54	17
<b>Total</b>	1,446	56	16
		59	16
		60	31
		63	36
		67	24
		73	89
		79	16
		99	15
		Other	256
		<b>Total</b>	1,446

**APPENDIX E. HPC BY 10-YEAR PERIOD, COUNTRY, AND INDUSTRY  
(INDUSTRIES IDENTIFIED IN APPENDIX D)**

1988–1997			1989–1998			1990–1999		
Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies
20	USA	1	20	USA	1	27	SGP	1
30	USA	1	26	USA	1	28	USA	1
37	FRA	1	27	SGP	1	35	USA	1
	USA	1	28	GBR	1	36	USA	1
37: Sub-total		2		USA	1	37	USA	1
39	JPN	1	28: Sub-total		2	38	USA	1
52	USA	1	30	USA	1	39	JPN	1
73	GBR	1	37	USA	1	48	FRA	1
	USA	3	39	JPN	1		GBR	1
73: Sub-total		4	52	USA	1	48: Sub-total		2
<b>Total</b>		10	73	GBR	2	53	USA	1
				USA	3	73	GBR	1
			73: Sub-total		5		USA	4
			<b>Total</b>		14	73: Sub-total		5
						87	GBR	1
						<b>Total</b>		16

## APPENDIX E. (Continued)

1991-2000			1992-2001			1993-2002		
Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies
28	FRA	1	23	USA	1	20	USA	1
	USA	2	27	SGP	1	23	USA	1
28: Sub-total		3	28	FRA	1	28	FRA	1
35	USA	1		USA	2		USA	7
36	USA	4	28: Sub-total		3	28: Sub-total		8
37	USA	1	35	USA	2	31	FRA	1
38	USA	2	36	SGP	1	35	USA	3
39	USA	1		USA	3	36	SGP	1
48	FRA	1	36: Sub-total		4		USA	4
	GBR	1	37	USA	1	36: Sub-total		5
48: Sub-total		2	38	USA	4	37	FRA	1
52	USA	2	39	JPN	1		USA	1
73	GBR	2	48	FRA	1	37: Sub-total		2
	USA	5		GBR	1	38	USA	3
73: Sub-total		7	48: Sub-total		2	48	GBR	1

87	GBR	1	50	GBR	1	50	GBR	1	
<b>Total</b>		24	51	USA	1	1	USA	1	
			52	USA	2	50: Sub-total			2
			53	FRA	1	51	USA	1	1
				USA	1	52	USA	1	1
			53: Sub-total		2	53	FRA	1	
			56	GBR	1	1	USA	1	
			57	USA	1	53: Sub-total			2
			73	GBR	2	56	GBR	1	1
				USA	5	57	USA	1	1
			73: Sub-total		7	73	DEU	1	
			87	GBR	1		GBR	3	
				USA	1		USA	6	
			87: Sub-total		2	73: Sub-total			10
			<b>Total</b>		36	87	GBR	1	
							USA	1	
						87: Sub-total			2
						99	USA	1	1
						<b>Total</b>			46

## APPENDIX E. (Continued)

Industry group	1994–2003			1995–2004		
	Country	Quantity of companies	Industry group	Country	Quantity of companies	Industry group
23	FRA	1	15	USA	1	
	USA	1	27	USA	1	
23: Sub-total			2	USA	3	
27	USA	1	30	USA	1	
28	FRA	1	31	FRA	1	
	USA	6	35	ESP	1	
28: Sub-total			7	USA	3	
31	FRA	1	35: Sub-total		4	
35	ESP	1	36	SGP	1	
	USA	3		USA	4	
35: Sub-total			4		5	
36	FIN	1	37	USA	1	
	SGP	1	38	DNK	1	
	USA	4		GBR	1	
36: Sub-total			6	USA	4	

37	USA		1	38: Sub-total			6
38	GBR	1		39	USA		1
	USA	3		44	USA		1
38: Sub-total			4	47	USA		1
39	USA		1	48	GBR		1
48	GBR		1	50	USA		1
50	USA		1	51	USA		1
52	USA		1	52	GBR	1	
53	USA		1		USA	1	
56	GBR		1	52: Sub-total			2
57	USA		1	53	USA		1
59	USA		1	56	GBR		1
73	CHE	1		57	USA		1
	DEU	1		73	DEU	1	
	GBR	2			GBR	1	
	USA	5			SWE	1	
73: Sub-total			9		USA	7	
87	GBR	1		73: Sub-total			10
	USA	1		87	GBR	1	
87: Sub-total			2		USA	1	
<b>Total</b>			45	87: Sub-total			2
				<b>Total</b>			46



## APPENDIX E. (Continued)

1996-2005			1997-2006			1998-2007		
Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies
15	USA	2	15	GBR	1	15	GBR	2
20	USA	1		USA	1		USA	1
27	USA	1	15: Sub-total		2	15: Sub-total		3
28	FRA	1	20	USA	2	20	CHE	1
	USA	2	21	GBR	1		USA	1
28: Sub-total		3	23	USA	1	20: Sub-total		2
30	USA	1	27	USA	1	21	GBR	1
34	IRL	1	28	USA	2	28	USA	5
35	ESP	1	34	IRL	1	31	FRA	1
	USA	4	35	USA	2	34	CHE	1
35: Sub-total		5	36	USA	4		IRL	1
36	FIN	1	37	USA	1	34: Sub-total		2
	USA	3	38	AUS	1	36	FIN	1
36: Sub-total		4		DNK	1		USA	4
37	USA	1		JPN	1	36: Sub-total		5

38		DNK	1			USA	6	37	USA		4
		JPN	1		38: Sub-total			9	AUS	1	
		USA	8		39	USA		1	CHE	1	
38: Sub-total				10	47	USA		1	DNK	1	
39		USA		1	50	USA		1	GBR	1	
44		USA		1	51	USA		1	JPN	1	
47		USA		1	52	GBR	1		USA	7	
48		GBR		1		USA	1				12
50		USA		1	52: Sub-total			2	USA		1
51		GBR	1		53	USA		4	USA		1
		USA	3		54	BEL		1	USA		1
51: Sub-total				4	55	USA		1	HKG	1	
52		GBR	1		56	GBR	1		USA	1	
		USA	1			SWE	1				2
52: Sub-total				2		USA	1		GBR	1	
53		USA		2	56: Sub-total			3	USA	2	
56		GBR	1		57	USA		1			3
		SWE	1		73	GBR	1		USA		1
		USA	1			USA	7		USA		1

## APPENDIX E. (Continued)

1996-2005			1997-2006			1998-2007		
Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies	Industry group	Country	Quantity of companies
56: Sub-total		3	73: Sub-total		8	54	BEL	1
57	USA	1	87	GBR	1	55	USA	1
73	GBR	1		USA	1	56	GBR	1
	USA	8	87: Sub-total		2		SWE	1
73: Sub-total		9	<b>Total</b>		52		USA	1
87	GBR	1				56: Sub-total		3
	USA	1				57	USA	2
87: Sub-total		2				73	USA	5
<b>Total</b>		57				87	GBR	1
							USA	1
						87: Sub-total		2
						<b>Total</b>		59

# PERFORMANCE MEASUREMENT IN STRATEGIC CHANGES

Raffaele Fiorentino

## ABSTRACT

*Although strategic changes and management control systems are relevant, there is the need for an evolution in the tools of performance measurement, analysis and control to understand the ability of the firms, at first, to face environmental variability and, then, to achieve objectives through the strategic change management. This study was dedicated to the issue of what measures are relevant during the strategic change process. It also proposes a multidimensional control system for strategic changes. The framework is based on: the literature review and analysis about strategic change, change management and performance measurement; a two-stage empirical research. Overall, the proposed control system can help firms in managing strategic changes.*

## INTRODUCTION

Firms can face different changes. The volatility characterizing actual competitive contexts imposes, with increasing importance, a continuous

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management of strategic changes (Bertini, 1995; Tushman & Anderson, 2004; Volberda, 1996). Most of the managers recognize progressive abbreviations of the business idea life cycle (Hamel, 1998; Zook, 2007), increasing “frequency” and “speed” of strategic change activation and implementation (Bianchi Martini, 2001; Bruni, 2007). On one side, strategic change activation is becoming a key factor (Coda & Mollona, 2006) and, on the other, the establishment and effective application of control processes facilitates the achievement of change aims, monitoring results both at a business unit and corporate level (Rieley & Clarkson, 2001). At the same time, necessity of multidimensional control systems is affirming, by integration of qualitative and quantitative measures, in order to go up to value drivers (Kaplan & Norton, 1996).

Theoretical and empirical researches analysed performance measurement systems about “continuous change”, innovations (BCG, 2006) or relations between change and performance measurement systems introduction (Busco & Riccaboni, 2004), with general and sector focuses (e.g. Schmidt, Bateman, Breinlinger O'Really, & Smith, 2006). Each study, nevertheless, deals with only specific aspects of the strategic change processes; there is the need for an evolution in the tools of performance measurement, analysis and control to understand the ability of the firms, at first, to face environmental variability and, then, to achieve objectives through the strategic change management (Shapiro, 2006).

In this seam of research, our paper set the following research questions: How do we measure the ability to activate or to face changes? Which measures can be used for gathering the success or failure of change processes? How to go up to the *values drivers* of results achieved through change?

In an attempt to answer these questions we developed a research project articulated in: the elaboration of a framework for monitoring strategic change processes, based on the integration of several streams of literature and an investigation through interviews with specialists of performance measurement and strategic changes; the exploratory research of the system validity and applicability through surveys with administrative and financial managers associated to the ANDAF (National Association of the Administrative and Financial Directors).

To define measures, we have relied upon an in-depth analysis of strategic changes that leads to the identification of main dimensions of value creation: monitoring strategic change processes means controlling and managing these dimensions and the related performance indicators.

## **BACKGROUND**

### *The Dimensions of Analysis for Strategic Change*

Strategic change is a continuous challenge for both managers and researchers. Its management needs to develop strategic tools and approaches that improve the firm's capability to continuously renew itself (Hamel, 1998).

Change process was studied by scholars from economics, organization theory, history, sociology, management accounting and strategy (Higgs & Rowland, 2005; Zan, Zambon, & Pettigrew, 1993). In this work, we chose a strategic approach that may offer the possibility of interpreting, in a common way, the process of change referred to several objects, levels and dimensions of analysis. Strategic approach makes it possible to link many studies about change, favouring a conceptual recombination of different perspectives towards the definition of a useful performance measurement system.

The concept of strategic change was widely and increasingly used in management studies giving rise to a specialized seam of research generally referred to as strategic management. Although exciting and insightful, the concept of "strategic change" assumes different definitions, which raises of theoretical challenges and issues in literature. Every "school of strategy" studied changes, focusing on several dimensions and recognizing different features: from the design, planning, positioning, entrepreneurial and cognitive schools to the learning, power, cultural, environmental and configurational schools (Mintzberg, Ahlstrand, & Lampel, 2005).

On the whole, the several researches about "change" seem to be joined around 11 main dimensions of analysis.

#### *Innovation Capability*

Nowadays, successful firms reach or maintain their success by continuous revolution in the industry where they compete through a systemic innovation of business models; their competitive success comes from "running differently", by reinventing themselves through innovation capability. An increasing number of studies underlines the existing correlations between the innovation capability and the odds of success in strategic changes (Baden Fuller & Pitt, 1995; Barker & Duhaime, 1997; Bertini, 1995; Christensen & Raynor, 2003; Coda, 2004; Drucker, 1999; Epstein, Davila, & Matusik, 2004; Markides, 1997; Tushman & Smith, 2004).

*Financial Status*

Manifold searches investigated strategies in relation to the several financial and business results preliminary to the change, generally distinguishing about: corporate crisis, need of turnarounds; dysfunctional status, risking a potential crisis; positive/success status, pushing for renewed successes. (Bastia, 1996; Baden Fuller & Stopford, 1992; Coda, 1987; Drucker, 1995; Epstein, Leonard, & Tritter, 2008; Foster & Kaplan, 2001; Garzella, 2005; Gilardoni & Danovi, 2000; Guatri, 1995; Hamel & Prahalad, 1995; Johnson, Scholes, & Whittington, 2008; Normann, 2001).

*Timing*

Different authors analysed the relations among the time to introduce changes and the financial and business dynamics of the prior strategy (Abell, 1993; Cesaria, 2003; Foster & Kaplan, 2001; Ghemawat, 1991; Miller & Friesen, 1984; Tushman & O'Reilly, 1996).

*Depth of Change*

Numerous studies investigate the evolution of the relation among firms and environment and the connected impact on the operational conditions (Jick, 1993; Kotter, 1996; Pendlebury, Grouard, & Meston, 1998; Reboria & Minelli, 2007; Selznick, 1964).

*Firm–Environment Relation*

Starting from the assumptions that it is possible to individualize two alternative attitudes, to create the future or to accept the future created by other firms, researchers analysed the effects of these different decisions on strategic change success (Aaker, 2001; Robert, 1998; Schumpeter, 1994; Valdani, 2000).

*Planning*

Many studies on the strategic planning processes, analysed strengths and limits about more or less formalized definition of strategic change plans (Ansoff, 1965; Garzella, 2008; Lorange & Vancil, 1977; Mazzola, 2003; Mintzberg, 1994).

*Most Involved Stakeholder*

Further, researchers are assembled on the impact of the change on specific categories of stakeholder: ownership, directors, management or staff (Conner, 1995; Goodstein & Boeker, 1991; Pendlebury et al., 1998; Kotter, 2007; Westphal & Fredrickson, 2001; Zattoni, 2004).

### *Mode of Expansion*

From the elaboration of the transaction costs theory (Williamson, 1975), numerous studies faced the advantages and the disadvantages of changes predominantly when exploiting the firm' own distinctive competences, or when looking for integrations with other organizations (Aaker, 2001; Bertini, 1991; Collis & Montgomery, 1997).

### *Business Model Renewal*

With reference to strategic business unit level, many studies analysed relations between the achievement of competitive advantage and the opportunities of redefinition of the who (which customers?), the what (which products?) and the how (which structure?) of business models (Abell, 1980; Coda, 1984; Markides, 1997; Normann, 1977; Porter, 1980).

### *Organizational Change*

As exposed by specific investigations, the organizational change, involving a break-up of the previous structures, can produce different impacts on the new organizational balance (Dawson, 1994; Duck, 1993; Garzella, 2005; Gilardoni & Danovi, 2000; Kotter & Schlesinger, 2008, Tushman & Romanelli, 1985).

### *Funding Decisions*

The coverage of financial needs induced by the change investments imposes funding decisions. Specific constraints and leading factors should allow to potentially address the relationship between equity and debt towards the definition of the more convenient financial structure (Bianchi Martini, 2000; Damodaran, 2001; Ferrero 1981; Giannessi, 1982; Modigliani & Miller, 1958).

The manifold dimensions of analysis faced in the literature underline the complexity of the process of strategic change management, suggesting to model and manage in a unitary way a change process facing the specificities, tightly correlated and interdependent, of every dimension (Higgs-Rowland, 2005). Successful strategic changes seem to be those where these dimensions are carefully analysed and related to their key success variables. Accordingly, a performance measurement system of strategic change may be found on these dimensions.



*The Challenges of Performance Measurement Systems*

Performance measurement systems were identified as one of the common success factors for managing change (Oakland & Tanner, 2007) both in design and implementation of strategies (Anthony, Hawkins, Macri, & Merchant, 2001; Dent, 1990; Bromwich & Bhimani, 1994; Shank-Govindarajan, 1993). Performance measurement systems is a critical success factor in assessing the levels of performance before and after the change, and in providing a control during the process (Ford & Greer, 2005).

The predisposition and effective application of control processes facilitates the attainment of planned goals, monitoring results both at corporate and business level (Bergamin Barbato, 1991; Kotter & Schlesinger, 2008; Simons, 1995). It is necessary to promote an innovation attitude and to lead firms towards the attainment of the objectives with “an injection of managerial capability and not a contraction of entrepreneurship” (Bertini, 1995; Garzella, 2005; Govindarajan, 1988; Paolini, 1993; Rumelt, 1974).

The control of change through the elaboration of a performance indicators system assumes the role of stimulator and economic-financial conscience of the firm (Brunetti, 1987), turning it into the organizational trust and acceptance for change (Bruggeman & Van der Stede, 1993; Rieley & Clarkson, 2001; Simons, Dávila, & Kaplan, 1999).

The performance represents, in business field, the complex of the results achieved by firms. Such concept assumes a plenty and articulated meaning and is set in narrow connection with the business objectives, of which it expresses the degree of achievement. The performance measurement face up many aims and information questions, such as to evaluate results of firm's strategies, to support the decisional process, to check the development of processes execution, to communicate to external stakeholders financial and competitive status, to appraise and to stimulate management behaviours (Amigoni, 1988; Eccles, 1991).

To answer to such questions, theory and practice formed a consolidated system of performance indicators. To obviate to the lacks of financial measures, it was necessary to integrate the system of performance measurement with non-financial measures engaged to seize the value creation, in its various forms and configurations, as well as the action of the various factors that compete to determine it (Galeotti, 2006; Ittner & Larcker, 1998; Nanni, Dixon, & Vollman, 1990; Neumann, Roberts, & Cauvin, 2008; Vaivio, 1999).

While financial measures were widely used for many years, new frameworks have emerged in recent years that extend management control systems beyond traditional financial measures. Scholars proposed the

construction of multidimensional measurement systems, such as tableau de bord (Bourguignon, Malleret, & Nørreklit, 2004; Epstein & Manzoni, 1998), balanced scorecard (Kaplan & Norton, 1996), Skandia Navigator or Performance Prism (Kennerley & Neely, 2003; Wright & Keegan, 1997), some more “financial” and others more “balanced”. Such performance measurement systems are structured such that the performance indicators of many dimensions express the remarkable causal relationships to interpret the dynamics of the business results. The analyses of the application of these systems of measurement

- showed the consequential benefits from the employment of multidimensional systems in the translation of the strategic objectives in coherent measures of performance, in the satisfaction of the heterogeneous requirements of the management, in the effective support offered to the decision processes and to strengthen the reward systems effectiveness (Ittner & Larcker, 1998);
- identified the conditions of effectiveness in the use of these systems, tied up mainly to the selection of the indicators and the predisposition of fit organizational and operational conditions (Agliati, 2005; Amigoni, 2001).

A literature review in the areas of control management, management accounting and performance measurement exhibit that researches about relations between performance control systems and changes focused on (Langfield-Smith, 1997)

- the individualization of the most appropriate indicators for each specific “dimensions of analysis”. Different researches are assembled on single change dimensions of analysis, in the attempt of elaboration or selection of the most effective indicators to go up to the remarkable causal relations with the business results. Particularly, increasing importance has been given to the analysis of innovation capability (AIAF, 2006; BCG, 2006; Green, Gavin, & Aiman Smith, 1995; Galeotti, 2006; Hansen & Birkinshaw, 2007; Nambisan & Sawhney, 2007);
- or, the relations between changes and the introduction of performance measurement systems (Burns, Ezzamel, & Scapens, 2003). These authors deepened the management of “*path-dependent*” change processes of planning systems, budgeting and control (Burns & Scapens, 2000). Such analyses underlined the influence of the specific organizational, cultural and social context on the formalities of adoption, and on the use potentialities (Lupano, Maraghini, & Saviotti, 2007). The introduction of multidimensional performance measurement systems, tools of planning

and control, allows the effective management of strategic changes (Busco & Riccaboni, 2004; Giannetti & Marelli, 2004; Kaplan & Norton, 1996; Russel, 2003).

Subsequent studies were often finalized to the construction of multi-dimensional systems for firms of a specific industry. Many researches adjusted the several frameworks of performance measurement to managerial issues of a specific competitive context in the attempt to: individualize the performance indicators, mostly remarkable; check their effectiveness; put in evidence their strengths and weakness (e.g. Schmidt et al., 2006).

That said, it is possible to arrange multidimensional performance measurement systems to one of the most important managerial processes: strategic change. This requires novel performance measurement systems that transcend the traditional tools of the more stable past environments. Conventional approaches to control and performance measures of strategic changes present significant limitations in dealing with rapid changes. Most of these approaches are useful and relevant in daily management but they are less effective to strategic changes needs. Additional studies are therefore needed to keep exploring a problem that will be increasingly relevant for future years.

Furthermore, with reference to features of strategic change processes, the adoption of “ad hoc” performance measurement systems would be useful. Strategic change features, recommending the adoption of “ad hoc” control tools, are the uniqueness of every single process in terms of causes, times and strategies; the long duration, connected to radical changes working only in a multi-year time; the elevated uncertainty, such as for breakthrough innovations; the complexity, tied up to the multidimensional actions to be undertaken; the sequence, consistent to a gradual step approach; the time horizon, determined in the planning stage, constituting an appointment to respect towards stakeholders; the unitary vision, essential for the corporate balance (Bastia, 1996; Goold & Quinn, 1990; Lorange & Vancil, 1977).

In this perspective, firms need multidimensional systems that, integrating qualitative and quantitative analysis, succeed in going up again to the cause-effect relations from which the value originate and spread (Merchant & Riccaboni, 2001). Such multidimensional systems, founded upon a whole balance of indicators of bookkeeping and extra-bookkeeping nature, financial and physical techniques, could satisfy the manifold objectives and the various informative necessities connected to the performance measurement of strategic changes.

## FRAMEWORK BUILDING FOR PERFORMANCE MEASUREMENT IN STRATEGIC CHANGES

### *Theoretical Development: Following the Causal Model*

If strategic change success depends on the identified dimensions, these need to be understood, measured and improved. The need is to identify and define required changes, though the definition of success measures is important. Each dimension may be considered in its systemic attitude to simultaneously support the change management process.

Based on the previous literature review, a framework for performance measurement in strategic changes was theoretically developed following the logic underlying the most appreciated multidimensional systems: the causal model (Epstein, Kumar, & Westbrook, 2000; Keats & Hitt, 1988).

If more successful performance measurement systems choose performance indicators on the basis of causal model, we have to lay out the reasonable cause and effect relations that may exist between the drivers of each dimension and strategic change outcomes.

This allows to answer to the demand of selection around all the measures available facing one of the common mistake that Ittner and Larcker found firms make: “When companies don’t know what to measure, they often measure too much” (Ittner & Larcker, 2003).

Following the causal model (Fig. 1):

- first, we defined the dimensions of the performance measurement system coinciding with the 11 dimensions of analysis for strategic change found by literature review;
- second, since performance measures have not the same weight for every strategic change process, for each dimension we investigate the main options in order to assign, with reference to different change types, relative weights to different measures;
- third, for each change type we search for critical success factor, drivers of the strategic change process success;
- fourth, by the analysis of cause–effect links and the specification of financial and non-financial measures related to critical success factors, we select key performance indicators directly tied to the goals of change.

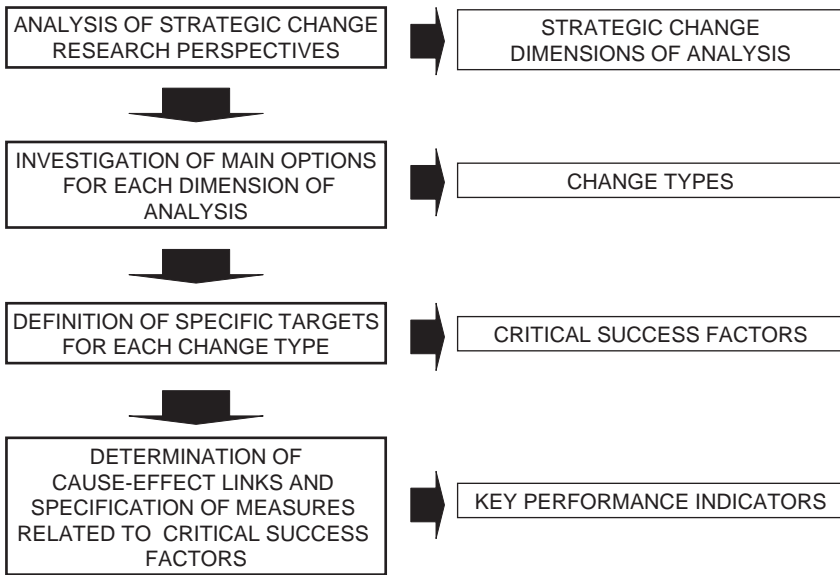


Fig. 1. The Logic Underlying the Theoretical Framework Building.

### *Linking Measures to Strategic Change Dimensions*

Starting from findings of literature review and following the causal model, we link key performance indicators to strategic change dimensions as described below.

#### *Innovation Capability*

This dimension is affirming more and more as a critical factor to increase the potential in achieving a competitive advantage in the actual environments (Epstein et al., 2004). The firms with scarce innovative ability will have to primarily pay attention to the first step of the innovation process: idea generation (Flynn & Chatman, 2004; Hansen & Birkinshaw, 2007). Instead, firms with high level of innovation capability would pay greater attentions towards the economic-financial results of the innovation and the possibilities to break the rules of the game (Aaker, 2001; Andrew & Sirkin, 2006).

#### *Financial Status*

Strategic changes take place differently according to the “financial status” of the firm in which they occur. A crisis imposes some ties in the change

planning in terms of financial resources, already scarce, and time-frame horizons (Garzella, 2005; Johnson et al., 2008). In dysfunctional status, the problems of effectiveness and efficiency impose the search, before, for operating profit and, then, for net income. In positive/success conditions good financial results represents a favour option to seek the value creation assembling on the potential synergies.

#### *Timing*

One of the most critical aspects is the capability to individualize the best timing for change: senior managers need to balance the opportunities “to grasp” the actual business idea with the risk to introduce late the new business model (Foster & Kaplan, 2001; Govindarajan & Trimble, 2005). In awaiting changes, firm may monitor and manage risks about starting in sub-optimal times when strategy is already in the decline stage of its life cycle; starting up front, when the previous business model has not undertaken the descending phase of life cycle curve, is relevant to check both the risk of product cannibalization and the development of the new business model (Audia, Locke, & Smith, 2000; Foster & Kaplan, 2001).

#### *Depth of Change*

It expresses the impact that the change process has on the firm’s operational conditions (Gibson & Birkinshaw, 2004; Flamholtz & Randle, 2008; Siggelkow & Levinthal, 2003; Tushman & O’Reilly, 1996). The evolutionary change consists of an improvement of what the firm already is. The strategy evolves in its own structures, competences, technologies and markets through slow incremental changes, with the risk that such attitude could be insufficient, facing deep modifications in the competitive context (Lynch & Cross, 1995; Lynch, 1997). The radical change, involves a depth impact on strategy, with possible change resistances and relevant variations in the customer image perception (Coch & French, 1948; Lawrence, 1954; Klein, 1969).

#### *Firm–Environment Relation*

Different directions taken by firm–environment relation design alternative change options (Flamholtz & Randle, 2008; Hambrick & Schecter, 1983). We distinguish between: proactive changes, when the business model of the firm imposes its structure to the external environment, and it is important to achieve and defend the advantage of the “first mover”; adaptive-reactive changes, processes of adaptation of business model to the external environment, when firms try to reduce the gap from market leaders by the

adoption of rules of the game consolidated in the industry (Audia et al., 2000; Charitou & Markides, 2003; Markides & Geroski, 2004).

### *Planning*

The vision, the strategic leading ideas and the connected implementation actions can be defined in more articulated ways in relation to the formalization level of change (Abell, 1980; Westley & Mintzberg, 1989). When the vision leads the action of senior managers in planning stage: to manage change means to assure the transition from the initial state to the programmed state (Gill, 2003). On the contrary, when the level of planning is limited, firms, in presence of an effective leadership, can exploit a greater flexibility in the management action, whose objectives are modified and progressively clarified with the advancement of the change process (Graetz, 2000; Hill & Jones, 1998).

### *Most Involved Stakeholders*

Changes can have a narrow or ampler involvement of the different categories of stakeholders and relations existing among them (Espeland & Hirsch, 1990; Grusky, 1963; Guest, 1962; Harrison, Torres, & Kukalis, 1988; Haveman, Michael, Russo, & Ivieyer, 2001). Planning and implementation of the strategic change can result in some changes in the ownership and being submitted to the same people that led the firm in past, or to new boards of directors, managers and staff employees: change management needs the management control of specific performance indicators about the most involved stakeholders (Wiersema & Bantle, 1992; Sliwka, 2007).

### *Mode of Expansion*

With reference to this dimension, the change realizes an internal development, if pursued by the organization's own resources. Searching and using resources of others organizations to reach strategic change aims leads to mergers and acquisitions or strategic alliances. The choice of the mode of expansion involves different characteristics, often antithetical, of change processes in terms of rapidity, reversibility, investments and odds of success (Christensen & Overdorf, 2000; Collis & Montgomery, 1997).

### *Business Model Renewal*

The results are remarkable with reference to the intensity of changes in relations among key competences and business structure, product system and competitive advantage, industry and its critical factors of success: from the risk to fail in acquiring the key resources necessary to the success of a

business model deeply modified to the risk of losing past competitive advantages for moderate renewals (Anthony, Eyring, & Gibson, 2006; Hamel & Välikangas, 2003).

#### *Organizational Change*

Inextricably linked to business model renewal, this dimension renders explicit the decisions related to the evaluation of the organizational structures that could better reduce times or make more effective strategy implementation (Johnson, 1992). The change needs different tools and attention with reference to the more or less invasive character assumed by changes (Kotter, 1996; Smith & Tushman, 2005).

#### *Funding Decisions*

Funding decisions, related to both previous dimensions management, are aimed to modify the financial structure of the organization, attracting the necessary financial resources to hold up planned investments to the firm. With reference to financial resources selection, we can distinguish between decisions more or less oriented to equity or debt. In the first option, the firm may control the capability of adequately remunerating equity by dividends or capital gains while in the second option, the prevailing appeal to debt have to be compatible with a suitable flexibility of financial structure and a balanced structure on the right hand side of balance sheet (Andrew & Sirkin, 2006; Kanter, 2006).

#### *First Stage Empirical Research: Specialists Interviews*

The analysis of the literature was completed by interviewing 20 specialists (10 academics teaching in Parthenope University of Naples, University of Pisa and University of Rome, 5 consultants managing strategic change processes and 5 executives of Italian firms involved in strategic changes) of performance measurement and strategies (Anderson, Heriot, & Hodgkinson, 2001; Huff, 2000). The choice was driven by expediency reasons: academics, consultants and executives, were specialists involved in previous researches on strategic changes, turnarounds and mergers and acquisitions. We structured the interviews around open-ended questions about theoretical framework, analysis dimensions and measures. Most of interviews were face-to-face, and in two cases more than one respondent were involved. All interviews were developed around interactive discussions, and research issues were related to changes that respondents had experienced and were experiencing (Huff & Jenkins, 2002).



Though the framework described in this paper, based on previous literature and researches, is greatly supported by these interviews, especially in the selection of change types and performance indicators, this process clarifies the relevance of some types of changes, and also adds some additional measures not found in the previous literature review.

Furthermore, these interviews were a pilot study for a subsequent web questionnaire survey: answers from professionals and executives provide an useful pretest to identify most relevant questions in the web-mail survey (Maltz, Shenar, & Reilly, 2003).

## THE PERFORMANCE MEASUREMENT SYSTEM

According to the framework described above, we build a performance measurement system where the 11 dimensions found are related to 3 different stage of the strategic change management process: the starting point, where dimensions describe the “status quo” of the firm; the definition of the strategic approach, involving the choice of the relations among strategy, industry life cycle and firm’s structure; the change process management, representative of the main operative decisions both at corporate and business unit levels.

In the chart used for the representation (Table 1) the system is articulated in four sections:

- (1) three “change stages”, steps of the strategic change management process;
- (2) eleven “dimensions”, the most important profile of analysis for strategic change processes;
- (3) two to four “change types” for each dimension, starting points or decisions options for mapping every strategic change process;
- (4) two to four performance indicators for each change type, financial and non-financial measures directly linked to the success of strategic changes.

While the change types of dimensions related to the “starting point” are data for managers, change types of dimensions related to the “strategic approach” and the “process management” are the results of managers’ decisions.

Besides, it is necessary to specify that change types, given conditions or strategic options, can be usefully thought of as existing on a continuum. At one end of the continuum, some variables and measures could be more important while at the other end, the same variables and measures could be less significant. However, to lead change towards the success, even

**Table 1.** A Performance Measurement System for Strategic Change Processes.

(1) Change stage	(2) Dimensions	(3) Change Types	(4) Key Performance Indicators
Starting point	Innovation capability	Low	<ul style="list-style-type: none"> <li>- Number of new patents</li> <li>- Amount of R&amp;D investments</li> <li>- Number of new innovative ideas</li> </ul>
		Sufficient	<ul style="list-style-type: none"> <li>- Number of incremental innovations</li> <li>- New patents revenues/number of new patents</li> <li>- Training investments</li> </ul>
		High	<ul style="list-style-type: none"> <li>- Innovation payback</li> <li>- "Time to market" total and by step</li> <li>- Revenues by innovative products</li> <li>- Breakthrough innovations</li> </ul>
	Financial status	Crisis	<ul style="list-style-type: none"> <li>- EBITDA</li> <li>- Net financial position</li> <li>- <math>\Delta</math> net working capital</li> </ul>
		Dysfunctional	<ul style="list-style-type: none"> <li>- Net income</li> <li>- Operating income</li> <li>- <math>\Delta</math> operating leverage</li> </ul>
		Positive/success	<ul style="list-style-type: none"> <li>- Value creation</li> <li>- Synergy value</li> <li>- Strategic options value</li> </ul>
	Timing	Awaiting	<ul style="list-style-type: none"> <li>- <math>\Delta</math> market share</li> <li>- Start-up costs</li> <li>- Break-even time</li> <li>- Time to cash</li> </ul>
		Up front	<ul style="list-style-type: none"> <li>- Post-launch investments</li> <li>- <math>\Delta</math> industry's revenues</li> <li>- Cannibalization of old products</li> </ul>
	Strategic approach	Change depth	Evolutionary
Radical			<ul style="list-style-type: none"> <li>- Resistances to change</li> <li>- Key people drops</li> <li>- Customer image perception</li> </ul>

**Table 1.** (Continued)

(1) Change stage	(2) Dimensions	(3) Change Types	(4) Key Performance Indicators
	Firm–environment relation	Adaptive/reactive	<ul style="list-style-type: none"> <li>– <math>\Delta</math> corporate market share/<math>\Delta</math> leader market share</li> <li>– <math>\Delta</math> industry-strategic group revenues</li> <li>– Competitor's resources replicability</li> </ul>
		Proactive	<ul style="list-style-type: none"> <li>– Speed of <math>\Delta</math> volumes for new industry or strategic group</li> <li>– Number of potential new entrants</li> <li>– Distinctive resources uniqueness</li> </ul>
Process management	Planning	High formalized	<ul style="list-style-type: none"> <li>– Actual performance/planned performance</li> <li>– <math>\Delta</math> basic assumptions</li> <li>– Numbers of changes in planned programs</li> </ul>
		Low formalized	<ul style="list-style-type: none"> <li>– Vision diffusion level</li> <li>– Chief officers leadership</li> </ul>
	Most involved stakeholders	Ownership	<ul style="list-style-type: none"> <li>– Capital control vitality</li> <li>– <math>\Delta</math> control share</li> </ul>
		Corporate bodies	<ul style="list-style-type: none"> <li>– Board of directors turnover</li> <li>– <math>\Delta</math> corporate governance model</li> <li>– Number of external directors</li> </ul>
		Management	<ul style="list-style-type: none"> <li>– Management turnover</li> <li>– <math>\Delta</math> management features</li> <li>– Number of temporary managers</li> </ul>
		Staff	<ul style="list-style-type: none"> <li>– Staff turnover</li> <li>– Number of employees</li> </ul>
	Mode of expansion	Internal development	<ul style="list-style-type: none"> <li>– Actual timings/goal timings</li> <li>– Industry competitiveness</li> <li>– Actual investments/planned investments</li> </ul>
		Alliances	<ul style="list-style-type: none"> <li>– Achieved/transferred know-how</li> <li>– % of joined resources</li> <li>– Duplication diseconomies</li> </ul>
		Mergers and acquisitions	<ul style="list-style-type: none"> <li>– Cultural integration level</li> <li>– Financial autonomy index</li> <li>– Actual synergy/planned synergy</li> </ul>

**Table 1.** (Continued)

(1) Change stage	(2) Dimensions	(3) Change Types	(4) Key Performance Indicators
	Business model renewal	Relevant	<ul style="list-style-type: none"> <li>- Key resources</li> <li>- % of new customers</li> <li>- % penetration of new markets</li> </ul>
		Moderate	<ul style="list-style-type: none"> <li>- Δ competitive advantage sources</li> <li>- Δ critical success factors</li> <li>- Δ competitive advantage</li> </ul>
	Organizational change	Invasive	<ul style="list-style-type: none"> <li>- Sense of urgency perceived</li> <li>- Level of vision sharing</li> <li>- Sense of belonging</li> </ul>
		Not much invasive	<ul style="list-style-type: none"> <li>- New roles required/covered</li> <li>- New tasks required/performed</li> <li>- Δ required skill/actual skills</li> </ul>
	Funding decisions	Equity	<ul style="list-style-type: none"> <li>- Capital gain</li> <li>- Δ dividend flow</li> <li>- Forward financial flows</li> </ul>
		Debt	<ul style="list-style-type: none"> <li>- Actual flows</li> <li>- Δ interest</li> <li>- Financial flexibility index</li> </ul>

though assigning them a different rank of correspondence and importance, a systematic analysis of dimensions and measures is needed. The structure of the performance measurement proposed can support, by this way, the acknowledgment of the criticalities of each strategic change process and favour its management.

*How to Use the Performance Measurement System*

The performance indicators system (Fig. 2) is finalized to lead the change management processes of firms:

- “ex-ante”, in the planning stage, suggests the most important dimensions to define, pushing the management to be aware of change types and to build strategic change road maps: the challenge is to focus on the most relevant dimension, making change manageable;

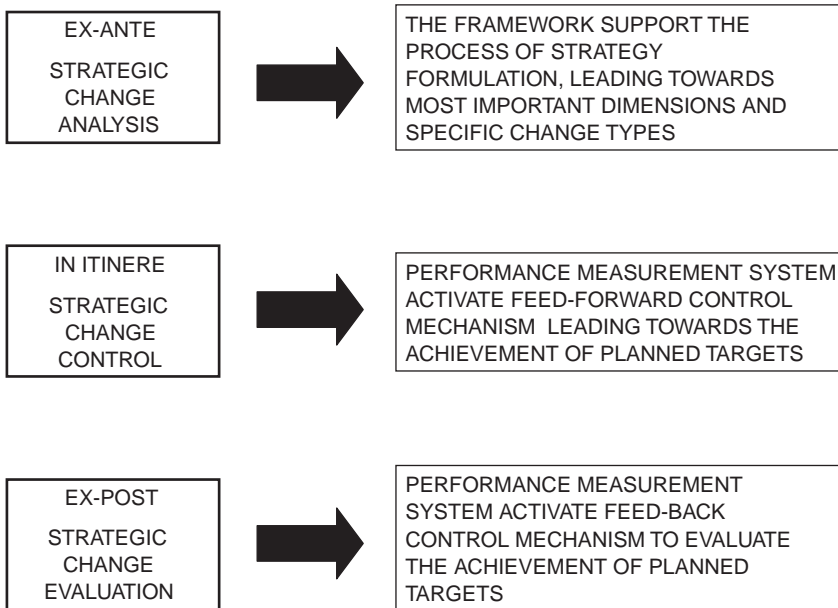


Fig. 2. The Performance Measurement System and the Change Process Stages.

- “in itinere”, in the implementation stage, the performance measurement integrate firm’s control favouring the check of change process and, if required, to activate by feed-forward mechanism correctives leading towards the achievement of planned targets or their redefinition: the assessment of the possibilities of achieving the main change objectives, so to advance the appropriate corrective action or to revise the objectives and planned actions due to corrections of the initial assumptions;
- “ex-post”, in the evaluation stage, allows an audit action of strategic change process by feedback mechanisms, determining whether the design and implementation actions produced the desired results.

Since the importance of the performance measurement “timing” is recognized, it would be appropriate to establish a time-frame horizon for the control of intermediate results and the evaluation of final results (Goold & Quinn, 1990; Lorange & Vancil, 1977). In this respect, the objectives for each performance indicator should be formulated as guidelines in order to make subsequent revisions and additions, which may be necessary.

This approach implemented through the process of splitting into “blocks”, which promote the reduction of the complexity of the strategic change process emphasizing the interrelationship among several blocks, will specify the period of performance and the expected date of completion. Each block is defined by reference to “critical events” (basic stages of realization) that, having operational dimensions and different durations, delineate a process of dynamic control for non-regular intervals (Lorange & Vancil, 1977): strategic change control would be realized by many short-term steps that lead to long-term goals such as milestones or interim targets (Goold & Quinn, 1990; Johnson et al., 2008).

Accordingly, the individualized measures assume a double dress: “lagging indicators”, that they manifest after the change, measuring the achieved results but not their determinants; “leading indicators”, to drive at each “milestone” the strategic change process management (Kaplan & Norton, 1996).

The management control process, that can make the change governance more rational and aware may be used, however, in the awareness that:

- there is a high degree of uncertainty around the predictability and stability of the future;
- it is not sufficient in itself to ensure the success of strategic changes;
- it cannot darken the typical characters of the entrepreneurship (Agliati, 2005).

## **THE VALIDITY OF PERFORMANCE MEASUREMENT SYSTEM: A WEB-MAIL SURVEY**

In order to have exploratory research findings about the validity of performance measurement system described, we submitted it to a further analysis. The survey addresses three questions specifically: Are these measures relevant for monitoring strategic changes? Which are strengths and weakness of this performance measurement system? Which types of firms are these measures useful for? Answers to these questions help us to check and after improve our framework.

### *Sample*

A web survey was sent to a sample team of administrative and financial managers. The choice of the sample was driven by the opportunity to submit

the performance measurement system to people who participate both in the definition of the performance measurement systems and in management control processes (Balogun, Huff, & Johnson, 2003). This choice is consistent to previous researches in the same stream of studies (BCG, 2006; Gates & Very, 2003; Green et al., 1995).

ANDAF is an association aimed to building a network among its members:

- to promote the exchange of experiences and information between those responsible for administration, finance, control management, planning and internal auditing functions of Italian companies;
- to contribute to the training, the professional development and gaining their views and needs.

The association operates: nationally, through an headquarter and local branches; internationally, through the World Federation IAFEI and the European EFFEI. ANDAF has about 1,500 members with diversified geographical origin on the Italian territory, working in firms and institutions in manifold industrial sectors, with different dimensions and competitive issues.

Six firms with recent experiences of strategic change processes were directly involved in the survey. Particularly, respondents are administrative and financial directors in firms:

- operating in industries such as hygiene services, medical, real estate, moulding plastics, manufacturing and yachting;
- with more than 30 million euros of revenues and more than 100 employees;
- involved in changes processes such as corporate restructuring and cultural change, entry into new markets by internal and external development, technological transformations, business model renewal after “private equity” acquisition.

### *Survey*

Starting from research questions and supported by feedbacks of the interviews, we developed the survey in five areas. The first area involves data about respondents, firms and faced strategic changes. The second group of questions concerns “dimensions of analysis” relevance and usefulness. The third area of inquiry concerns “performance indicators” use and usefulness. The fourth area examines usefulness and applicability of the overall performance measurement system. The final area asks respondents

to indicate their suggestions for framework improvement. In first, second and final areas survey proposes open questions. Instead in the third and fourth areas respondents use a five-point scale: very high, high, average, low, very low.

The questionnaire included the chart with the overall performance measurement system and also explanations about the theoretical framework.

### *Results*

Business model renewal and financial status are the most analysed dimensions in the firms of the sample (Table 2). Also, if firms use “tableau de bord” or “balance scorecard”, respondents pay attention first to the competitive or financial status.

The use of performance indicators reported in the performance measurement system show divergent results. Any respondent answers a very high use. In two firms the use is high and in others two it is average. But in the last two firms the use is low and very low, respectively. These results are consistent with the last survey on performance measurement systems in Italian firms that highlight needs for improvements (Busco, Riccaboni, & Saviotti, 2007).

Results about applicability and usefulness of the overall performance measurement seem to validate our framework in administrative and financial managers' perspectives. Specifically, usefulness is high for three respondents, average for two respondents and low for only one. Results are partially different for system applicability: two times it is high and four times average.

Answers about use, applicability and usefulness of proposed key performance indicators show interesting considerations. Also, if the use of financial or non-financial measures is low they judge their applicability and usefulness as high. It is worth noting that firms often do not use performance indicators because they do not catch their possible use, especially for what concerns financial measures, and not because they think they are not relevant.

## **DISCUSSION**

Interviews with academics, professionals and executives show a great interest around the strategic change management and the related performance measurement issues.



**Table 2.** Main Results of Web Questionnaire Survey.

Industry	Respondents	Strategic Changes	Most Analysed Dimensions	Performance Indicators Use	System Applicability	System Usefulness
Hygiene services	CFO	Turnaround with strong organizational change	Business model renewal; funding decisions	High	High	Average
Real estate of retail	CFO	New market entry	Financial status	High	High	High
Moulding plastics	Financial manager and HR manager	New corporate strategies	Innovation capability; business model renewal	Average	Average	Average
Manufacturing	CFO	New business entry by acquisition strategies	Mode of expansion	Very low	Low	Average
Medical	CFO and product manager	New markets entry exploiting firms own competences	Innovation capability; financial status	Average	High	High
Yachting	CFO	Business model renewal after private equity fund acquisition	Business model renewal; financial status; funding decisions	Low	Average	Average

In the second stage of the empirical research we have also explored framework's validity and applicability to administrative and financial managers. The choice of a sample among Italian financial and administrative directors, also representing a limit for the generalization of the results, has been induced from reasons of expediency, based on good relationships with the ANDAF, assurance of support and collaboration. Besides, the presence of directors working in international and multinational firms should guarantee enough possibilities of results extension.

The limited number of firms surveyed by questionnaires does not make quantitative analysis possible but give important indications about:

- the usefulness of framework and performance measurement system in several change processes management;
- the importance to fit key performance indicators proposed with financial and non-financial measures specific of each business and industry;
- the applicability of performance indicators, larger in medium- and large-sized firms with an efficient organizational structure and effective information systems and management control processes;
- the managers' capability to arrange this performance measurement system to corporate decision process in order to avoid every risk of limiting strategic flexibility (Preble, 1992; Schreyogg & Steinmann, 1987).

In such sense, the elaboration of the framework and the exploration of its value and applicability set new issues for the future:

- to analyse its effectiveness in the strategic changes in selected business cases, where the framework may be applied for measuring performance and to appraise the support to change management process;
- to investigate the compatibility with the performance measurement systems, actually used from firms;
- to verify possible organizational impacts from the introduction of the framework.

## **CONCLUSIONS**

Strategic change management can be a challenging task that requires careful performance measurement before, during and after the process. The demand to build a performance measurement system with a suitable level of synthesis has made necessary to circumscribe the dimensions of change

analysis and to select a limited number of indicators among the manifold available.

From the discussion above, measuring strategic change processes assumes that the management involved to:

- formulate the strategy – analysing the starting point and designing the strategic change plan taking into account the most important dimensions and change types;
- relate performance indicators to the specific features of its own strategic change process – identifying targets and key success factors;
- define milestones – by reference to critical events;
- adopt feed-forward and feedback control mechanisms leading the strategic change.

This way, we identify a set of potential baseline measures across 11 success dimension that can be examined as applicable to different change processes and firm types. The performance measurement system allows the preliminary definition of financial and non-financial measures to lead design and implementation of strategic changes.

It emerges, besides, as the proposed framework can favour:

- the odds of success for strategic change processes;
- the articulated design of the strategic change and the adoption of the proper tools for the implementation, clarifying “where firm wants to go and how”;
- the management involvement, pushing to reflect on the validity of the new strategy, rendering more explicit anticipated objectives, actions and achieved results;
- chief financial officers in their activities of reporting, leading to the selection of key performance indicators that may be shown to boards;
- the production of an information flow implicitly turned by the firm towards external stakeholders, in order to individualize, before, and to coordinate, then, the privileged tools for the success of strategic change.

This multidimensional performance measurement system can improve the firm’s ability to adapt and survive in the ever changing business environment. Firms can use this framework as a starting point for choosing measures that would best fit their strategic change.

In every case, this performance measurement system should be harmonized with the tools of management control commonly used by firms, for daily management.

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## REFERENCES

- Aaker, D. A. (2001). *Strategic market management*. New York, NY: Wiley.
- Abell, D. F. (1980). *Defining the business. The starting point of strategic planning*. Englewood Cliffs, NJ: Prentice Hall Inc.
- Abell, D. F. (1993). *Managing with dual strategies*. New York, NY: The Free Press.
- Agliati, M. (2005). *Budget e controllo di gestione*. Milano, Italy: Il Sole 24 Ore.
- AIAF. (2006). *Innovation focus indicators*. Rivista AIAF, No. 58, suppl. 126.
- Amigoni, F. (1988). *Misurazioni d'azienda*. Milano, Italy: Giuffrè.
- Amigoni, F. (2001). Il value based management: i principi di fondo e gli impatti sui sistemi di pianificazione e controllo. *Finanza Marketing e Produzione*, 19(1), 7–23.
- Anderson, N., Heriot, P., & Hodgkinson, G. P. (2001). The practitioner-researcher divide in industrial work and organizational psychology: Where are we now and where do we go from here? *Journal of Occupational and Organizational Psychology*, 74(4), 391–411.
- Andrew, J., & Sirkin, H. (2006). *Payback: Reaping the rewards of innovation*. Cambridge, MA: Harvard Business School Press.
- Ansoff, H. I. (1965). *Corporate strategy*. New York, NY: McGraw-Hill.
- Anthony, R. N., Hawkins, D. F., Macri, D. M., & Merchant, K. A. (2001). *Sistemi di controllo*. Milano, Italy: McGraw-Hill.
- Anthony, S. D., Eyring, M., & Gibson, L. (2006). Mapping your innovation strategy. *Harvard Business Review*, 84(5), 104–113.
- Audia, P. G., Locke, E. A., & Smith, K. G. (2000). The paradox of success: An archival and a laboratory study of strategic persistence following radical environmental change. *Academy of Management Journal*, 43(5), 837–853.
- Baden Fuller, C., & Pitt, M. (1995). *Strategic innovation*. London: Routledge.
- Baden Fuller, C., & Stopford, J. (1992). *Rejuvenating the mature business*. London: Routledge.
- Balogun, J., Huff, A. S., & Johnson, P. (2003). Three responses to the methodological challenges of studying strategizing. *Journal of Management Studies*, 40(1), 197–224.
- Barker, V. L., III., & Duhaime, I. M. (1997). Strategic change in the turnaround process: Theory and empirical evidence. *Strategic Management Journal*, 18(1), 13–38.
- Bastia, P. (1996). *Pianificazione e controllo dei risanamenti aziendali*. Torino, Italy: Giappichelli.
- Bergamin Barbato, M. (1991). *Programmazione e controllo in un'ottica strategica*. Torino, Italy: Utet.
- Bertini, U. (1991). Strategie di sviluppo interno e forme organizzative. In: A. Gozzi (Ed.), *La definizione e la valutazione delle strategie aziendali*. Milano, Italy: Etas.
- Bertini, U. (1995). *Scritti di politica aziendale*. Torino, Italy: Giappichelli.

- Bianchi Martini, S. (2000). I processi di finanziamento. In: L. Marchi (Ed.), *Introduzione all'economia aziendale. Il sistema delle operazioni e le condizioni di equilibrio aziendale*. Torino, Italy: Giappichelli.
- Bianchi Martini, S. (2001). *Idee e strategia*. Pisa, Italy: Il Borghetto.
- Boston Consulting Group. (2006). *Measuring innovation 2006*. Available at: [www.bcg.com/expertise\\_impact/publications](http://www.bcg.com/expertise_impact/publications)
- Bourguignon, A., Malleret, V., & Norreklit, H. (2004). The American balanced scorecard versus the French tableau de bord: The ideological dimension. *Management Accounting Research, 15*(2), 107–134.
- Bromwich, M., & Bhimani, A. (1994). *Management accounting: Pathways to progress*. London: CIMA publishing.
- Bruggeman, W., & Van der Stede, W. (1993). Fitting management control systems to competitive advantage. *British Journal of Management, 4*(3), 205–218.
- Brunetti, G. (1987). Il controllo di gestione nei processi di risanamento aziendale. In: AA.VV., *Crisi di impresa e strategie di superamento*. Milano, Italy: Giuffrè.
- Bruni, G. (2007). Le informazioni complementari al bilancio. Quale reporting revolution? *Rivista Italiana di Ragioneria e di Economia Aziendale, 107*(1/2), 2–15.
- Burns, J., Ezzamel, M., & Scapens, R. W. (2003). *The challenge of management accounting change: Behavioural and cultural aspects of change management*. London: CIMA publishing.
- Burns, J., & Scapens, R. W. (2000). Conceptualizing management accounting change: An institutional framework. *Management Accounting Research, 11*(1), 3–25.
- Busco, C., & Riccaboni, A. (2004). Governare il cambiamento con la misurazione e il controllo della performance. *Controllo di gestione, 1*(2), 54–65.
- Busco, C., Riccaboni, A., & Saviotti, A. (2007). *Governance, Strategia e misurazione della performance. Le nuove frontiere della Balanced Scorecard*. Arezzo, Italy: Knowita Editore.
- Cesaria, R. (2003). La gestione del cambiamento. *Sviluppo & Organizzazione, 200*, 17–31.
- Charitou, C. D., & Markides, C. (2003). Responses to disruptive strategic innovation. *Sloan Management Review, 44*(2), 55–63.
- Christensen, C., & Overdorf, M. (2000). Meeting the challenge of disruptive change. *Harvard Business Review, 78*(2), 66–76.
- Christensen, C. M., & Raynor, M. E. (2003). *The innovator's solution: Creating and sustaining successful growth*. Cambridge, MA: Harvard Business School Press.
- Coch, L., & French, J. R. P. (1948). Overcoming resistance to change. *Human Relations, 1*(4), 512–532.
- Coda, V. (1984). La valutazione della formula imprenditoriale. *Sviluppo & Organizzazione, 82*, 7.
- Coda, V. (1987). Le tappe critiche per il successo dei processi di ristrutturazione aziendale. In: AA.VV., *Crisi d'impresa e strategie di superamento*, Milano, Italy: Giuffrè.
- Coda, V. (2004). Le determinanti del successo aziendale negli studi di strategia. In: G. Invernizzi (Ed.), *Strategia e politica aziendale: testi*. Milano, Italy: McGraw-Hill.
- Coda, V., & Mollona, E. (2006). Dynamics of strategy: A feedback approach to corporate strategy-making. In: G. Minati, E. Pessa & M. Abram (Eds), *Systemics of emergence. Research and development*. New York: Springer.
- Collis, D. J., & Montgomery, C. (1997). *Corporate strategy*. New York, NY: McGraw-Hill.
- Conner, D. R. (1995). *Managing at the speed of change*. New York, NY: Villard Books.
- Damodaran, A. (2001). *Corporate finance. Theory and practice*. New York, NY: Wiley.

- Dawson, P. (1994). *Organizational change: A processual approach*. London: Paul Chapman Publishing.
- Dent, J. R. (1990). Strategy, organization and control: Some possibilities for accounting research. *Accounting, Organizations and Society*, 15(1/2), 3–25.
- Drucker, P. F. (1995). *Managing in a time of great change*. New York, NY: Truman Talley Books.
- Drucker, P. F. (1999). *Management challenges for 21st century*. New York, NY: Harper Business.
- Duck, J. D. (1993). Managing change: The art of balancing. *Harvard Business Review*, 71(6), 109–118.
- Eccles, R. G. (1991). The performance measurement manifesto. *Harvard Business Review*, 69(1), 131–137.
- Epstein, M., & Manzoni, J. (1998). Implementing corporate strategy: From tableaux de bord to balanced scorecard. *European Management Journal*, 16(2), 190–203.
- Epstein, M. J., Davila, T., & Matusik, S. (2004). Innovation strategy and the use of performance measures. *Advances in Management Accounting*, 13, 27–58.
- Epstein, M. J., Kumar, P., & Westbrook, R. A. (2000). The drivers of customer and corporate profitability: Modelling, measuring, and managing the causal relationships. *Advances in Management Accounting*, 9, 43–72.
- Epstein, M. J., Leonard, H. B., & Tritter, M. (2008). *The home depot: Leadership in crisis management*. Harvard Business School Case.
- Espeland, W. N., & Hirsch, P. M. (1990). Ownership changes, accounting practice and the redefinition of the corporation. *Accounting, Organizations and Society*, 15(1/2), 77–96.
- Ferrero, G. (1981). *Finanza aziendale*. Milano, Italy: Giuffrè.
- Flamholtz, E., & Randle, Y. (2008). *Leading strategic change: Bridging theory and practice*. Cambridge, MA: Cambridge University Press.
- Ford, M. W., & Greer, B. M. (2005). The relationship between management control system usage and planned change achievement: an exploratory study. *Journal of Change Management*, 5(1), 29–46.
- Foster, R. N., & Kaplan, S. (2001). *Creative Destruction*. New York, NY: Currency.
- Flynn, F. J., & Chatman, J. A. (2004). Strong culture and innovation. Oxymoron or Opportunity. In: M. L. Tushman & P. Anderson (Eds), *Managing strategic innovation and change*. Oxford: Oxford University Press.
- Galeotti, M. (2006). *Governo dell'azienda e indicatori di performance*. Torino, Italy: Giappichelli.
- Garzella, S. (2005). *Il sistema d'azienda e la valorizzazione delle potenzialità inesprese*. Torino, Italy: Giappichelli.
- Garzella, S. (2008). La progettazione, la valutazione e la comunicazione delle strategie economico-finanziarie. Il piano industriale. In: M. Galeotti (Ed.), *La finanza nel governo dell'azienda*. Milano, Italy: Apogeo.
- Gates, S., & Very, P. (2003). Measuring performance during M&A integration. *Long Range Planning*, 36(2), 167–186.
- Ghemawat, P. (1991). *Commitment: The dynamic of strategy*. New York, NY: Free Press.
- Giannessi, E. (1982). *L'equazione del fabbisogno di finanziamento*. Milano, Italy: Giuffrè.
- Giannetti, R., & Marelli, A. (2004). Un nuovo ruolo delle misure non finanziarie nella contabilità direzionale? I risultati di un'indagine empirica. In: AA.VV., *L'evoluzione del controllo di gestione*. Milano, Italy: F. Angeli.

- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226.
- Gilardoni, A., & Danovi, A. (2000). *Cambiamento, ristrutturazione, e sviluppo dell'impresa*. Milano, Italy: Egea.
- Gill, R. (2003). Change management or change leadership. *Journal of Change Management*, 3(4), 307–318.
- Goodstein, J., & Boeker, W. (1991). Turbulence at the top: A new perspective on governance structure changes and strategic change. *Academy of Management Journal*, 34(2), 306–330.
- Goold, M., & Quinn, J. J. (1990). *Strategic control. Milestones for long-term performance*. London: The Economist Books/Hutchinson.
- Govindarajan, V. (1988). A contingency approach to strategy implementation at business unit level: Integrating administrative mechanism with strategy. *Academy of Management Journal*, 31(4), 828–853.
- Govindarajan, V., & Trimble, C. (2005). *Ten rules for strategic innovators*. Cambridge, MA: Harvard Business School Press.
- Graetz, F. (2000). Strategic change leadership. *Management Decisions*, 38(8), 550–562.
- Green, S. G., Gavin, M. B., & Aiman Smith, L. (1995). Assessing a multidimensional measure of radical technological innovation. *IEEE Transactions on Engineering Management*, 42(3), 203–215.
- Grusky, O. (1963). Managerial succession and organizational effectiveness. *American Journal of Sociology*, 69(1), 21–31.
- Guatri, L. (1995). *Turnaround. Declino, crisi e ritorno al valore*. Milano, Italy: Egea.
- Guest, R. H. (1962). Managerial succession in complex organizations. *American Journal of Sociology*, 68(1), 47–54.
- Hambrick, D. C., & Schecter, S. M. (1983). Turnaround strategies for mature industrial-product business units. *Academy of Management Journal*, 26(2), 231–248.
- Hamel, G. (1998). The challenge today: Changing the rules of the game. *Business Strategy Review*, 9(2), 19–26.
- Hamel, G., & Prahalad, C. (1995). *Competing for the future*. Cambridge, MA: Harvard Business School Press.
- Hamel, G., & Välikangas, L. (2003). The quest for resilience. *Harvard Business Review*, 81(9), 52–63.
- Hansen, M. T., & Birkinshaw, J. (2007). The innovation value chain. *Harvard Business Review*, 85(6), 121–130.
- Harrison, J. R., Torres, D. L., & Kukalis, S. (1988). The changing of the guard: Turnover and structural change in top-management positions. *Administrative Science Quarterly*, 33(2), 211–232.
- Haveman, H. A., Michael, V., Russo, M. V., & Ivieyer, A. D. (2001). Organizational environments in flux: The impact of regulatory punctuations on organizational domains, CEO succession, and performance. *Organization Science*, 12(3), 253–273.
- Higgs, M., & Rowland, D. (2005). All changes great and small: Exploring approaches to change and its leadership. *Journal of Change Management*, 5(2), 121–151.
- Hill, C. H., & Jones, G. (1998). *Strategic management: An integrated approach*. New York, NY: Houghton Mifflin.
- Huff, A. S. (2000). Changes in organizational knowledge production. *Academy of Management Review*, 25(2), 288–293.
- Huff, A. S., & Jenkins, M. (2002). *Mapping strategic knowledge*. London: Sage Publications.

- Ittner, C. D., & Larcker, D. F. (1998). Are non financial measures leading indicators of financial performance? An analysis of customer satisfaction. *Journal of Accounting Research*, 3(3), 1–35.
- Ittner, C. D., & Larcker, D. F. (2003). Coming up short on nonfinancial performance measurement. *Harvard Business Review*, 81(11), 88–95.
- Jick, D. (1993). *Managing change – cases and concepts*. Boston, MA: Irwin.
- Johnson, G. (1992). Managing strategic change. *Long Range Planning*, 25(1), 28–36.
- Johnson, G., Scholes, K., & Whittington, R. (2008). *Exploring corporate strategy*. London: Pearson Education.
- Kanter, R. M. (2006). Innovation: The classic traps. *Harvard Business Review*, 84(11), 72–83.
- Kaplan, R. S., & Norton, D. P. (1996). *Balanced scorecard: Translating strategy into action*. Cambridge, MA: Harvard Business School Press.
- Keats, B. W., & Hitt, M. A. (1988). A causal model of linkages among environmental dimensions, macro organizational characteristics and performance. *Academy of Management Journal*, 31(3), 570–598.
- Kennerley, M., & Neely, A. (2003). Measuring performance in a changing business environment. *International Journal of Operations and Production Management*, 23(2), 213–229.
- Klein, D. (1969). Some notes on the dynamics of resistance to change: The defender role. In: W. G. Bennis, K. D. Benne & R. Chin (Eds), *The planning change*. New York, NY: Ringhart & Winston.
- Kotter, J. P. (1996). *Leading change*. Cambridge, MA: Harvard Business School Press.
- Kotter, J. P. (2007). Leading change. Why transformation efforts fail. *Harvard Business Review*, 85(1), 96–103.
- Kotter, J. P., & Schlesinger, L. A. (2008). Choosing strategies for change. *Harvard Business Review*, 86(7/8), 130–139.
- Langfield-Smith, K. (1997). Management control systems and strategy: A critical review. *Accounting, Organizations and Society*, 22(2), 207–232.
- Lawrence, P. R. (1954). How to overcome resistance to change. *Harvard Business Review*, 32(3), 9–32.
- Lorange, P., & Vancil, R. F. (1977). *Strategic planning systems*. Englewood Cliffs, NJ: Prentice Hall.
- Lupano, P., Maraghini, M. P., & Saviotti, A. (2007). Balanced scorecard e gestione del cambiamento: il caso MEMC Europe. In: C. Busco, A. Riccaboni & A. Saviotti (Eds), *Governance, strategia e misurazione della performance. Le nuove frontiere della balanced scorecard*. Arezzo, Italy: Knowita Editore.
- Lynch, R. (1997). *Corporate strategy*. London: Pitman Publishing.
- Lynch, R. L., & Cross, K. F. (1995). *Measure up! Yardsticks for continuous improvement*. Cambridge, MA: Blackwell.
- Maltz, A. C., Shenar, A. J., & Reilly, R. R. (2003). Beyond the balanced scorecard: Refining the search for organizational success measures. *Long Range Planning*, 36(2), 187–204.
- Markides, C. (1997). Strategic innovation. *Sloan Management Review*, 38(3), 9–23.
- Markides, C., & Geroski, P. A. (2004). Racing to be second. Conquering the industries of the future. *Business Strategy Review*, 15(4), 25–31.
- Mazzola, P. (2003). *Il piano industriale: progettare e comunicare le strategie d'impresa*. Milano, Italy: Egea.
- Merchant, K. A., & Riccaboni, A. (2001). *Il controllo di gestione*. Milano, Italy: McGraw-Hill.



- Miller, D., & Friesen, H. (1984). *Organizations: A quantum view*. Englewood Cliffs, NJ: Prentice Hall.
- Mintzberg, H. (1994). *The rise and fall of strategic planning*. New York, NY: Free Press.
- Mintzberg, H., Ahlstrand, B., & Lampel, J. (2005). *Strategy safari*. London: Simon & Schuster.
- Modigliani, F., & Miller, M. (1958). The cost of capital corporate finance and the theory of investment. *American Economic Review*, 48(3), 261–297.
- Nambisan, S., & Sawhney, M. (2007). A buyer's guide to innovation bazaar. *Harvard Business Review*, 85(6), 109–118.
- Nanni, A. J., Dixon, R., & Vollman, T. E. (1990). Strategic control and performance measurements. *Cost Management*, 4(2), 33–43.
- Neumann, B., Roberts, M. L., & Cauvin, E. (2008). Financial and nonfinancial performance measures. *Journal of Cost Management*, 22(6), 5–14.
- Normann, R. (1977). *Management for growth*. New York, NY: Wiley.
- Normann, R. (2001). *Reframing business: when map changes the landscape*. New York, NY: Wiley.
- Oakland, J. S., & Tanner, S. (2007). Successful change management. *Total Quality Management*, 18(6), 572–589.
- Paolini, A. (1993). *Il controllo strategico. Uno schema d'analisi*. Milano, Italy: Giuffrè.
- Pendlebury, J., Grouard, B., & Meston, F. (1998). *The ten key to successful change management*. New York, NY: Wiley.
- Porter, M. E. (1980). *Competitive strategy*. New York, NY: Free Press.
- Preble, J. F. (1992). Toward a comprehensive system of strategic control. *Journal of Management Studies*, 29(4), 391–409.
- Rebora, G., & Minelli, E. (2007). *Change management. Come vincere la sfida del cambiamento in azienda*. Milano, Italy: Etas.
- Rieley, J. B., & Clarkson, I. (2001). The impact of change on performance. *Journal of Change Management*, 2(2), 160–172.
- Robert, M. (1998). *Strategy pure & simple II*. New York, NY: McGraw-Hill.
- Rumelt, R. P. (1974). *Strategy, structure and economic performance*. Cambridge, MA: Harvard University Press.
- Russel, R. (2003). *The international perspective: Balanced scorecard usage in Europe*. Cambridge, MA: Harvard Business School Press.
- Schmidt, S., Bateman, I., Breinlinger O'Really, J., & Smith, P. (2006). A management approach that drives actions strategically, Balance Scorecard in mental health trust case study. *International Journal of Health Care Quality Assurance*, 19(2), 119–135.
- Schreyogg, G., & Steinmann, H. (1987). Strategic control: A new perspective. *Academy of Management Review*, 12(1), 91–103.
- Schumpeter, J. (1994). *Capitalism, socialism and democracy*. London: Routledge.
- Selznick, P. (1964). *Work and motivation*. New York, NY: Wiley.
- Shank, J. K., & Govindarajan, V. (1993). *Strategic cost management: The new tool for competitive advantage*. New York, NY: Free Press.
- Shapiro, A. R. (2006). Measuring innovation: Beyond revenue from new products. *Research Technology Management*, 49(6), 42–51.
- Siggelkow, N., & Levinthal, D. (2003). Temporarily divide to conquer: Centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation. *Organization Science*, 14(6), 650–669.

- Simons, R. (1995). *Levers of control: How managers use innovative control systems to drive strategic renewal*. Cambridge, MA: Harvard Business School Press.
- Simons, R., Dávila, A., & Kaplan, R. S. (1999). *Performance measurement & control systems for implementing strategy: Text & cases*. Englewood Cliffs, NJ: Prentice Hall.
- Sliwka, D. (2007). Managerial turnover and strategic change. *Management Science*, 53(11), 1675–1687.
- Smith, W. D., & Tushman, M. L. (2005). Managing strategic contradiction: A top management model for managing innovation streams. *Organization Science*, 16(5), 522–536.
- Tushman, L. M., & O'Reilly, C. A., III. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4), 8–30.
- Tushman, L. M., & Romanelli, E. (1985). Organizational evolution: A metamorphosis model of convergence and reorientation. In: L.L. Cummings, B.M. Shaw (Eds), *Research in organizational behaviour*. (Vol. 17, pp. 171–222). Greenwich, CT: JAI Press.
- Tushman, M. L., & Anderson, P. (2004). *Managing strategic innovation and change*. Oxford: Oxford University Press.
- Tushman, M. L., & Smith, W. K. (2004). Innovations streams, organization designs, and organizational evolution. In: M. L. Tushman & P. Anderson (Eds), *Managing strategic innovation and change*. Oxford: Oxford University Press.
- Vaivio, J. (1999). Exploring a “non-financial” management accounting change. *Management Accounting Research*, 10(4), 409–437.
- Valdani, E. (2000). *L'impresa pro-attiva. Co-evolvere e competere nell'era dell'immaginazione*. Milano, Italy: McGraw-Hill.
- Volberda, B. W. (1996). Toward the flexible form: How to remain vital in hypercompetitive environments. *Organization Science*, 7(4), 359–374.
- Westley, F., & Mintzberg, H. (1989). Visionary leadership and strategic management. *Strategic Management Journal*, 10, 17–32.
- Westphal, J. D., & Fredrickson, J. W. (2001). Who directs strategic change? Director experience, the selection of new CEOs, and change in corporate strategy. *Strategic Management Journal*, 22(12), 1113–1137.
- Wiersema, M. F., & Bantle, K. A. (1992). Top management team demography and corporate strategic change. *Academy of Management Journal*, 35(1), 91–121.
- Williamson, O. E. (1975). *Markets and hierarchies*. New York, NY: Free Press.
- Wright, P. D., & Keegan, D. P. (1997). *Pursuing value: The emerging art of reporting in the future*. London: Price Waterhouse.
- Zan, L., Zambon, S., & Pettigrew, A. M. (1993). *Perspectives on strategic change*. New York, NY: Springer.
- Zattoni, A. (2004). *L'assetto istituzionale delle imprese italiane*. Milano, Italy: Egea.
- Zook, C. (2007). Finding your next core business. *Harvard Business Review*, 85(4), 66–75.



# NONFINANCIAL PERFORMANCE MEASURES: HOW DO THEY AFFECT FAIRNESS OF PERFORMANCE EVALUATION PROCEDURES?

Chong M. Lau and Erin Berry

## ABSTRACT

*Purpose – The purpose of this study is to investigate the process by which nonfinancial performance measures affect employee perceptions of how fair are their organizations' performance evaluation procedures. With increased interest in performance measurement systems that rely heavily on nonfinancial measures (e.g., balanced scorecard), it is important to understand the ramifications of these measures.*

*Methodology – Data are drawn from mail survey questionnaire responses of 121 Australian managers and analyzed by structural equation modeling.*

*Findings – The results provide support for the proposition that employees perceive the use of nonfinancial measures as fair. However, these effects are found to be indirect through (1) the enhancement of employee role clarity, and (2) the enhancement of the trust the employees have in their supervisors.*

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Research limitations and practical implications – *This study does not directly address the issue of whether nonfinancial measures will ultimately lead to improved overall organizational performance. However, the results do suggest that the use of nonfinancial measures for employee performance evaluation is beneficial. Hence, there may scope for increasing their role in the workplace. This may ultimately lead to improved organizational performance.*

Value of paper – *The current interest in multidimensional performance systems clearly necessitates systematic empirical investigation to ascertain their effectiveness and benefits. This study contributes in this regard by focusing on nonfinancial measures, a key component of multidimensional performance measurement systems. It also adds to our understanding of the process by such systems influence employee reactions and ultimately overall organizational performance.*

## INTRODUCTION

While nonfinancial measures are not new, there has been an increased interest in recent period in their roles in performance measurement and evaluation systems. The balanced scorecard in particular advocates the use of nonfinancial measures to complement financial measures to produce a comprehensive expression of an organization's measurement and performance evaluation system. Proponents of nonfinancial measures suggest that the employment of such measures may lead to many benefits including improvements in organizational and individual productivity, as well as the enhancements of employee morale, loyalty, and satisfaction (Kaplan & Norton, 1992, 1996; Niven, 2002).

A primary motivation in advocating the use of nonfinancial measures is the inadequacies associated with the traditional focus on financial measures to evaluate organizational and managerial performance. Kaplan (1984, p. 415) argues that the use of such financial measures is likely to encourage opportunistic behavior because they are relatively "easy to manipulate in ways that do not enhance the long term competitive position of the firm, and they become the focus of opportunistic behavior by divisional managers." As a solution, he proposes a greater role for nonfinancial measures.

While the above suggestion may ameliorate the inadequacies of financial measures, we do not know how employees, who are used to being evaluated by traditional financial measures, will react to the use of nonfinancial

measures as performance evaluation criteria. What are the consequences of changing from the more traditional financial measures to a system comprising multiple measures of nonfinancial nature? Would such measures clarify or cloud the employee roles? Would employees trust such measures and would such measures promote or reduce the trust between the employees and their superiors? Above all, would employees perceive these measures as fair?

The issue of fairness is important in the context of performance evaluation. Anthony and Govindarajan (2007, p. 556) suggest that in designing compensation system, top management should be aware that “objective, goals and standards are likely to provide strong incentive only if the manager perceive them as *fair*.” Kaplan and Atkinson (1998, p. 682) similarly argue that “there are important behavioral consideration that the performance measurement system must reflect. First and above all, the individual must believe that the system is *fair* ... Absent this belief, the motivational potential of incentive compensation will be lost.” Lind and Tyler (1988, pp. 11, 201) consider fairness “a major social concern” because “the research ... shows that when procedures are fair, the organization can expect to see greater employee satisfaction, less conflict and more obedience to procedures and decisions.” Based on their review of research on procedural fairness, they conclude as follows:

Wherever research has examined procedural justice it has been found that people care about the fairness of procedures. People may give different weights to various concerns as they decide in different situations what constitutes procedural justice, but they appear always to make procedural justice judgments and *these judgments are always important to them*. (Lind & Tyler, 1988, p. 141)

There is therefore little doubt that the employees’ perceptions of the fairness of their organizations’ performance evaluation systems will have profound behavioral consequences. However, while procedural fairness has been investigated extensively in legal, political, psychological, and organizational settings (Leventhal, 1980; Lind & Tyler, 1988; Folger & Konovsky, 1989), its application in management accounting setting has been quite limited.

More importantly, while there is an abundance of empirical evidence to suggest that positive employee perceptions of procedural fairness are likely to result in beneficial behavioral consequences, there is a lack of systematic empirical evidence in management accounting research on how and which aspects of the management control systems would enhance employee fairness perceptions. Prior management accounting studies involving fairness issues have generally focused on employee fairness perception as

an explanatory (independent) variable (Lindquist, 1995; Lau & Lim, 2002; Lau & Moser, 2008). In other words, they were generally interested in ascertaining the *consequences* of procedural fairness or how fairness in procedures affected employee behavior. The *antecedents* of employee fairness perceptions or how fairness perception is derived in the first instance have generally been less well understood. Top management and system designers probably do not need further reminder on the importance of fairness in performance evaluation systems. Instead, they are likely to be more interested in how they could enhance the fairness of their systems. Hence, an investigation on how the current interest in the use of nonfinancial performance measures can affect employee fairness perceptions may contribute not only to the development of fairer performance evaluation systems, but may also assist our understanding of the contributory factors of procedural fairness judgments on management control systems in general.

Considering the importance of performance evaluation to employees and the importance of fairness in such systems, our study aims to contribute to the literature by attempting to explain the process by which the use of nonfinancial measures are related to the fairness perceptions of employees. It proposes that nonfinancial measures would enhance employees' perceptions of how fair are their organizations' performance evaluation procedures. However, this relationship may not be a direct one. Instead, it is likely to be explained by two important intervening variables. Fig. 1 depicts the model employed in our study. It hypothesizes that the relationship between nonfinancial performance measures and fairness perception is indirect through (1) the extent of role clarity felt by the employees, and (2) the extent of trust the employees have in their supervisors.

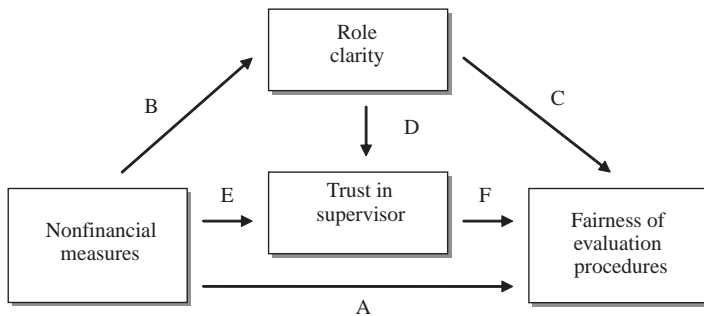


Fig. 1. Relationship between Nonfinancial Performance Measures and Fairness of Evaluation Procedures.

The power of performance measures to positively influence procedural fairness beliefs is likely to stem from their ability to communicate to the employees the expectations of their supervisors. We theorize that the use of nonfinancial measures as performance evaluation criteria is likely to enhance the clarity of employees' roles regarding their work, their supervisor's expectations of them, and how their performance will be evaluated. The enhancement of employees' role clarity in the workplace, due to the use of nonfinancial performance measures, is likely to foster healthy work relationships between the employees and their supervisors. Such environments are conducive to the enhancement of interpersonal trust between the employees and their supervisors. Employees, whose roles are clear and who trust their supervisors, are likely to perceive that the evaluative procedures used by the supervisors, are designed and implemented fairly.

The remainder of the paper is set out as follows. The next section discusses the theoretical justification leading to the development of the hypotheses. Method section explains the method used to test the hypotheses, while Results section reports the findings from the statistical analyses. The final section discusses the findings and the limitations of the study.

## HYPOTHESIS DEVELOPMENT

### *Performance Measures and Fairness of Evaluation Procedures (See A in Fig. 1)*

Employee performance evaluation is important to employees as their evaluations may be closely linked to their remuneration and promotions. They are therefore likely to be concerned with the fairness of the performance measures used. There are many factors that may affect employee judgments on how fair are the organization's performance measures.

One of the tenets in management accounting is the notion that a manager's performance is best evaluated on the factors under the manager's control. Kaplan and Atkinson (1998, p. 682) suggest that for a performance evaluation system to be considered fair, "employee must believe that she can legitimately influence the performance measures that are linked to her rewards." This means that performance measures must reflect the true and entire performance, which is within the control of the employee.

In today's global environment, organizations are facing intense pressure to remain competitive and are doing so through the adoption of customer-driven strategies aimed at ensuring high levels of quality and innovation.



Employees are expected to perform and excel in possibly many diverse and complex roles. The performance measures used must therefore be capable of capturing such diversity and complexity. Nonfinancial performance measures may be particularly suited to such contemporary situations. Because they are not linked to the annual reporting circles and need not be expressed in monetary terms, there are opportunities for organizations to design and develop numerous measures, which could be long term or short term. Such flexibility and broad array of measures may have two advantages. First, they may facilitate the use of measures, which are tailored to the individualized situations of each employee. Second, they may allow more information to be expressed about performance outcomes. Nonfinancial measures such as defect rate, customer satisfaction rate, and number of new products launched may assist to identify clearly the essential activities for value creation. They may measure improvements in product quality and innovation necessary to sustain and improve customer satisfaction and retention. They are capable of capturing the future technologies and capabilities the organization possesses to ensure long-term viability (Kaplan & Atkinson, 1998). In other words, they are able to measure organizational and managerial long-term productivity. Employees are measured on the quality of their work, the initiatives they undertake, and in areas in which they have control. They are therefore likely to perceive the employment of nonfinancial measures as relatively complete and hence a fair evaluation of their performance.

The above discussion therefore suggests that the use of nonfinancial measures for performance evaluation is related to employee perceptions of the fairness of evaluation procedures (see A in Fig. 1). However, this relationship may be indirect through several intervening variables. The following discussion provides the theoretical justification to suggest that role clarity may be one of such intervening variables.

*Nonfinancial Performance Measures and Role Clarity (See B in Fig. 1)*

Role clarity has been defined as the degree to which information is available regarding “the expectations associated with a role; methods for fulfilling known role expectations; and the consequences of role performance” (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Van Sell, Brief, & Schuler, 1981). A high level of role clarity among employees can have numerous beneficial effects including low job stress, high employee satisfaction, high organizational commitment, favorable attitudes toward superiors, increased productivity, reduced burnout rates, and low employee turnover

(Miles & Perreault, 1976; Senatra, 1980; Jackson & Schuler, 1985; Chenhall & Brownell, 1988). These outcomes can be nurtured by ensuring that subordinates understand their role within the organization.

Information is therefore necessary for employees to know their roles and to perform effectively. Performance measures play a critical role in this regard. They are a means through which an organization is able to communicate its goals, objectives, strategies, and plans to its employees. Performance measures communicated properly to employees let employees know what is expected of them and what targets to aim for through their performance. The use of nonfinancial measures as performance evaluation criteria is likely to be an effective communication tool within an organization. The lack of constraints from the annual reporting cycle and the infinite variety of nonmonetary terms that could be used may make it possible for the organizations to develop and use a wide variety of nonfinancial measures that are tailored to the individualized situation of each employee. This is likely to facilitate a more complete communication of the organization's expectations to employees including direction to employees in their day-to-day activities as well as what is needed to create long-term value to the organization. This may help to bring superiors and subordinates to a mutual understanding of job expectations, tasks, and evaluation procedures and allow employees to understand how they can contribute to the organization.

In summary, the use of nonfinancial performance measures is a means of providing the necessary information to clarify the role of employees so that they are aware of what is expected of them. Hence, the use of nonfinancial performance measures is likely to be positively related to employee role clarity (see B in Fig. 1).

#### *Role Clarity and Fairness of Evaluation Procedures (See C in Fig. 1)*

Role clarity is likely to play an important role in employee fairness perceptions. Perceptions of fairness are likely to be related to the existence of a formal appraisal system and the supervisor's knowledge of the subordinate's performance (Tang & Sarfield-Baldwin, 1996). Kaplan and Atkinson (1998, p. 682) suggest that "clarity and understanding reflect the important characteristics of the performance measurement system required to ensure that decision makers understand the causal chain between performance and rewards." Patton (1972) suggests that for incentive system to work, control systems need to be well defined and performance needs to be evaluated on a systematic basis.

When role clarity is lacking, superiors and subordinates are confused as to the job expectations that need to be achieved and how job tasks are to be fulfilled. This uncertainty and lack of clarity in the information provided may evoke negative emotions among employees. This may translate into feelings of injustice in the superiors and in the evaluation system. Employees who are unsure as to how they are evaluated may perceive their evaluations as unfair, ineffective, and inappropriate.

However, if role clarity is high, positive attitudes among employees are a likely consequence and a harmonious work environment may be fostered. Employees may be more satisfied, committed, productive, and less stressed (Senatra, 1980; Van Sell et al., 1981). They may also feel respected and fairly treated by the organization, and hence are likely to perceive the evaluation system as fair. Therefore, high role clarity is likely to enhance procedural fairness perceptions. A significant positive relationship between role clarity and procedural fairness is therefore likely to exist.

The discussion in the preceding few sections suggests that (1) the use of nonfinancial measures as performance evaluation criteria is related to employee perceptions of fairness in evaluation procedures (see A in Fig. 1); (2) the use of nonfinancial measures is related to role clarity (see B); and (3) role clarity is related to employee perceptions of procedural fairness (see C). Hence, the hypothesized positive relationship between the use of nonfinancial measures and employee perceptions of fairness is likely to be indirect through role clarity. The following hypothesis is therefore tested:

**H1.** The relationship between the use of nonfinancial measures as performance evaluation criteria, and the employees' perceptions of procedural fairness in the performance evaluation procedures, is indirect through role clarity.

*Nonfinancial Performance Measures and Trust in Supervisor*  
(See E in Fig. 1)

Apart from role clarity, the extent of the employees' trust in their supervisors may also be an important intervening variable in the relationship between performance measures and employee perceptions of the fairness of the evaluation process. Interpersonal trust is an important aspect of any personal or vocational relationship. It enriches relationships by fostering cooperation, creativity, and commitment (Zand, 1997). According to Zand (1997, p. 91) trust consists of "a willingness to increase your vulnerability to another person whose behavior you cannot control, in a situation in which your potential benefit is much less than your potential loss if the other person

abuses your vulnerability.” Establishing trust within an organizational relationship is beneficial as it increases openness, communication, and mutual understanding between parties. Trust has also been found to be related to individual and organizational performance (Reina & Reina, 1999). It increases productivity as workers can depend on one another to create and achieve appropriate goals (Zand, 1997). The value of trust within organizations has increased in today’s global economy where organizations need to be open and flexible to adapt rapidly to the changing market conditions (Reina & Reina, 1999).

Empirical studies have examined the impact on trust from using accounting-based performance measures (Hopwood, 1972; Otley, 1978; Ross, 1994). In these studies, trust was conceptualized as interpersonal trust or, more specifically, “trust in supervisor.” The results from such studies indicate that performance evaluative styles affected the level of trust the subordinates felt for their superiors. Both Hopwood (1972) and Otley (1978) found that the greater the level of trust the subordinate had for the evaluative style, the greater the level of trust in the superior.

The adoption of nonfinancial measures as performance evaluation criteria is likely to promote trust within the superior–subordinate relationship. Nonfinancial measures can be seen as a communication tool, which allows superiors and subordinates to clarify their intentions and roles within the relationship. In any kind of relationship, trust can be improved by imparting knowledge between each other and clarifying one another’s intentions (Zand, 1997). According to Reina and Reina (1999, p. 68), “trust comes out of a clear understanding of responsibility; that is, what is expected of an individual and what the individual may expect in return. When people have a clear understanding of what is expected of them, and they meet those expectations, trust grows.”

Because nonfinancial measures are not linked to the annual financial reporting cycle, they can be designed for both short term and long term. More importantly, because they can be expressed in nonmonetary terms (e.g., defect rate, employee satisfaction rate, number of new products launched), an infinite variety of measures are possible. Such flexibility facilitates the development and use of measures that are tailored to each employee individualized situation. This may lead to the measurement and evaluation of a broad spectrum of employee performance. Such systems and procedures may signal to the subordinates the importance the superiors attached to the subordinates’ performance as well as the ensuing performance evaluations. They also show the respect the superiors have for their subordinates and their concern for the subordinates’ interest and well-being. This is likely to engender improved trust in the superior. It is therefore reasonable to propose

a positive relationship between the use of nonfinancial measures and trust in the evaluating supervisor (see E in Fig. 1).

*Trust and Fairness of Evaluation Procedures (See F in Fig. 1)*

The existence of trust in superior–subordinate relationships is likely to influence procedural fairness perceptions. If subordinates harbor trust in their supervisors, they are likely to believe that their supervisor will act in their best interests. Hence, they are likely to believe that their supervisors will appraise their performance fairly. The trust the employees have for their supervisors will likely be translated into faith in the performance evaluation system used by the superiors. However, if trust is not established between the subordinates and their superiors, a hostile work environment could occur. A lack of trust would cause subordinates to suspect that their superiors may be deceptive and selfish. This may lead to a perception that the performance evaluation procedures used by the superiors may be unfair.

Numerous prior studies have documented a significant relationship between trust in management and fairness of allocation procedures (Folger & Konovsky, 1989; Tang & Sarfield-Baldwin, 1996). For instance, Tyler (1988) found trustworthiness to be the strongest predictor of evaluations of fairness of decision making. It is therefore likely that there is a positive relationship between the subordinates' trust in their supervisors and the subordinates' perception of fairness in the performance evaluation procedures. This is depicted by F in Fig. 1.

The above discussion concerning performance measures, trust, and procedural fairness suggests that (1) the use of nonfinancial measures is related to employee perceptions of fairness of evaluation procedures (see A in Fig. 1); (2) the use of nonfinancial measures is related to the subordinates' trust in their supervisors (see E); and (3) trust in their supervisors is related to employee perceptions of fairness (see F). Hence, the positive relationship between the use of nonfinancial measures as performance evaluation criteria and employee perceptions of fairness in evaluation procedures is likely to be indirect through the subordinates' trust in their supervisors. The following hypothesis is therefore tested:

**H2.** The relationship between the use of nonfinancial measures as performance evaluation criteria, and the employees' perceptions of procedural fairness in the performance evaluation procedures, is indirect through the subordinates' trust in their supervisors.

*Role Clarity and Trust (See D in Fig. 1)*

Empirical studies have shown that the existence of role clarity within organizations may lead to high trust toward the superiors (Miles & Perreault, 1976; Senatra, 1980). In contrast, a low level of role clarity is almost synonymous with tension and anxiety. When the subordinates are not provided with information concerning what is expected of them, how they are to achieve their job tasks and how their performance will be assessed, confusion and dissatisfaction are likely to occur. Employees may become misdirected and detached from the organization's goals and may be unfairly penalized by superiors in performance appraisals. The work environment may be highly stressful and even confrontational. The subordinates' trust in the supervisors may be undermined in such situations.

Hence, when role clarity is low, subordinates are not likely to trust the performance evaluations conducted and the supervisors who undertake such evaluations. Providing the subordinates with appropriate, truthful, and timely information is crucial in order to establish a trustworthy environment. Zand (1997, p. 3) states that "leaders earn trust by disclosing relevant information, sharing influence and competently using knowledge." If the superiors inform employees of their expectations and appraisal systems, subordinates will be able to focus their efforts toward achieving the desired goals. Communication between the two parties will reduce the uncertainty within the work environment and the negative side effects associated with role ambiguity will be contained. A healthy work environment will be created allowing employees to have faith in their superior's ability to manage and evaluate appropriately and effectively. A positive relationship is therefore likely to exist between role clarity and interpersonal trust. As role clarity increases, the level of trust subordinates' hold for their superiors will increase. This may result in improved perceptions of procedural fairness.

The above discussion suggests that the relationship between the level of role clarity and procedural fairness may be indirect through the level of subordinates' trust in their supervisors. The following hypothesis is therefore tested:

**H3.** The relationship between role clarity and perceptions of fairness in evaluation procedures is indirect through the level of subordinates' trust in the supervisors.

## METHOD

A survey questionnaire was distributed to managers holding senior positions in manufacturing firms located in Australia. The organizations were selected from the *Who's Who of Australia* business directory published in the electronic version of *Jobson's Year Book of Public Companies 2001–2002*. (Dun and Bradstreet, 2002). In order to provide some degree of control over the size of the organizations and the type of industry, only manufacturing companies that had over 100 employees each and an annual revenue in excess of Australian \$250,000,000 were considered. A total of 162 manufacturing organizations were found to satisfy these criteria. In order to keep the sample manageable, a random sampling technique was employed to select only 100 of these manufacturing organizations for study.

Telephone calls were made to the selected organizations to obtain the names of managers who were departmental heads so that the questionnaires could be addressed personally to the intended participants. Two hundred and seventy-six manufacturing, marketing, and sales managers were identified and questionnaires were distributed to them. Each survey was posted with a cover letter explaining the purpose of the study and assuring the participants the confidentiality of their responses. Reminder letters were sent to the managers five weeks after the initial mailing of the questionnaires.

From the 276 questionnaires posted, 133 responses were received resulting in a response rate of 48%. However, 12 of the questionnaires were not fully completed and thus were not usable. There were therefore 121 usable responses and they formed the final sample for statistical analyses. In order to ascertain whether a nonresponse bias existed, tests were undertaken in the manner suggested by Oppenheim (1992). The sample was divided in two halves based on the dates the surveys were returned. *T*-tests were conducted to ascertain whether the later responses differed from the early responses for all the variables measured. As no significant differences were found between the later responses and the earlier responses, it can be concluded that nonresponse bias was not detected.

The average manager had 8 years experience in his or her responsibility area and was in charge of 165 employees. The average age was 43 years with 98% of the sample having either a vocational certificate or a university degree. These demographic data suggest that the respondents were generally highly qualified and experienced managers.

*Variable Measurement**Nonfinancial Performance Measures*

For the measurement of nonfinancial performance measures, we compare the newer Hoque and James (2000) instrument with the older Hopwood (1972) instrument. Hopwood's (1972) instrument asks the respondents as follows: "When your superior is evaluating *your* performance, how much importance do you think he or she attaches to the following items?" This refers to the evaluation of the *respondent's* performance. In contrast, the instrument used by Hoque and James (2000) asks: "Please rate the extent to which each of the following measures is used for performance evaluation of *your business unit*." Hence, it refers to the evaluation of the respondent's *overall business unit* performance. Recall that the primary aim of our study is to investigate how managers react to the use of performance measures to evaluate *their individual performance*. As it is possible for an organization to use one set of criteria to evaluate the managers' individual performance and a different set to measure the overall business unit performance, we selected the wording from Hopwood's instrument even though it is an older instrument.

We used measures from the learning and growth perspective of the balanced scorecard. The learning and growth perspective represents the long-term growth and improvement needed to meet the organization's long-term targets. This might assist to highlight the reactions of managers evaluated by longer-term measures. Moreover, as the "customer perspective" is likely to be applicable only to marketing and sales managers, while the "internal business perspective" is likely to be applicable only to production managers, measures from the "learning and growth perspective" are likely to be applicable to all groups of managers and hence have wider applicability. For these reasons, measures from the learning and growth perspective were chosen as surrogates for nonfinancial measures.

The choice of nonfinancial measures was based on those suggested by Kaplan and Atkinson (1998, pp. 374–375) who note as follows:

Learning and growth identifies the infrastructure that organization must build to create long term growth and improvement. The financial, customer, and internal business objectives on the Balanced Scorecard will typically reveal large gap between existing capabilities of people, systems, and procedures and what will be required to achieve targets for breakthrough performance...To close these gaps, business must invest in *reskilling employees, enhancing information technology and systems*...As in the customer perspective, employee based measures include several generic outcome measures: *employee satisfaction, employee retention, employee training, and employee skills*.



**Table 1.** Factor Analysis Results and Cronbach Alphas.

Items	Nonfinancial Measures	Role Clarity	Trust	Fairness of Procedures
Factor loadings				
1	0.816	0.834	0.728	0.887
2	0.846	0.882	0.807	0.856
3	0.794	0.740	0.836	0.840
4	0.625	0.876	0.771	0.892
5	0.676	0.928		
6		0.840		
Eigenvalue	2.86	4.355	2.473	3.021
Variance explained	57.21%	72.58%	61.82%	75.53%
Cronbach alpha	0.810	0.922	0.794	0.892

Accordingly, the following five employee and innovation measures are used to capture the use of nonfinancial measures: (1) employee satisfaction rate in my department, (2) number of employees trained in my department, (3) employee turnover rate in my department, (4) number of innovations developed by my department, and (5) adoption of new technology by my department. A factor analysis is undertaken with all five items. [Table 1](#) presents the results of the factor analyses and reliability tests. They indicate that all five items of the nonfinancial instrument load satisfactorily into a single factor with factor loadings between 0.625 and 0.846. The total variance explained is 57% and the eigenvalue is 2.86. The Cronbach alpha value is 0.81, which indicates internal consistency of the five items.

#### *Role Clarity*

This variable was captured through the use of [Rizzo, House, and Lirtzman's \(1970\)](#) six-item instrument. This instrument has been used extensively in the role stress literature ([Pearce, 1981](#); [Jackson & Schuler, 1985](#)) and successfully applied in the accounting literature ([Chenhall & Brownell, 1988](#); [Fisher, 2001](#)). Participants were asked to rate whether they had goals and explanations, and also whether they knew they had allocated their time correctly, knew their responsibilities, what was expected, and how much authority they possessed. The six items were worded to capture role clarity. Hence a high score would indicate high role clarity, while a low score would indicate low role clarity or high role ambiguity. A factor analysis of the six items resulted in the extraction of only one factor with an eigenvalue of 4.36 and factor loadings in excess of 0.5 for all six items (minimum factor

loading = 0.74) (see Table 1). The proportion of variance explained is 72.6%. Reliability analysis indicates that the instrument has a Cronbach alpha coefficient of 0.92.

#### *Trust in Supervisor*

Read's (1962) four-item instrument was used to measure the level of trust subordinates experienced toward their superiors. This instrument has been used successfully in numerous studies to capture this variable (Hopwood, 1972; Otley, 1978; Ross, 1994). Survey participants were asked to what extent their superior took advantage of opportunities to further their interests, how free they felt to discuss problems and difficulties with their superiors, how confident they felt about their superiors keeping them fully informed, and how much trust they had that their superiors' decisions were justified. The factor analysis results in Table 1 indicate that a single factor with an eigenvalue of 2.47 is extracted. The portion of variance explained is 61.8%. The factor loadings are in excess of 0.5 for all four items (minimum = 0.728). Reliability analysis shows the instrument has a Cronbach alpha of 0.794.

#### *Fairness in Evaluation Procedures*

This variable was measured by the four-item instrument developed by McFarlin and Sweeney (1992). This instrument measures the respondents' perceptions of the fairness of their organizations' performance evaluation procedures. The respondents were asked to rate on a five-point scale, how fair were the procedures used by their superiors to evaluate employee performance, to determine promotions, to communicate performance feedback, and to determine pay increases. A factor analysis of the four items indicates the extraction of a single factor with an eigenvalue of 3.02 and the portion of variance explained is 75.5%. The four items each has a factor loading of considerably greater than 0.5 (minimum = 0.84) (see Table 1). The Cronbach alpha of 0.892 obtained for the four items indicates high internal consistency for the instrument. These results are consistent with those found in Lau and Sholihin (2005) and Lau and Tan (2006). The descriptive statistics of the variables studied are presented in Table 2.

## RESULTS

This study investigates the process by which the use of nonfinancial measures for performance evaluation affects subordinates' perception of procedural

fairness. This involves the decomposition of the total effects into direct and indirect effect and the evaluation of these effects. Structural equation modeling is an appropriate technique here because apart from its ability to model relationships among multiple predictors and criterion variables, provide overall tests of model fit and individual parameter estimate test simultaneously, it is also able to evaluate the relative importance of the various direct and indirect links among variables and as such helps in the understanding of the causal mechanism among variables.

*Hypotheses H1 and H2*

In order to test the hypotheses, the zero-order correlations based on the observed variables were examined initially. Table 3 presents the Pearson correlations of the relationships among the variables studied. These statistics show that nonfinancial measures are significantly correlated with fairness of evaluation procedures with a coefficient of 0.183 ( $p < 0.05$ ).

Hypothesis H1 states that the relationship between nonfinancial measures and fairness of evaluation procedures is indirect through role clarity. Hypothesis H2 proposes that the relationship between nonfinancial

**Table 2.** Descriptive Statistics.

Variable	Mean	Standard Deviation	Theoretical Range		Actual Range	
			Minimum	Maximum	Minimum	Maximum
Nonfinancial measures	22.86	5.33	5	35	5	35
Trust in supervisor	15.02	2.83	4	20	5	20
Role clarity	32.03	6.16	6	42	9	42
Fairness of procedures	14.02	3.12	4	20	4	20

**Table 3.** Correlation Matrix among Independent and Dependent Variables (Based on Observed Variables).

Variable	Trust	Role Clarity	Fairness of Procedures
Nonfinancial measures	0.327**	0.462**	0.183*
Trust		0.498**	0.488**
Role clarity			0.468**

\* $p < 0.05$  (two-tailed).

\*\* $p < 0.01$  (two-tailed).

**Table 4.** Model Fit Indices Based on Latent Variables.

RMSEA $\leq 0.10$	AGFI $\geq 0.8$	IFI $\geq 0.9$	NNFI $\geq 0.9$	CFI $\geq 0.9$
0.06	0.81	0.95	0.94	0.95

measures and fairness of evaluation procedures is indirect through trust in supervisor. In order to compute these indirect effects, the path coefficients of the relationships among the variables in the model are needed.

The path coefficient results are derived by structural equation modeling based on the latent variables. We use AMOS Version 17. Before tests of hypothesis are undertaken, it is necessary to ascertain if the model fits the data. The chi-square test of the overall model fit produces a value of 211 and a probability value of less than 0.001. This is smaller than the 0.05 probability level used by convention. Because the chi-square test of absolute model fit is sensitive to sample size, additional tests are undertaken to assess the overall fit of our model to the data to ascertain if it outperforms the independence model. The fit indices from these tests are presented in Table 4. They indicate a root mean square error of approximation (RMSEA) of 0.06, an adjusted goodness-of-fit index (AGFI) of 0.812, an incremental fit index (IFI) of 0.95, a non-normed fit index (NNFI) of 0.94, and a comparative fit index (CFI) of 0.95. As the values of these measures of fit are all in accordance with the levels recommended (Segars & Grover, 1993; Harwick & Barki, 1994; Chau, 1997), they suggest that overall the model is a good fit of the data. Accordingly, the results of the structural model (based on the latent variables) are presented in Table 5 and Fig. 2 and interpreted in the light of the hypotheses proposed in the study.

Table 5 indicates that indirect effect of the relationship between nonfinancial measures and procedural fairness is 0.351. This effect can be interpreted using the following paths based on the path coefficients in Fig. 2:

Path (1)	NF-RC-FP	$0.524 \times 0.312$	0.163
Path (2)	NF-TR-FP	$0.137 \times 0.451$	0.062
Path (3)	NF-RC-TR-FP	$0.524 \times 0.534 \times 0.451$	0.126
Indirect effect			0.351

Recall that Table 3 indicates that the relationship between nonfinancial measures and fairness of evaluation procedures is significant ( $p < 0.05$ ). This total effect can be decomposed into direct effect and indirect effect. The direct effect is a *negative* 0.15 (see Fig. 2 and Table 5). The indirect

**Table 5.** Structural Equation Modeling Results Based on Latent Variables.

Independent Variable	Dependent Variable	Standardized Direct Effects	Standardized Indirect Effects	Standardized Total Effects
Nonfinancial	Role clarity	0.524	–	0.524
Nonfinancial	Trust	0.137	0.280	0.416
Role clarity		0.534	–	0.534
Nonfinancial	Fairness	–0.15	0.351	0.201
Role clarity		0.312	0.241	0.552
Trust		0.451	–	0.451

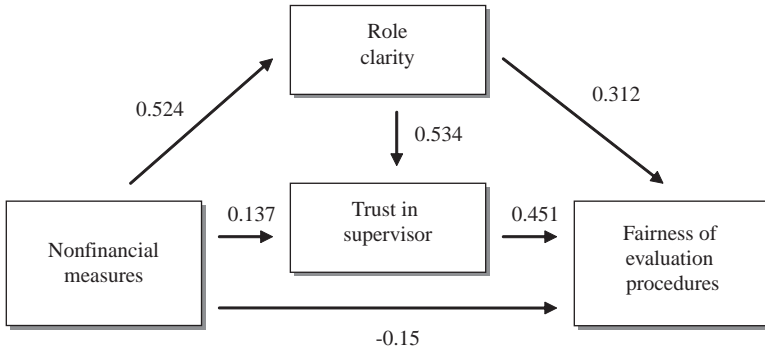


Fig. 2. Path Coefficient (Standardized Direct Effects) Based on Latent Variables.

effect is a *positive* 0.351 as computed above. This indirect effect can be further decomposed into the portions attributable to role clarity and trust, respectively. The indirect effect attributable to role clarity is 0.163 (Path 1). The indirect effect attributable to trust is 0.188 (0.062 + 0.126) (Paths 2 and 3). According to Bartol (1983, p. 809) and Pedhazur (1982, p. 617), an indirect effect in excess of the absolute amount of 0.05 may be considered meaningful. As the indirect effects through role clarity and through trust are both much larger than 0.05, they are therefore meaningful. Based on these results, hypotheses H1 and H2 are both supported.

*Hypothesis H3*

Hypothesis H3 states that the relationship between role clarity and fairness of evaluation procedures is indirect through trust in supervisor. Table 5

indicates that the indirect effect for the relationship between role clarity and procedural fairness is 0.241. Based on the path coefficient in Fig. 2, this indirect effect can be interpreted as  $(RC-TR-FP) = (0.534 \times 0.451) = 0.241$ . As this indirect effect is considerably higher than the meaningful threshold of 0.05, hypothesis H3 is supported (Bartol, 1983, p. 809; Pedhazur, 1982, p. 617).

## CONCLUSION

This study investigates if the use of nonfinancial measures to evaluate employee performance affects three important work-related outcomes. These are employee role clarity, employee trust in their superior, and employee perception of fairness in performance evaluation procedures. It also attempts to explain the processes by which these effects occur. Specifically, the study addresses three research questions. First, would nonfinancial performance measures clarify or cloud the employee roles? Second, would such measures promote or reduce the trust between the employees and their superiors? Third, would employees perceive these measures as fair? These questions are important as they enable several important management accounting issues to be investigated.

Employee performance evaluations are important aspects of management control systems because of their link to employee compensation and reward (Lau, Low, & Eggleton, 1995). Consequently, they can play a critical role in motivating employees to achieve organizational goals (Kaplan & Atkinson, 1998). Second, fairness in organizational procedures in general, and in the procedures employed to evaluate employee performance in particular, is crucial for organizations to function effectively. Issues relating to people's judgments that procedures and social process are fair have dominated psychological research (Lind & Tyler, 1988). Surprisingly, such issues are given much less attention in management accounting research. More importantly, while practitioners are generally well aware of the importance of fairness in organizational procedures, they are generally less clear on how fairness of performance evaluation systems can be enhanced. The current interest by both practitioners and researchers in nonfinancial measures stems from assertions that the adoption of such measures is likely to be beneficial. However, performance evaluation procedures are only workable if they are accepted by employees. Employees are not likely to accept evaluation procedures that they perceive as unfair. Are performance evaluations based on nonfinancial measures perceived as fair? Exactly how

do nonfinancial performance measures affect employee fairness perceptions? These are the important unanswered research questions that need to be addressed given the current interest in nonfinancial measures.

The results are in accordance with expectation. First, based on bivariate analyses, they indicate that the use of nonfinancial measures for employee performance evaluation is positively related to (1) role clarity, (2) trust in superior, and (3) procedural fairness. Second, they indicate that the effect of nonfinancial measure use on procedural fairness is indirect via (1) role clarity, and (2) trust in superior. Third, they suggest that the effect of role clarity on procedural fairness is also indirect via trust in superior. These indirect effects are above the meaningful threshold and accounted for a substantial portion of the total effect. Overall, these results suggest that the use of nonfinancial measures is perceived as procedurally fair. They also indicate the processes by which these effects occur. First, nonfinancial measures enhance employee role clarity. Role clarity, in turn, has two positive outcomes. It engenders higher procedural fairness perception. It also engenders higher trust in the superior which, in turn, also engender higher procedural fairness.

Overall, the results indicate that employees perceive nonfinancial measures as fair. Such results may have important implications. From a practical perspective, it appears that organizations, which are concerned with fairness in the workplace, should employ nonfinancial measures for employee performance evaluation and ensure that these criteria are communicated to employees. Nonfinancial measures are not new and may have been used by organizations for a variety of purposes. The results of this study suggest that their role in employee performance evaluation may have beneficial effects. Hence, there may be additional scope for increasing their use in this direction. This could be an effective and efficient way of furthering organizational interests. Lind and Tyler (1988, p. 200) emphasize this as follows: "When procedures are fair, the organization can expect to see greater employee satisfaction, less conflict, and more obedience to procedures and decisions. These benefits can be realized at very little cost to the organization – in fact, it is quite likely that investment of organizational resources in the achievement of procedural justice would produce much greater benefit on these dimensions at less cost than would most other changes in organizational policy or practice." The increased use of nonfinancial measures as criteria for employee performance evaluation may be one such means, which organizations can use to promote procedural fairness in the workplace.

There are some limitations associated with this study. First, the sample was chosen based on a certain number of employees employed by the organizations and a certain amount of annual revenue the organizations

received. These selection criteria were used to ensure that only large manufacturing organizations would be included in the study. Consequently, this restricts the generalizability of the findings to smaller organizations. Second, the sample was drawn from the manufacturing sector. The results may not be generalized to nonmanufacturing sectors such as the financial sector. This study also does not include the antecedents to the use of nonfinancial measures such as perceived environmental uncertainty, market competition, and business strategy. Other possible intervening variables, such as managerial participation and job-relevant information, are also omitted from the study. Nevertheless despite these limitations, this study contributes to management accounting in several ways. It provides the empirical evidence to demonstrate not only the effects of nonfinancial measures on three important employee-related outcomes, namely, role clarity, interpersonal trust, and procedural fairness in the workplace, but also the processes by which these effects occur.

## REFERENCES

- Anthony, R. N., & Govindarajan, V. (2007). *Management control systems* (12th ed.). New York: McGraw-Hill.
- Bartol, K. M. (1983). Turnover among DP personnel: A causal analysis. *Communications of ACM*, 26, 807–811.
- Chau, Y. K. (1997). Reexamining a model for evaluating information center success using a structural equation modeling approach. *Decision Sciences*, 28, 309–334.
- Chenhall, R. H., & Brownell, P. (1988). The effect of participative budgeting on job satisfaction and performance: Role ambiguity as an intervening variable. *Accounting, Organizations and Society*, 13(3), 225–233.
- Dun and Bradstreet. (2002). *Jobson's year book of public companies 2001–2002 Dun & Bradstreet Marketing Pty Ltd*. New South Wales: Chatswood.
- Fisher, R. T. (2001). Role stress, the type A behavior pattern, and external auditor job satisfaction and performance. *Behavioral Research in Accounting*, 13, 143–170.
- Folger, R., & Konovsky, M. A. (1989). Effects of procedural and distributive justice on reactions. *Academy of Management Journal*, 32(1), 115–130.
- Harwick, J., & Barki, H. (1994). Explaining the role of user participation in information system use. *Management Science*, 40(4), 440–465.
- Hopwood, A. G. (1972). An empirical study of the role of accounting data in performance evaluation. *Journal of Accounting Research*, 156–182.
- Hoque, Z., & James, W. (2000). Linking balanced scorecard measures to size and market factors: Impact on organizational performance. *Journal of Management Accounting Research*, 12, 1–16.
- Jackson, S., & Schuler, R. (1985). A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings. *Organizational Behaviour and Human Decision Processes*, 36, 16–78.



- Kahn, R., Wolfe, D., Quinn, R., Snoek, J., & Rosenthal, R. (1964). *Organizational stress: Studies in role conflict and ambiguity*. New York: Wiley.
- Kaplan, R. S. (1984). The evolution of management accounting. *The Accounting Review*, *LIX*(3), 390–417.
- Kaplan, R. S., & Atkinson, A. A. (1998). *Advanced management accounting* (3rd ed.). Upper Saddle River, NJ: Prentice Hall Inc.
- Kaplan, R. S., & Norton, D. P. (1992). *The balanced scorecard- measures that drive performance*. Boston: Harvard Business School Press.
- Kaplan, R. S., & Norton, D. P. (1996). *The balanced scorecard: Translating strategy into action*. Boston: Harvard Business School Press.
- Lau, C. M., & Lim, E. (2002). The effects of procedural justice and evaluative styles on the relationship between budgetary participation and performance. *Advances in Accounting*, *19*, 139–160.
- Lau, C. M., Low, L. C., & Eggleton, I. R. (1995). The impact of reliance on accounting performance measures on job-related tension and managerial performance: Additional evidence. *Accounting, Organizations and Society*, *20*(5), 359–381.
- Lau, C. M., & Moser, A. (2008). Behavioral effects of nonfinancial measures: The role of procedural fairness. *Behavioral Research in Accounting*, *20*(2), 55–71.
- Lau, C. M., & Sholihin, M. (2005). Financial and nonfinancial performance measures: How do they affect job satisfaction? *British Accounting Review*, *37*, 389–413.
- Lau, C. M., & Tan, S. (2006). The effects of procedural fairness and interpersonal trust on job tension in budgeting. *Management Accounting Research*, *17*, 171–186.
- Leventhal, G. S. (1980). What should be done with equity theory? New approaches to the study of fairness in social relationships. In: K. Gergen, M. Greenberg & R. Willis (Eds), *Social exchange: Advances in theory and research* (pp. 27–55). New York: Plenum Press.
- Lind, E. A., & Tyler, T. R. (1988). *The social psychology of procedural justice*. New York: Plenum Press.
- Lindquist, T. M. (1995). Fairness as antecedent to participative budgeting: examining the effects of distributive justice, procedural justice and referent cognitions on satisfaction and performance. *Journal of Management Accounting Research*, *7*, 122–147.
- McFarlin, D. B., & Sweeney, P. D. (1992). Distributive and procedural justice as predictors of satisfaction with personal and organizational outcomes. *Academy of Management Journal*, *35*, 626–637.
- Miles, R., & Perreault, W. (1976). Organizational role conflict: Its antecedents and consequences. *Organizational Behaviour and Human Performance*, *17*, 19–44.
- Niven, P. R. (2002). *Balanced scorecard step-by-step: Maximising performance and maintaining results*. New York: Wiley.
- Oppenheim, A. N. (1992). *Questionnaire design, interviewing and attitude measurement*. London: Pinter Publishers.
- Otley, D. (1978). Budget use and managerial performance. *Journal of Accounting Research*, *16*, 122–148.
- Patton, A. (1972). *Why incentive plans fail*. Boston: Harvard Business Review.
- Pearce, J. L. (1981). Bringing some clarity to role ambiguity research. *The Academy of Management Review*, *6*(4), 665–674.
- Pedhazur, E. J. (1982). *Multiple regression in behavioral research*. New York: Holt, Rinhart & Winston.
- Read, W. H. (1962). Upward communication industrial hierarchies. *Human Relations*, *15*(1), 3–15.

- Reina, D. S., & Reina, M. L. (1999). *Trust and betrayal in the workplace*. San Francisco, CA: Berrett-Koehler.
- Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative Science Quarterly*, 15, 150–163.
- Ross, A. (1994). Trust as a moderator of the effect of performance evaluation style on job-related tension: A research note. *Accounting, Organizations and Society*, 19(7), 629–635.
- Segars, A. H., & Grover, V. (1993). Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. *MIS Quarterly*, 17(4), 517–525.
- Senatra, P. (1980). Role conflict, role ambiguity and organizational climate in a public accounting firm. *The Accounting Review*, 55(4), 594–603.
- Tang, T. L., & Sarfield-Baldwin, L. J. (1996). Distributive and procedural justice as related to satisfaction and commitment. *SAM Advanced Management Journal*, 61(3), 25–31.
- Tyler, T. (1988). What is procedural justice? *Law and Society Review*, 22, 301–355.
- Van Sell, M., Brief, A., & Schuler, R. (1981). Role conflict and role ambiguity: Integration of the literature and directions for future research. *Human Relations*, 34(1), 43–71.
- Zand, D. (1997). *The leadership triad: Knowledge, trust and power*. New York: Oxford University Press.



# THE RELATION BETWEEN EXECUTIVE TIME ORIENTATION AND PERFORMANCE MEASUREMENT

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## ABSTRACT

*Purpose – This research presents empirical evidence on which performance measures are perceived as short-term oriented and long-term oriented by company executives, and on whether any perceived performance measure-related time orientation affects the time orientation of these executives. In addition, the study explores which measures impact executive time orientation, regardless of how these measures are perceived.*

*Methodology/approach – A survey was used to collect the perceptions of chief financial officers (CFOs) in 109 companies listed in the Nasdaq OMX, the Nordic Stock Exchange. Performance measures include: stock price, earnings, returns, cash flow, success of development programs, EVA™, sales, and balanced scorecard, and the method employed was multiple regression.*

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*Findings – First, the CFOs perceived returns, sales, EPS, and stock price to have long time orientation. Second, the use of returns, stock price, and success of development programs as major performance measures encourage the CFOs toward long-term behavior, whereas the use of cash flow encourages short-term behavior. Third, stock price, earnings, and EPS are measures whose perceived time orientation affects the time orientation of executives. It is most likely due to this influence, that they have received major attention in public debates on the short time orientation of executives at the expense of other, more “silent” measures that also impact executive time orientation. Contextual factors strongly affect the results.*

*Practical implications – The study assists in designing executive performance measurement systems that encourage desired time orientation.*

*Originality/value – This study contributes to the fields of performance measurement and time orientation by recognizing the multidimensionality of the construct of time orientation and by showing how performance measures and their perceived time orientation influence executive time orientation.*

## INTRODUCTION

The time orientation of executives in publicly quoted companies has recently been called into question. Jensen, Murphy, and Wruck (2004) and Graham, Harvey, and Rajgopal (2005) have argued that the pressures to perform in the short term in the financial markets can lead to short-term-oriented actions within companies. Graham et al. (2005) found in their study, that a large percentage of CFOs (chief financial officers) in the United States would avoid making long-term value-increasing investments if those investments affected their attainment of the short-term analyst EPS (earnings per share) consensus estimate. Jensen et al. (2004) discussed in their paper how listed companies aim at short-term stock price maximization at the risk of long-term value destruction. This behavior materializes due to financial markets that pressure them to continually increase their quarterly earnings in order to maximize their stock price. Executives rely on an underlying assumption that this price automatically reflects long-term value, although this is not, in fact, the case automatically in every situation (Jensen et al., 2004). Regarding European evidence, Liljebloom and

Vaihekoski (2009) revealed that Finnish company executives feel a moderate amount of short-term pressures from the financial markets.

The use of certain executive performance measures and compensation systems has been proposed as a reason for the short time orientation. Indeed, Rappaport (2005) has called for a reform in executive compensation in order to encourage the attainment of long-term performance targets by increasing, for example, the vesting periods of stock options. The research by Graham et al. (2005) indicated that listed companies experience short-term pressures due to the measures and targets financial analysts employ. Therefore, Fuller and Jensen (2002) suggest that firms stop using analysts' EPS estimates as earnings targets in order to regain a more long-term look at their own operations.

However, the issue of which measures encourage which time orientations, long or short, is not straightforward. Traditionally, earnings have been conceptualized as a myopic measure that typically settles on quantifying the past (Ittner, Larcker, & Meyer, 2003). On the other hand, earnings are possibly easily manipulated by company representatives (e.g. Bartov, 1993; Teoh, Wong, & Rao, 1998; Das & Zhang, 2003), and analytical research has shown that the opportunities for manipulation imply that executives do not have to expend resources in this manipulation and in the fulfilling of excessive demands for short-term performance, thus allowing them to concentrate on the creation of long-term value (Demski, Frimor, & Sappington, 2004). Similarly, stock price is a contested measure whose time orientation implications are not straightforward. Stock options have been seen as a compensation class that persuades executives to aim for the long-term benefit of their company (e.g. Lambert, 1993; Puffer & Weintrop, 1991; Brickley, Bhagat, & Lease, 1985). However, alternative viewpoints have also been recently expressed. For example, executives who perceive that their companies' stock prices are formed based on the short-term focus of EPS consensus estimates may disagree with the view that stock options encourage performance for the long term (Rappaport, 2005, p. 69). In addition, the phenomenon of short-term stock price maximization may be strengthened by the use of stock options and performance measurement with stock price (Jensen et al., 2004).

The current paper focuses on three interrelated questions regarding performance measures: (1) What are the perceived time orientations of individual performance measures? (2) Is the use of these performance measures associated with executive time orientation? (3) Is the perceived time orientation of each performance measure connected with executive time orientation?

CFOs in companies listed in Nasdaq OMX have been surveyed to find answers to the above questions. This survey has been targeted toward listed firms, since they form an influential population, as many large companies are also listed. In addition, in listed companies there are measures and compensation bases (particularly the stock price and EPS) that are different from the measures and compensation bases in use in non-listed companies. Due to the focus on listed companies, the current study also provides an opportunity to reflect on the findings of previous research, providing alternative explanations for contradictory and puzzling findings. The survey design for this study was structured following Dillman's (2000) guidelines. The measures studied encompass: stock price, earnings, EPS, returns, cash flow, success of development programs, EVA™ (economic value added), sales, and balanced scorecard (BSC) (e.g. Murphy, 1998; Ikäheimo, Kontu, Kostander, Tainio, & Uusitalo, 2003, 2007).

In addition, the countries studied were: Sweden, Finland, Denmark, Iceland, Lithuania, and Estonia. This setting was chosen, because research regarding executive time orientation in Northern Europe is rare (Liljebloom & Vaihekoski, 2009). However, there have been several mergers and acquisitions in this area (Bernitz, 2004; Skog, 2004; Carlsson, 2007). These takeover activities can induce a shorter time orientation on executives than in countries with less extensive takeover activities (Liljebloom & Vaihekoski, 2009). This is because extensive takeovers decrease the ontological security of those involved, making the future less certain and decreasing time orientation. The Nordic Nasdaq OMX stock exchange was also chosen due to the common exchange regulations and arrangements connected with it.

This study contributes to the time orientation and performance measurement literatures by making explicit the distinction between two notions of measure-related time orientation: perceived time orientations of performance measures, and the influence of these performance measures on executive time orientation. Executive perceptions concerning the time orientation of measures, potentially formed based on education and public discussion regarding measures are analyzed distinctly from the extent to which the use of certain measures is connected with executive time orientation, as measured in the questionnaire. This extent of connection between measures and time orientation is unrelated to the views "learned" in education and from public discussion on the time orientation of specific measures.

In addition, a literature review on the topic suggests that a considerable amount of previous studies rely on a priori assumptions on user perceptions, as well as on researchers' own perceptions of performance measures; and that attempts to empirically quantify the actual time orientation these

measures encourage are nonexistent. At a minimum, empirical data have indicated that certain measures can induce a shorter time orientation than would be optimal (Graham et al., 2005), but the time orientation has not been quantified. The current study also provides a significant contribution to this field by filling this gap.

Moreover, the study proves its worth by measuring time orientation with several constructs. The construct that has traditionally been used involves measuring time orientation as the percentage of time used for activities influencing company performance after a certain time period, usually one year (e.g. Lawrence & Lorsch, 1969). This construct is used with minor adjustments, but, in addition, it is developed in several ways. It is divided into components that permit the measurement of long and short time orientations separately, allowing for the issue that it is possible for an executive to concentrate simultaneously on both the long and the short term and to give them equal or unequal weight. The current study thereby questions the assumption made in the previous research that executives would always have to focus on long (short) time orientation at the expense of short (long) time orientation. In addition, average responses concerning time orientation generated by this instrument are used, when previously only part of the responses collected have been used (answers pertaining to the period of one year or longer). Finally, in addition to the instruments developed from the construct by Lawrence and Lorsch (1969), this study used the estimated timing of R&D (research and development) spending, and required payback period used in the companies in order to measure time orientation.

The paper is structured as follows. In the next section, the theoretical framework is presented. Subsequently, details are provided on the survey administration and methods, as well as variables and regression used. The results are then discussed, and finally, the last section concludes with final points on the study.

## **THEORETICAL FRAMEWORK**

### *Executive Time Orientation*

The actions necessary for managing a given business are complex and diverse, which is also true of the time orientation behind those actions. The actions of executives can be said to reproduce the time orientation of those executives. The time orientation of the actor's mindset and actions are thereby interconnected.



Compared to managers, executives are expected to hold a longer time orientation since their work is more far-reaching and uncertain than that of, for example, departmental managers (Lawrence & Lorsch, 1969). A short time orientation in this study refers to the tendency to “[focus] on business matters that improve current period performance while sometimes causing harm to the long-term effectiveness of the firm” (Van der Stede, 2000, pp. 609–610), and long time orientation refers to the importance of long-term improvements even if they cause harm in the short-term. To elaborate further on these concepts, the time orientation in this study refers to an executive mindset on issues that executives consider important and strategic for the company, not on issues they consider trivial. It should also be noted that it is not obvious that a long time orientation is superior to a short time orientation (van Rinsum & Hartmann, 2007). Sometimes short time orientation is needed in specific situations in order to survive in the long term, such as when signaling reliability to customers or creditors, or at a critical moment in the midst of a change in strategic direction (Merchant & Manzoni, 1989, p. 552; van Rinsum & Hartmann, 2007).

Graham et al. (2005) have studied the time orientation of executives in the United States, and they argue that pressures to perform in the short-term in the financial markets can lead to short-term-oriented actions inside companies. They found in their study that a very large percentage of CFOs would avoid making certain investments if those investments affected their attainment of the short-term EPS consensus estimate by the analysts. In their paper, they describe hypothetical situations that enabled them to find this result. The interview evidence used by Graham et al. (2005) complements this result by indicating that executives typically attempt to stay within GAAP (generally accepted accounting practices). Indeed, they prefer to take real actions, for example, by decreasing discretionary spending such as R&D and advertising in order to meet earnings targets. However, due to the accounting-related crises prior to the data collection period of Graham et al. (2005), it would be highly unlikely that executives would admit to playing with accounting regulations even in an anonymous study. Admitting to actual investment tempering seemed to be, at the time, a much safer road for them.

Jensen et al. (2004) described how listed companies take risks when aiming at short-term stock price maximization instead of long-term value creation. Again, it is difficult to quantify and prove this kind of behavior. Executives have to concentrate on present decisions; extended long-term value creation is also not beneficial if it impairs the ability of executives to adjust to the present acute situations (Chakhovich, 2009).

As indicated above, the concept of time orientation is complex. Therefore, it is operationalized in the study by using several measures. In previous research (Lawrence & Lorsch, 1969; Van der Stede, 2000, van Rinsum & Hartmann, 2007),<sup>1</sup> a single measure has commonly been used (with the exception of the study by Merchant, 1990)<sup>2</sup> in order to measure time orientation. In the current paper, this instrument by Lawrence and Lorsch (1969) was further developed by using more information generated by the instrument than has commonly been used. Traditionally, only the percentage of time used for issues influencing the company performance after one year has been used to measure long time orientation. The study uses data on the other time periods that have been gathered by the use of the instrument.

We acknowledge that a long time orientation and a short time orientation do not necessarily foreclose each other. In line with recognizing this multifaceted nature of time orientation, instruments have been developed to measure both long and short time orientations separately, as well as in combination. In other words, the study acknowledges that executives can focus on and even give (almost) equal weight to both short and long time orientation; they do not always have to choose between these so that more focus on the short time frame would automatically reduce the focus on the long time frame. The long time orientation is measured separately from short time orientation by separating the shorter and longer periods under investigation in the traditional instrument. Long and short time orientation are measured in combination by taking the average of the time periods surveyed.

Moreover, the instrument is complemented with other dimensions. These dimensions include the measurement of the payback period and of the time period during which profits from R&D projects are expected to materialize. In other words, the study adds to the time orientation construct that is measured primarily according to estimates and perceptions of executives (e.g. Van der Stede, 2000), other constructs that are less dependent on perceptions and more clearly grounded on the actual operations of the focal company (e.g. Liljebloom & Vaihekoski, 2009). This introduces significant triangulation possibilities.

There are also other reasons for adding these operational constructs. Van Rinsum and Hartmann (2007) claim that their study emphasizes the cognitive perspective of time orientation, and the current study follows their lead in recognizing the cognitive perceptions and biases of executives. This recognition requires an implicit assumption that a given executive mindset will be transformed into actions approximately in line with this mindset. It is admitted that this assumption does not necessarily hold in all situations.

For that reason, the use of operational measures is beneficial. These measures allow for a checking of the actual interconnections between executive mindset and actions.

The operational time orientation measures are expected to be tied with the wider concept of company time orientation. They are not direct proxies of the time orientation of a specific executive. However, as the executive is working in the company, they can be used as proxies of executive time orientation as well, keeping in mind this caveat.

Finally, we measure a preference gap in time orientation as the difference between preferred and actual time orientations, as well as with a separate question enquiring after the extent of pressure regarding time orientation from the financial markets. The preference gap complements the time orientation measures outlined above and represents the pressures felt by executives regarding their use of time.

### *Performance Measurement*

#### *Overview*

A given measurement structure can be classified according to the (1) *performance measures* and (2) *performance standards* in place (Murphy, 1998, pp. 11–13). Here the term “performance measure” refers to the actual measure used (e.g. earnings), and the term “performance standard” refers to the standard used to judge the acceptability of the level of performance achieved (e.g. last year’s earnings or budgeted earnings). Measures are a purer determinant of executive actions and mindsets than standards, because any given standard contains an underlying assumption on the measure as it is necessarily based on a certain measure. When studying standards, it is thus demanding to segregate the impact of a given standard from the impact of the associated measure. This study focuses on measures in order to reveal the pure impact of measures alone.

Traditionally, performance measures of top executives have been considered to be those formal measures that, along with their standard, are set by the executives, owners or the board and monitored by the board. One of the most important functions for performance measures for top executives is therefore to focus executive attention on the issues perceived as correct and important by the board (Bender, 2004). However, the current study also analyzes those measures, which exist in the environment of the company but for which there is no formal board decision that they would be part of executive evaluation. An example of the latter could be stock price

and earnings measures regarding which standards are potentially set by analysts or owners. The study recognizes that these measures, regardless of their informal status, can still be perceived by executives as important.

It has been suggested in previous literature that executive performance measures and compensation systems could induce a certain time orientation. In his discussion paper, [Rappaport \(2005\)](#) analyzes the need to increase the vesting periods of stock options contracts in order to extend the time orientation of executives. [Graham et al. \(2005\)](#) found in their empirical study that financial analysts and their estimates on EPS encourage executives toward an excessively short time orientation. Along the same lines, [Fuller and Jensen \(2002\)](#) suggested that executives should stop using the EPS estimates by analysts as targets in order to encourage a more optimal long time orientation.

If measures encouraging long-term actions have an effect on executive time orientation and this effect results in a longer-term-oriented mindset, a positive association between the importance of these measures in creating a response and a long-term-oriented mindset should be observed: an executive who recognizes being measured for working toward the long-term benefit of the company, can be expected to be more likely to achieve that kind of a long-term horizon in his work. It may, however, be premature to directly attribute any top executive perception or action to the direct effects of measures ([Larcker, 1983](#)). Companies relying more on stock price-based measures might exhibit fundamental differences compared with companies relying less on them – differences regarding, for example, industry conventions or executive and board member backgrounds or mindsets. The perceptions of executives may thus depend more on the fundamentals like investment opportunities ([Rajgopal & Shevlin, 2002](#)), strategy ([Miles & Snow, 1978](#)), industry ([Kaplan & Norton, 1996](#); [Simons, 1995](#)), or other contingencies ([Donaldson, 2001](#)) than on any direct effects of measures. Potential factors affecting time orientation in this way are sought after by the use of variables relating to the context of the company.

It may be that a given time orientation of executives makes the existence of a specific measure suited to that time orientation more likely, as executives prefer to be compensated based on their own preexisting time orientation. For example, recruitment processes may favor executives with a given time orientation, and this time orientation is thereby strengthened in the company. However, previous studies ([van Rinsum & Hartmann, 2007](#); [Van der Stede, 2000](#); [Chow, Kato, & Merchant, 1996](#)) indicate that the effect of time orientation on performance measures is not as common as the

direct effect of measures on time orientation, and the current study follows the path demarcated by these studies.

There are two notions of performance measurement-related time orientation concepts used in the previous studies. The current study makes this distinction explicit. There are executive and researcher perceptions on the time orientation of given measures (e.g. Rappaport, 2005; Jensen et al., 2004; Fuller & Jensen, 2002). These perceptions have been formed through executive education, public discussion, and indirect researcher experiences in the field. The current study analyzes the extent to which these perceptions correspond to the time orientation of executives. In addition to perceptions, the study analyzes the extent to which the actual use of certain measures, regardless of how these measures are perceived, is connected with time orientation (Graham et al., 2005; Van der Stede, 2000). This extent is unrelated to perceptions formed through education or as a result of public discussion. Respondents cannot search for a “politically correct” answer on the time orientation of measures, because the measures and executive time orientation have been separated from each other in the questionnaire.

Van der Stede (2000) found that management time orientation is influenced by budgetary slack. However, as his study focused on business unit managers who function under the constraints of the budget, and the current study focuses on top executives, the findings of his study are not directly translatable to the current study. Executives usually endogenously set their budget slack; they are not exogenously subject to it in a similar manner as other managers. Moreover, at the level of the executive, budget (if it exists at all) takes on a different meaning – an aggregate figure – than within the operational activities of a business unit manager. However, executives are under several different types of pressure, and the pressure from the financial markets, for example, can function as a substitute for the budgetary pressures at the middle management level. Therefore, the current study relates to Van der Stede (2000) through the notion of pressure.

The above discussion regarding the effect of measures on time orientation can be summarized with the following hypotheses, first:

**Hypothesis 1.** The use of executive performance measures is related to executive time orientation.

We are also interested to know whether the perceived time orientation of each performance measure is related to the time orientation of executives.

This would be an even stronger claim than that concerning the use of certain performance measure, thus the second hypothesis would be:

**Hypothesis 2.** The perceived time orientation of executive performance measures is related to executive time orientation.

Hypothesis 2 has not been studied by any previous research, although it may offer a more profound reason why some performance measures and their consequences on executive time orientation and behavior are so widely discussed whereas other performance measures are not.

### *Individual Measures*

In the following section, each individual measure is discussed in turn. As a purely empirical question, it is investigated how the individual measures are perceived with respect to executive time orientation. Measures were selected based on earlier studies that indicated that these measures are commonly used in companies in the Nordic countries (e.g. Ikäheimo, Löyttyniemi, & Tainio, 2003, 2007; Liljebloom & Vaihekoski, 2009).

For the purposes of the current study, *earnings* is defined as any kind of an earnings measure (such as, net earnings, operating earnings) since the effect of time orientation is not assumed to vary according to the exact definition. Using the current year's earnings as a measure and budgeted earnings as a standard, might focus the attention of management explicitly on the current year and the past, not necessarily beyond (Ittner et al., 2003). The focus on the past is induced as executives may aim at achieving performance that is simply stronger than the past, and not focus on creating novel strategies. However, as Demski et al. (2004) point out, a measure, which is traditionally and easily manipulated by executives (e.g. Bartov, 1993; Das & Zhang, 2003), can be useful in the long term as, after the initial manipulation is taken as given, the executives do not have to exert effort to achieve further manipulation of the measure. Instead, they can "forget" about the measure and are free to focus on actions that can enhance long-term value (Demski et al., 2004). It is worth noting, however, that the study by Demski et al. (2004) is based on an analytical model, not on empirical data.

*EPS* is derived from earnings and calculated, for example, as net earnings divided by the number of average outstanding shares (Das & Zhang, 2003). *EPS* is a measure that especially interests analysts, investors, and other participants of the financial markets, and is therefore naturally of interest to publicly quoted company executives (Hong, Kubik, & Solomon, 2000). *EPS* has been targeted in several discussion papers as a short-term measure that encapsulates the myopia potentially dwelling on the financial markets

(Rappaport, 2005; Jensen et al., 2004; Fuller & Jensen, 2002). The study by Graham et al. (2005) also provides some empirical evidence that executives may be excessively following the level and consistency of their EPS, instead of focusing on long-term issues.

*Returns* (such as return on capital employed and return on equity) are also derivatives of earnings, but they are calculated by dividing the earnings figure by a figure derived from the balance sheet (Libby, Libby, & Short, 2004; Hughes, Ayres, & Hoskin, 2005). Return figures measure how much earnings these given balance sheet items are able to generate. They could be considered more long-term oriented than pure earnings due to the length of the time frame during which these balance sheet items, so called long-lived assets, are expected to generate earnings (Hughes et al., 2005).

*Stock price* can potentially induce a very long-term outlook as a measure incorporating all available future information. In previous research, it has been elaborated that the stock price would automatically be a long-term measure, compared, for example, to earnings (e.g. Puffer & Weintrop, 1991; Brickley et al., 1985). In addition, R&D spending and other long-term investments, as a measure of time orientation, have been related to the strength of institutional ownership and block-holders, to whom stock price is important (McConnell & Wahal, 1997; Edmans, 2006).

Executives perceiving their companies' stock prices as being formed based on the short-term focus of EPS consensus estimates may disagree with this view (e.g. Rappaport, 2005). Jensen et al. (2004) also warn against short-term stock price maximization at the expense of long-term value reduction. If a company's equity becomes overvalued compared to the underlying value of the business of that company, executives may feel themselves to be under pressure to maintain this high equity value. This might lead them to conceal the real value of the company since a fall in the company value would be disastrous for their own stock options and career opportunities. The activities these executives undertake in order to conceal the real value are often non-value adding activities in the long term. It is notable that the papers by Jensen et al. (2004) and Rappaport (2005) are neither based on clearly defined empirical research nor on an analysis with quantitative methods. The managers may also suffer from an inappropriate fixation on the short-term stock price as a result of the overemphasis on the options, as suggested by Bergstresser and Philippon (2006). In their study, the value of CEO stock options in a company is positively related to the earnings management of the company: executives manipulate earnings in order to contribute to an increase in the stock price on which their incentives are based. This manipulation can be seen as an example of short-term actions.

*Cash flow* measures the net cash flow accumulated from company operations during a given period (e.g. Brealey, Myers, & Allen, 2006). The same reasoning as for earnings is applicable here: cash flows for the past year as a measure might be myopic. Particularly when cash flow is used to measure current liquidity at a time of potential liquidity crisis, its time orientation can be very short (Van der Stede, 2000).

*Success of development programs* has traditionally been a relatively common measure in executive performance measurement, for example, in Finland (Ikäheimo et al., 2003). In present day companies, multiple programs and projects are common and important for their success, and the management of these projects can be very demanding (Szymczak & Walker, 2003). Some of these projects are necessarily longer lasting than others. The success of development programs could be perceived as a long-term measure if it is constructed so that it measures executive performance in programs that require commitment to long-term development. These development programs are expected to yield results only after an extended time period, not a few months, as the word “development” implies.

*EVA™* is measured as net operating profit after taxes (i.e. NOPAT) minus the cost of capital. It was developed by Stern Stewart & Co. and purports to measure the actual long-term value created by a company, as opposed to pure accounting measures (Stewart, 1999). When EVA is used as a performance measure, the emphasis is on bonus banks whereby compensation is extended over longer periods of time (Stewart, 1999). *EVA™* also connects with the value measured in the financial markets and can therefore be criticized for shortsightedness on the same grounds as financial markets overall (Jensen et al., 2004; Graham et al., 2005).

*Sales* have traditionally been used to measure the effectiveness of sales personnel (Ryerson, 2008). However, it is also relatively commonly used in executive performance measurement (Ikäheimo et al., 2003). It is a relatively straightforward and simple measure for executives and managers at all levels of an organization. In some contexts, it may be vital and very farsighted to focus on sales, for example, in order to improve the market position of the company (Baghai, Bradshaw, Coley, & White, 1999). However, it can be questioned if it is farsighted to measure only sales, not costs, since costs depend on the volume sold (Drury, 2008). In a recent discussion on the reasons for the financial crisis, sales as a basis for compensation especially in financial services industry have been perceived to encourage a short time horizon, since it does not include the long-term influences on company risks (G-20 Pittsburgh Summit, 2009). Moreover, sales form a measure focusing on the past and are thus similar to earnings in this respect (Ittner et al., 2003).



**Table 1.** Performance Measures and their Expected Time Orientation.

Performance Measure	Time Orientation in Previous Literature
Earnings	Short with reservations
Earnings per share (EPS)	Short
Returns	Long
Stock price	Short or long
Cash flow	Short or long
Success of development programs	Long
EVA™	Long with reservations
Sales	Short or long
Balanced Scorecard	Long

BSC is a performance measurement system that typically consists of four perspectives: (A) customer, (B) internal business process, (C) learning and growth, and (D) financial perspective (Kaplan & Norton, 1996). In the BSC, each perspective is set to consist of measures that are expected to influence the performance within that perspective. BSC has been suggested to be farsighted in two ways. First, it connects performance measures formally with long-term strategy. When using BSC, the objectives and strategy of a given company are first decided on and the measures are then specified based on the strategy and its associated objectives (Otley, 1999). Second, in addition to financial measures, the BSC consists of non-financial measures that are expected to function as leading indicators of future success (Banker, Potter, & Srinivasan, 2000; Kaplan & Norton, 1996).

Table 1 presents a list of measures studied and the time orientation of each measure, as it is expected to appear in our study based on previous literature. The time orientation-related claims on certain measures, such as EPS or BSC, have been relatively homogenous, whereas other measures, such as stock price, have generated more extensive debate.

### *Contextual Factors*

There are also other factors potentially affecting the business planning horizon and time orientation of executives in a given company. *Industry* can potentially be a determinant of the time orientation for a specific company: some industries may have longer planning horizons than others (Murphy, 1998, p. 17). As an illustrative example, industries that involve long-lasting projects could be considered more long-term oriented than industries that

involve the sale of seasonal items such as clothes. Van Rinsum and Hartmann (2007) used industry (measured as a dummy: 1 if production, 0 otherwise) as an independent variable, hypothetically influencing managerial time orientation.

*Company performance* also has a strong impact on the time orientation of executives (Van der Stede, 2000); firms performing poorly and being under an immediate threat of illiquidity can be expected to prefer shorter planning horizons. For them, a longer horizon may not be an option since they are first and foremost required to stay in business in the short term.

*Company size* affects several company characteristics. Van Rinsum and Hartmann (2007) used organization size as an independent variable affecting managerial time orientation. However, they did not find a significant relationship between the variables.

*Environmental uncertainty* can impose short time orientation on executives. The logic is the same as in the case of company performance: in a volatile environment, executives may not have a chance to see the long-term performance if they do not concentrate on the short-term performance. Merchant (1990) considered the moderating influence of environmental uncertainty on the relationship between the pressure to meet financial targets and the existence of manipulation of performance data. Although he also analyzed time orientation, he did not use environmental uncertainty as a variable affecting time orientation or a relationship between time orientation and any other variable. In the current study, however, the relationship between environmental uncertainty and time orientation is examined.

## METHODS

### *Survey Administration*

The survey method was chosen in order to generate findings that could be generalized to a larger population of listed companies. The survey was tested by executives in four companies (two listed, one delisted, one mutual company), one former CFO of a listed company, one representative of OMX Nasdaq, and six academics. Comments were collected from each participant and the survey questions were refined based on the comments.

A full-scale mailing of the survey was implemented only after the test rounds. The survey was Internet administered. First, potential respondents were sent a prenotice by email to inform them about the upcoming request for participation in a survey. Several days after the prenotice, a link to the

survey was sent to the respondents by e-mail. After about a week, the first round of reminders was sent, followed by a second round, after which, those who had not responded were approached by phone. Subsequently, a final round by e-mail was implemented where respondents were informed that the survey was ending and it was their last opportunity to respond. The response rate was 18.0%. This is in line with the response rates in previous survey studies on the topic (e.g. [Graham et al., 2005](#)).

The main reason the survey was sent to CFOs (or equivalent) was that the CFOs out of all top executives are most often in direct contact with analysts and financial markets ([Graham et al., 2005](#)). Most of the respondents were formally titled either “CFO” or “Chief Financial Officer” (76%). The rest of the respondents also held a position with certain responsibilities related to financials, qualifying them to participate in the survey. CFOs and CEOs work in close proximity and have a possibility to reflect each other’s perceptions. Therefore, the perceptions of CFOs have also been used as surrogates for the perceptions of CEOs, whose compensation and incentives have been extensively studied in the previous research (e.g. [Murphy, 1998](#)).

### *Measurement of Variables*

In the questionnaire, most questions were closed-ended with ordered response categories ([Dillman, 2000](#)). Most of the *dependent variables* were derived from five questions in the survey (see [Table 2](#)): a question on the relative spread of time horizons used by the executives in their normal conduct of business (“*Time orientation, actual*”); a question on their preferred relative spread of working time devoted to tasks relating to different time horizons (“*Time orientation, preferred*”); a question on financial market pressure (“*Quarterly pressures shorten time horizon*”), and two questions on operation-related issues focused on the time orientation of the company (“*Payback period*” and “*Timing of R&D profit expectations*”). The “*Time orientation, actual*” was measured by using the instrument developed by [Lawrence and Lorsch \(1969\)](#), used by [Merchant \(1990\)](#) and [Van der Stede \(2000\)](#), and further developed by [van Rinsum and Hartmann \(2007\)](#). This instrument requires the respondent to state the percentage of his or her own working time spent on activities appearing in the income statement (1) during the next quarter, (2) after the next quarter, but during the next year, (3) after the next year, but during the next three years, and (4) after the next three years. The “*Time orientation, preferred*” was measured similarly. The sum of the responses was allowed to exceed 100%.

**Table 2.** Descriptive Statistics of Time Orientation Variables in the Study, as Enquired in the Questionnaire.

Time Orientation Measures	<i>n</i>	Next Quarter	Quarter to Year	1–3 Years	Over 3 Years	Total
“Time orientation, actual”	110	30.7%	36.9%	30.5%	21.5%	119.6%
“Time orientation, preferred”	110	29.2%	39.4%	40.7%	31.4%	140.7%
		Next Annual Report	1–3 Years	3–5 Years	After 5 Years	
“Timing of R&D profit expectation”	96	27.3%	30.9%	23.8%	19.1%	101.1%
		One Year	Two Years	Three Years	Four Years	Longer
“Payback period”	50	6%	28%	32%	24%	14%
		Disagree or Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
“Quarterly pressures shorten CFO’s time horizon”	108	20.4%	13.0%	40.7%	17.6%	8.3%

The question on “*Quarterly pressures shorten time horizon*” enquired if respondents felt that financial markets shorten their time horizon. The two questions related to operations enquired after the proportion of R&D investments for which no profit is expected within a certain number of years (“*Timing of R&D profit expectations*”), as well as the average payback period requirement for operational investments in the company (“*Payback period*”) (Liljebloom & Vaihekoski, 2009). Various types of variables were formed to provide space for various dimensions of executive time orientation.

The variables used in this study were formed in the following way (Table 3). The *Average time orientation* was measured as an average of the time horizons weighted by the percentage of working time devoted to each time horizon (“*Time orientation, actual*”). The variable *Short time orientation* was formed by summing up answer categories 1 and 2 (described earlier, referring to the period of one year or less) (e.g. Lawrence & Lorsch,

**Table 3.** The Calculation of Time Orientation Variables.

Time Orientation Measure	Calculation
Average time orientation	“Time orientation, actual”: the average of all four points
Short time orientation	“Time orientation, actual”: the first two categories summed up
Long time orientation	“Time orientation, actual”: the last two categories summed up
Long minus short time orientation	“Time orientation, actual”: the last two categories minus the first two categories
R&D timing	“Timing of R&D profit expectations”: average of all four categories
R&D next annual report	“Timing of R&D profit expectations”: the first category
R&D over one year	“Timing of R&D profit expectations”: the last three categories summed up
Payback period	“Payback period” – question
Preferred minus actual time orientation	“Time orientation, preferred” minus “Time orientation, actual” averages
Time pressure	“Quarterly pressures shorten time horizon” – question

1969). Similarly, the variable *Long time orientation* was formed by summing up answer categories 3 and 4 (described earlier, referring to the period of longer than one year). The variable *Long minus short time orientation* was measured as the difference of the two previous measures. This is a measure of the tendency to favor longer than one year time orientation compared to shorter than one year time orientation. It is possible that a respondent can simultaneously stress both long and short time orientation, and the study has accounted for that, by also acknowledging that the sum of the percentages of time orientation categories can exceed 100%. Moreover, the study uses the difference between preferred and actual time orientations as a measure of the preference gap (*Preferred minus actual time orientation*). This measure, along with the measure on the pressure in financial markets (*Time pressure*), accounts for the extent of time pressure. We calculated all these variables in two ways: using the percentages as indicated by respondents (*Unscaled*), and using the percentages obtained after scaling to sum up to 100%, for each respondent (*Scaled*).

The operational time orientation variables used were as follows: the percentage of R&D projects creating profits in the next annual report (*R&D next annual report*), the percentage of R&D projects not creating profits until after one year (*R&D over one year*), and the average year on which R&D creates profits (*R&D timing*), as well as the length of the payback period in years (*Payback period*).

*Independent variables* were measured in the following way. Dummy variables indicate the use of performance measures: the value equals 1 if the specific measure was mentioned in the questionnaire as important, 0 if it was

not mentioned. The perceived time orientation of each performance measure was measured on a Likert scale from 1 (short-term) to 7 (long-term), where each scale point has a separate preference rating attached to it, resulting in an interval scale (Sharma, 1996, pp. 2–3).

Control variables collected from the Orbis database include industry (the first digit of each SIC code) (Table 4), company size (total assets, annual operating revenue, see Singh & Davidson, 2003), company performance (return on capital employed, profit margin), financial position (solvency ratio, the natural logarithm of current ratio) (see Boubakri, Cosset, & Guedhami, 2005),<sup>3</sup> and relative ownership of the largest owner (Table 5). All figures were

**Table 4.** SIC Codes (the First Digit) of the Sample Companies.

Industry (SIC Code)	<i>n</i>
1000	7
2000	20
3000	11
4000	2
5000	8
6000	20
7000	30
8000	1
9000	2
Total	101

**Table 5.** Descriptive Statistics of Contextual Variables in the Study.

Contextual Variables	<i>n</i>	Average	Median	First Quartile	Third Quartile
Operating revenue (million euros)	89	165.4	60.6	20.2	227.5
Total assets (million euros)	86	221.5	99.7	42.0	297.2
Profit margin	90	10.4%	9.1%	2.4%	15.2%
ROCE	85	12.2%	14.6%	2.4%	25.9%
Solvency ratio	100	47.4%	45.7%	30.3%	69.4%
Current ratio	91	2.5	1.5	1.1	2.6
Ownership of the largest owner	95	31.6%	25.7%	16.0%	43.6%
		Average	Median	Mode	SD
Predictability of overall business environment	100	4.27	5	5	1.21

*Note:* The scale for the predictability of overall business environment: 1, very unpredictable; 2, unpredictable; 3, moderately unpredictable; 4, neutral; 5, moderately predictable; 6, predictable; 7, very predictable.

collected from 2007 data in order not to allow the abnormalities of stock markets and operating environment in fall 2008 to impact the results.

The uncertainty of the environment is measured in the questionnaire using the instrument developed by [Lorsch and Allen \(1973\)](#) and used by, for example, [Merchant \(1990\)](#) (Table 5). Here, respondents indicate the rate of change within six categories of the environment (the requirements of customers, distributors and suppliers, competitors' strategies, technological change, and internal process changes), on a scale from 1 (highly stable/infrequent change) to 4 (highly volatile/constant change). However, in order to preserve consistency in the questionnaire, the scale in our study was altered from 1 to 7. Moreover, the wording of the instrument was altered in order to better fit the current operating environment. Scores on the items were then added up to produce a scale measuring environmental uncertainty ([Merchant, 1990](#)).

### *Empirical Models*

The statistical analysis of the Hypotheses 1 and 2 is based on separate linear regression models. Hypothesis 1 is studied based on the following linear regression model that was estimated separately for each time orientation measure:

$$\text{TOM}_k = \alpha_0 + \sum \alpha_i D(\text{PM}_i) + \sum \alpha_j C_j + \varepsilon$$

where  $\text{TOM}_k$  refers to the time orientation measure  $k$  (listed earlier),  $D(\text{PM}_i)$  to the dummy variable  $i$  indicating if a particular performance measure  $i$  was stated as important (1, if important; 0 if not mentioned as important),  $C_j$  refers to control variable  $j$ ; the  $\alpha$ -parameters refer to the regression coefficients, and  $\varepsilon$  is the error term.

Hypothesis 2 is studied through simple linear regression models that were estimated within each group of respondents that were using a particular performance measure:

$$\text{ATO} = \beta_0 + \beta_i \text{TPM}_i + \varepsilon$$

where ATO refers to the perceived average time orientation,  $\text{TPM}_i$  refers to the time horizon related to performance measure  $i$ , the betas are the regression coefficients, and  $\varepsilon$  is the error term.

The *t*-values and statistical significances of the regression coefficients were calculated. Their values and implications are reported in the following section.

## RESULTS

Earnings, cash flow and stock price were the most popular performance measures in the survey. According to the respondents, returns, sales and EPS encouraged them to adopt a relatively long time orientation, compared to other measures. Averages for these measures varied between 2.04 and 2.27 years (see Table 6). Especially the result for EPS is interesting, because in previous research it has been implied that it is an extremely short-term measure (e.g. Graham et al., 2005). BSC and EVA<sup>TM</sup> were felt to encourage a relatively short time orientation compared to other measures, with an average of 1.47 and 1.48 years, respectively. Given that the BSC has been marketed as a long-term-oriented measure (Kaplan & Norton, 1996), its position in our survey is interesting. A short time horizon of BSC could be explained with the role of BSC measures acting as bridges from the long-term goals and strategy to operative targets.

Hypothesis 1 studies whether the use of specific executive performance measures is related to the executive time horizon. We use performance measure dummies in order to study this relationship. The following evidence is provided in Table 7. When time orientation is measured with the variable

**Table 6.** The Most Popular Performance Measures, When Respondents' Own Personal Performance is Evaluated, and their Average Time Orientation, Measured in Years ( $n = 108$ ).

Measure	<i>n</i>	Time Orientation
Earnings	76	1.59
Cash flow	45	1.53
Stock price	37	1.91
Returns (ROCE, ROI, ROA, etc.)	27	2.27
Success of development programs	24	1.69
Sales	24	2.09
EPS	21	2.04
Balanced scorecard	15	1.47
EVA <sup>TM</sup>	9	1.48
Some other measure	16	1.73



**Table 7.** Results of the Regression, where Dependent Variables are Related to Time Orientation (TOM<sub>*t*</sub>) and Independent Variables are Performance Measure Dummies.

Independent Variables $D(PM_j)$	Dependent Variable: Time Orientation Measure (TOM <sub><i>t</i></sub> )							
	1 Average Time Orientation (Not Scaled)	2 Long Time Orientation (Scaled)	3 Short Time Orientation (Not Scaled)	4 R&D Timing	5 R&D Next Annual Report	6 R&D Over One Year	7 R&D Over One Year	8 Payback Period
Constant	1.447	0.436	0.592	2.773	0.342	0.618	0.909	2.675
$D(\text{Earnings})$	14.64	13.14	14.11	7.59	9.76	9.11	1.00	3.32
$D(\text{Cash flow})$	-0.092	-0.038		-0.111		0.033	0.057	0.496
	-0.91	-1.12		-0.31		0.48	0.56	0.61
	-0.156	-0.051	<b>0.212</b>	-0.221		-0.031	-0.109	0.931
	-1.62	-1.59	<b>3.50</b>	-0.62		-0.47	-1.04	1.40
$D(\text{Stock price})$	-0.008	-0.005		0.622		0.126	<b>0.224</b>	0.245
	-0.09	-0.15		1.72		1.88	<b>2.20</b>	0.39
$D(\text{Returns})$	<b>0.245</b>	<b>0.100</b>		0.394	-0.124	0.126	0.121	-0.907
	<b>2.33</b>	<b>2.82</b>		0.98	-1.70	1.68	0.77	-1.32
$D(\text{Suc. of Dev. Prog})$	-0.017	-0.002		-0.218		-0.041	0.119	<b>1.790</b>
	-0.15	-0.05		-0.54		-0.55	0.95	<b>2.23</b>
Contextual variables	no	no	no	no	no	no	yes	no
Industry dummies	no	no	no	no	no	no	yes	no
Adjusted $R^2$	0.040	0.065	0.081	0.005	0.022	0.085	0.286	0.114
$n$	105	105	109	83	83	83	48	49

*Note:* In each cell, the first value is the regression coefficient and the second value is the *t*-value. The sign  $D(\dots)$  represents a dummy variable; for example,  $D(\text{Earnings}) = 1$ , if earnings is an important performance measure, and  $D(\text{Earnings}) = 0$  otherwise. The sign “yes” means that the specific independent variables have been included in the regression and “no”, that they have not been included. Dependent variables are listed in the order in which they appear in the text. Figures in bold represent significant results.

average time orientation (Model 1) and long time orientation (Model 2) the measure of returns appears to extend the time horizon of executives. According to the *average time orientation*, the use of returns extends the time orientation of CFO by 0.245 years (almost three months). We also have some indication that cash flow tends to shorten the time horizon of executives to some degree (Model 3).

These results are theoretically well grounded. The measure of returns includes balance sheet items from a lengthy period of time, whereas cash flow can be used to measure liquidity in the short-term. It is interesting that within the measure of returns, the potentially myopic component of earnings does not make the returns measure myopic. Moreover, cash flows are not tied with any long-term effects of stock price, but rather, with short-term liquidity.

When time orientation is measured by the “*Timing of R&D*” using *R&D timing* (Model 4), *R&D timing next annual report* (Model 5), and *R&D over one year* (Models 6 and 7), the stock price appears to lengthen the time horizon of R&D investments, and so does the returns, but to a lesser extent. The use of stock price as an important performance measure extends the expected R&D timing by 0.622 years (over seven months). The influence of stock price as a performance measure seems to be unaffected by the contextual variables and industry dummies (Model 7). This finding is in line with previous research (McConnell & Wahal, 1997; Edmans, 2006).

In Model 8, we analyze the influence of performance measures on the length of the *Payback period*. These results are quite different compared to the results of other regressions. The use of the success of development programs as a performance measure seems to increase the required payback period of operative investments by 1.790 years (one year and over nine months). This finding appears to be reasoned; both payback and development programs are tied to the operations of the company and should therefore be related. This result indicates that companies emphasizing development programs have long-term projects prolonging in turn the payback period.

We may assume that the use of several performance measures simultaneously may have joint effects beyond the individual main effects. For this reason, pairwise interactions between the five most commonly used performance measures were analyzed, but these proved to be insignificant (the results are not reported here).

After controlling for contextual variables, most of the performance measures lost their influence on time orientation variables (the results are not reported here except in Model 7) with the exception of the stock price. The connection between stock price and R&D, however, remained

significant after the contextual variables had been added (Model 7). The fact that most relations did not appear significant after the contextual variables had been added indicates that both time orientation and performance measures are influenced by the industry and company context. Out of the control variables, profit margin, current ratio, and the natural logarithm of solvency ratio were significant. Industry and company size did not have an impact.

In Hypothesis 2 we claimed that the perceived time orientation of performance measures is related to the executive time horizon. Regarding Hypothesis 2, it was found that the perceived time orientation of stock price, earnings, and EPS affect the time orientation of executives, positively (see Table 8). Our results indicate that a one year increase in the perceived time horizon of earnings extends the time orientation of CFO's work by 0.085 years (one month), a one year increase in perceived time horizon of stock

**Table 8.** Results of the Regression, where Dependent Variable is Actual Time Orientation of CFOs (ATO) and Independent Variables are the Experienced Time Orientation of Each Performance Measure (TPM) Used to Evaluate the CFO in Question.

Independent Variables TPM	1 ATO (Not Scaled)	2 ATO (Not Scaled)	3 ATO (Not Scaled)	4 ATO (Not Scaled)	5 ATO (Not Scaled)	6 ATO (Not Scaled)	7 ATO (Not Scaled)
Constant	1.209	1.212	1.192	1.558	1.297	1.121	1.272
Earnings time	<b>0.085</b> <b>2.18</b>	14.23	10.35	14.35	7.80	6.93	8.90
Cash flow time		0.047 1.17					
Stock price time			<b>0.114</b> <b>2.12</b>				
Returns time				-0.012 -0.30			
Success of development programs time					0.039 0.453		
Sales time						0.100 1.59	
EPS time							<b>0.12</b> <b>2.04</b>
<i>n</i>	76	45	37	27	24	24	21

*Note:* In each cell, the first value is the regression coefficient and the second value is the *t*-value. Figures in bold represent significant results.

**Table 9.** Results of the *t*-Test Comparison of “Quarterly Pressure Shorten Time Horizon” between the Groups Using Earnings and those who Are not Using it as a Performance Measure.

Earnings	Average
Used	4.326
Not used	5.196
Difference	<b>-0.770</b>
<i>n</i>	107
<i>t</i> -value	<b>-2.78</b>

*Note:* “Quarterly pressure shorten time horizon” had the following alternatives: 1, strongly disagree; 2, disagree; 3, somewhat disagree; 4, neither agree nor disagree; 5, somewhat agree; 6, agree; 7, strongly agree. Figures in bold represent significant results.

price by 0.114 years (over one month) and EPS by 0.120 years (almost one and a half months). This finding is interesting since these are also the measures that have sparked the most heated debate both in previous academic literature and in public discussion. Current research has now revealed that it is natural that this debate has focused on them: the perceived time orientations of these measures appear to impact the actual time orientation of executives.

We also used *Time pressure* to measure the influence of financial markets on executive time orientation. When earnings are used as a measure, CFOs feel less short-term pressures from the stock markets than otherwise (Table 9). Other performance measures did not have any influence on the time pressure felt by CFOs. Although earnings is often claimed to be one of the reasons for short-term pressures in situations where executives are required to meet earnings target set by analysts (Graham et al., 2005; Rappaport, 2005), the results belie the opposite. It appears that earnings are perceived by the CFOs as an internal measure whose level is related to the actual business operations of the company, and the connection between these business operations and the stock market is limited.

The survey data, as presented in Table 10, indicate that performance measures are considered to be shorter-term oriented if analysts set the targets for the measures. On the contrary, the executive team, along with the board, seems to be conceived as the most long-term-oriented standard setting body. It should be noted that based on our empirical evidence, earnings targets were never set by analysts (contrary to the targets for EPS, for example), and, therefore, the earnings measure is not very strongly tied to the financial markets.

**Table 10.** The Setters of the Most Important Evaluation Standards and Time Orientation of Each of these Standards.

Setter of Evaluation Standard	Earnings		Cash Flow		Stock Price		Returns		Success of Development Programs		Sales		EPS		BSC		EVA	
	N	Time	N	Time	N	Time	N	Time	N	Time	N	Time	N	Time	N	Time	N	Time
Board	35	1.59	18	1.59	16	2.35	17	2.07	8	1.73	11	2.61	11	2.31	2	2.00	3	1.54
CEO	22	1.40	15	1.28	4	2.00	2	2.00	9	1.76	4	1.54	3	1.54	10	1.24	3	1.54
Owners	10	1.38	2	1.31	9	1.06	2	2.00	2	2.00	4	2.16	1	4.00	1	2.00	1	2.00
Executive team	5	2.83	3	3.83			3	3.83	5	1.31	4	1.08	1	2.00	1			
Analysts			3	0.13	1	2.00	1	2.00			1	0.63	3	0.40			1	0.63
Some other party	4	2.00	4	2.00	7	2.00	2						2		1	2.00	1	

*Note:* Time orientation is measured in years.

When we studied *preferred vs. actual time orientation*, we could not find any relationship between the performance measures used or their time orientation and the time pressure. Therefore, the measures do not appear to cause any preference gap in time orientation.

The analysis of Hypothesis 2 concluded that the perceived time horizons of stock price, earnings, and EPS affect the overall time orientation of CFOs. Out of these measures, stock price and EPS have a rather high perceived time orientation, whereas the perceived time orientation of earnings is lower. The internal consistency of the current study can be checked by analyzing if stock price and EPS indeed foster long time orientation, and earnings toward slightly shorter time orientation, as suggested by Hypothesis 1. An analysis of Hypothesis 1 indicates that stock price as a measure indeed lengthens time orientation, when this time orientation is measured by the timing of R&D. EPS does not appear to affect time orientation in regressions, possibly due to the small amount of observations regarding this measure (used by 21 individuals). The measure of earnings appears to be connected to limited pressures from the stock markets, but otherwise does not impact time orientation. This result could be due to the issue that the measure of earnings does not clearly encourage very extended or reduced time orientation. Another explanation could be that earnings measures are already optimally in use, as they have been popular for a long time, and do not therefore affect time orientation any more.

Overall, the current paper investigated the time orientation of CFOs. The respondents were also asked if they felt that the time orientation of CEOs was comparable to their own. Respondents indicated that the similarity between CFO and CEO time orientations was remarkable (results not reported here). Therefore, the findings can also be extended toward understanding the formation of time orientation of CEOs.

## CONCLUSIONS

The study has indicated that multiple measures foster relatively long time orientation. This evidence is relieving in the sense that at least measures do not seem to encourage myopic time horizons. According to the findings, when time orientation is measured by the personal time orientation of the executive, returns are a long-term measure and cash flow a short-term measure. When time orientation is measured as the timing of R&D, stock price is a long-term measure and when time orientation is measured by the payback period, the success of development programs is a long-term measure.

All these impacts are justifiable both theoretically and analytically, although they have not received much explicit attention in earlier literature.

It is notable that traditionally the measures whose perceived time orientation is tied with executive time orientation (i.e. earnings, stock price, and EPS) have been overemphasized at the expense of other measures (e.g. Fuller & Jensen, 2002; Graham et al., 2005). The findings suggest that it is inadequate solely to focus on those measures whose perceived time orientation is related to actual time orientation; there are other measures, which may not be perceived strongly or whose perceived time orientation may not coincide with the actual executive time orientation, but which may, in any case, affect the time orientation of executives. The measures, such as the success of development programs, are the “silent” measures of executives; they might not raise strong feelings, but they nevertheless affect executive time orientation.

The study has indicated that executives possess a fairly adequate grasp on which performance measures encourage them toward certain time horizons. Stock price and returns, revealed to encourage a longer horizon, were also experienced by executives as relatively long-term-oriented measures. Moreover, cash flow was tied to a short time horizon, and was experienced by respondents to be a short-term measure as well. The success of development programs is a case in point; it was felt to be a relatively short-term measure, but, in the case when time orientation was measured with the payback period, it actually encouraged a lengthy time orientation. However, executives also felt that sales and EPS encouraged them toward a lengthy time horizon, although this was not confirmed by the regressions. Furthermore, BSC and EVA<sup>TM</sup> were experienced as short-term measures, but these perceptions were not confirmed either.

We also added the multidimensionality of the construct of time orientation to the time orientation literature (e.g. Van der Stede, 2000; van Rinsum & Hartmann, 2007). How this multidimensional construct is measured, affects which performance measures influence it. Previous studies on time orientation and performance measures have been unable to show all the current results due to their limited conceptualization of this construct. Executive action and mindset-related instruments of time orientation appear to measure different sides of the time orientation construct. Returns and cash flow were tied to the mindset-related, individually oriented time orientation instruments, whereas the stock price and success of development programs were tied to the action-related, company-oriented instruments.

Based on our findings, many performance measures (such as BSC, EPS, and EVA<sup>TM</sup>) did not have a significant influence on time orientation,

although it had been hypothesized. This raises the question if previous research (e.g. Van der Stede, 2000; van Rinsum & Hartmann, 2007) has been excessively focused on the importance of performance measures as a determinant of time orientation. It appears that only a limited number of measures actually influence time orientation. After adding control variables, most influences disappear. However, several measures unquestionably have an independent role in influencing executive time orientation because they affect how CFOs conceptualize issues in their work. The influence remains immaterial after adding contextual variables since some of them represent contextual factors, so called external drivers that simultaneously affect both the use of measures and the time orientation of executives. Further research is needed on these vital contextual drivers.

Earnings has traditionally been claimed to be a short-term measure (Ittner et al., 2003), albeit with reservations (Demski et al., 2004). This study did not find any connection between earnings and a short time horizon, although it indicated that if earnings are perceived as short-term (long-term) measure, they should also lead executives toward the short (long) term in actual fact. It is possible that earnings have been used for such a long time that their use has been balanced to such an extent that they do not influence time orientation any more. It is also worth noting that the measure of returns, where earnings form one component, is a long-term measure. In any case, the role of earnings in contributing to executive time orientation appears to be a fruitful subject for further studies. In addition to time orientation, earnings is a multidimensional construct as well and it can be measured in a multitude of ways. Future research could explore the different associations earnings can form with time orientation.

Finally, in addition to measures, targets, compensation classes, and financial markets can also impact executive time orientation. The examination of these relations would be an interesting and revealing target for future research studies.

## NOTES

1. In the studies mentioned here, the focus has usually been on the *management* time orientation, and not on the *executive* time orientation.

2. Merchant (1990) used the encouragement toward new ideas for different types of investments as a measure of time orientation. The types of investments included, among others, new product development, improvement of existing products, manufacturing process engineering, and basic research. Our constructs relating to R&D are tied to this measurement by Merchant (1990).



3. Demsetz and Villalonga (2001) argue for the use of accounting earnings as a backward-looking estimate and Tobin's Q as a forward-looking estimate. In this study, the purpose is to find out the current pressures that executives are facing due to company performance. Therefore, the previous performance is a better indicator of the time orientation of executives: executives themselves might consider company performance in the future to be quite uncertain, and, on the other hand, their time orientation mindset is likely to be relatively stable and not likely to change very fast with the arrival of new information about the future. Hence, accounting earnings are used. In addition, executives often complain that the stock price of their own company is undervalued. Accounting earnings thereby provide an estimate in which executives themselves also have relative confidence.

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## REFERENCES

- Baghai, M., Bradshaw, L., Coley, S., & White, D. (1999). Performance measures: Calibrating for growth. *Journal of Business Strategy*, 20(4), 17–21.
- Banker, R. D., Potter, G., & Srinivasan, D. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. *The Accounting Review*, 75(1), 65–92.
- Bartov, E. (1993). The timing of asset sales and earnings manipulation. *The Accounting Review*, 68(4), 840–855.
- Bender, R. (2004). Why do companies use performance-related pay for their executive directors? *Corporate Governance*, 12(4), 521–533.
- Bergstresser, D., & Philippon, T. (2006). CEO incentives and earnings management. *Journal of Financial Economics*, 80(3), 511–529.
- Bernitz, U. (2004). The attack on the Nordic multiple voting rights model: The legal limits under EU law. *European Business Law Review*, 15, 1423–1437.

- Boubakri, N., Cosset, J.-C., & Guedhami, O. (2005). Postprivatization corporate governance: The role of ownership structure and investor protection. *Journal of Financial Economics*, 76, 369–399.
- Brealey, R. A., Myers, S. C., & Allen, F. (2006). *Corporate finance*. Boston, MA: McGraw-Hill/Irwin.
- Brickley, J., Bhagat, S., & Lease, R. (1985). The impact of long-range managerial compensation plans on shareholder wealth. *Journal of Accounting and Economics*, 7(1–3), 115–129.
- Carlsson, R. H. (2007). Swedish corporate governance and value creation: Owners still in the driver's seat. *Corporate Governance: An International Review*, 15, 1038–1055.
- Chakhovich, T. (2009). What is myopia, and how do organisational controls influence it? Paper presented in 32nd Annual Congress of European Accounting Association, Tampere.
- Chow, C. W., Kato, Y., & Merchant, K. A. (1996). The use of organizational controls and their effects on data manipulation and management myopia: A Japan vs. U.S. comparison. *Accounting, Organizations and Society*, 21(2–3), 175–192.
- Das, S., & Zhang, H. (2003). Rounding-up in reported EPS, behavioral thresholds, and earnings management. *Journal of Accounting and Economics*, 35, 31–50.
- Demsetz, H., & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of Corporate Finance*, 7, 209–233.
- Demski, J. S., Frimor, H., & Sappington, D. E. M. (2004). Efficient manipulation in a repeated setting. *Journal of Accounting Research*, 42(1), 31–49.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method* (2nd ed.). New York, NY: Wiley.
- Donaldson, L. (2001). *The contingency theory of organizations*. Thousand Oaks, CA: Sage.
- Drury, C. (2008). *Management and cost accounting*. London: Thomson Learning.
- Edmans, A. (2006). Blockholder trading, market efficiency, and managerial myopia. *Journal of Finance*, Forthcoming; University of Penn., Institute for Law & Economics Research Paper No. 08–08. Available at: <http://ssrn.com/abstract=946669>
- Fuller, J., & Jensen, M. C. (2002). Just say no to Wall Street: Putting a stop to the earnings game. *Journal of Applied Corporate Finance*, 14(4), 41–46.
- G-20 Pittsburgh Summit. (2009). Promoting responsible remuneration practices in the financial sector. September 24–25. Pittsburgh.
- Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40, 3–73.
- Hong, H., Kubik, J. D., & Solomon, A. (2000). Security analysts' career concerns and herding of earnings forecasts. *RAND Journal of Economics*, 31(1), 121–144.
- Hughes, J. S., Ayres, F. L., & Hoskin, R. E. (2005). *Financial accounting – a valuation emphasis*. Hoboken, NJ: Wiley.
- Ikäheimo, S., Kontu, H., Kostander, L., Tainio, R., & Uusitalo, A. (2007). In: T. Chakhovich (Trans.), Ylimmän johdon palkitsemisjärjestelmien toimivuus valtionyhtiöissä ja osakkuusyhtiöissä. [The functionality of executive compensation systems in state fulfilled owned and associated companies.] Helsinki: Yliopistopaino.
- Ikäheimo, S., Löyttyniemi, T., & Tainio, R. (2003). *Ylimmän johdon palkitsemisjärjestelmät – Hyvä saa palkkansa? [Executive compensation systems; Do the good ones benefit? translated by TC]*. Helsinki: Talentum Media Oy.
- Ittner, C. D., Larcker, D. F., & Meyer, M. W. (2003). Subjectivity and the weighting of performance measures: Evidence from a balanced scorecard. *Accounting Review*, 78(3), 725–758.

- Jensen, M. C., Murphy, K. J., & Wruck, E. G. (2004). Remuneration: Where we've been, how we got to here, what are the problems, and how to fix them. Harvard NOM Working Paper No. 04-28; ECGI-Finance Working Paper No. 44/2004. Available at: <http://ssrn.com/abstract=561305> or doi:10.2139/ssrn.561305
- Kaplan, R., & Norton, D. (1996). *The balanced scorecard*. Boston, MA: Harvard University Press.
- Lambert, R. A. (1993). The use of accounting and security price measures of performance in managerial compensation contracts. *Journal of Accounting and Economics*, 16, 101–123.
- Larcker, D. F. (1983). The association between performance plan adoption and corporate capital investment. *Journal of Accounting and Economics*, 5, 3–30.
- Lawrence, P. R., & Lorsch, J. W. (1969). *Organization and environment: Managing differentiation and integration*. Homewood, IL: Irwin.
- Libby, R., Libby, P. A., & Short, D. G. (2004). *Financial accounting*. New York: McGraw-Hill/Irwin.
- Liljeblom, E., & Vaihekoski, M. (2009). Corporate ownership and managerial short-termism: Results from a Finnish study of management perceptions. *International Journal of Production Economics*, 117, 427–438.
- Lorsch, J. W., & Allen, S. A., III. (1973). *Managing diversity and interdependence: An organizational study of multi-division firms*. Boston, MA: Division of Research, Harvard Business School.
- McConnell, J. J., & Wahal, S. (1997). *Do institutional investors exacerbate managerial myopia?* Available at: <http://ssrn.com/abstract=47271> or doi:10.2139/ssrn.47271
- Merchant, K. A. (1990). The effects of financial controls on data manipulation and management myopia. *Accounting, Organizations and Society*, 15(4), 297–313.
- Merchant, K. A., & Manzoni, J. F. (1989). The achievability of budget targets in profit centers: A field study. *The Accounting Review*, 64, 539–558.
- Miles, R. E., & Snow, C. C. (1978). *Organizational strategy, structure and process*. New York, NY: McGraw-Hill.
- Murphy, K. J. (1998). *Executive compensation*. Available at: <http://ssrn.com/abstract=163914> or doi:10.2139/ssrn.163914
- Otley, D. (1999). Performance management: A framework for management control systems research. *Management Accounting Research*, 10, 363–382.
- Puffer, S. M., & Weintrop, J. B. (1991). Corporate performance and CEO turnover: The role of performance expectations. *Administrative Science Quarterly*, 36, 1–19.
- Rajgopal, S., & Shevlin, T. (2002). Empirical evidence on the relation between stock option compensation and risk taking. *Journal of Accounting and Economics*, 33(2), 145–171.
- Rappaport, A. (2005). The economics of short-term performance obsession. *Financial Analysts Journal*, 61(3), 65–79.
- Ryerson, A. (2008). Pharmaceutical sales performance: A proposed study measuring behavioral aspects of self-efficacy as compared to general self-efficacy. *International Journal of Pharmaceutical and Healthcare Marketing*, 2(3), 181–194.
- Sharma, S. (1996). *Applied multivariate techniques*. New York, NY: Wiley.
- Simons, R. (1995). *Levers of control – how managers use innovative control systems to drive strategic renewal*. Boston, MA: Harvard Business School Press.
- Singh, M., & Davidson, W. N., III. (2003). Agency costs, ownership structure and corporate control mechanisms. *Journal of Banking & Finance*, 27, 793–816.

- Skog, R. (2004). The takeover directive, the 'breakthrough' rule and the Swedish system of dual class common stock. *European Business Law Review*, 15, 1439–1451.
- Stewart, B. (1999). *The quest for value*. New York: HarperCollins.
- Szymczak, C. C., & Walker, D. H. T. (2003). Boeing – a case study example of enterprise project management from a learning organisation perspective. *The Learning Organization*, 10(3), 125–137.
- Teoh, S. H., Wong, T. J., & Rao, G. R. (1998). Are accruals during initial public offerings opportunistic? *Review of Accounting Studies*, 3, 175–208.
- Van der Stede, W. A. (2000). The relationship between two consequences of budgetary controls: Budgetary slack creation and managerial short-term orientation. *Accounting, Organizations and Society*, 25, 609–622.
- Van Rinsum, M., & Hartmann, F. (2007). Performance measurement system properties and managerial time orientation: Survey and experimental evidence. Paper presented at the Annual Congress of European Accounting Association, Lisbon.



**PART IV**  
**BALANCED SCORECARD AND**  
**PERFORMANCE MEASUREMENT**  
**SYSTEM ADOPTION**



# PERFORMANCE CONSEQUENCES OF BALANCED SCORECARD ADOPTIONS: CLAIM FOR LARGE-SCALE EVIDENCE AND PROPOSITIONS FOR FUTURE RESEARCH

Michael Burkert, Antonio Davila and Daniel Oyon

## ABSTRACT

*Purpose – Since the introduction of the concept of the balanced scorecard (BSC) in the early 1990s, researchers and practitioners have been discussing its impact on managerial and organizational performance. However, there are still few empirical results available in favor of the effectiveness of the BSC to justify its high rate of diffusion among companies. The central aim of this paper is to substantiate the claim for more empirical studies on performance implications of BSC use and to derive recommendations how to conduct such research effectively.*

*Approach – We review existing research on costs and benefits of the BSC in order to pinpoint to the necessity to do more large-scale empirical work on this topic. Moreover, we discuss important methodological challenges*

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*researchers are confronted with when analyzing performance consequences of the system.*

*Findings – Empirical studies have found both, evidence in favor and against the BSC by investigating specific elements constituting the system. However, no large-scale empirical evidence exists so far that unambiguously shows that companies using a fully developed BSC outperform non-users. We argue in the paper that this might be explainable by the holistic nature of the concept and particularly the methodological difficulties associated with analyzing its effects on performance.*

*Contribution – The paper is supposed to motivate researchers to conduct more large-sale empirical studies in the area and offers recommendations how to effectively design such studies. It emphasizes the opportunities structural equation modeling offers to investigate possible indirect effects and moderating effects stemming from the BSC.*

## 1. INTRODUCTION

Since the introduction of the concept of the balanced scorecard (BSC) in the early 1990s, researchers and practitioners have shown great interest in the concept. In the more practitioner-oriented literature, the concept has been celebrated as representing one of the most important management instruments in recent years (Sibbet, 1997, p. 12). Surveys provide evidence for impressively high rates of adoptions of BSCs worldwide: among the US firms, the rate of adoption had already been estimated to be around 50% by earlier studies (Silk, 1998; Williams, 2001), and more recent evidence even indicates that this percentage has increased significantly, up to 66% (Rigby, 2007). Also, the diffusion rates in other countries have been found to be high (Anand, Sahay, & Saha, 2005; Bourne, Franco-Santos, Kennerly, & Martinez, 2005; Chenhall & Langfield-Smith, 1998) or are expected to be high in the future (Sandt, 2004).

From a research point of view, these high diffusion rates are impressive, as companies deciding to use the new system need to be convinced that its benefits outweigh the costs of designing, implementing, and using it (see Mooraj, Oyon, & Hostettler, 1999, for an early discussion). Our review of the literature indicates that too little empirical evidence is available to justify the high rate of diffusion. In contrast to the rapid spread of BSCs, consider

the careful testing of new drugs in the pharmaceutical industry. In the pharmaceutical industry, a new drug can only be launched in the market after having passed through several stages, commonly known as Phase I (test for negative side effects), Phase II (test for efficacy using a small sample), and Phase III (test for efficacy using a large sample). In the field of business, meanwhile, new practices come and go without such careful assessment of efficacy and potential negative side effects.

The BSC can be considered to have passed Phase I, as there is no evidence from published field research that BSC use entails negative side effects. However, this finding is not necessarily insightful, since it could easily be the result of double selection bias, since companies with negative experiences are not likely to report failures, and journals do not often publish non-findings. Given the articles reporting on the positive effects of BSC implementation, one could argue that the BSC has also gone through the Phase II stage, as it has been shown to work well in a smaller setting (Davis & Albright, 2004). In contrast to a drug, however, the BSC has spread worldwide without the availability of large-scale evidence comparable to that provided by a Phase III study.

This lack of large-scale evidence may be due to several methodological challenges associated with the holistic nature of the concept and the numerous variables potentially affected by its design, implementation, and use. This paper contributes to the BSC literature in two ways. First, we substantiate our claim for the lack of convincing large-scale evidence via a review of existing empirical knowledge. Second, we derive propositions regarding how to conduct such a survey and discuss three ways of effectively analyzing the data. In particular, we discuss problems associated with the identification of BSC adopters in a sample and derive recommendations for how to account for these problems when designing a survey instrument. Moreover, we propose future studies not only examining the direct effects of BSC use on organizational performance, but also to analyzing its potential indirect effects and its potential role as a moderator variable. Given the expected complex relationships, we finally highlight the advantages of structural equation modeling (SEM) for examining the performance implications of BSC use in a comprehensive model.

The remainder of this paper is organized as follows. The next section reviews the literature on BSC adoptions and its performance implications, substantiating the need for further large-scale evidence. Section 3 discusses a number of issues that researchers are confronted with when designing a large-scale study to investigate the performance outcomes of BSCs and

discusses three ways of analyzing the data. Finally, [Section 4](#) summarizes the findings.

## 2. LITERATURE REVIEW

As outlined in the introduction, numerous publications in the practitioner press on the BSC discuss its potential advantages, and many consulting companies have developed a practice around it and recommend its implementation. In contrast to the overall positive reception of the concept in the business world, some researchers have raised the concern that the high number of publications focusing on new management instruments such as the BSC “has produced a faddish nature to the managerial accounting literature” ([Ittner & Larcker, 2001, p. 356](#)). In particular, [Norreklit \(2003\)](#) argues that the rapid diffusion of BSCs worldwide is merely the result of a management fashion triggered by viral marketing. Indeed, the countless practitioner articles published on the concept support this suspicion, and it could be argued that the high diffusion rate of BSCs is mainly driven by institutional isomorphism as described by [DiMaggio and Powell \(1983\)](#). According to these authors, organizations tend to adopt similar structures and management modes over time in an attempt to reduce uncertainty (mimetic isomorphism) and because of normative pressures resulting from standardized management accounting education at universities.

Others have asked whether the new concept simply represents “old wine in new wineskins,” meaning that the BSC is a repackaged bundle of already well-known management practices. [Andersson and Seiving \(2008\)](#) find in a recent study that core concepts underlying the BSC are not really new, such as non-financial measurement or the reflection of the organization’s strategy in the measurement system. However, they note that the popularity patterns of these underlying core concepts were modest before 1992, the year of the first publication on the BSC.

Given the high popularity of the system on the one hand and these serious concerns on the other, it is not surprising that leading scholars have claimed to systematically analyze BSC adoption in companies and its effects on organizations ([Atkinson et al., 1997](#); [Ittner & Larcker, 1998](#); [Otley, 1999](#)). Convincing large-scale empirical evidence of positive performance implications of BSC use could thereby help to justify the high rate of diffusion of the system and to address the legitimate objections that have been expressed.

However, despite the importance attributed to the BSC, large-scale empirical evidence on this new concept in general and on its performance consequences in particular is still surprisingly limited.

According to [De Geuser, Mooraj, and Oyon \(2009\)](#), empirical research on the BSC can be categorized in three main topics:

- I. Studies examining the diffusion of the concept;
- II. Studies analyzing whether the BSC contributes to organizational performance (the “*how much*” question);
- III. Studies analyzing how the BSC contributes to organizational performance (the “*how*” question).

As outlined in the introduction, there is already considerable evidence on the diffusion of the BSC for many countries worldwide. Confirming the conclusion of [De Geuser et al., \(2009\)](#), we do not find a great deal of empirical evidence published in scientific journals addressing the other two questions. The literature thereby contains both, empirical studies reporting case-specific experiences rather justifying its high rate of adoption and others shedding a critical light on the system.

Several studies that can be interpreted in favor of the BSC have empirically shown that some of its constitutive elements enhance performance. [Hoque and James \(2000\)](#) provide large-scale empirical evidence that the use of typical performance measures (PMs) contained in a BSC enhance organizational performance. This is an important finding, as it underscores the central claim of the BSC to measures organizational performance not only using financial PMs, but also using non-financial PMs. However, this study does not provide conclusive evidence in favor of the BSC in particular, as companies can profit from using a diverse set of unlinked PMs without having implemented this specific concept. The same criticism could apply to several studies that have brought important insights by analyzing other constitutive elements of a BSC in experiments ([Banker, Chang, & Pizzini, 2004](#); [Lipe & Salterio, 2002](#)).

Other studies supporting the BSC report on positive empirical outcomes of BSC use in a specific setting of one large company ([Davis & Albright, 2004](#); [Malina & Selto, 2001](#)). Again, while these findings are highly interesting and the studies are methodologically excellent, critics of the BSC could still claim that this evidence is not large scale.

Finally, there is supportive large-scale evidence from companies that have adopted the concept. In a very recent study, [De Geuser et al. \(2009\)](#) empirically demonstrate that BSC adopters are generally satisfied with the system and perceive the concept as contributing to organizational performance. Moreover, this study provides further important insights regarding how the BSC is perceived to contribute to performance.

Notably, some important studies have reported empirical results shedding a rather critical light on the BSC. [Lipe and Salterio \(2000\)](#) find in an experiment that common measures are clearly preferred to unique measures. This finding questions one of the key expected benefits of the BSC, as its measures should by definition be unique since they translate a specific strategy into specific actions. Moreover, [Ittner, Larcker, and Randall \(2003b\)](#) find that satisfaction with implemented BSCs falls over time. In addition, comparing a sample of BSC adopters with a sample of non-adopters did not lead to any significant effects on organizational performance in their study (see [Ittner, Larcker, & Meyer, 2003a](#) for a field study also showing that the subjectively perceived benefits of BSC use falls over time). Similarly, [Chenhall \(2005\)](#) does not find evidence in favor of the BSC concept in particular in his large-scale study of Australian companies.

Given the described current state of empirical knowledge, we conclude that the existing literature does not provide consistent evidence for or against the supposed benefits of BSC use. Moreover, little large-scale evidence has been reported that goes beyond the perceived usefulness of the system to demonstrate unambiguously that BSC use enhances organizational performance.

### **3. RECOMMENDATIONS FOR DEMONSTRATING BSC OUTCOMES IN A LARGE-SCALE SETTING**

As discussed in the preceding section, previous empirical research on BSCs has provided many valuable insights. In particular, previous studies provide evidence for a high diffusion rate of the concept. Additionally, several studies report on the satisfaction with the new concept among adopters (with the important exception being [Ittner et al. \(2003b\)](#) as mentioned in the previous section). However, given the scarce large-scale evidence available, an important research gap consists in conducting empirical research in a larger setting to test for the potential performance implications of the system. Given the complex nature of the BSC in general and the difficulty related to an unambiguous assessment of its potential performance implications in particular, this section addresses related methodological issues and derives propositions for this future empirical work.

### *3.1. Survey Design and Variable Measurement*

#### *3.1.1. Sample Construction*

As in a Phase III study in the pharmaceutical industry that tests the efficacy of a new drug compared to that of a placebo, conclusive empirical evidence on the positive organizational outcomes of BSCs should be large scale in nature.

Ideally, a longitudinal research design would be chosen to allow for the analysis of the effects of designing, implementing, and using the BSC in companies over time (see [Davila & Foster, 2005](#) for such a longitudinal study on effects of the adoption of management accounting systems). However, given the high costs and difficulties associated with longitudinal studies, cross-sectional survey designs also represent an appropriate method. In this case, the researcher should accommodate for the fact that there is a time lag between the design, implementation, and use of a BSC on the one hand and measurable organizational outcomes on the other, for example, by asking how long the BSC has remained conceptually unchanged in its use in the company.

It is important that the final sample is representative (at least for a certain population) and that it includes companies with and without the BSC. Hard conclusions regarding positive organizational outcomes of BSC use can only be drawn if the sample contains enough companies with the BSC and others without it. Restricting the sample to a specific industry might be useful in controlling for the countless variables that can potentially distort the results of multi-industry studies ([Ittner et al., 2003b, p. 722](#)).

#### *3.1.2. Identification of BSC Adoption, Type of Design, and Stage of Development*

The accurate determination of whether companies make use of a BSC is the necessary condition to assess its performance implications. Any failure on this issue undermines the validity of the whole study. This may seem trivial at the first glance, but when reviewing the literature on BSC adoption we noticed that in most studies, respondents were directly and explicitly asked whether or not their company uses a BSC. This is problematic in at least two respects. First, given the fact that the BSC is considered a breakthrough in modern management accounting by the business world, respondents could be biased because they perceive it as socially desirable to have this system, leading to a significant overestimation of its diffusion (regarding the problem of perceived social desirability, see [Podsakoff, McKenzie, Lee, & Podsakoff, 2003, p. 881](#)).

Second and even more importantly, in continental European countries, companies often use BSC-like performance measurement systems (PMS) but label them differently. In France, for example, many companies have used the *Tableau de Bord* for a long time; this is a specific PMS developed decades ago (Lebas, 1994). In the past, several authors have discussed the similarities of the two concepts (Epstein & Manzoni, 1998; Bessire & Baker, 2005; Bourguignon, Malleret, & Norreklit, 2004), and Epstein and Manzoni (1997) mention that some French academics consider the BSC as a special version of the *Tableau de Bord*. Conducting a survey focusing on French companies in the sample would lead to biased results when narrowly asking whether or not companies make use of a BSC. Respondents would indicate that they do not use a BSC, and thus they would be spuriously classified as non-adopters, although they might have used a BSC-like *Tableau de Bord* for years.

Similarly, asking the narrow question of whether or not a BSC has been adopted also leads to an underestimation of its diffusion in surveys among German companies. Early studies on the diffusion of the BSC among German companies seemed at a first glance to provide evidence for rather low diffusion rates for the system (Günther & Grüning, 2002; Sandt, 2004). However, the very same studies report that the majority of companies use what they call an *own system*. Again, it is very likely that these companies have designed and implemented BSC-like PMS but do not label them as such, but instead consider them as *own systems*.

Kaplan and Norton (2001) themselves raise a further issue related to the accurate identification of whether or not companies use BSCs. They state that many companies might indicate having a BSC although they only possess a number of unlinked financial and non-financial PMs but do not use them as a comprehensive management tool. This issue has recently been tackled by Speckbacher, Bischof, and Pfeiffer (2003), who recommend that BSC adoption be measured beyond a binary “have-it-or-not” variable. In their paper, they develop a typology of BSCs differentiated according to their degree of sophistication. A BSC is classified as a type I BSC if it contains a set of financial and non-financial PMs constituting a multi-dimensional framework. A type II BSC is additionally linked to the organization’s strategy and is characterized by a high degree of linkage among the PMs in terms of established cause-and-effect relationships. Finally, a type III BSC is used as a comprehensive management tool with additionally defined objectives and action plans for the different performance dimensions and with a connection to the company’s incentive system. We fully agree with these authors that the possible performance implications associated with BSC use might largely depend on the specific design type implemented, and that any failure to

account for this will lead to invalid research results. Additionally, in order to be as thorough as possible, it is also necessary to specify whether the BSC-like system is still in the design or implementation stage or whether it has already been in use for a certain period.

In order to overcome the outlined biases, we recommend asking companies in a first place to indicate what kind of PMS they use. This should include the option “own PMS” as well as any country-specific PMS. In a second step, respondents should be asked on a general level how their PMS can be characterized – for example, using Speckbacher et al.’s measurement framework. The characteristics of the company’s PMS can be used to indirectly derive whether the company makes use of a BSC-like PMS or not. Moreover, taking into account the precise differences in BSC sophistication and the question of how long the BSC-like system has already been in place prepares the ground for a more accurate investigation of the performance implications of BSC use.

### *3.1.3. Outcome Variables*

It has been argued that the use of a BSC to translate strategy into action increases the probability that organizational objectives will be met. According to Kaplan and Norton (1996) designing and implementing a BSC entails an explicit elaboration of the strategy, the broad measurement of performance, and the identification of managerial actions that are aligned with set strategic objectives. Given this holistic nature of the BSC, future empirical research can potentially focus on two main categories of outcome variables that are theoretically affected by the design, implementation, and use of BSCs in companies: the improvement of companies’ general management practices and the achievement of organizational performance outcomes.

Both categories can be further subdivided into two groups each. Management practices include overall performance measurement as practiced in the company on the one hand, and on the other hand, specific management practices such as the elaboration and communication of the company’s strategy as well as the monitoring of goal achievement.

The second category, organizational performance outcomes, includes both the soft value drivers of future organizational success (e.g., customer satisfaction) and financial performance that results from a time lag (e.g., return on investment, return on sales). Moreover, in order to guarantee comparability to previous studies, evidence of satisfaction with the system could also be collected. It might not be possible to include all the possible variable categories in one study, but a wider selection would still allow for insightful analyses.



#### *3.1.4. Contextual Variables*

As pointed out in the previous section, the BSC represents a holistic management tool that potentially impacts a whole set of outcome variables. In this context, considering contextual variables helps understanding why certain companies make use of sophisticated BSC-like PMSs and others do not. Moreover and even more important, it is necessary to include contextual factors as control variables when investigating performance implications of BSC use. The most important contextual variables identifiable in the literature with regard to the BSC are company size and environmental uncertainty of the external environment, which are both associated with a stronger emphasis on modern performance measurement techniques (Baines & Langfield-Smith, 2003; Hoque & James, 2000). Moreover, internal context factors could also play an important role; these would include the attitude of companies toward newer management tools and the number of newer measurement practices relied on (e.g., target costing). Again, it may not be possible to include all possible variables, but accounting for as many as possible will enhance the credibility of the results.

### *3.2. Statistical Analysis*

Given the holistic nature of the BSC concept as well as the numerous variables potentially affected by its design, implementation and use rigorous testing of performance implications in a comprehensive way represents a methodologically challenging exercise.

Following our recommendation to more indirectly determine whether companies make use of a BSC or not (and if so, what type of BSC they use) results technically speaking in a non-metric scale variable. However, measuring a wide range of outcome variables that are interval scale in nature still provides the opportunity to analyze the direct and indirect effects on performance as well as to investigate the moderating effects of the level of BSC sophistication on relationships between other variables.

#### *3.2.1. Analysis of Direct Effects*

The most straightforward approach to testing for performance implications of BSC adoption is to group the companies according to their BSC sophistication and to check for significant differences in the means of the outcome variables. In their paper, Ittner et al. (2003b) conducted such an analysis for different outcome variables but did not find significant differences in financial performance. However, they mention that 76.9%

of companies reporting to have the BSC did not make use of causal business modeling, which is a central element of the BSC (Ittner et al., 2003b, p. 725). In a subsequent paper, Davis and Albright (2004) reasoned that this finding might be due to the binary “BSC-yes-no” grouping of companies and the non-use of causal business modeling by BSC adopters. Following our recommendation to differentiate between different levels of BSC sophistication in the performance analysis would mitigate this objection. However, it is not unlikely that this sort of more precise grouping of companies with regard to BSC sophistication would lead to insignificant results as well. To illustrate this, it is necessary to consider that a single BSC with its 15–20 PMs represents only one element of the company’s PMS, which consists broadly of the total number of PMs available in a company. Prior studies report on empirical findings that the overall quality of PMs available in an organization depends significantly on data accuracy and timeliness, for example (Nelson, Todd, & Wixom, 2005), which in turn significantly impact the quality of the decisions made (Gupta & King, 1997). Thus, the potential positive effect of BSC sophistication as a contribution to overall performance measurement quality in a company could easily be disguised by problems regarding data accuracy, a methodological problem that can only be marginally taken into account when comparing group differences.

Moreover, assuming direct effects on the part of this single element of the company’s performance measurement activities involves leaps in logic, as it is not entirely clear whether the mechanisms that transform BSC use in organizational performance work smoothly. Analyzing direct effects on performance using this rather simple methodological approach described above therefore represents an inappropriate way to reject the hypothesis that BSC use results in positive organizational outcomes.

### *3.2.2. Analysis of Indirect Effects*

A more promising way of investigating the performance implications of BSC adoption could be analyzing its indirect effects. Such an approach requires a two-step procedure. In the first step, antecedents to organizational performance need to be identified on theoretical grounds that are themselves affected by the design, implementation, and use of a BSC. In the second step, the indirect effects of BSC adoption over the identified antecedents of organizational performance have to be tested and empirically shown to be significant. As depicted in Fig. 1, this can be done by making use of one or several dummy variables capturing the sophistication levels of BSC-like PMS. These dummy variables can be integrated into a comprehensive model to analyze its direct effects on antecedents of

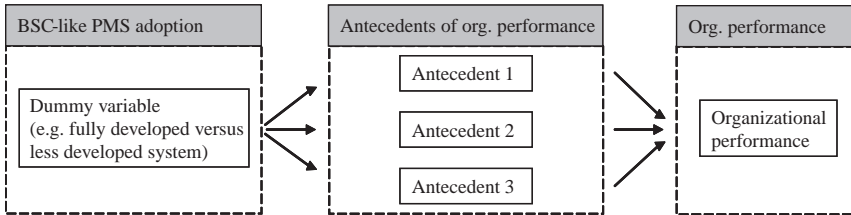


Fig. 1. Investigating the Indirect Effects of BSC Use on Organizational Performance.

organizational performance. If there is a direct link of the dummies on organizational performance that disappears or significantly decreases after having integrated the antecedents one can speak of a mediating model (Baron & Kenny, 1986). Otherwise it might be more correct to speak of an indirect effect only (Mathieu & Taylor, 2006).

This kind of analysis is particularly feasible relying on modern software packages like LISREL or MPlus that are used for SEM. Among other more general advantages, SEM is superior to traditional multiple regression techniques because it allows for the investigation of more complex relationships among variables. For example, it is possible to examine a set of dependent variables that are in turn independent variables for other dependent variables (Henri, 2007; Smith & Langfield-Smith, 2004).

Overall, an indirect assessment of the performance implications of BSC use can be particularly insightful because it not only addresses the question of whether the BSC affects organizational performance but also addresses *how* it affects performance.

### 3.2.3. Analysis of Moderating Effects

The investigation of potential moderating effects represents a second promising way to find evidence for or against the positive performance implications of BSC use. Again, a two-step procedure is required. Relying on conceptual work undertaken on the BSC, a theoretical model needs to be identified in the first step relating variables to organizational performance. As shown in Fig. 2, it could be interesting to develop a model that analyzes the (inter)relationships between the companies' soft value drivers and resulting hard outcomes. In the second step, a potential moderating role of BSC adoption on these relationships can be assessed. As indicated in Fig. 2, a particularly elegant way to do this would be to split the sample into at least two groups – for example, one group not making use of the BSC and the other making use of a fully developed BSC. The existence of a moderator effect is

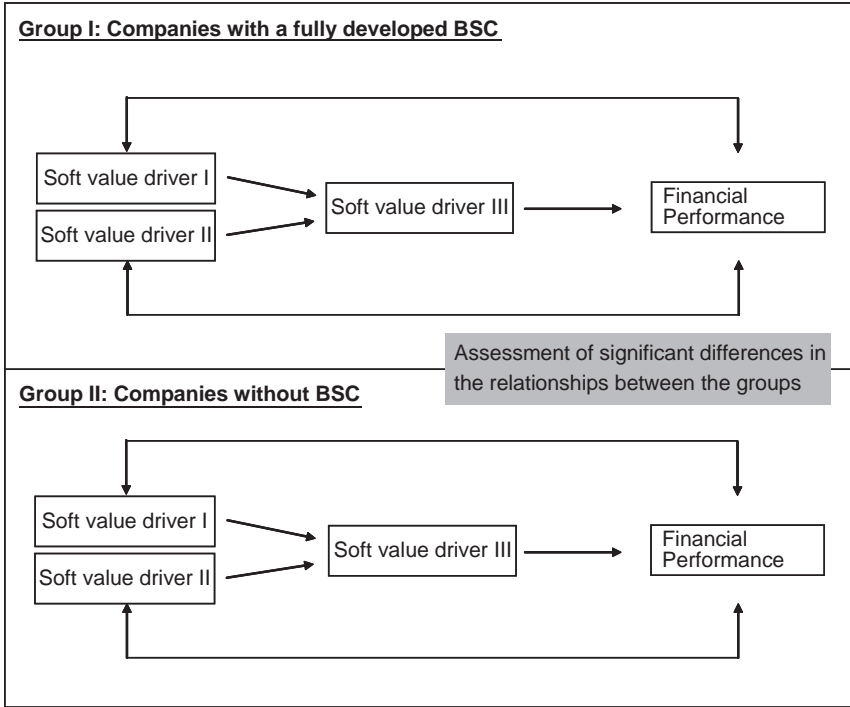


Fig. 2. Use of Multi-Sample Analysis to Test for the Moderating Effects of BSC Adoption.

assessed by analyzing whether there are significant differences in the (inter)relationships between the value drivers and hard outcomes. This kind of analysis can again be appropriately done using SEM, as it offers the opportunity to accurately conduct the proposed multi-group analysis by testing for a significant improvement of the chi-square value when moving from a joint estimation of the respective paths in the two sub-samples to a separate estimation (Jaccard & Wan, 1996). Multi-group SEM analysis has already regularly been applied in other fields such as marketing (see Homburg & Pflesser, 2000, for an example) and has recently been recommended by Smith and Langfield-Smith (2004) to be used in the field of management accounting.

Again, SEM offers the opportunity to deal with the expected complexity of relationships and to assess the existence of moderator effects within one comprehensive analysis, making it a promising approach.

## 4. CONCLUSIONS

This paper aimed to substantiate the need for convincing evidence-based research to justify the high diffusion rate of BSCs. The starting point of our reasoning in [Section 2](#) was that many new concepts such as the BSC or ABC are developed in the business world and gain a high degree of popularity before a rigorous assessment of their benefits and costs has been conducted by academics. Reviewing the empirical literature published on the performance implications of the BSC, we have found both, important evidence for positive effects of some of the elements constituting the BSC and results that shed a more critical light on the expected benefits stemming from its constituting practices. However, we have not found large-scale evidence in favor of the BSC in a study that rigorously compares BSC adopters with non-adopters and thus focuses on the concept as a bundle instead of considering the single elements constituting it. So far, such evidence only exists in smaller settings of large companies with different branches; thus, it can hardly be generalized ([Davis & Albright, 2004](#)). In [Section 2](#), we have addressed methodological issues that researchers are confronted with when designing such a large-scale survey to investigate the performance implications of BSC use. In particular, we have derived recommendations as to how to accurately identify BSC adoption in a sample of companies and what categories of variables could be considered outcome variables. Moreover, we have discussed three ways of analyzing the data and pinpointed the more promising research strategy of investigating the indirect effects of BSC adoption or of treating BSC adoption as a moderator variable in contrast to just examining the direct effects on performance. Given the holistic concept of the BSC and the potentially high number of variables affected by its design, implementation, and use, we finally recommend the use of SEM, as it is able to effectively deal with the rather complex nature of expected relationships. In conclusion, we think that academics should play an important role in the evaluation of new concepts popular in the business world. For this, large-scale studies are required that will empirically examine the costs and benefits associated with such concepts complementing theoretical reasoning. With regard to the BSC, there is still a need for such large-scale evidence, and we hope that this paper stimulates the debate on how to conduct such research appropriately.

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## REFERENCES

- Anand, M., Sahay, B. S., & Saha, S. (2005). Balanced scorecard in Indian companies. *Vikalpa: The Journal for Decision Makers*, 30(2), 11–25.
- Andersson, C. O., & Seiving, E. (2008). *Hot or not? – Scrutinizing the balanced scorecard from a management fad and fashion perspective* (<http://www.essays.se/essay/d22d7ef2ac/>), pp. 1–49). Göteborg: University essay from Göteborgs universitet/Företagsekonomiska institutionen.
- Atkinson, A. A., Balakrishnan, R., Booth, P., Cote, J. M., Groot, T., Malmi, T., Roberts, H., Uliana, E., & Wu, A. (1997). New directions in management accounting research. *Journal of Management Accounting Research*, 9, 79–108.
- Baines, A., & Langfield-Smith, K. (2003). Antecedents to management accounting change: A structural equation approach. *Accounting, Organizations and Society*, 28(7/8), 675–698.
- Banker, R. D., Chang, H., & Pizzini, M. J. (2004). The balanced scorecard: Judgmental effects of performance measures linked to strategy. *The Accounting Review*, 79(1), 1–23.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Bessire, D., & Baker, C. R. (2005). The French tableau de bord and the American balanced scorecard: A critical analysis. *Critical Perspectives on Accounting*, 16(6), 645–664.
- Bourguignon, A., Malleret, V., & Norreklit, H. (2004). The American balanced scorecard versus the French tableau de bord: The ideological dimension. *Management Accounting Research*, 15(2), 107–134.
- Bourne, M., Franco-Santos, M., Kennerly, M., & Martinez, V. (2005). Reflections on the role, use and benefits of corporate performance measurement in the UK. *Measuring Business Excellence*, 9(3), 36–40.
- Chenhall, R. H. (2005). Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: An exploratory study. *Accounting, Organizations and Society*, 30(5), 395–422.
- Chenhall, R. H., & Langfield-Smith, K. (1998). Adoption and benefits of management accounting practices: An Australian study. *Management Accounting Research*, 9(1), 1–19.
- Davila, A., & Foster, G. (2005). Management accounting systems adoption decisions: Evidence and performance implications from early-stage/startup companies. *The Accounting Review*, 80(4), 1039–1068.
- Davis, S., & Albright, T. (2004). An investigation of the effect of balanced scorecard implementation on financial performance. *Management Accounting Research*, 15(2), 135–153.
- De Geuser, F., Mooraj, S., & Oyon, D. (2009). Does the balanced scorecard add value? Empirical evidence on its effect on performance. *European Accounting Review*, 18(1), 93–122.
- DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(1), 147–160.
- Epstein, M. J., & Manzoni, J.-F. (1997). The balanced scorecard and tableau de bord: Translating strategy into action. *Management Accounting: Official Magazine of Institute of Management Accountants*, 79(2), 28–36.
- Epstein, M. J., & Manzoni, J.-F. (1998). Implementing corporate strategy: From tableaux de bord to balanced scorecards. *European Management Journal*, 16(2), 190–203.
- Günther, T., & Grüning, M. (2002). Performance Measurement – Systeme im praktischen einsatz. *Controlling*, 14(1), 5–13.

- Gupta, M., & King, R. R. (1997). An experimental investigation of the effect of cost information and feedback on product cost decisions. *Contemporary Accounting Research*, 14(1), 99–127.
- Henri, J.-F. (2007). A quantitative assessment of the reporting of structural equation modeling information: The case of management accounting research. *Journal of Accounting Literature*, 26, 76–115.
- Homburg, C., & Pflesser, C. (2000). A multiple-layer model of market-oriented organizational culture: Measurement issues and performance outcomes. *Journal of Marketing Research*, 37(4), 449–462.
- Hoque, J., & James, W. (2000). Linking balanced scorecard measures to size and market factors: Impact on organizational performance. *Journal of Management Accounting Research*, 12, 1–17.
- Ittner, C. D., & Larcker, D. F. (1998). Innovations in performance measurement: Trends and research implications. *Journal of Management Accounting Research*, 10, 205–238.
- Ittner, C. D., & Larcker, D. F. (2001). Assessing empirical research in managerial accounting: A value-based management perspective. *Journal of Accounting and Economics*, 32(1–3), 349–410.
- Ittner, C. D., Larcker, D. F., & Meyer, M. W. (2003a). Subjectivity and the weighting of performance measures: Evidence from a balanced scorecard. *The Accounting Review*, 78(3), 725–758.
- Ittner, C. D., Larcker, D. F., & Randall, T. (2003b). Performance implications of strategic performance measurement in financial services firms. *Accounting, Organizations and Society*, 28(7/8), 715–741.
- Jaccard, J., & Wan, C. K. (1996). *LISREL approaches to interaction effects in multiple regressions*. Thousand Oaks, CA: Sage Publications.
- Kaplan, R. S., & Norton, D. P. (1996). *The balanced scorecard: Translating strategy into action*. Boston: Harvard Business School Press.
- Kaplan, R. S., & Norton, D. P. (2001). Transforming the balanced scorecard from performance measurement to strategic management: Part I. *Accounting Horizons*, 15(1), 87–104.
- Lebas, M. (1994). Managerial accounting in France – Overview of past tradition and current practice. *European Accounting Review*, 3(3), 471–487.
- Lipe, M. G., & Salterio, S. E. (2000). The balanced scorecard: Judgmental effects of common and unique performance measures. *The Accounting Review*, 75(3), 283–298.
- Lipe, M. G., & Salterio, S. E. (2002). A note on the judgmental effects of the balanced scorecard's information organization. *Accounting, Organizations and Society*, 27(6), 531–540.
- Malina, M. A., & Selto, F. H. (2001). Communicating and controlling strategy: An empirical study of the effectiveness of the balanced scorecard. *Journal of Management Accounting Research*, 13, 47–90.
- Mathieu, J. E., & Taylor, S. R. (2006). Clarifying conditions and decision points for mediational type inferences in organizational behavior. *Journal of Organizational Behavior*, 27(8), 1031–1056.
- Mooraj, S., Oyon, D., & Hostettler, D. (1999). The balanced scorecard: A necessary good or an unnecessary evil? *European Management Journal*, 17(5), 481–491.
- Nelson, R. R., Todd, P. A., & Wixom, B. H. (2005). Antecedents of information and system quality: An empirical examination within the context of data warehousing. *Journal of Management Information Systems*, 21(4), 199–235.

- Norreklit, H. (2003). The balanced scorecard: What is the score? A rhetorical analysis of the balanced scorecard. *Accounting, Organizations and Society*, 28(6), 591–619.
- Otley, D. (1999). Performance management: A framework for management control systems research. *Management Accounting Research*, 10(4), 363–382.
- Podsakoff, P. M., McKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.
- Rigby, D. (2007). *Executive guide – Management tools 2007* ([http://www.bain.com/management\\_tools/Management\\_Tools\\_and\\_Trends\\_2007.pdf](http://www.bain.com/management_tools/Management_Tools_and_Trends_2007.pdf)). Boston: Bain & Company Publishing.
- Sandt, J. (2004). *Management mit kennzahlen und kennzahlensystemen-bestandsaufnahme – Determinanten und erfolgsauswirkungen*. Wiesbaden, Germany: Gabler.
- Sibbet, D. (1997). 75 years of management ideas practices 1922–1997. *Harvard Business Review*, 75(5), 2–12.
- Silk, S. (1998). Automating the balanced scorecard. *Management Accounting: Official Magazine of Institute of Management Accountants*, 79(11), 38–44.
- Smith, D., & Langfield-Smith, K. (2004). Structural equation modeling in management accounting research: Critical analysis and opportunities. *Journal of Accounting Literature*, 23, 49–86.
- Speckbacher, G., Bischof, J., & Pfeiffer, T. (2003). A descriptive analysis on the implementation of balanced scorecards in German-speaking countries. *Management Accounting Research*, 14(4), 361–388.
- Williams, S. (2001). Drive your business forward with the balanced scorecard. *Management Services*, 45(6), 28–30.





# THE IMPORTANCE OF BALANCED SCORECARDS IN HOSPITALS

Lars-Göran Aidemark, Stefano Baraldi,  
Elin K. Funck and Andreas Jansson

## ABSTRACT

*Purpose – The purpose of this study is to examine the importance of balanced scorecard (BSC) in Swedish emergency hospitals, that is, to describe its prevalence and its use in these hospitals.*

*Methodology/approach – The study is based on a questionnaire administered to financial managers in all of Sweden's emergency hospitals. The questionnaire investigates the prevalence of the BSC, the reasons for its implementation, and how BSC is used.*

*Findings – The study shows that 65% of Swedish emergency hospitals use the BSC. The use of the BSC was motivated by a need to make strategy clear and to obtain a more comprehensive view of organizational performance. BSC is used mainly for measurements connected to the organizations' strategy and to create goal congruence. Performance monitoring is only of secondary importance, even though emergency hospitals with more than five years' experience with the BSC tend to use it for that purpose. The BSC is almost never used in the hospitals' reward systems.*

*Research implications – The findings suggest that BSC in hospitals is mainly important for implementing strategy and stimulating strategy*

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*discussions that create goal congruence. Performance monitoring is only of secondary importance, but becomes increasingly important for seasoned BSC users.*

*Originality/value of paper – Few studies have surveyed the importance of BSC in healthcare organizations. By pointing out the importance of BSC in Swedish healthcare, this paper calls for similar studies in other healthcare contexts.*

## INTRODUCTION

In recent decades, healthcare organizations in many countries have struggled with financial problems. To keep the use of resources within budgetary frameworks, the providers of healthcare have introduced a whole string of financial control reforms (cf. [Arvidsson & Jönsson, 1997](#); [Anell, 2004](#)). From a financial perspective, these reforms have attempted to increase administrative influence over activities that have traditionally been dominated by medical and healthcare professionals. However, the focus on financial difficulties and the emphasis on budget restrictions have caused new problems for healthcare. The long-term aspects of healthcare organizations have been put to one side. Many healthcare providers are aware of this and have been searching for new ways of managing their performance. They are looking for a control system that balances short-term financial restrictions with long-term needs for quality development and well-educated staff. In an effort to achieve this aim, hospitals have introduced the balanced scorecard (BSC) (cf. [Aidemark, 2001b](#)).

This study investigates the prevalence of the BSC, the reasons for its implementation, and its use in Swedish emergency hospitals. Based on a questionnaire sent to all emergency hospitals in the country, the report presents and analyzes the experiences of financial managers and controllers. The aim is to examine the importance of BSC in Swedish emergency hospitals, that is, to describe its prevalence and its use in these hospitals.

[Kaplan and Norton \(1996b\)](#) maintain that the BSC fits very well in organizations of this kind.

While the initial focus and application of the balanced scorecard has been in the for-profit (private) sector, the opportunity for the scorecard to improve the management of government and not-for profit enterprises is, if anything, even greater. (p. 179)

The problem, [Kaplan and Norton \(2001b\)](#) declare, is that public organizations often have difficulties defining their strategy and that this

could give rise to a BSC where existing measures are rearranged based on four perspectives rather than generated through strategy maps. Public organizations may develop scorecards for key ratios rather than for strategic management. There are, however, cases in which the BSC has been implemented in hospitals to manage a benchmarking strategy, a quality improvement strategy and as a part of the hospital reward system (Harber, 1998; ten Asbroek et al., 2004; Baraldi, 2007; Patel, Chausalet, & Millard, 2008; Aidemark & Funck, 2008).

It is an open question whether the healthcare organization is a suitable context for this control instrument. Several researchers during the 1970s and 1980s suggested that hospitals are organizations where a management control system may actually be extremely difficult to implement (Kouzes & Mico, 1979; Mintzberg, 1979; Ouchi, 1979, 1980). The plans to introduce new leadership structures simply do not work. Old patterns are hard to eradicate (Borum & Bentsen, 1999). Planned leadership systems are redefined by organizational contexts (Bentsen, 2000). The reformers make little impression on those responsible for the activities. Reform remains simply talk (Rombach, 1986; Brunsson, 1990). The possibilities of realizing the ambitions of BSC are limited against this background. Despite this, studies have shown that the BSC has proven attractive to healthcare organizations (cf. Aidemark, 2001a; Aidemark & Funck, 2008). As a result it is interesting to investigate the prevalence and the importance of the BSC in healthcare organizations.

The paper will be organized in the following way. The next section reviews the literature on the importance of BSC in healthcare organizations in order to form a basis for our empirical study. Under section Method, we describe our questionnaire and the measures we develop for assessing the importance of BSC in healthcare. The section that follows presents our results, a discussion, and a conclusion.

## **THE BALANCED SCORECARD IN HEALTHCARE ORGANIZATIONS**

Conventional management accounting, based on financial measurement, has lost relevance (Johnson & Kaplan, 1987). As a solution to this problem, Kaplan and Norton (1992) developed the BSC. The premise of the BSC was that organizations get what they measure and that measurements within three perspectives – the customer, internal business processes, and learning

and growth – are vital to a fourth, the financial perspective. The BSC was originally designed as a hierarchical top-down management tool linking long-term financial goals to performance targets and measures within these four perspectives (Kaplan & Norton, 1992). Kaplan and Norton (1993) continued the BSC idea and presented new arguments for why organizations ought to implement it. One was the linking of the performance measurements to strategy and that only strategically important measures should be included in the BSC. In a third article, Kaplan and Norton (1996a) discussed the use of BSC as a strategic management system; and this theme was further expanded in a book, subtitled *Translating Strategy into Action* (Kaplan & Norton, 1996b). Even though Kaplan and Norton insisted that not-for profit enterprises have particular services to targeted constituents as their rationale (Kaplan & Norton, 1996b, p. 185), the BSC was suggested to extend hierarchical control to activities of operational services in these organizations.

As early as 1994, BSC was discussed as appropriate for healthcare organizations (Griffith, 1994) and several authors recommended the implementation of the model (e.g., Baker & Pink, 1995; Castaneda-Mendez, Mangan, & Lavery, 1998; Weber, 1999; Jones & Filip, 2000). Even if the positive strains have continued, some articles have been more critical and have identified problems in the implementation of the BSC. The criticism refers to both the theoretical model and to the practical uses of BSC. Nørreklit (2003), for example, criticized the principles of the model and claimed that BSC was persuasive but not convincing. She accused Kaplan and Norton of using rhetoric and metaphors connected to feelings rather than intellect to create a credible argument. This, she claimed, will result in readers reading their own intentionality into the theory and forming their own theories rather than that of Kaplan and Norton. Several authors have also questioned whether the BSC that has been identified in real-world settings is the same instrument that was introduced by Kaplan and Norton or instead the idea of the implementers (Käll, 2005; Bukh & Malmi, 2005; Johanson, Skoog, Backlund, & Almqvist, 2006). However, Kaplan and Norton (1996b, 2001a, 2001b) stated in accordance with several other authors (Zelman, Blazer, Gower, Owens Bumgarner, & Miller Cancilla, 1999; Zelman, Pink, & Matthias, 2003; Urrutia & Eriksen, 2005; Paranjape, Rossiter, & Pantano, 2006; Johanson et al., 2006) that the BSC needs to be modified to reflect the specific characteristics of healthcare organizations.

Zelman et al. (1999) identify two problems that healthcare organizations will have to confront when implementing BSC. First, the BSC model assumes that an overall vision can be defined and that the units within the

organization are coordinated to realize that vision. However, healthcare organizations are traditionally loosely coupled systems in which strategy planning and management are not as vital as they are in more centralized organizations. A precondition for successful use of BSC is thus that a common vision is created and that interdependence among units is stressed. Second, the ranking of the perspectives within the BSC can be questioned. Financial success is not of utmost importance, but an impediment to the success within the other perspectives. From the discussion, it becomes obvious that BSC can be important for *strategy implementation*. Kaplan and Norton (1996b, 2001b, 2001c, 2001d, 2008) describe BSC as a model for strategic management. However, as Zelman et al. (1999) indicate, the specific conditions of healthcare may cause problems for management when trying to use the BSC for strategy implementation.

Several studies indicate that BSC in healthcare organizations was initially regarded as a model for performance measurements with little or no connection to strategy implementation (Castaneda-Mendez et al., 1998; Sahney, 1998; Griffith, Pattullo, & Arbor, 2000). Some authors describe how the implementation of BSC has become a regular step in the quality improvement work in several healthcare organizations (Peters & Ryan, 1999; Colaneri, 1999; Santiago, 1999). Chow-Chua and Goh (2002) describe how the requirements for receiving a specific quality award had been linked with BSC at a hospital in Singapore. Through BSC a balance was struck between a handful of critical measures and the quality improvement work was combined with indicators of non-financial characteristics.

Moullin (2004) argues that healthcare organizations already have numerous ideas about how to improve the care. How these improvements can be monitored, however, has been relatively unexplored. By reviewing different evaluation models, Moullin (2004) concludes that BSC has some weaknesses as an evaluation model within public organizations. After a few modifications and in combination with the Performance Prism, BSC can become an excellent model for evaluation, Moullin claims. However, the link to quality is not the only link that emerges in the literature. In addition to quality, BSC has been linked to the budget cycle, resource distribution, and to reward systems in several organizations (cf. Biro, Moreland, & Cowgill, 2003; Pineno, 2002; Gumbus, Bellhouse, & Lyons, 2003; Baraldi, 2007; Aidemark & Funck, 2009).

BSC may thus play a role in implementing strategy but also in monitoring performance and thus in inducing certain behavior in employees, especially if these measurements are tied to the system of organizational rewards. However, measuring and monitoring is not the only way of aligning

individual behavior with organizational goals – individuals can also be induced to accept the goals of the organization as their own through, for example, socialization. This creates what [Anthony and Govindarajan \(1995\)](#) call goal congruence:

Goal congruence in a process means that action which it leads people to take in accordance with their perceived self-interest are also in the best interest of the organization. (p. 53)

According to [Ouchi \(1980\)](#), goal congruence and performance monitoring are independent mechanisms for promoting efficiency in organizations that are, to some extent, substitutable. He argues that some organizations, in particular those in which professionals dominate, are not at all dependent on performance monitoring for reaching their targets, but rely on so-called clan governance – a form totally dependent on goal congruence among employees. For a business firm operating in a proper market, basic conflicts of interest may lead performance monitoring to be the only instrument for governing the organization. In a professional organization, the creation of goal congruence may be a plausible strategy. It would follow that for all organizations, there exists an (theoretically) optimal amount of performance monitoring and investment in creating goal congruence, which is likely to be dependent on, among others, the organization's environment and the character of its operations.

The question of whether performance monitoring and goal congruence are independent from each other remains an open issue. Case study evidence suggests, for example, that if the process of developing BSC in hospitals involves the professionals, the BSC can at the same time be a performance monitoring system and, in due time, lead to a greater acceptance of the organization's goals, because it leads to dialogue and a common language in which to communicate these goals ([Aidemark, 2001a](#); [Aidemark & Funck, 2009](#)). From the discussion, we can formulate two more dimensions for which BSC can be of importance: *performance monitoring* and *goal congruence*. Performance monitoring is the work of measuring, monitoring, and comparing performance in healthcare organization. Goal congruence is the creation of a dialogue, a common language, mutual agreement and co-operation among employees within the organization.

According to [Weick \(1995, p. 3\)](#) "Organizations stay tied together by means of controls in form of incentives and measurement." To this we might, based on the discussion thus far, add that incentives may have many sources. Measurement and rewards tied to these measurements may create incentives inducing organizational members to act in line with

organizational goals (Bass, 1990). However, a strong agreement about the goals of the organization may also create incentives to act in line with organizational goals. Such goal congruence may be created in many ways; for example by socialization into professions, but also through organizationally based processes of dialogue and communication.

The link between measurement systems and reward systems is a controversial subject since there is no widely accepted evidence that the pros outweigh the cons for linking rewards to performance (Baraldi, 2007). However, studies have showed that when incentives were tied to achieving targets within BSC, managers allocated more time to non-financial areas (Ullrich & Tuttle, 2004). Studies of the relationship between BSC and formal rewarding in a healthcare organization have also illustrated that BSC contributed to and supported the compensation policies within healthcare organizations (Baraldi, 2007). For that reason, the BSC can be of importance for *reward systems*.

Our review has identified four dimensions along which the importance of BSC may vary: the degree to which the BSC is important for (1) performance monitoring, (2) strategy implementation, (3) the promotion of goal congruence, and (4) the reward system. We empirically assess the importance of BSC to Swedish hospitals along these four dimensions.

## METHOD

### *The Questionnaire*

We document the importance of BSC in healthcare using a questionnaire completed by chief financial managers<sup>1</sup> of Swedish emergency hospitals. The questionnaire, part of an international research project coordinated by the Centre for Healthcare Management Studies and Research, Catholic University, Milan, was web-based.

In Sweden, responsibility for providing healthcare is decentralized to 18 county councils and 2 regions. The county councils and regions are under democratic control, which means that they are responsible for ensuring that all Swedish citizens have access to good healthcare. Healthcare is largely tax-financed and the principle of local self-government gives the county councils and regions the right to design and structure their activities on the basis of local conditions. In Sweden, healthcare is divided among local primary care centers, hospitals at the county council level, and nine regional/university hospitals. The most advanced technical equipment is



only available at regional hospitals and highly specialized care has been concentrated here. Even though the greater part of the Swedish healthcare is public, some healthcare services in the county councils are purchased from private care institutions. In this study, 6 out of a total of 54 emergency hospitals were run as limited companies.

The work on the questionnaire began in April 2007 by a group of 11 researchers from many countries. This year saw a number of revisions of the questionnaire based on discussions, theoretical ambitions, and pilot studies in the respective countries of research group members. The Swedish version of the questionnaire, which underlies this report, was tested at three hospitals before making it available to the respondents. The final questionnaire comprises 16 questions inquiring into where in the organization BSC is used, how and why it was implemented, what importance it has for the hospital, and to what extent the BSC met expectations.

Around 3,000 hospitals internationally, and 54 in Sweden, have been able to complete the questionnaire on a web site administered from Milan during the spring and summer of 2008. All Swedish respondents had been contacted by mail and phone to confirm their willingness to complete the questionnaire. The response rate amounted to 17.7% internationally in September 2008, while the response rate among Swedish hospitals was 70%, as shown in Table 1.

Thirty-eight of 54 Swedish hospitals completed the questionnaire, yielding a response rate of 70%. Twenty-five of 38 responding hospitals (65%) have experiences with BSC, of which 24 completed the questionnaire in full. All 24 of these emergency hospitals report that they are and will continue using the BSC. An analysis of the non-responding hospitals<sup>2</sup> shows that BSC is just as frequent among hospitals that did not complete the questionnaire as it is among those that did. The hospitals that did not respond explain the lack of response by time constraints or insufficient (personal) experiences, making it impossible to complete the questionnaire, or that they considered the questions irrelevant or too difficult to answer; in most cases, however, hospitals did not

**Table 1.** Number of Responding Hospitals in Sweden.

Total Number of Emergency Hospitals (or Equivalent) in Sweden	Responding Hospitals with Experience from BSC (of Which One Has Only Partially Completed the Questionnaire)	Hospitals that Have Completed the Questionnaire (or Parts of It), but Lack Experiences of BSC	Hospitals that Have Not Completed the Questionnaire
54	25	13	16

explain why they had not completed the questionnaire. We have, however, little reason to suspect that our final sample is not representative.

### *Measuring Importance of the Balanced Scorecard*

We measure the importance of BSC to healthcare along four dimensions: (1) performance monitoring, (2) strategy implementation, (3) goal congruence, and (4) rewards. Four composite measures are developed to measure the importance of the BSC in healthcare along these dimensions.

Performance within the professional work can be measured, compared, and monitored within several perspectives by implementing a BSC. As described in the theoretical section, *performance monitoring* captures whether the measurements within the framework of BSC are used for monitoring performance in the healthcare organizations. The questionnaire comprises three items a priori associated with this dimension: (1) "In my hospital, the balanced scorecard actually is a good means for measuring and following up performance in the organization," (2) "In my hospital, the balanced scorecard actually is used for meaningful comparisons (over time within each department, between departments inside the hospital, or with other healthcare organizations)," (3) "In my hospital, the balanced scorecard actually is used for performance evaluation, but without directly linked incentives." All items are measured on a four-point Likert scale.

Based on experiences presented by Kaplan and Norton (2001b), we are unlikely to find that the measurements within the framework of BSC are tied to the strategy of hospitals. However, this remains to be explored. The second dimension, *strategy implementation*, captures whether the measurements within the framework of BSC are connected to the strategy of hospitals. The survey comprises five items a priori associated with this dimension: "In the experiences of my hospital, the implementation of the balanced scorecard actually made an important contribution to: (1) making strategy clear, (2) aligning organizational objectives to strategy, (3) sharing and communicating strategy both inside and outside the organization, (4) clarifying how employees can actually contribute to strategy's execution, (5) effectively orientating the budgeting process, providing a better link between departmental goals/initiatives and organizational strategy."

Case study evidence has shown that BSC can be used to create goal congruence in healthcare settings (Aidemark, 2001a). The third dimension, *goal congruence*, captures whether measurements within the framework of BSC contribute to the creation of goal congruence in hospital organizations.

The questionnaire comprises five items a priori associated with this dimension: “In my hospital, the balanced scorecard actually: (1) leads to dialogue between parties in the organization about the aims and organization of healthcare activities, (2) enhances mutual agreement on the goals of the hospital, (3) is a common language for communication, (4) promotes co-operation between employees, (5) promotes participation in the development of the hospital.”

The last dimension, *rewards*, captures whether measurements within the framework of BSC are used in reward systems. Even though we have little reason to expect that Swedish hospitals have designed reward systems that integrate BSC measurements of performance, this remains to be explored. The issue seems politically sensitive (Aidemark, 1998), even though hospitals that are financed based on performance have discussed the possibility to let the financing model reflect the reward system for employees (Aidemark & Lindkvist, 2004). The questionnaire comprises two items a priori associated with this dimension: (1) “In my hospital, the balanced scorecard actually is used for performance evaluation, including directly linked incentives,” (2) “In my hospital, the implementation of the balanced scorecard actually made an important contribution to linking incentives to the contribution that each organizational unit makes to strategy’s execution.”

We use factor analysis to test the consistency of the four groups of items. The items load largely on the expected factors and the factor analysis thus confirms the relevance of the four dimensions and the appropriateness of forming composite measures capturing the importance of BSC along these dimensions. A number of items, however, load heavily on more than one factor, indicating poor discriminatory validity; these items were excluded from further analysis. The factor analysis and a detailed description of this exclusion procedure are enclosed (Appendix A). Based on the factor analysis, we form four composite measures with good discriminatory validity capturing the importance of BSC along the four theoretically identified dimensions by averaging the included items (Table 2).

The composite measure performance monitoring (Cronbach’s  $\alpha = 0.752$ ) captures the extent to which BSC-induced measurements are used to monitor performance. The measure of strategy implementation (Cronbach’s  $\alpha = 0.892$ ) captures whether measurements within the framework of BSC are used for communicating and following up the strategy of the organization. Goal congruence (Cronbach’s  $\alpha = 0.842$ ) is a measure of the extent to which BSC-induced measurements are used as a common language for communication and dialogue leading to agreement on the organization’s goals. Measurements per se are not necessarily the central aspect of the BSC

**Table 2.** Composite Measures Capturing the Importance of BSC.

Composite Measure	Captures	Included Items
Performance monitoring	The extent to which the measurements within the framework of BSC are used to monitor performance in the organization	BSC is used to measure and follow up performance in the organization BSC is used for performance evaluation, but without directly linked incentives
Strategy implementation	The extent to which the measurements within the framework of BSC are tied to the strategy of the organization	BSC makes strategy clear BSC aligning organizational objectives to strategy BSC makes a contribution to sharing and communicating strategy both inside and outside the organization
Goal congruence	The extent to which the measurements within the framework of BSC contributes to the creation of goal congruence within the organization	BSC enhances mutual agreement on the goals of the hospital BSC promotes participation in the development of the hospital BSC is a common language for communication
Rewards	The extent to which the measurements within the framework of BSC are used in organizational reward systems	BSC is used for performance evaluation, including directly linked incentives

*Abbreviation:* BSC, balanced scorecard.

in this role; the development and revision of the BSC may be more important. The rewards measure, comprising a single item, captures the extent to which measurements within the framework of BSC are used in organizational reward systems.

## RESULTS

### *Where, How, and Why the BSC was Implemented*

The 25 responding hospitals that use BSC had used the instrument for an average of five years. All of them reported that they, at least in the near future, would continue using the BSC. Of the 24 hospitals that had completed the entire questionnaire, all used BSC on the hospital level.

The questionnaire also inquired into whether the BSC was used on county and/or the clinic levels (Swedish hospitals are generally organized in clinics based on medical specialties). Four percent (1 respondent) reported using the BSC on the hospital level only. Thirty-three percent (8 respondents) used the BSC on both the hospital and clinic levels. Seventeen percent (4 respondents) reported using the BSC on hospital and county levels, whereas 46% used the BSC on all levels. Altogether, the BSC is used on the level of the county in 15 hospitals, and on the level of clinics in 19 hospitals in our sample. Fifteen of the hospitals (39%) used the BSC on all clinics at the hospitals.

The respondents were also asked to characterize the implementation of the BSC at their respective hospital. Ninety-six percent (23 of 24) of the respondents described the implementation of BSC as a top-down process when allowed to choose among the three alternatives: top-down, bottom-up, and not yet completed (the choice of the remaining respondent).

The questions inquiring into the hospitals' motives for implementing the BSC indicated that some motives were more important than others. The need "to make strategy clear, shared and executed" and "to get a more comprehensive view of organizational performance" seems to be the strongest motives for implementing the BSC. There are statistically significant differences ( $p < 0.01$ ) between these items and many other motives. Two of the suggested motives, the "need to fully exploit the potential of the information system" and "growing competitive pressure" received the least support and were only marginally acknowledged by six respondents.

To test the a priori distinction between internal and external motives, we conducted a factor analysis on the items that the respondents had acknowledged as significant. The factor analysis suggested the following division of items that differ somewhat from the a priori one; however, there is no statistically significant difference between the two groups of items and we can thus conclude that both internal and external motives are important for the decision to implement BSC (Table 3).

### *The Importance of BSC in Healthcare*

We measure the importance of BSC in healthcare in terms of four composite measures: performance monitoring, strategy implementation, goal congruence and rewards. The empirical objectives are to describe to what extent BSC are important in healthcare along these dimensions and to rank the significance of these uses of BSC. The following diagrams show the

**Table 3.** Internal and External Motives for the Decision to Implement BSC.

“Internal” Motives	“External” Motives
The need to make strategy clear, shared and executed	The need for a more comprehensive view of organizational performance
The need for effective and efficient resource management	The strong commitment by the top management
Growing financial pressure	The need to manage relationships with external stakeholders (e.g., patients, employees, government)

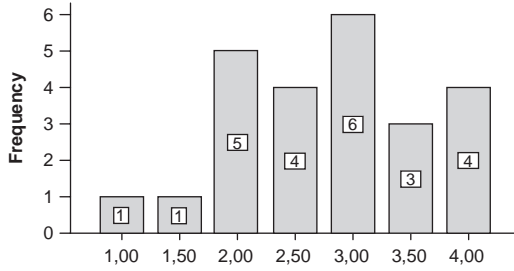
distribution of these four composite measures. The scale runs from 1–4 (based on the scale in the questionnaire: 1 = disagree strongly, 2 = disagree slightly, 3 = agree slightly, 4 = agree strongly) (Fig. 1).

The diagrams show that an overwhelming majority of the respondents report that BSC is important for conducting measurements associated with the hospital’s strategy implementation and that the work with BSC contributes to goal congruence in the organization. These two composite measures are also significantly correlated (Spearman coefficient = 0.435,  $p < 0.05$ ). One interpretation could be that the task of developing strategy-related measures within the framework of the BSC requires a dialogue among organizational members about goals and the organization of operations. BSC may offer a useful language for this dialogue, and thus strengthen agreement on the hospital’s goals.

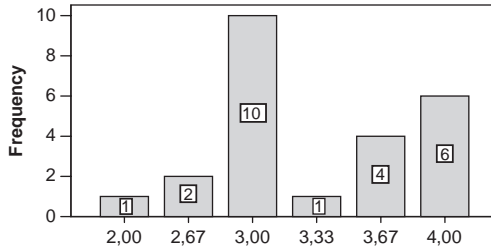
A comparison of the means of the four composite measures confirms what ocular screening suggested: strategy implementation and goal congruence are more important uses of the BSC than performance monitoring or as a basis for reward systems (see Appendix B for details). The differences between the two former and the two latter composite measures are statistically significant ( $p < 0.05$ ). The results of comparing the means for these composite measures support our tentative conclusion: BSC is primarily important in healthcare for creating goal congruence and for measuring aspects tied to the hospital’s strategy. Goal congruence is likely to be enhanced because the BSC leads to widespread involvement in discussions and in a common language that can be used, among others, for communication about the hospital’s goals.

A slight majority (13 of 24) of the respondents agree (slightly or strongly) that BSC is used for performance monitoring in their hospitals. Of those hospitals where BSC is used for performance monitoring, 77% (10 respondents) use BSC in all clinics at the hospital, and 62% (8 respondents)

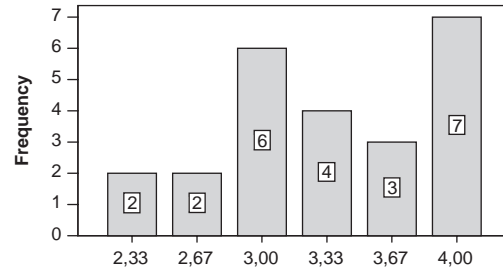
1. Performance monitoring:



2. Strategy implementation:



3. Goal congruence:



4. Rewards:

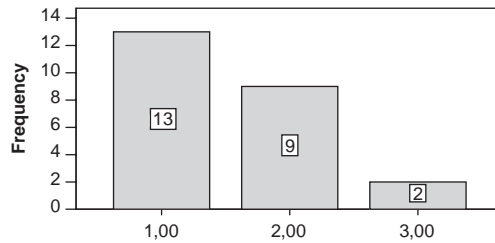


Fig. 1. Distribution of the Four Composite Measures.

have used the BSC for at least five years. In fact, there is only one hospital that has used BSC more than five years and uses BSC in all clinics that reports the BSC not being of importance for performance monitoring. The group of hospitals that have used BSC longer than average (five years or longer, the group averages seven years) and which have implemented BSC on all clinics, agree (3.4 on the scale of 1–4) that BSC is a good facility for measuring and monitoring performance in the organization. The difference between this group and other hospitals is statistically significant ( $p < 0.01$ ) when evaluated by a Mann–Whitney test.

This result is not very surprising. Case study evidence has shown that it takes a very long time to implement BSC-based performance measurements in hospitals (Aidemark & Funck, 2009). Performance measurements associated with the core activities require co-operation among and with medical professionals. Measurements that are used for performance measurements require much more detail than do measurements tied to the strategy of hospitals. Strategy-related measurements may include, for example, waiting times, queue sizes, or number of occupied beds occupation. These measurements are both easier to carry out and less controversial than measurements of, for example, treatment results within different subspecialties.

As expected, the measurements within the framework of BSC are rarely used in hospitals' reward systems; not even for the group of hospitals that had used BSC for more than five years and had implemented it on all clinics. Only two respondents agree that BSC is used in their organizations' reward system.

Furthermore, we note significant differences among the hospitals that reported that the result from implementing BSC was (i) below expectations, (ii) in line with expectations, or (iii) above expectations. These groups of hospitals differ on the composite measure performance monitoring ( $p < 0.10$ ), and those reporting the result of BSC implementation to be under expectations have also strictly reported that BSC is not used for performance monitoring. In the same way, the groups differ on the dimension of goal congruence ( $p < 0.05$ ). Those respondents who reported that the result of BSC implementation were over expectations agree more strongly that the BSC is important for creating goal congruence than the other two groups, and those reporting the results for BSC implementation to be in line with expectations agree more strongly than those that were less satisfied with the BSC.



## DISCUSSION

Our empirical study indicates some possible generalizations for the population of Swedish emergency hospitals that use BSC. First, we can conclude that measurements with the aim of realizing strategic goals are an important aspect of BSC for hospitals. Second, measurements within the framework of BSC contribute to goal congruence in the hospital organizations. This result is also fairly unambiguous. Our interpretation is that BSC contributes to goal congruence by becoming a common language of communication about the hospitals' goal and strategies, and that implementing and working with a BSC creates widespread involvement in such strategic discussion. Furthermore, the study suggests that measurements within the framework of BSC are sometimes used for performance monitoring in hospitals. However, we find that hospitals that have used the BSC for a relatively long period of time (five years or longer), and that have implemented the BSC at all clinics at the hospital, use the BSC for this end; other hospitals do not. Finally, the study shows that measurements within the framework of BSC are not used in the reward systems in hospitals. In line with expectations, we find no indications that BSC-induced measurements are tied to the reward systems at the hospitals.

The result of the measurements associated with performance monitoring is particularly interesting. Measuring performance plays a central role in the design and use of BSC in business firms. These measurements are considered essential to the idea of BSC and a necessary, though not sufficient, criterion for a functioning BSC. However, this does not seem to be the case for hospitals. It is obviously difficult to measure performance in emergency hospitals, with many complex professional specialties and unforeseeable ad hoc operations. Measurements per se are a common feature of healthcare work, both with regards to treatment methods and drugs. However, introducing performance measurements requires medical professionals to be involved in and assume responsibility for identifying appropriate measures and target levels. Case studies show that it takes years for hospitals to diffuse the usage of the BSC for performance monitoring to clinics and operational activities, because it is difficult to engage physicians and nurses in identifying relevant measures (Aidemark & Funck, 2009; Funck, 2009).

Against this background, the result of performance monitoring becomes clearer. BSC-induced measurements as a part of performance monitoring tend to take place in hospitals where medical professionals are involved in the management of the scorecard and it takes time to develop suitable measures that they can agree on. This explains the pattern in our data

suggesting that the use of the BSC for performance monitoring is limited to hospitals that have used the BSC for a long time and that have implemented it in all clinics. Conversely, hospitals that have not implemented the BSC on the level of clinics tend not to use it for performance monitoring.

## CONCLUSION

This study has examined the use of BSC in Swedish emergency hospitals. The study indicates that 65% of the hospitals have experiences from using BSC, and almost 40% of the hospitals have implemented the BSC at all clinics. Those hospitals that use BSC have on average been using it for five years. The BSC is consequently a very common management control instrument in Swedish hospitals.

BSC is important for making measurements tied to the implementation of hospitals' strategy and for contributing to goal congruence in Swedish hospitals. This indicates that the development and implementation of BSC is beneficial for dialogue on the goals and strategy of the hospitals, thus contributing to goal congruence.

BSC is also important for monitoring performance for hospitals that have used the BSC for more than five years and that have implemented it in all clinics at the hospital; it is not important for other hospitals. This indicates that medical professionals must participate in the development and implementation of the BSC for it to be relevant in monitoring performance in the healthcare environment and that this process takes time. Measurements within the framework of BSC are, however, almost never used in the hospitals' reward systems.

The study's findings should be interpreted in light of some limitations. First, the questionnaire has been filled out by financial managers in Swedish emergency hospitals. This study is therefore limited to financial managers' perceptions of the importance of BSC in Swedish hospitals. If the same questionnaire had been sent to other respondents within the emergency hospitals in Sweden, the results might have been different. However, the results from several case studies investigating the design and use of BSC in healthcare organization in Sweden support the findings in this study (Aidemark, 2001a, 2001b; Funck, 2007, 2009; Aidemark & Funck, 2008, 2009).

A further shortcoming is evident in that the study only investigates the importance of BSC in the Swedish healthcare context. As described in the method section of this paper, Sweden has few private hospitals and therefore

the structure of the healthcare system of Sweden, might have an effect on the importance of BSC in healthcare. In countries with more private hospitals, other uses of BSC might be noticeable. A study comparing the results from Sweden to those from other countries has the potential to offer insight into this question.

## NOTES

1. In two cases, the questionnaire was completed by a chief controller and in one case by a strategist.

2. This analysis consists of an inquiry by mail and a search on the hospitals' web sites with the search string "balanced scorecard." This search shows in most cases whether and how BSC is used at the hospitals.

## REFERENCES

- Aidemark, L.-G. (1998). *Vårdens ekonomi i förändring. En studie av ekonomistyrning i Landstinget Kronoberg*. Göteborg: BAS.
- Aidemark, L.-G. (2001a). The meaning of balanced scorecards in the health care organization. *Financial Accountability and Management*, 17(1), 23–40.
- Aidemark, L.-G. (2001b). *Balanced scorecard i sjukvården – Erfarenheter från försöksverksamhet med balanced scorecard inom fem landsting*. Stockholm: Landstingsförbundet.
- Aidemark, L.-G., & Funck, E. (2008). Ledarskap och mätning i sjukvården. *Kommunal Ekonomi och Politik*, 12(1), 7–33.
- Aidemark, L.-G., & Funck, E. K. (2009). Measurement and health care management. *Financial Accountability and Management*, 25(2), 253–276.
- Aidemark, L.-G., & Lindkvist, L. (2004). The vision gives wings – A study of two hospitals run as limited companies. *Management Accounting Research*, 15(3), 305–318.
- Anell, A. (2004). *Strukturer, resurser, drivkrafter: sjukvårdens förutsättningar*. Lund: Studentlitteratur.
- Anthony, R., & Govindarajan, V. (1995). *Management control system* (8th ed.). Chicago: Irwin.
- Arvidsson, G., & Jönsson, B. (1997). *Politik och marknad i framtidens sjukvård*. Stockholm: SNS Förlag.
- Baker, G. R., & Pink, G. H. (1995). A balanced scorecard for Canadian hospitals. *Healthcare Management Forum*, 8(4), 7–21.
- Baraldi, S. (2007). Balancing formal rewarding and intrinsic motivation: The role of the balanced scorecard in professional organizations, 4th conference on performance measurement and management control, Nice, September, 26–28.
- Bass, B. (1990). *Bass & Stogdill's handbook of leadership*. New York: The Free Press.
- Bentsen, E. (2000). *Sygehusledelse i Danmark-Trojkamodellens opståen, spredning og funktion*. Copenhagen: Institut for Organisation og Arbejdssociologi.
- Biro, L. A., Moreland, M. E., & Cowgill, D. E. (2003). Achieving excellence in veterans healthcare: A balanced scorecard approach. *Journal of Healthcare Quality*, 25(3), 33–39.

- Borum, F., & Bentsen, E. Z. (1999). At skabe ledelse-Rikshospitalets import af centerstrukturen. In: E. Z. Bentsen, F. Borum, G. Erlingsdóttir & K. Sahlin-Andersson (Eds), *Når styringsambitioner møder praksis-den svære omstilling af sygehus- og sundhedsvæsenet i Danmark og Sverige* (pp. 243–264). Copenhagen: Munksgaard.
- Brunsson, N. (1990). Individualitet och rationalitet som reforminnehåll. In: N. Brunsson & J. P. Olsen (Eds), *Makten att reformera* (pp. 86–117). Stockholm: Carlssons.
- Bukh, P. N., & Malmi, T. (2005). Re-examining the cause-and-effect principle of the balanced scorecard. In: S. Jönsson & J. Mouritsen (Eds), *Accounting in Scandinavia – The northern lights* (pp. 87–113). Malmö: Liber.
- Castaneda-Mendez, K., Mangan, K., & Lavery, A. (1998). The role and application of the balanced scorecard in healthcare quality Management. *Journal of Healthcare Quality*, 20(1), 10–13.
- Chow-Chua, C., & Goh, M. (2002). Framework for evaluating performance and quality improvement in hospitals. *Managing Service Quality*, 12(1), 54–66.
- Colaneri, J. (1999). A balanced scorecard approach to quality improvement in a renal transplant program. *Nephrology News & Issues*, August, 19–26.
- Funck, E. (2007). The balanced scorecard equates interests in healthcare organizations. *Journal of Accounting & Organizational Change*, 3(2), 88–103.
- Funck, E. K. (2009). *Ordination balanced scorecard – översättning av ett styrinstrument inom hälso- och sjukvården*. Växjö: Växjö University Press.
- Griffith, J. R. (1994). Reengineering health care: Management systems for survivors. *Hospital & Health Services Administration*, 39(4), 451–471.
- Griffith, J. R., Pattullo, A., & Arbor, A. (2000). Championship management for healthcare organizations. *Journal of Healthcare Management*, 45(1), 17–31.
- Gumbus, A., Bellhouse, D. E., & Lyons, B. (2003). A three-year journey to organizational and financial health using the balanced scorecard: A case study at a Yale New Haven health system hospital. *Journal of Business & Economic Studies*, 9(2), 54–64.
- Harber, B. W. (1998). The balanced scorecard solution at Peel Memorial Hospital. *Hospital Quarterly*, Summer, 59–61.
- Johnson, T., & Kaplan, R. (1987). *Relevance lost – On the rise and fall of management accounting*. Boston: Harvard Business School Press.
- Johanson, U., Skoog, M., Backlund, A., & Almqvist, R. (2006). Balancing dilemmas of the balanced scorecard. *Accounting, Auditing & Accountability Journal*, 19(6), 842–857.
- Jones, M. L., & Filip, S. J. (2000). Implementation and outcomes of a balanced scorecard model in women's services in an academic health care institution. *Quality Management in Health Care*, 8(4), 40–51.
- Käll, A. (2005). *Översättningar av en managementmodell – en studie av införandet av Balanced Scorecard i ett landsting*. Linköping: Universitetet och Tekniska Högskolan i Linköping.
- Kaplan, R., & Norton, D. (1992). The balanced scorecard-measures that drive performance. *Harvard Business Review*, 70(1), 71–79.
- Kaplan, R., & Norton, D. (1993). Putting the balanced scorecard to work. *Harvard Business Review*, 71(5), 134–141.
- Kaplan, R., & Norton, D. (1996a). Using the balanced scorecard as a strategic management system. *Harvard Business Review*, 74(1), 75–86.
- Kaplan, R., & Norton, D. (1996b). *The balanced scorecard: Translating strategy into action*. Boston: Harvard Business School Press.
- Kaplan, R., & Norton, D. (2001a). Balance without profit. *Financial Management*, January, 23–26.

- Kaplan, R., & Norton, D. (2001b). *The strategy-focused organization: How balanced scorecard companies thrive in the new business environment*. Boston: Harvard Business School Press.
- Kaplan, R., & Norton, D. (2001c). Transforming the balanced scorecard from performance measurement to strategic management: Part I. *Accounting Horizons*, 15(1), 87–104.
- Kaplan, R., & Norton, D. (2001d). Transforming the balanced scorecard from performance measurement to strategic management: Part II. *Accounting Horizons*, 15(2), 147–160.
- Kaplan, R., & Norton, D. (2008). *The execution premium: Linking strategy to operations for competitive advantage*. Boston: Harvard Business Press.
- Kouzes, J., & Mico, P. (1979). Domain theory: An introduction to organisational behavior in human service organizations. *Applied Behavioral Science*, 15(4), 449–469.
- Mintzberg, H. (1979). *The structuring of organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Moullin, M. (2004). Evaluating a health service taskforce. *International Journal of Health Care Quality Assurance*, 17(5), 248–257.
- Nørreklit, H. (2003). The balanced scorecard: What is the score? A rhetorical analysis of the balanced scorecard. *Accounting, Organizations and Society*, 28(6), 591–619.
- Ouchi, W. (1979). A conceptual framework for design of organisational control mechanisms. *Management Science*, 25(9), 833–848.
- Ouchi, W. (1980). Markets, bureaucracies and clans. *Administrative Science Quarterly*, 25(1), 129–141.
- Paranjape, B., Rossiter, M., & Pantano, V. (2006). Performance measurement systems: Success, failures and future – A review. *Measuring Business Excellence*, 10(3), 4–14.
- Patel, B., Chausalet, T., & Millard, P. (2008). Balancing the NHS balanced scorecard!. *European Journal of Operational Research*, 185(3), 905–914.
- Peters, K., & Ryan, H. (1999). An integrated dialysis delivery network in Ontario. *CANNT Journal*, 9(1), 20–23.
- Pineno, C. J. (2002). The balanced scorecard: An incremental approach model to health care management. *Journal of Health Care Finance*, 28(4), 69–80.
- Rombach, B. (1986). *Rationalisering eller Prat*. Lund: Doxa.
- Sahney, V. K. (1998). Balanced scorecard as a framework for driving performance in managed care organizations. *Managed Care Quarterly*, 6(2), 1–8.
- Santiago, J. M. (1999). Use of the balanced scorecard to improve the quality of behavioral health care. *Psychiatric Services*, 50(12), 1571–1576.
- ten Asbroek, A. H. A., Arah, O. A., Geelhoed, J., Custers, T., Delnoij, D. M., & Klazinga, N. S. (2004). Developing a national performance indicator framework for the Dutch health system. *International Journal for Quality in Health Care*, 16(1), i65–i71.
- Ullrich, M. J., & Tuttle, B. M. (2004). The effects of comprehensive information reporting systems and economic incentives on managers' time-planning decisions. *Behavioral Research in Accounting*, 16, 98–106.
- Urrutia, I., & Eriksen, S. D. (2005). Application of the balanced scorecard in Spanish private health-care management. *Measuring Business Excellence*, 9(4), 16–26.
- Weber, D. (1999). The balanced scorecard: A framework for managing complex and rapid change. *Strategies for healthcare excellence*, 12(11), 2–7.
- Weick, K. (1995). *Sensemaking in organizations*. London: Sage.
- Zelman, W. N., Blazer, D., Gower, M., Owens Bumgarner, P., & Miller Cancilla, L. (1999). Issues for academic health centers to consider before implementing a balanced-scorecard effort. *Academic Medicine*, 74(12), 1269–1277.
- Zelman, W. N., Pink, G. H., & Matthias, C. B. (2003). Use of the balanced scorecard in health care. *Journal of Health Care Finance*, 29(4), 1–16.

**APPENDIX A. FACTOR ANALYSIS**

		Component				
		1	2	3	4	5
11:8	BSC promotes co-operation among employees.	0.843				
14:6	BSC made an important contribution to orienting the budgeting process, and to providing a better link between departmental goals/ initiatives and organizational strategy.	0.824				
14:4	BSC made an important contribution to clarifying how employees can actually contribute to strategy's execution.	0.700	0.527			
14:7	BSC made an important contribution to a better understanding of organizational performance.	0.656	0.300		0.514	
14:9	BSC made an important contribution to a more participatory management style.	0.641			-0.336	-0.383
14:10	BSC made an important contribution to the diffusion of an open and performance-oriented culture.	0.641				-0.373
14:2	BSC made an important contribution to aligning organizational objectives to strategy.		0.840			
14:1	BSC made an important contribution to making strategy clear.		0.819			
14:3	BSC made an important contribution to sharing and communicating strategy both inside and outside the organization.		0.736			
14:8	BSC made an important contribution to improving decision making.	0.353	0.627			
11:7	BSC is a common language for communication.			0.792		
11:6	BSC enhances mutual agreement on the goals of the hospital.		0.304	0.787		

**APPENDIX A.** *(Continued)*

		Component				
		1	2	3	4	5
11:9	BSC promotes participation in the development of the hospital.		0.413	0.774		
14:5	BSC made an important contribution to linking incentives to the contribution that each organizational unit makes to strategy's execution.	0.548		-0.682		
11:1	BSC is a good means for measuring and following up performance in the organization.				0.880	
11:3	BSC is used for performance evaluation, but without directly linked incentives.				0.835	
11:2	BSC is used for meaningful comparisons (over time within each department, between departments inside the hospital, or with other healthcare organizations).		-0.489		0.509	0.353
11:4	BSC is used for performance evaluation, including directly linked incentives.					0.768
11:5	BSC leads to dialogue between parties in the organization about the aims and organization of healthcare activities.	0.391	0.436			0.468

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization – Rotation converged in nine iterations.

Factors 2, 3, 4, and 5 empirically identified in the factor analysis correspond to the dimensions strategy implementation, goal congruence, performance monitoring, and rewards, respectively. Factor 1 does not correspond to any of the theoretically identified dimension and will not be further considered in this report (but will be the object of further analysis in future work). Of the three items a priori associated with performance measurements (11:1–3), one was excluded. Item 11:2 loads almost equally

high on factors 2 and 5 as on the performance measurement factor, and was therefore excluded from further analysis. Of the five items a priori associated with strategy implementation (14:1–4, 6), two were excluded. Item 14:4 and 14:6 load on factor 1, which does not correspond to any of the dimensions under scrutiny in this report, rather than factor 2 corresponding to strategy implementation. Five items were a priori associated with the dimension goal congruence, but two were excluded from further analysis. Item 11:5 loads on multiple factors and item 11:8 loads on factor 1 rather than factor 3, which corresponds to the dimension goal congruence. Only one of the two items a priori assigned to the dimension rewards remains, as item 11:5 loads on multiple factors.

### **APPENDIX B. COMPARISON OF THE MEANS**

Measure	N	Subset for $\alpha = 0.05$		
		1	2	3
Rewards	24	1.5417		
Performance monitoring	24		2.7917	
Strategy implementation	24			3.3056
Goal congruence	24			3.3472
Sig.		1.000	1.000	0.996

Tukey HSD, means for groups in homogeneous subsets are displayed, uses Harmonic Mean Sample Size = 24.





# ALIGNING STRATEGY AND PERFORMANCE MEASUREMENT SYSTEMS IN THE SERVICE SECTOR COMPANIES: THE GREEK EXAMPLE

Androniki Triantafylli and Apostolos Ballas

## ABSTRACT

*This study explores whether the implementation of Management Control Systems (MCS) by the Greek shipping companies influences the adoption of their performance measurement systems and the implication of this choice on organizational performance. The study uses data collected from semi-structured interviews and a survey instrument addressed to shipping companies located in Greece. The paper finds evidence that MCS are defined in terms of the informational purposes these MCS fulfill. Analysis of responses to the questionnaire results that the choice of MCS is contingent upon the strategy pursued by the shipping companies. In addition, evidence suggests that shipping companies with an optimal fit between their strategy and their MCS experience superior performance and higher perceived usefulness of MCS. Moreover, it is concluded that Greek shipping companies adopt subjective performance measures*

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*irrespective of the MCS they implement and that this choice leads to enhanced perceived performance.*

## 1. INTRODUCTION

Over the past two decades, contingency-based research in managerial accounting has focused on how large, mature manufacturing organizations design their performance measurement and control systems as a function of a number of contextual variables, or contingencies (Chenhall, 2003). However, there is no evidence of intensive research that examines the choice of Management Control Systems (MCS) in the shipping sector, despite its importance for the economy of most developed countries.

This study investigates the performance implications of MCS in the Greek shipping industry. The investigation of control systems in this industry becomes even more important due to the recent, extensive implementation of numerous rules and regulations such as the International Safety Management Code (1997) which is related to the safe operation of vessels and to the protection of the marine environment, the improvement of the public control and follow-up, and the improvement of contract relations between the governments (flag states). In addition, new requirements from the cargo owners in terms of safety and reliability of services enhance the demand for more complete and thorough control mechanisms (i.e., T.M.S.A controls). As a result, shipping companies have started to put more emphasis on the design and implementation of those MCS that could enhance their compliance with the new circumstances. This shift toward the more detailed design and implementation of MCS in shipping companies offered the motivation for this study. Moreover, the specific characteristics of this industry make the need for the investigation of control systems and specifically performance measurement systems (PMS) more interesting. The distance between the office and the vessel(s), the multinational crew, the cyclicity of the industry, and the high technological dependence make the implementation of effective PMS an even more complicated procedure.

This study was conducted in two phases. Initially, field interviews were conducted followed by a survey instrument directed to shipping companies' managers. In the first phase, the interviews were used to understand what MCS are introduced and implemented in shipping companies and why. In the second phase, the survey-based instrument was used to test whether shipping companies with a better fit between their MCS and their strategy

experience superior performance and whether shipping companies align their PMS with their strategy.

The interviews reveal that shipping companies characterize their MCS in terms of the purposes MCS should fulfill, rather than in terms of individual control systems. Three categories of MCS emerged from the data: “Basic MCS” are common for all firms and are used to set standards and support basic operations of the business, “Cost MCS” collect information about cost minimization, while “External Information MCS” focus on the compliance with cargo owners’ requirements and on protecting asset integrity.

The findings suggest the relationship between the strategy followed by the shipping companies and the choice of the two latter types of MCS. Moreover, regarding the performance consequences of the choice of MCS results indicate that a better fit between MCS and the shipping company’s strategy and organizational structure is associated with management perception of superior firm performance and greater usefulness of MCS. Finally, evidence from this study suggests that shipping companies tend to adopt subjective PMS irrespective of their MCS.

The remainder of the paper proceeds as follows. The next section presents the literature review and the development of the hypotheses. The [Section 3](#) describes the research design and the data collection methods. The [Section 4](#) focuses on the development of the categorization of MCS and the [Section 5](#) describes the relationship between the choice of MCS and the strategy pursued by the shipping companies. The link between PMS and control systems is presented in [Section 6](#), whereas its performance implications are found in [Section 7](#). The conclusions of the study are presented in [Section 8](#).

## **2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### *2.1. The Contingency Approach to MCS Implementation: The Role of Strategy*

The contingency approach to management accounting is based on the premise that there is no universally appropriate accounting system, which applies equally to all organizations in all circumstances (Otley, 1980). Rather it is suggested that particular features of an appropriate accounting system

will depend upon the specific circumstances in which the organization finds itself. Thus a contingency theory must identify specific aspects of an accounting system, which are associated with certain defined circumstances and demonstrate an appropriate matching (Otley, 1980).

Previous studies have shown that the choice of MCS depends on a number of contingencies surrounding the firm such as structure, technology, size, and environment (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Khandwalla, 1977; Merchant, 1981, 1984; Chenhall & Morris, 1995; Abernethy & Brownell, 1999; Bouwens & Abernethy, 2000) More recently, firm strategy has emerged as an important contingency in analyzing the use and usefulness of MCS. For the purpose of the study, MCS are defined as “any formal information-based procedures and statements used by managers to monitor and influence the behavior and activities in a firm” (Simons, 1994).

Literature abounds with definitions of strategy ranging from the general to specific. “But despite their differences there is a common theme. Strategy is thought to constitute a logic underlying an organization’s interactions with environment” (Dent, 1990).

A variety of taxonomies has been used to define strategy in a way that is generalizable across firms and industries (Langfield-Smith, 1997). Porter (1980) described two generic strategies (cost leadership, differentiation) and argued that each of these provides a sustainable competitive advantage in an industry. For companies pursuing a low-cost strategy their competitive advantage comes from economies of scale, low-cost raw materials, and superior technology that make them being the lowest-cost producer in their industry. For differentiators, emphasis is given on providing products with attributes that are highly valued by their customers such as product quality, flexibility, wide availability, and others.

Following Porter’s (1980) strategy categorization, the analysis of the firm’s strategy comes under two dimensions: the extent of differentiation and the extent of cost leadership. Specifically for the shipping industry the introduction of the term “quality shipping” is important for the firms using differentiation strategies, meaning that these shipping companies focus primarily on innovation and the formulation of services’ attributes that are highly valued by their customers. These include:

- quality of services (satisfaction of charterers, terminals, and cargo owners in terms of speedy and safe delivery of cargo, usually these companies are certified by ISO 9001 on a voluntary basis in order to ensure their customers about the quality of the services they offer);

- safety of services (i.e., number of accidents, number of incidents, number of lost injuries, number of defects and dealing time of defects, number of port state controls, number of class recommendations etc.);
- environmental protection (i.e., use of processes, practices, techniques, materials, products, services, or energy to avoid, reduce, or control the creation, emission, or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts);
- investment on new technologies (i.e., double hull vessels, new machinery, etc.);
- and personnel training (i.e., participation in seminars, receipt of certifications about ISM, internal audits, new technologies, new regulations stemming from the International Maritime Organization (IMO) and other international organizations etc.).

On the other hand, there is the low-cost (non-quality) shipping emphasized by shipping companies whose primary aim is to offer their services at the lowest cost. The source of this competitive advantage may arise from factors such as economies of scale, minimum investments on technology, safety, and personnel training.

The way strategy influences the adoption and implementation of MCS has become a core field of study in the management accounting literature recently. The research of the nature of control systems and strategy resulted in two contrasting pictures according to the strategy pursued by companies. Defenders focus on control systems that reduce uncertainty, emphasize problem solving, put emphasis on finance and production, and are usually centralized and formal. Since efficiency and ongoing cost monitoring are very important to defenders their main focus on control systems rely on cost objectives, operating goals, and budgets (Miles & Snow, 1978). Similarly, Porter (1980) supported that cost leadership firms are highly structured and adopt tight cost controls. Miller and Friesen (1982) described firms according to their degree of innovation by indicating reduction in sales or in market share and declining profitability. Simons (1987) – contrary to Miles and Snow (1978) – resulted that defenders, especially the large ones, used less intensively cost control systems, tight budget controls, and output monitoring. Chenhall and Morris (1995) found that tight controls were suitable for conservative strategies, while Chenhall and Langfield-Smith (1998) concluded that higher-performing firm pursuing a low-cost strategy may gain benefits from the use of manufacturing systems innovation, activity-based techniques, and improvement of existing processes. Kaplan and Norton (2004) suggested that cost leadership firms should use more cost

controls, operating goals, and budgets and also quality controls in order to minimize the costs of detecting and fixing errors. Auzair and Langfield-Smith (2005) argued that in service organizations cost leaders place a greater emphasis on more bureaucratic forms of MCS compared to differentiator firms. Sandino (2007) proposed that cost leaders place more emphasis on the use of initial MCS to minimize costs and risks and they tend to introduce inventory controls more often than low-cost firms.

Information content consists another dimension along which MCS differ. Several researchers investigated the role MCS play in the learning processes of an organization. Firms pursuing growth strategies use MCS that have stronger effects on decision making and learning (Merchant, 1985), while differentiators rely on result controls in order to encourage learning in the face of uncertainties (Simons, 1987, 1994). Kaplan and Norton (2004) argued that differentiators must develop systems to learn about customers' preferences and needs. Strategic change leads firms to focus on learning and communication (Abernethy & Brownell, 1999) and many companies use MCS in order to develop new ideas and learning capacities that can help them in the formation of new strategies (Marginson, 2002). The emphasis on external information was examined by Guilding (1999) and Simons (1987) who argued that firms following differentiation or prospector strategies use measures related to their competitors more intensely than other firms. *Cost leaders decide to use MCS in order to gain financial information about their companies while differentiators focus more on non-financial control systems* (Simons, 1987; Dent, 1990; Chenhall & Morris, 1995; Van der Stede, 2000). The adoption of flexible control systems gives to differentiators the advantage to respond rapidly to environmental change and innovation (Miles & Snow, 1978; Govindarajan & Gupta, 1985; Simons, 1987; Kaplan & Norton, 2004) while cost leaders adopt tight controls (Chenhall & Morris, 1995). Surprisingly, Simons (1987) found that tight controls are appropriate for differentiators as well because they eliminate excessive innovation.

## *2.2. The Performance Implications of the Alignment of MCS with Strategy*

The control and quality management literatures content that performance should be an increasing function of the match between the organization's strategy and its formal control practices. In contrast, a number of management researchers claim that performance may actually be lower when formal control systems are implemented. For instance, field study by Lorange and Murphy (1984) and Goold and Quinn (1993) also indicates that formal

control systems may reduce performance by focusing attention on incomplete or incorrect goals and performance measures, increasing bureaucracy and costs, and fostering behavioral and political barriers that adversely affect the utility of controls. But despite the conflicting claims regarding the performance consequences of control practices, large sample empirical evidence on the topic is relatively limited. Govindarajan and Gupta (1985) examined the association between strategy and remuneration and concluded that perceived organizational performance was higher when reward systems were matched to organizational strategies. Simons' investigation of the relations among control systems, business strategy, and firm performance also found preliminary evidence that return on investment was higher when control systems and strategies were more closely linked (Simons, 1987). Ittner and Larcker (1995) in contrast, found that more extensive use of formal quality-oriented information and reward systems was related to higher performance in organizations without extensive quality programs, but observed no performance improvement in organizations already making extensive use of quality improvement activities. Ittner and Larcker (1997) conclude that the performance effects of the control practices used vary by industry, suggesting that control systems must be modified to reflect the firm's competitive environment. Several of the practices exhibit negative relations with performance, consistent with claims that formal control systems can actually hinder performance in some circumstances.

In the management accounting literature, there are a number of studies that suggest a positive relationship between MCS and organizational performance (Baines & Langfield-Smith, 2003; Ittner & Larcker, 2003, 1997; Luft & Shields, 2007; Emsley, 2000; Bonner, Hastie, Springle, & Young, 2000; Said, Elnaby, & Wier, 2003; Widener, 2006). MCS are used to guard against undesirable behavior and to encourage desirable actions (Merchant, 1982). Thus, they promote goal congruence between the individual and the organization, coordinate and communicate strategic priorities, direct managers to critical areas of concern, and improve the allocation of resources based on organizational goals (Flamholtz, Das, & Tsui, 1985; Henri & Journeault, 2008). Baines and Langfield-Smith (2003) argue that the provision of information offered by MCS helps support of resource management and fosters performance. MCS can improve contracting, and ultimately performance by incorporating information concerning managerial actions that are not fully captured in the financial results (Said et al., 2003; Hemmer, 1996; Feltham & Xie, 1994; Banker & Datar, 1989). In addition, following a resource-based view (Wernerfelt, 1984; Barney, 1991), MCS contribute to the development and maintenance of organizational



capabilities leading to the achievement of a competitive advantage and superior performance (Henri, 2006).

Literature provides evidence that companies that adopt MCS according to their strategy outperform companies that do not associate their control systems with their strategy (Kaplan, 1990; Meyer, 1994). Nanni, Dixon, and Vollmann (1992) conducted a series of case studies, which provide evidence that companies align their MCS according to their strategies in order to experience superior performance. The measurement of performance is used to guide the execution of strategy through actions, but it is also used to evaluate strategy in terms of the results of taking the actions. Moreover, Sandino (2007) concludes that retail companies that do not experience a fit between their MCS and their strategy, experience lower levels of performance. Henri (2006) provides empirical evidence between the use of specific PMS and organizational performance. However, literature has not provided any evidence so far about the performance consequences (if any) of the implementation of MCS in shipping companies.

In order to test whether these results are applicable to the Greek shipping industry we test the following hypothesis:

**Hypothesis 1.** Shipping companies with a better fit between their MCS and their strategy experience superior performance.

### *2.3. The Choice of PMS According Strategy*

Contingency theory has long held that control systems must be aligned with organizational characteristics such as firm strategy (Fisher, 1995b) in order to lead to improved efficiency. Similarly, economic theories content that the optimal design of a firm's information and reward systems is a function of the firm's business strategy (e.g., Brickley, Smith, & Zimmerman, 1997; Milgrom & Roberts, 1992)

The choice of performance measures is one of the most critical challenges organizations face. PMS play a key role in developing strategic plans, evaluating the achievement of organizational objectives, and compensating managers (Ittner & Larcker, 1998). Top managers set strategic goals, show to their teams how it fits into these goals, and they train their team to choose its own measure of performance (Meyer, 1994). As a result, the PMS adopted by a company need to be aligned with its strategy, in order for this strategy to be realized.

The PMS is involved in all aspects of this business management cycle. Performance needs to be assessed in determining the adequacy of the strategies for achieving organizational objectives, in revising the strategies, in communicating them, and in developing tactical objectives (Nanni et al., 1992).

More recent studies directly examine the effects of organizational strategy on performance measurement choices, and the relation between these choices and organizational performance. Simons (1987) and Govindarajan (1988) found evidence of higher performance in organizations following low-cost strategies when bonuses are based on budget targets. Govindarajan and Gupta (1985) also found that greater reliance on non-financial compensation criteria has a stronger positive impact in organizations following a build strategy than in those following a harvest strategy. Studies by Abernethy and Gurthie (1994), Chong and Chong (1997), and Bouwens and Abernethy (2000) generally support that broad scope PMS are associated with higher performance in companies following differentiation strategies.

Thus, every organization needs to decide as to what approach to take in determining a specific bonus amount: at one extreme, the bonus amount may be derived strictly from a formula where numerical measures of performance on one or more criteria constitute the independent variable(s); at the other extreme, the superior may rely totally on his/her subjective judgment in determining the managers' bonus; alternatively part of the bonus may be formula based and part may be subjective (Govindarajan & Gupta, 1985). Gupta (1988) argued that creating and sustaining differentiation requires incurring discretionary expenditures in several areas – improvement of quality and speed of delivery, advertisement to build an image, research and development, and so forth. Cost savings are easy to measure but the potential differentiating benefits of high discretionary expenditures are not. Since differentiators need greater amounts of intuitive judgment for decision making, it is more possible that they need corporate openness, informality and subjective approaches to performance assessment to greater extent than cost leaders (Gupta, 1988). Since shipping companies pursuing differentiation strategies are hypothesized to adopt External Information MCS, it is expected that these companies will rely more heavily on subjective performance measures, leading to the next hypothesis:

**Hypothesis 2a.** Shipping companies adopting External Information MCS rely more heavily on subjective performance measures than shipping companies that adopt Cost MCS.

On the other hand, companies pursuing low-cost strategies are more oriented to adopt objective performance measures since more aspects of managers' results are quantifiable (i.e., higher profits, lower costs, etc.). Thus, it is expected that shipping companies that decide to follow a low-cost strategy will rely more heavily on objective PMS than shipping companies following differentiation strategies:

**Hypothesis 2b.** Shipping companies adopting Cost MCS rely more heavily on objective performance measures than shipping companies that adopt External Information MCS.

Literature suggests that focusing on the definition and implementation of strategies and information systems that emphasize value creation and the underlying drivers of value can ideally align management processes and internal goals with external goals (Ittner & Larcker, 2001). The fit between strategies and processes promotes congruence between the actions taken by the agent and the actions desired by the principal, thereby maximizing shareholders' value (Banker & Datar, 1989; Feltham & Xie, 1994; Holmstrom, 1979). Evidence suggests that strategy influences the adoption of PMS according to the company's strategic goals (Govindarajan & Gupta, 1985; Gupta, 1987). Cost leaders have an orientation in which they attempt to focus on established products and markets to extract strategic advantage by minimizing costs through improvements in operating efficiencies. This focus leads low costers to employ short-term financial performance measures to align their performance to the near term financial strategy of the firm (Govindarajan & Fisher, 1990; Simons, 1987). Thus, it is expected that companies following low-cost strategies will adopt objective performance measures since through these measures they are able to control for costs reduction, profit maximization, and other objective measures, which are consistent with their strategy. Accordingly, the following hypothesis is posited:

**Hypothesis 3a.** Greater reliance on objective (formula-based) approaches toward the determination of the shipping company managers' incentive bonus will have a stronger positive impact on effectiveness in the case of shipping companies adopting Cost MCS rather than in the case of shipping companies adopting External Information MCS.

This study hypothesizes that, in terms of impact on effectiveness, the utility of determining the bonus in a subjective rather than objective manner will be greater for differentiation rather than low-cost strategies. Literature suggests that two reasons are offered in support of this

expectation: (1) unlike the case for a manager emphasizing low-cost strategy, more aspects of a differentiation manager's job – such as market development, personnel development, R&D – are not quantifiable and, therefore, objective performance measures for such tasks are not available; and (2) managers in charge of differentiation strategies face greater environmental uncertainty than do managers in charge of low-cost strategies and that strategy implementation under conditions of greater uncertainty requires a more subjective approach toward the determination of the incentive bonus (Govindarajan & Gupta, 1985). The performance measurement literature also assumes that the integration of non-financial measures in measurement systems allows managers to better understand the relations among various strategic objectives, to communicate the association between employees' actions and strategic goals, and to allocate resources and set priorities based on these objectives (Kaplan & Norton, 1996). Differentiators seek new products and markets via initiatives that are unlikely to be immediately evident in the financial results of operations. As a result, for differentiator firms, short-term financial measures of performance will be less informative with regard to management efforts to attain long-term strategic goals. Govindarajan and Gupta (1985) found that firms following a prospector strategy are more likely to rely on non-financial measure of performance. Based on these arguments, it is expected that shipping companies that pursue strategic “forward-looking” goals to be more likely to place emphasis on non-financial (subjective) performance measures in contracting with their managers. Therefore it is hypothesized that:

**Hypothesis 3b.** Greater reliance on subjective (non-formula-based) approaches toward the determination of the shipping company managers' incentive bonus will have a stronger positive impact on effectiveness in the case of shipping companies adopting External Information MCS rather than in the case of shipping companies adopting Cost MCS.

### 3. RESEARCH DESIGN AND DATA COLLECTION

This work relies on field-collected data; exploratory interviews with experts in the shipping industry and a survey instrument completed by a sample of Greek-based shipping companies. Focusing on a single industry provides depth to the study and allows controlling for several industry-specific conditions – including regulations and environmental conditions – factors that may be relevant to the introduction of MCS in a company.

Shipping is chosen because it is a major contributor to Greece's economic performance, with significant impact on Greek financial and transport sectors. Moreover, Greek ocean-going fleet constitutes one of the most important competitive advantages of the country; only during 2006 Greek interests control 8.5% of the world's total number of ships in service and on order today, and 16.5% of the world fleet DWT (dead weight). More specifically, dry-bulk vessels represent 21% of international fleet and tankers represent 24% of international fleet during 2006 (*Shipping Magazine*, January 2007).

Initially, information was collected from 30 exploratory interviews directed to a number of professionals with previous experience at the shipping industry. From these interviews arose the opportunity to obtain a qualitative description of the MCS used in the shipping industry and the circumstances leading to their implementation. Second, data from a survey of top managers in 87 shipping companies are used. The questionnaire is composed of two sections. The first section gathers information on firm's strategy and identifies firm's value proposition. The second part focuses on the description of MCS implemented by the firm (purpose, usefulness, etc.). The final set of questions asks managers to self-assess the overall performance of the firm they manage.

After designing and pilot testing the questionnaire, it was sent to the targeted firms along with a cover letter directed to the managers of the company. The population of firms targeted by this survey consists of all Greek-owned ocean-going merchant marine shipping companies that own more than four ships each at the time of study, a total of 205 companies. These criteria were chosen in order to ensure that the resulting sample was composed of firms that had understood and implemented MCS. Companies were identified from the Greek Shipping Publications 2007 database. Departmental and general managers were chosen as respondents because they are knowledgeable about the firm's MCS. In addition, they occupy a position in which they have knowledge about strategic issues and other items asked in the survey. The letter briefly described the motivation for the study and offered managers a copy of the results. This mailing was followed up with two rounds of e-mails to non-responding firms requesting the same information and at least five telephone calls. The respondents had the option to complete the survey online or on paper and even through a telephone or face-to-face interview. Confidentiality was guaranteed to all respondents.

Out of the 205 companies targeted, 93 companies replied; i.e., a response rate of 45%. In 28 cases, the survey was completed in face-to-face interviews and as a result it was an opportunity to explore the reasoning behind the

**Table 1.** Descriptives of the Sample.

Variable	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
Size (# vessels)	17.29	16.37	7.0	11.5	21.25
Age (# years)	26.29	29.81	9.0	22.0	36.0
SUBJECTIVEPMS	3.23	1.20	3.00	4.00	4.00
OBJECTIVEPMS	3.64	0.98	3.00	4.00	4.00
CEO EXPERIENCE	0.40	0.49	–	–	–
STOCKEXCHANGE	0.11	0.32	–	–	–

respondent's answers. After eliminating unsuitable responses, 87 of the completed surveys were utilized in the analysis.<sup>1</sup> In most cases the respondent was a top manager from one of the technical, operations, or finance departments of the firm.

Descriptive statistics of the sample presented in Table 1 include the size and age of companies and the control variables used for testing the hypothesis developed. Interestingly, 11% of the companies in the sample are listed on a stock exchange market and the CEOs of 40% of the shipping companies of the sample had previous experience in implementing MCS in shipping companies.

In order to test for non-response bias, a two-step analysis was conducted. First, respondents were compared with non-respondents in terms of the sample characteristics size and age; *t*-tests did not reveal significant differences between respondents and non-respondents in terms of size and age. Then, the main construct measures (MCS variables, strategy, and performance) were checked for dissimilarities between the immediate respondents and the respondents to the follow-up surveys. Independent samples *t*-tests did not reveal any differences. As a result, non-response bias is not a major concern in this sample.

#### 4. VALUE-BASED CATEGORIZATION OF MCS

Initially, we explored whether there is a variation in the nature of MCS introduced and used by shipping companies. Qualitative and quantitative analyses were performed on the basis of the interviews with shipping industry's experts and the survey-collected quantitative data.

The first result derived from the interviews is that participants characterize MCS in terms of the purposes they fulfill, rather than in terms

of individual control systems such as budgets, cost controls, inventory controls, etc., mostly because individual control systems can be used to achieve different purposes (e.g., inventory controls are used by some companies to optimize stock levels and replenishment and by other firms to prevent merchandise theft). For example, one of the experts (finance manager in a shipping company) stated:

The important issue in the use of MCS is not only which control systems you have and which not but rather why you use them. The trick is to determine what information people should look at when they conduct a business.

As a result, such a strong focus on the informational purposes of MCS, consistently with the literature,<sup>2</sup> leads the analysis around sets of MCS identified on the basis of the information needs they meet rather than around individual MCS.

Moreover, different interviewees indicated different information needs to introduce MCS, probably a reflection of their own experiences in implementing MCS and an indication of potential variation across firms in terms of the MCS introduced.

Based on these interviews, two basic informational purposes of MCS have been identified: (i) to externally orient information, i.e., to analyze external information based on customer satisfaction, competition, economic events; and (ii) to minimize cost and achieve operational efficiencies, i.e., to achieve internal learning by constantly setting targets and comparing actual performance against these targets.

After learning the two main purposes of MCS from the exploratory interviews and identifying the 29 individual control systems used in the shipping industry, we explored whether the two major purposes affected the frequency of introduction of any specific individual control system. The first set of questions in the survey explored which MCS were introduced in each firm.

A second set of questions in the survey asked about the type of information sought through the MCS. Managers were asked the extent to which their companies utilized MCS to capture the different dimensions of information identified in the academic literature (internal vs. external, financial vs. non-financial, learning vs. monitoring, tight vs. flexible), as well as those that emerged through interviews (minimize costs, use of externally oriented information). Each dimension was ranked in a Likert scale from 1 to 5, where 1 indicated that the particular MCS was “not used at all” and 5 indicated that it was used “to a great extent” for the information purpose in question (please see [appendix](#)).

In order to test whether there is a variation in the nature of MCS introduced and used by shipping companies, a factor analysis<sup>3</sup> (where factors are allowed to be correlated<sup>4</sup>) procedure was estimated. Results indicate that several dimensions of information are pursued simultaneously. The two factors of solution were determined using a scree plot of the eigenvalues (total communality between all variables and each factor). The two factors selected had eigenvalues greater than 1 (thus satisfying the Kaiser criterion). The variance explained by factors 1 and 2 (each taken in isolation) is 4,423 (49.14%) and 1,430 (15.88%), respectively.

To complement the analysis, an evaluation needs to take place whether the dimensions of information captured by the two factors explain the choice of MCS (i.e., for each of the 29 MCS, the choice of whether to implement it as MCS). The canonical correlation between the MCS (29 dummy variables) and the two dimensions of information (collect externally oriented information and minimize costs) as reflected in the factor scores was calculated. The resulting canonical correlation is 0.839 ( $p$ -value = 0.000). This result indicates that a linear combination of the two dimensions of information emphasized by management explains 70.4% (squared value of 0.839) of the variance in a linear combination of the choices of MCS. This result reveals that the choice of MCS differs across shipping companies contingent upon their preferences for information.

As a final step toward understanding the dimensions of information that constitute the different categories of MCS, an in-detail examination of the association between the two dimensions (external information and cost efficiency) and the implementation of MCS was performed. To achieve this objective two analyses were conducted: (i) for each MCS identified, an examination of correlations between a dummy indicating whether it was used as MCS and the values of the two factors (as declared by the factor scores) corresponding to the dimensions of information pursued by management was performed; (ii) then, for each MCS, a logistic regression was estimated where the dependent variable is the same dummy as in (i) and the independent variables are, again, the values of the two factors. Based on these analyses, a categorization was performed whether each of the 29 MCS relates to the needs to collect externally oriented information or to the needs to minimize costs and optimize operating efficiencies or to none of these (Basic MCS), and they are accordingly assigned to the corresponding MCS category.

To construct the proposed categorization, a given MSC was assigned to a factor (information purpose) – only if that factor is significantly associated with the implementation of that particular MCS across the two analyses



conducted (i.e., correlations and logistic regressions). Moreover, MCS not assigned on the basis of the previous criterion, were classified as Basic MCS, if they are used in more than 60% of the sample firms, since we expect that this category should include MCS commonly adopted by most firms.

To summarize, based on the findings, a categorization of MCS is proposed that includes two sets of systems: Basic MCS implemented by most shipping companies, regardless of the dimension of information emphasized by the company, to establish a basis for their operations and MCS chosen by shipping companies based on their specific information needs. This latter set includes “External Information MCS” and “Cost MCS,” which help shipping companies to achieve distinctive purposes. These categories are described in Table 2.<sup>5</sup>

The Basic MCS enable shipping companies to establish a basis for their operations. Systems to “externally orient information” are focused on internal risks and are implemented when the firm feels the need to inform cargo owners about the reliability of its services and operations and also about protection of asset integrity and/or establishment of rules of conduct. Finally, firms searching for data to “minimize costs” use cost controls more heavily than the other firms, to achieve higher operating efficiencies. Several of the managers interviewed explained that cost minimization should not be attained at the expense of quality, but on the contrary, it is necessary due to the cyclicity of the business and reassures the viability of the company even when freight rates fall down. Since basic expenses of the shipping companies (i.e., fuels, repairs, dry-dockings, etc.) are not fixed, but are susceptible to market pressures the control of these costs is of great importance.<sup>6</sup>

The different emphases that firms place on their implemented MCS appear to reflect the two key components of the value creation process; i.e., to minimize cost and collect information readily available to cargo owners. Even when shipping companies choose one of the components at the time they implement MCS, most of them acknowledge the importance of eventually integrating both components.

## **5. EMPIRICAL RESULTS: PERFORMANCE IMPLICATIONS OF THE CHOICE OF MCS**

To test whether the strategy pursued by shipping companies will be a significant determinant of which MCS to introduce and implement the following choice model has been developed (a binomial logit model), which

**Table 2.** Value-Based Categorization of MCS.

Basic Systems	
Purpose	Basic systems implemented to set standards and support basic operations
Associated MCS	<ul style="list-style-type: none"> <li>• Externally oriented information systems (e.g., subscription to databases such as Lloyd’s lists, Fair Play, Equasis, etc.)</li> <li>• Capital budgeting controls</li> <li>• Quality standards’ controls</li> <li>• Sales productivity standards</li> <li>• Credit rules and controls</li> <li>• Off-hire analysis (e.g., off-hire ratios, profit/ship ratios)</li> <li>• Information systems’ controls (IT services)</li> <li>• Check of bids for repairs</li> <li>• Check of bids for spare parts</li> <li>• Controls on selection criteria for the purchase of second hand vessels</li> <li>• Control for investment in long-term assets</li> </ul>
Externally oriented Information	
Purpose	Collect information related to: <ul style="list-style-type: none"> <li>• Avoiding internal risks</li> <li>• Protecting asset integrity</li> <li>• Financial data available to cargo owners</li> <li>• Comply with cargo owners’ requirements</li> </ul>
Associated MCS	<ul style="list-style-type: none"> <li>• Budget controls</li> <li>• Inventory control systems to optimize stock levels and replenishment</li> <li>• On-board inspections</li> <li>• Planned maintenance system (computerized)</li> <li>• Controls on employee behavior and development (turnover, training, etc.)</li> <li>• Internal audits, transactions’ record, information control</li> <li>• Code of business conduct</li> <li>• Procedures (specified and recorded)</li> <li>• Key performance indicators (KPIs)</li> <li>• Statement of purpose/mission/credo</li> <li>• New buildings control</li> <li>• Reports for the performance of each department</li> <li>• Risk assessment procedures</li> </ul>
Information to minimize cost	
Purpose	Collect information related to: <ul style="list-style-type: none"> <li>• Cost minimization</li> </ul>
Associated MCS	<ul style="list-style-type: none"> <li>• Cost controls</li> </ul>

is the “Strategy Model of MCS”:

$$\Pr(\text{CHOICEMCS}_i = \text{MCS\_category}) = f(\text{LOWCOST}_i, \text{DIFFERENTIATION}_i, \text{CONTROLVARIABLES}_i)$$

CHOICEMCS is a categorical variable describing the two categories of MCS. This variable is coded 1 and 2, respectively, for firms emphasizing mostly Cost MCS and External Information MCS, respectively. To determine what category of MCS each firm most emphasized, a survey question was used where the respondents were asked to rate the emphasis placed on each of the corresponding information dimensions based on a Likert scale. Specifically, for each firm, “most emphasized” MCS is the one that received the highest Likert value. Firms with ties between the two MCS were excluded from the analysis, resulting in a sample size of 42 observations. The main independent variables in the model consist of the strategy variables, LOWCOST and DIFFERENTIATION. Both variables are constructed as composite measures from a set of survey questions that characterize the strategy of the firms. Also two sets of control variables are included in the multivariate analysis, one consisting of a number of organizational variables identified as important determinants of the choice of MCS systems in previous studies, and another one describing the ownership structure of a shipping company.

Results from these analyses indicate that shipping companies following low-cost strategies put significantly greater emphasis on the use of MCS to minimize costs and are more likely to adopt cost controls and credit controls as MCS.

The relationship between the pursuit of a differentiation strategy and the emphasis on MCS to externally orient information it is generally weaker. Overall, the results provide evidence that the choice of MCS is tailored to fulfill management information needs based on the firm’s strategy. Multivariate tests also show that shipping companies in the process of defining their strategy are more likely to adopt Cost MCS over External Information MCS.

To test the hypothesis that shipping companies with a better fit between their MCS and their strategy experience superior performance, the sample firms are classified in two groups based on whether their choice of MCS deviates from the “optimal” choice predicted by the Strategy Model of MCS. For each firm, the type of MCS is identified (i.e., Cost MCS) with the highest probability of being selected according to the Strategy Model of MCS Choice and a dummy variable “FIT” is defined that equals 1 if the shipping company actually chose (i.e., placed more emphasis on) that type

of MCS, and 0 otherwise. As a result, firms are classified into two groups: “high-fit” (FIT = 1) and “low-fit” (FIT = 0).

For the purpose of the univariate tests, the two groups are compared in terms of two measures of performance:

- **PERCEIVEDPERFORM:** This is a categorical variable drawn from a survey question where managers were asked to evaluate the firm’s overall performance since founding, relative to the shipping industry. The scale of this variable is described as 1 if the firm’s performance is in the lower 10%, 2 if it is in the lower 25%, 3 if performance is average, 4 if the firm is in the top 25%, and 5 if it is in the top 10%.
- **USEFULMCS:** This is a composite measure based on seven survey questions where managers were asked to assess from 1 to 5 the overall usefulness of their firm’s MCS (with 5 being more useful). It complements PERCPERFORM in that it provides a more specific and direct assessment of the contribution of MCS to the firm performance.

Although self-rating measures have sometimes been criticized for a potential leniency bias (i.e., the respondent tends to be more lenient when rating company’s performance, this bias can occur when a manager has a tendency to be overly positive about performance), this is less a concern where such bias is generic and where the ratings are needed for relative rather than absolute analysis, as is the case in the present study.

Measures of perceived performance are multidimensional since respondents are better suited to consider all the various dimensions of performance – e.g., the balance between revenues, growth, and profitability – as well as to assess the extent to which overall performance is satisfactory in terms of the firm’s business plan. Measures of actual performance are, in most cases, unable to capture the trade offs between different dimensions of the business and assume a definition of good performance that may differ from the firm’s definition, given its objective function at that point in time.

To perform the multivariate test, an Ordinal Logit Model, was run where the dependent variable is the one measure of perceived performance (PECPERFORM) and an Ordinary Least Squares Regression (OLS) where the dependent variable is the other measure of perceived performance, USEFULMCS. In these regressions, the independent variables include a measure of whether the firm chose the type of MCS predicted by the Strategy Model of MCS Choice (dummy variable FIT) and a number of control variables:

$$\text{PERFORMANCE}_i = f(\text{FIT}_i, \text{CONTROLVARIABLES}_i)$$

The number of control variables included is drawn from the literature. These variables are correlated both with the introduction of MCS and the performance of a shipping company and include CEO experience,<sup>7</sup> Size, and age. Previous accounting and entrepreneurship literature suggests that the presence of a CEO or top manager with previous experience introducing and implementing MCS in a shipping company will increase the chances of implementing MCS effectively and, thus, enhance performance (Bruderl, Preisendorfer, & Ziegler, 1992). Size and age were also associated to performance as well as to the emergence of MCS in companies. Older firms are more likely to achieve higher performance than younger firms (Freeman, Carroll, & Hannah, 1983; Singh, Tucker, & House, 1986; Hannan & Freeman, 1989). On the other hand, USEFULMCS might be negatively correlated with age given that technologies have become more available and less expensive in recent years, increasing the potential benefit younger firms can derive from MCS. Smaller firms were referred to as experiencing lower operating performance than larger firms (Fama & French, 1995), because small size companies tend to be riskier and larger firms improve performance through economies of scale. A more intensive use of MCS was reported for larger and older firms (Bruns & Waterhouse, 1975; Khandwalla, 1977; Merchant, 1981; Davila, 2003), possibly an indication of a more effective implementation of MCS.<sup>8</sup>

The results of the parametric (*t*-test for differences in means) and non-parametric (Wilcoxon rank-sum) univariate tests presented in Table 3

**Table 3.** Univariate Performance Tests.

Performance Variable	Mean for Sub-Sample		Difference in Means	<i>t</i> -Test (Pr > <i>t</i> )*	Wilcoxon Test (Pr > <i>z</i> )*
	High-fit FIT = 1	Low-fit FIT = 0			
PERCPERFORM	3.53	4.2	0.66	0.067	0.068
USEFULMCS	3.41	2.92	-0.49	0.107	0.135

\**p*-values in the univariate analysis describe two-tailed results.

FIT: Dummy equal to 1 if the firm implemented the MCS predicted as the most probable by the Strategy Model of MCS Choice, and 0 otherwise.

PERCPERFORM: This is a categorical variable drawn from a question in the survey, measuring managers' perception of firm's performance since founding, in a scale where 1 indicates bottom performance and 5 top.

USEFULMCS: This is a composite measure drawn from seven questions from the survey where managers were asked to assess from 1 to 5 the overall usefulness of MCS to their firms (with 5 being more useful).

partially support the hypothesis tested. Shipping companies with a better fit to the Strategy Model of MCS Choice appear to perform less well than the other firms (low-fit), in terms of perceived performance, whereas the contrary takes place in terms of perceived usefulness of MCS. For both variables the difference in mean performance across the two sub-samples is statistically significant at the 5% level. The result, though it seems surprising, it is explained by the fact that the two measures of perceived performance are negatively correlated.

Multivariate results in [Table 4a](#) and [4b](#) provide support for the hypothesis tested. This means that data show a significant positive relation between FIT<sup>9</sup> and PERCPERFORM, and also they indicate a positive relationship between FIT and USEFULMCS. As for the control variables, EXPERIENCE and SIZE (though they seem to be not statistically significant) are both positive associated with PERCPERFORM. EXPERIENCE is negatively associated with USEFULMCS, meaning probably that usefulness of implementation of MCS exists independently of managers' experiences. AGE is positively associated with PERCPERFORM, but negatively associated with USEFULMCS. The latter finding suggests that on average, mature companies rely more on systems other than formal MCS in order to ensure viability (such as informal MCS, interpersonal relations, everyday routine, etc.).<sup>10</sup>

The performance results reinforce the notion that shipping companies should adapt their MCS to their strategy. The CEO of a large shipping company located in Athens argued: "When my father decided to retire, I took over the company- one of the most successful in the shipping industry those years. The greatest challenge for me was to maintain the success of the business while at the same time improving the quality of its services. The first step was to redefine the strategic mission of the company; that led me to the decision to split the main company into two companies – the one comprising of the bulk carrier vessels and the other one of the tanker vessels- since I believe that these categories of vessels operate in different markets that have different needs, different trends and different regulatory frameworks. Moreover, I decided to have an average fleet age of about 5 years old and always train the personnel to new technologies and regulations in order the firm to keep up with latest market trends. Although these procedures are costly for the company, they helped us establish our good name in the market and moreover we still succeed to obtain higher freights for our services since they guarantee reliability and safety of procedures."

In conclusion, the evidence suggests that a good fit between the emphasis on MCS and the strategy and organizational structure of the firm is

**Table 4.** Multivariate Performance Tests.

Panel A: Ordinal Regression Results	
$\Pr(\text{Performance} = m) = f(\text{FIT}_i, \text{EXPERIENCE}_i, \text{SIZE}_i, \text{AGE}_i)$	
	Performance Measure
	PERCPERFORM
FIT	1.076 (0.176)*
EXPERIENCE	0.068 (0.684)
SIZE	0.058 (0.030)
AGE	0.022 (0.022)
$\tau_1$	-1.826 (1.660)
$\tau_2$	-0.625 (1.453)
$\tau_3$	1.281 (1.394)
$\tau_4$	3.677 (1.530)***
Pseudo <i>R</i> -squared ( <i>N</i> )	<b>0.304 (42)</b>
Prob > $\chi^2$ : Likelihood ratio <sup>a</sup> test of proportionality of odds across response categories (test of parallel lines)	<b>0.005<sup>b</sup></b>
Panel B: Ordinary Least Squares Regression Results	
$\Pr(\text{Performance} = m) = f(\text{FIT}_i, \text{EXPERIENCE}_i, \text{SIZE}_i, \text{AGE}_i)$	
	Performance Measure
	USEFULMCS
FIT	0.518 (0.336)*
EXPERIENCE	-0.380 (0.285)
SIZE	0.005 (0.008)

**Table 4. (Continued)**

Panel B: Ordinary Least Squares Regression Results	
Pr(Performance = $m$ ) = $f(\text{FIT}_i, \text{EXPERIENCE}_i, \text{SIZE}_i, \text{AGE}_i)$	
	Performance Measure
	USEFULMCS
AGE	-0.006 (0.009)
CONSTANT	3.101 (0.467)
R-square ( $N$ )	<b>0.188 (42)</b>

Significant at \*\*\*  $p$ -value < 0.01; \*\*  $p$ -value < 0.05; \*  $p$ -value < 0.10.

Standard errors are presented in parentheses ( ).

The bold values represents pseudo  $R^2$  are reported for ordinal logit results.

PERCPERFORM: This is a categorical variable drawn from a survey question, measuring managers' perception of firm's performance since founding, in a scale where 1 indicates bottom performance and 5 top.

USEFULMCS: This is a composite measure drawn from seven questions from the survey where managers were asked to assess from 1 to 5 the overall usefulness of MCS to their firms (with 5 being more useful).

FIT: Dummy equal to 1 if the firm implemented the MCS predicted as the most probable by the Strategy Model of MCS Choice, and 0 otherwise.

EXPERIENCE: Dummy indicating if CEO or whoever was responsible for the implementation of MCS had experience in introducing and implementing MCS in shipping companies (1) or not (0).

SIZE: Equals the number of vessels owned by the company.

AGE: It is the number of years since the date of founding.

$\tau_j$ : Cutoff point " $j$ " predicted for the ordinal logit.

<sup>a</sup>When an ordinal regression is fit, the main assumption is that the relationships between the independent variables and the logits are the same for all the logits. That means the results are a set of parallel lines or planes – each for each category of the outcome variable. This assumption can be checked by allowing the coefficients to vary, estimating them, and then testing whether they are all equal. The test of parallel lines assumes the null hypothesis that the lines are parallel. Ideally, I do not want to reject the null hypothesis that the lines are parallel.

<sup>b</sup>The proportional odds assumption implicit in the ordinal logit model is rejected at the 1% level. To verify the robustness of the PERCPERFORM results, I additionally run an OLS regression and find similar results (The FIT variable remains positively related to PERCPERFORM).

instrumental to reap the benefits that control systems can provide to the performance of a shipping company. There is no single set of successful MCS that will equally fulfill all the needs of shipping companies and thus, choosing the appropriate set of MCS can have a significant effect on firm performance. As the CFO of a well-performing shipping company stated: "The success



of our company does not rely exclusively on the MCS we use, but mainly is relies on the alignment of these systems with our strategy and value structure. Our operational and informational system is the base of our control systems, however I am pretty sure that even if we offered our MCS systems for free to our competitors, they would not have done them any good because they do not have the kind of commitment to the business as we do.”

### 6. PERFORMANCE MEASUREMENT SYSTEMS AND BUSINESS STRATEGY

To test the Hypotheses 2a and 2b, i.e., the shipping companies adopt their PMS according to their strategy, in a univariate setting, the sample of companies is split into Low Costers and Differentiators and contrast was made in order to realize how the two groups differ in terms of their emphasis on the adoption of objective and subjective PMS (Table 5).<sup>11</sup>

Univariate results indicate that shipping companies adopting Cost MCS tend to use more objective PMS than shipping companies pursuing External Information MCS, and companies adopting External Information MCS tend to adopt more subjective PMS than shipping companies adopting Cost MCS.

In a multivariate setting, the following choice model has been developed (a binomial logit model), which is the “Strategy Model of Performance Measurement Systems”:

$$\Pr(\text{CHOICEMCS}_i = \text{MCS\_category}) = f(\text{LOWCOST}_i, \text{DIFFERENTIATION}_i, \text{OBJECTIVEPMS}_i, \text{SUBJECTIVEPMS}_i)$$

CHOICEMCS is a categorical variable describing the two categories of MCS. This variable is coded 1 and 2, respectively, for firms emphasizing

**Table 5.** Univariate Analysis.

Performance Measurement Variable	Shipping Companies Adopting Low Cost MCS	Shipping Companies Adopting External Information MCS	Difference in Means	t-Test (Pr>t) – Two-Tailed	Wilcoxon Test (Pr>z) Two-Tailed
SUBJECTIVEPMS	3.30	3.91	-0.61	0.104	0.013
OBJECTIVEPMS	3.76	2.75	1.01	0.06	0.10

mostly Cost MCS and External Information MCS, respectively. To determine what category of MCS each firm most emphasized, a survey question was used where the respondents were asked to rate the emphasis placed on each of the corresponding information dimensions based on a Likert scale. Specifically, for each firm, “most emphasized” MCS is the one that received the highest Likert value. Firms with ties between the two MCS were excluded from the analysis, resulting in a sample size of 42 observations.<sup>12</sup>

The main independent variables in the model consist of the strategy variables: **LOWCOST** and **DIFFERENTIATION**. Both variables are constructed as composite measures from a set of survey questions that characterize the strategy of the firms.

The **LOWCOST** measure reports higher values for strategies emphasizing low price, and lower values for firms, and customers indifferent to prices. This measure is constructed through principal components analysis and captures 60% of the variation in two questions: (1) please define the extent to which your company follows the above criteria for spare parts acquisition: lowest transportation cost, and (2) how would you characterize your charterers’ price sensitivity. The corresponding Cronbach alpha in this case is 0.665 (please see [appendix](#) for questions that fully comprise **LOWCOST** measure).

The **DIFFERENTIATION** measure reports higher values for strategies putting more emphasis on customer’s satisfaction and uniqueness. It is also constructed through principal components and captures 74% of the variation in two questions: (1) “the extent to which shipping companies consider charterers’ satisfaction,” and (2) “the extent to which shipping companies place the relative emphasis on the following attributes to attract and retain charterers: tailor-made services.” The corresponding Cronbach alpha in this case is 0.905 (please see [appendix](#) for questions that fully comprise **DIFFERENTIATION** measure).

**OBJECTIVEPMS** is drawn from a survey question that asked managers to express from 1 to 5 to what extent performance rewards are objectively determined, based on specific measures tied by formula to compensation.

**SUBJECTIVEPMS** is drawn from a survey question that asked managers to express from 1 to 5 to what extent performance rewards are subjectively determined.

Multivariate results indicate that shipping companies that decide to implement Cost MCS place greater emphasis on the adoption of objective PMS, whereas shipping companies that adopt External Information MCS place greater focus on the adoption of subjective PMS ([Table 6](#)).<sup>13</sup>

**Table 6.** Binomial Logit: Strategic Choice of Performance Measurement System.

Cost/External Info MCS		
	Coefficient	Pr>Chi <sup>2</sup>
INTERCEPT	-9.934* (5.868)	0.09
LOWCOST	<b>2.259**</b> <b>(0.903)</b>	<b>0.012</b>
DIFFERENTIATION	0.100 (0.589)	0.866
OBJECTIVEPMS	<b>1.115*</b> <b>(0.494)</b>	<b>0.072</b>
SUBJECTIVEPMS	-0.081 (0.620)	0.870

*Note:* Values in parentheses represent standard errors.

The bold values represents pseudo  $R^2$  are reported for ordinal logit results.

Significant at \*\*  $p$ -value < 0.05; \*  $p$ -value < 0.10.

As a result, the equation derived from the binomial regression is the following:

$$\begin{aligned} \text{COSTMCS/EXTERNALINFOMCS} = & 9.934 + 2.259\text{LOWCOST} \\ & + 0.100\text{DIFFERENTIATION} \\ & + 1.115\text{OBJECTIVEPMS} \\ & - 0.081\text{SUBJECTIVEPMS} \end{aligned}$$

Results indicate that shipping companies adapt their PMS according to the choice of MCS they incorporate. This finding is consistent with literature that suggests that PMS are aligned to the development of strategic plans, the evaluation of organizational objectives, and the compensation of managers (Ittner & Larcker, 1998). Moreover, the CEO of a large shipping company located in Athens stated that:

Controls need to be customized for the company in order to respond to its specific needs and conditions...management of the company should go first and performance measurement systems should support the business.

## 7. PERFORMANCE MEASUREMENT SYSTEMS AND PERFORMANCE IN STRATEGY IMPLEMENTATION

The propositions tested in Hypotheses 2a and 2b, i.e., the performance implications of shipping companies' adoption of PMS according to their

choice of MCS are of the following form: the impact of  $S_1$  on  $Y$  will be stronger when  $S_2$  is high (low) as compared to when  $S_2$  is low (high). Following the arguments of Allisson (1977) and Southwood (1978) and similar to the approaches taken by Argote (1982), Brownell (1982), Schoonoven (1981), Govindarajan and Gupta (1985), and Gupta (1987), the most appropriate analytical method to test such a hypothesis is to run the two regression equations given below:

$$Y = c_1 + a_1S_1 + a_2S_2 + \varepsilon_1 \quad (1)$$

$$Y = c_1 + b_1S_1 + b_2S_2 + b_3S_1S_2 + \varepsilon_2 \quad (2)$$

Mathematically, this specification implies that  $(\partial Y/\partial S_1) = a_1 + b_3S_2$ .

If the unstandardized regression coefficient  $b_3$  is positive and significant, one can conclude that the positive impact of  $S_1$  on  $Y$  is indeed stronger for higher as compared to lower values of  $S_2$ . Alternatively, a negative and significant  $b_3$  would lead to the conclusion that the positive impact of  $S_1$  on  $Y$  is stronger for lower rather than higher values of  $S_2$ . Finally, if  $b_3$  is not significantly different from zero, one would conclude that  $S_2$  does not have any contingency effect on the relationship between  $S_1$  and  $Y$ . The net conclusion is that the utility of Eq. (2) is to learn about the significance and nature of the impact of interaction between  $S_1$  and  $S_2$  on  $Y$  and not about the nature of its main effects. If one is interested in learning about the main effects of  $S_1$  and/or  $S_2$  on  $Y$ , it is Eq. (1) that can be of some value. Over the observed range of MCS Choice (i.e., 1 if a shipping company chooses a Cost MCS and 2 if a shipping company chooses an External Information MCS), it can be calculated for which values of MCS Choice, the ratio  $(\partial Y/\partial S_1)$  becomes positive for every pair of equations.

Four pairs of regression equations were developed for the purposes of testing Hypotheses 3a and 3b. In order to test Hypotheses 3a and 3b performance was defined in terms of perceived performance (see appendix).

For this measure of performance two equations developed in order to capture the effects of objective performance measurements on performance, and two equations developed in order to capture the effects of subjective performance measurement on performance (Table 7).

Results indicate that from the equations tested only the relationship between SUBJECTIVEPMS and PERCPERFORM is statistically significant, when shipping companies adopt either Cost MCS or External Information MCS. The partial derivative from the second equation.

$(\partial P/\partial S) = 0.0218 + 0.165 \text{ CHOICEMCS}$  becomes positive when  $\text{ChoiceMCS} > -1.3$  thus subjective PMS is important for shipping companies either adopting Cost MCS or External Information MCS.

**Table 7.** Implications of PMS on Performance.

Panel A: Results for the Implications of Subjective PMS on Performance		Independent Variables			
	CONSTANT	CHOICEMCS	SUBJECTIVEPMS	SUBJECTIVEPMS*CHOICE	Adjusted R <sup>2</sup> F-ratio
Perceived performance					
Equation (1a)	2.301*** (0.543)	0.754*** (0.316)	0.155 (0.130)	0.149	4.587
Equation (2a) (interaction)	0.888 (1.965)	1.338 (0.842)	0.218 (0.155)	0.165 (0.221)	3.210
Panel B: Results for the Implications of Objective PMS on Performance		Independent Variables			
	CONSTANT	CHOICEMCS	OBJECTIVEPMS	OBJECTIVEPMS*CHOICE	Adjusted R <sup>2</sup> F-ratio
Perceived performance					
Equation (1b)	3.266*** (0.790)	0.733** (0.339)	-0.115 (0.140)	0.133	4.143
Equation (2b) (interaction)	2.462 (1.632)	1.080 (0.704)	-0.750 (0.158)	0.093 (0.165)	2.820

$N = 42$ . Unstandardized regression coefficients are reported. Figures in parentheses represent standard errors.  
 Equation (1a,b):  $E = \text{Constant} + \alpha\text{CHOICEMCS} + \beta\text{OBJECTIVEPMS}$ .  
 Equation (2a,b):  $E = \text{Constant} + \alpha\text{CHOICEMCS} + \beta\text{OBJECTIVEPMS} + \gamma\text{OBJECTIVEPMS} \times \text{CHOICE}$ .  
 \* $p$ -value  $< 0.10$ ; \*\* $p$ -value  $< 0.05$ ; \*\*\* $p$ -value  $< 0.01$ .

This finding is not at all surprising for shipping companies. Formula-based compensation schemes are not very usual in the Greek shipping sector. Note that shipping companies usually pay bonus subjectively, i.e., without using specific formulas as, for example, other companies in other sectors do, i.e., manufacturing companies/banks. This is because efficiency in shipping companies is not captured only financially (i.e., performance indicators include off-hire period, safety, reliability of services, low rate of deficiencies reported, and claims, etc., which are important for every shipping company independently of its MCS) and because profits usually depend on the freight market and not directly on the managers' choices. That is why it is not very surprising that both Cost MCS and External Info companies adopt subjective PMS. This finding is supported by the interviews as well. The technical manager at a tanker company located in Athens stated that:

The bonus is usually equal to one monthly salary per year... this is a tradition here. It does not have to do with the exact freights we have collected or with what maintenance we do. It is enough to perform well at our jobs and keep the safety and quality standards of the company at the desirable level.

## **8. CONCLUSION, LIMITATIONS, AND DIRECTIONS FOR FUTURE RESEARCH**

This paper provides insights about the choices made by shipping companies when deciding what type of MCS to implement and the consequences of such choices on organizational performance. Shipping companies tend to introduce and implement three categories of MCS based on the informational purposes pursued: "Basic MCS," which are similar across all companies and they are used to collect information for planning and establishing basic operations; "Cost MCS," which are implemented to minimize costs; and "External Information MCS," which are used to collect information related to compliance with cargo owners' requirements.

Findings result that the choice among the categories of MCS depends on the shipping company's strategy and structure, and that firms that choose MCS better suited to their strategy perform better than the other firms.

The results of the study contribute to the literature by demonstrating the importance of the fit between strategy and MCS in enhancing organizational performance and by indicating the performance benefits of that fit in the context of service sector companies and especially shipping companies.

The findings, however, should be interpreted with caution. First, the focus on a single industry such as the ocean-going merchant marine sector rather than multiple industries may limit the generalizability of the results to other services companies, mainly due to the particular nature of the shipping industry. In respect, this work calls for more studies on the emergence of MCS in other shipping sectors such as the cruisers where different laws and regulations apply. That would be interesting to investigate the differences in the adoption and implementation of MCS due to differences in the environment and legal obligations of each sector.

Second, ideally the research should have employed “real-time” data rather than relying on the recollections of survey respondents and should have employed triangulation (i.e., more than one respondent per firm) to minimize memory and interpretation biases. But such a study would have been particularly costly and time consuming.

An obvious limitation of this study has been its exclusive reliance on self-report measures. Although authors believe that the results of validity and reliability tests carried out argue for sufficient confidence in these measures, a similar study with multimethod measurements should yield more powerful results.

Moreover, matching incentive bonus systems to MCS is only one – albeit a significant one – of the control mechanisms used by corporate executives to ensure effective implementation of strategies. Other important control mechanisms whose relationships to the strategic choice of MCS might be worthy of investigation would be: use of administrative vs. interpersonal control, degree of decentralization, nature of data included in internal reports (e.g., financial vs. non-financial data, etc.).

Finally, the study also presents potential survival and self-selection biases. In order to eliminate these biases, we tried to include firms older than two years and increase efforts to maximize the rate of response.

Calls for future research include more in-depth research (for instance case study research). In-depth research can help understanding the complex interactions between MCS and strategy. This becomes even more important if we recognize that strategy is an evolving and multifaceted concept. Case study research could evolve through the longitudinal study of one or more shipping companies in order to understand the reasoning behind the choice of certain control mechanisms and how these mechanisms change through time due to changes in the strategy and environment faced by each company.

Many research opportunities and unresolved questions remain. It is not yet clear what role MCS play to bring intended strategies into realization, or whether MCS can minimize the disruption caused by strategic change.

Research could be undertaken to explore whether the role of MCS changes as shipping companies mature. Moreover, it would be interesting to introduce more variables in our model (i.e., technology, external and internal environment, etc.) – since strategy is not the only determinant of control systems – and test the interactions between the variables and their influence on control mechanisms of shipping companies.

Notwithstanding these limitations, the results presented in this paper try to contribute to an emerging literature in accounting and control in the service sector by establishing the importance of contingencies in the choice of different types of MCS in shipping companies and by providing evidence on the performance implications of this choice.

## NOTES

1. Six out of the 93 responding firms were eliminated because, ex post, it was discovered that they did not fit the selection criteria. This happened because the databases utilized for the analysis did not provide information accurate enough as to identify perfectly the targeted population. Also, shipping is an industry with high variability, i.e., for the number of vessels each company has since during a year many sales and purchases take place.

2. Studies analyzing MCS in mature firms have identified the following dimensions of information: information to learn vs. information to monitor; internal vs. external information; financial vs. non-financial information; and tight vs. flexible information (Miles & Snow, 1978; Govindarajan & Gupta, 1985; Merchant, 1985; Simons, 1987, 1994; Dent, 1990; Chenhall & Morris, 1995; Abernethy & Brownell, 1999; Guilding, 1999; Van der Stede, 2000; Marginson, 2002; Kaplan & Norton, 2004).

3. Factors include the extent to which MCS are used to:

- Achieve tight control and monitoring over procedures, rules/standards
- Achieving learning and flexibility to act upon information
- Minimize risks
- Increase revenue
- Minimize costs and achieve operating efficiency
- Collect internally oriented information
- Collect externally oriented information
- Financial performance measures
- Non-financial performance measures

4. Since the factors described by the interviewees were observed as emphases and were not mutually exclusive, factors are allowed to be correlated. Principal axis factoring is used and axes are rotated using Promax so that factors are not constrained to be orthogonal to each other.



5. As a result of our categorization criteria, 3 of the 29 MCS were not assigned to any of the three types of MCS. This should not be viewed as a limitation of the analysis, since our objective was not to categorize any MCS implemented by shipping companies' managers, but to provide a general, intuitive framework that would capture the types of MCS most often introduced by shipping companies with different information needs. With respect to the three unassigned MCS, no convincing evidence was found of a systematic relation between their introduction among the set of MCS and the firm's informational needs. For example, marketing databases, suppliers' databases, and competitors' benchmarking were not classified as Basic MCS because shipping companies explained that since the freight rates are a result of demand for vessels by charterers and supply of vessels by ship owners and of the international freight market, it is of little interest the implementation of such MCS in a shipping company. Thus, we conclude that the nature of implementation of these two MCS was not consistent with the notion of Basic MCS that was pursuing in the survey – i.e., MCS commonly adopted because they are essential to the development of a shipping company. Certainly, the categorization criteria are partly subjective and the resulting classification should be viewed as tentative.

6. The robustness test of the results that link each dimension with specific implemented MCS was verified by analyzing the sub-sample of firms owning only bulk carriers. The list of MCS assigned to each category remains unchanged except that Budget controls and Capital Budgeting controls appear to be Basic MCS.

7. EXPERIENCE: Dummy indicating whether the CEO (or whoever was in charge of introducing and/or implementing MCS) had previous experience in introducing and/or implementing controls in shipping companies.

AGE: Number of years since the date of founding.

SIZE: Number of vessels owned by the shipping company.

8. Since the measure of size is based on current data, a positive association with performance can partly reflect a survivorship bias (Brown, Goetzmann, Ibbotson, & Ross, 1997) or a mechanical relationship (top performers presumably have grown bigger).

9. Note that if the shipping company has optimally chosen its MCS based on its strategy, but the strategy is not the “right” one, this would lead to a negative relation between the FIT measure and performance, thereby biasing against finding the hypothesized positive relation. To assess this problem, I interact a dummy that proxies for “right” strategy with the variable FIT. This dummy RIGHTSTRAT equals 0 if the firm changed its strategy – an indication of “wrong” strategy in the past, and 1 otherwise. Results remain the same for all variables.

10. Note that the performance effect presented in the analysis cannot be exclusively attributed to the fit between the MCS and the strategy. This is captured by the multinomial model, which includes other organizational variables separate from strategy. Two additional analyses were conducted to better understand whether the fit between MCS and strategy plays an important role on performance:

- Results of Table 4, panels A and B, were replicated for the sub-sample of firms with a low-cost score above median, given that low-cost strategy was the only strategy variable that was a significant predictor in the multinomial model.

- Results in Table 4, panels A and B, were replicated using a redefined FIT variable, where the multinomial model is substituted for the one that includes only the strategy variables as exploratory variables.

The FIT variable is positively associated with the perceived performance and usefulness of MCS in both tests.

11. The study does not assume that objective and subjective performance measurement systems are mutually exclusive; rather the study is based on preferences (i.e., emphasis) shipping companies put on objective over subjective performance measures (and the contrary).

12. While the categories of MCS are not mutually exclusive (shipping companies may emphasize all of them to some extent), turning relative emphases into “choices” allows to control for biases in terms or ratings clustering (differential respondent’s propensity for rating levels; e.g., someone giving all 5’s vs. someone giving all 1’s) and in terms of ratings dispersion (differential respondents’ propensity for ratings variation: e.g., someone answering in a range 1–5s vs. someone answering in a range 3–4s). Moreover, to the extent that a higher emphasis on one set of MCS reflects a greater use of the firm’s limited resources (financial, human, etc.), emphases can be viewed also as “choices.”

13. In case of shipping companies that adopt Cost MCS, the results of multivariate analysis are statistically significant; however, this is not the case for shipping companies adopting External Information MCS (in this case the non-significance of results may be due to the small number of shipping companies in the sample that adopt External Information MCS).

## REFERENCES

- Abernethy, M. A., & Brownell, P. (1999). The role of budgets in organizations facing strategic change: An exploratory study. *Accounting, Organizations and Society*, 24, 189–204.
- Abernethy, M. A., & Gurthie, C. (1994). An empirical assessment of “fit” between strategy and management information system design. *Accounting and Finance*, 34(2), 49–66.
- Allison, P. D. (1977). Testing the interaction in multiple regression. *American Journal of Sociology*, 83(1), 144–153.
- Argote, L. (1982). Input uncertainty and organizational co-ordination in hospital emergency units. *Administrative Science Quarterly*, 27(3), 420–434.
- Auzair, S. M., & Langfield-Smith, K. (2005). The effect of process type, business strategy and life cycle stage on bureaucratic MCS in service organizations. *Management Accounting Research*, 16, 399–421.
- Baines, A., & Langfield-Smith, K. (2003). Antecedents to management accounting change: A structural equation approach. *Accounting, Organizations and Society*, 28, 675–698.
- Banker, R. D., & Datar, S. M. (1989). Sensitivity, precision, and linear aggregation of signals. *Journal of Accounting Research*, 27, 21–40.
- Barney, J. B. (1991). Firms resources and sustained competitive advantage. *Journal of Management*, 17, 99–120.

- Bonner, S. E., Hastie, R., Springle, G. B., & Young, S. M. (2000). A review of the effects of financial incentives on performance in laboratory tasks: Implications for management accounting. *Journal of Management Accounting Research*, 12, 19–64.
- Bouwens, J., & Abernethy, M. A. (2000). The consequences of customization on management accounting system design. *Accounting, Organizations and Society*, 25, 221–241.
- Brickley, J., Smith, C., & Zimmerman, J. (1997). *Managerial economics and organizational architecture*. Burr Ridge, IL: Richard D. Irwin.
- Brown, S. J., Goetzmann, W. N., Ibbotson, R. G., & Ross, S. A. (1997). Rejoinder: The J-shape of performance persistence given survivorship bias. *The Review of Economics and Statistics*, 79, 167–170.
- Brownell, P. (1982). The role of accounting data in performance evaluation, budgetary participation and operational effectiveness. *Journal of Accounting Research*, 20(1), 12–27.
- Bruderl, J., Preisendorfer, P., & Ziegler, R. (1992). Survival chances of newly founded business organizations. *American Sociological Review*, 57, 227–242.
- Burns, T., & Stalker, G. M. (1961). *The management of innovation*. London: Tavistock.
- Bruns, W. J., Jr., & Waterhouse, J. H. (1975). Budgetary control and organizational structure. *Journal of Accounting Research*, 13, 177–203.
- Chenhall, R., & Langfield-Smith, K. (1998). The relationship between strategic priorities, management techniques and management accounting: An empirical investigation using a systems approach. *Accounting, Organizations and Society*, 28, 243–264.
- Chenhall, R., & Morris, D. (1995). Organic decision and communication processes and management accounting systems in entrepreneurial and conservative business organizations. *Omega International Journal of Management Science*, 23, 485–497.
- Chenhall, R. H. (2003). Management control systems design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting, Organizations and Society*, 28, 127–168.
- Chong, V. K., & Chong, K. M. (1997). Strategic choices, environmental uncertainty and SBU performance: A note on the intervening role of management accounting systems. *Accounting and Business Research*, 27, 268–276.
- Davila, T. (2003). *The emergence of management control systems: Formalizing human resource management in small growing firms*. Working Paper, Stanford University, USA.
- Dent, J. F. (1990). Strategy, organization and control: Some possibilities for accounting research. *Accounting, Organizations and Society*, 15, 3–25.
- Emsley, D. (2000). Variance analysis and performance: Two empirical studies. *Accounting, Organizations and Society*, 25(1), 1–12.
- Fama, E., & French, K. (1995). Size and book to market factors in earnings and returns. *Journal of Finance*, 50, 131–155.
- Feltham, G. A., & Xie, J. (1994). Performance measures congruity and diversity in multi-task principal/agent relations. *The Accounting Review*, 69, 429–453.
- Fisher, J. (1995). Contingency based research on management control systems: Categorization by level of complexity. *Journal of Accounting Literature*, 14, 24–53.
- Flamholtz, E. Z., Das, T. K., & Tsui, A. (1985). Towards an integrative framework of organizational control. *Accounting, Organizations and Society*, 10(1), 35–50.
- Freeman, J., Carroll, G. R., & Hannah, M. T. (1983). The liability of newness: Age dependence in organizational death rates. *American Sociological Review*, 48, 692–710.
- Goold, M., & Quinn, J. J. (1993). *Strategic control: Milestones for long-term performance*. London: Pitman Publishing.

- Govindarajan, V., & Gupta, A. K. (1985). Linking control systems to business unit strategy: Impact on performance. *Accounting, Organizations and Society*, 10, 51–66.
- Govindarajan, V., & Fisher, J. (1990). Strategy, control systems and resource sharing: Effects on business-unit performance. *Academy of Management Journal*, 33, 259–285.
- Govindarajan, V. A. (1988). Contingency approach to strategy implementation at the business-unit level: Integrating administrative mechanisms with strategy. *Academy of Management Journal*, 31, 825–853.
- Guilding, C. (1999). Competitor-focused accounting: An exploratory note. *Accounting, Organizations and Society*, 24, 583–595.
- Gupta, A. K. (1987). SBU strategies, corporate-SBU relations, and SBU effectiveness in strategy implementation. *Academy of Management Journal*, 30, 477–500.
- Gupta, A. K. (1988). Contingency perspectives on strategic leadership: Current knowledge and future research directions. In: D. C. Hambrick (Ed.), *The executive effect: concepts and methods for studying top managers* (pp. 141–178). Greenwich, CT: JAI Press.
- Hannan, M. T., & Freeman, J. (1989). *Organizational ecology*. Cambridge, MA: Harvard University Press.
- Hemmer, T. (1996). On the design and choice of “modern” management accounting measures. *Journal of Management Accounting Research*, 8, 87–116.
- Henri, J.-F. (2006). Organizational culture and performance measurement systems. *Accounting, Organizations and Society*, 31(1), 77–103.
- Henri, J.-F., & Journeault, M. (2008). *Revisiting the link between management control systems and strategy in contingency-based research*. Working Paper. École de Comptabilité, Université, Laval, Quebec.
- Holmstrom, B. (1979). Moral hazard and observability. *Bell Journal of Economics*, 10(1), 74–91.
- Ittner, C. D., & Larcker, D. F. (1995). Total quality management and the choice of information and reward systems. *Journal of Accounting Research*, 33, 1–34.
- Ittner, C. D., & Larcker, D. F. (1997). Quality strategy, strategic control systems, and organizational performance. *Accounting, Organizations and Society*, 22, 293–314.
- Ittner, C. D., & Larcker, D. F. (1998). Innovations in performance measurement: Trends and research implications. *Journal of Management Accounting Research*, 10, 205–238.
- Ittner, C. D., & Larcker, D. F. (2001). Assessing empirical research in managerial accounting: A value-based management perspective. *Journal of Accounting and Economics*, 32, 349–410.
- Ittner, C. D., & Larcker, D. F. (2003). Coming up short on non-financial performance measurement. *Harvard Business Review*, 81(10), 88–95.
- Kaplan, R., & Norton, D. (2004). *Strategy maps: Converting intangible assets into tangible outcomes*. Boston: Harvard Business School Press.
- Kaplan, R. S. (1990). *Measures for manufacturing excellence*. Boston: Harvard Business School Press.
- Kaplan, R. S., & Norton, D. P. (1996). *The balanced scorecard*. Boston: Harvard Business School Press.
- Khandwalla, P. (1977). *The design of organizations*. New York: Harcourt Brace Jovanovich.
- Langfield-Smith, K. (1997). Management control systems and strategy: A critical review. *Accounting, Organizations and Society*, 22, 207–232.
- Lawrence, P. R., & Lorsch, J. W. (1967). *Organization and environment-managing differentiation and integration*. Boston: Graduate School of Business Administration, Harvard University.

- Lorange, P., & Murphy, D. (1984). Considerations in implementing strategic control. *Journal of Business Strategy*, 4(4), 27–35.
- Luft, J., & Shields, M. D. (2007). Mapping management accounting: Graphics and guidelines for theory-consistent empirical research. In: C. S. Chapman, A. G. Hopwood & M. D. Shields (Eds), *Handbook of management accounting research*. Oxford: Elsevier.
- Marginson, D. E. (2002). Management control systems and their effects on strategy formation at middle management level: Evidence from a U.K. organization. *Strategic Management Journal*, 23, 1019–1031.
- Merchant, K. A. (1981). The design of the corporate budgeting system: influences on managerial behavior and performance. *The Accounting Review*, 56, 813–829.
- Merchant, K. A. (1982). The control function of management. *Sloan Management Review*, 23(4), 43–55.
- Merchant, K. A. (1984). Influences on departmental budgeting: An empirical examination of a contingency model. *Accounting, Organizations and Society*, 9, 291–307.
- Merchant, K. A. (1985). Organizational controls and discretionary program decision making: A field study. *Accounting, Organizations and Society*, 10, 67–85.
- Meyer, J. W. (1994). Social environments and organizational accounting. In: W. R. Scott & J. W. Meyer (Eds), *Institutional environments and organizations: Structural complexity and individualism*. Thousand Oaks, CA: Sage Publications.
- Miles, R. E., & Snow, C. C. (1978). *Organizational strategy, structure and process*. Stanford, CA: Stanford Business Classics.
- Milgrom, P., & Roberts, J. (1992). *Economics, organization and management*. Englewood Cliffs, NJ: Prentice Hall.
- Miller, D., & Friesen, P. H. (1982). Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal*, 3, 1–25.
- Nanni, A. J., Dixon, J. R., & Vollmann, T. E. (1992). Integrated performance measurement: Management accounting to support the new manufacturing realities. *Journal of Management Accounting Research*, 4, 1–9.
- Otley, D. T. (1980). The contingency theory of management accounting: Achievement and prognosis. *Accounting, Organizations and Society*, 5, 413–428.
- Porter, M. E. (1980). *Competitive strategy*. New York: Free Press.
- Said, A. A., Elnaby, H. R. H., & Wier, B. (2003). An empirical investigation of the performance consequences of nonfinancial measures. *Journal of Management Accounting Research*, 15, 193–223.
- Sandino, T. (2007). Introducing the first M.C.S evidence from the retail sector. *Accounting Review*, 82, 265–295.
- Singh, J. V., Tucker, D. J., & House, R. J. (1986). Organizational legitimacy and liability of newness. *Administrative Science Quarterly*, 31, 171–193.
- Schoonoven, C. B. (1981). Problems with contingency theory: Testing assumptions hidden within the language of contingency theory. *Administrative Science Quarterly*, 26(3), 349–377.
- Shipping Magazine*. (January 2007). International monthly review ed. Dimopoulou-Makri, London.
- Simons, R. (1987). Accounting control systems and business strategy: An empirical analysis. *Accounting, Organizations and Society*, 12, 357–374.
- Simons, R. (1994). How new top managers use control systems as levers of strategic renewal. *Strategic Management Journal*, 15, 169–189.

- Southwood, K. E. (1978). Substantive theory and statistical interaction: Five models. *American Journal of Sociology*, 83(5), 1154–1203.
- Van der Stede, W. (2000). The relationship between two consequences of budgetary controls: Budgetary slack creation and managerial short-term orientation. *Accounting, Organizations and Society*, 25, 609–622.
- Widener, S. K. (2006). Associations between strategic resource importance and performance measure use: The impact on firm performance. *Management Accounting Research*, 17, 433–457.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180.

## **APPENDIX. ABBREVIATED RESEARCH QUESTIONS**

### *Informational Purposes of MCS*

Please indicate how has the main focus and use of control systems developed inside your company (1 = to a small extent, 5 = to a great extent)

1. To achieve tight control and monitoring over procedures, rules, and/or standards
2. To achieve learning and flexibility to act upon information (e.g., gather information for decision making)
3. To minimize risks
4. To increase revenue
5. To minimize costs and achieve operation efficiencies
6. Internally oriented information (e.g., financial results, employee development, standards and rules, input–output measures)
7. Externally oriented information (e.g., customer satisfaction, competition, economic events, etc.)
8. Financial performance measures (e.g., cash controls, financial ratios, etc.)
9. Non-financial performance measures (e.g., customer satisfaction, employee turnover, market share, etc.)

### *Low-Cost Strategy*

Please indicate the extent to which has your company pursued the following strategies to achieve growth (1 = to a small extent, 5 = to a great extent)

1. Criteria for spare parts acquisition: lowest possible price
2. Criteria for spare parts acquisition: lowest transportation cost

3. Flag of convenience
4. Emphasis on charterers' price sensitivity
5. Lower prices to attract and retain charterers

### *Differentiation Strategy*

Please indicate the extent to which has your company pursued the following strategies to achieve growth (1 = to a small extent, 5 = to a great extent)

1. Compliance with the latest international shipping rules and regulations
2. Implementation of innovative technology on vessels
3. Consideration of charterers' satisfaction
4. Record of charterers' satisfaction
5. Criteria for spare parts acquisition: originality
6. Criteria for spare parts acquisition: prompt delivery
7. The officers' training
8. The ratings' well trained
9. Quality of services
10. Tailor-made services

### *Usefulness of MCS*

To what extent do you agree with the following statements? (RC = reverse coded) (1 = to a small extent, 5 = to a great extent)

1. Control systems facilitated my company's growth.
2. Control reports have provided timely information for managers to respond to new threats and opportunities.
3. Control systems have protected my company from loss or excessive risk.
4. Control systems have reduced flexibility. (RC)
5. Control systems provide information that is NOT useful to management. (RC)
6. Control systems monitor virtually all tasks in the organization.
7. There is frequent reporting control information to senior managers.

For questions that are Reverse Coded (RC) in order to flip the scale, we calculated them as 6 minus the rating given in answering the question.

*Perceived Performance*

How would you categorize your firm's performance since founding (revenue growth & profitability) with respect to the shipping industry?

1. In the lower 10%
2. In the lower 25%
3. Average
4. Top 25%
5. Top 10%





**PART V**  
**PROVIDING INFORMATION FOR**  
**DECISION MAKING**



# MANAGEMENT ACCOUNTING AND INFORMATION TECHNOLOGY – SOME EMPIRICAL EVIDENCE

Maria do Céu F. Gaspar Alves

## ABSTRACT

*The role of information technology (IT) in the business arena has continuously shifted over the last decades, and it has become an important part of how companies manage and control their resources. User satisfaction in IT usage is critical because this construct is often viewed as a surrogate for IT success. Decisions regarding the building of the technical IT architecture should be closely linked to the organizational design of the company itself. So, IT plays a crucial role in organization, especially regarding the accounting function.*

*The purpose of this paper is to contribute to the body of knowledge in the extent to which IT affects the ability to solve accounting tasks. We will measure the impact of IT on user satisfaction, on accounting information use and, finally, on accountants' tasks.*

*The relationship between IT and management accounting practices was investigated. On one hand, data from Portuguese manufacturing firms were collected using a survey and analyzed using statistical software.*

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*On the other hand, based on findings from 17 in-depth interviews, 6 case studies were built and analyzed.*

*The findings suggest that user satisfaction in IT usage and the use of accounting techniques and accounting information increases with new IT investments. We also find a tendency for change in the decentralization of management accounting tasks.*

*These study findings have significant implication for practice and research. Today accounting and IT are inseparable and accountant's uses of sophisticated management accounting techniques are clearly dependent of IT existence.*

## INTRODUCTION

The role of information technology (IT) in the business arena has continuously shifted over the last decades (Teng & Calhoun, 1996; Granlund & Mouritsen, 2003) to become an important part of how companies manage and control their resources. During the last years business computing has changed from these basic local data administrative systems into international computer networks, and as the sophistication of the computer systems increased, so did the investment cost. So, traditionally, companies tend to perceive their IT systems as costs, often due to IT being looked at as a support function.

The IT architecture defines the technical computing, information management, and communication platform of the company. User satisfaction in IT usage is critical because this construct is often viewed as a surrogate for IT success. Decisions regarding the building of technical IT architecture should be closely linked to decisions made in designing the IT organization that should be connected to the organizational design of the company itself. As a result, "Information technology plays a critical role in modern business, especially regarding the accounting function" (Efendi, Mulig, & Smith, 2006, p. 117). "The initial interest in the relationships between accounting and information technology was gradually taken for granted; accounting was simply not possible without information technology, and the assumption appears to be that information technology is the platform for accounting data and it allows certain sophisticated queries to be performed" (Granlund & Mouritsen, 2003, p. 78). Thus, IT and accounting systems would be a major component of accounting research. "While it is widely acknowledged that IT plays an important role (and

increasingly so) in the field of accounting the relationship between IT and accounting has been studied relatively little” (Granlund, 2007, p. 3).

Based on a literature review of earlier research and empirical studies we can rapidly conclude that there is very limited knowledge about the impact of the most recent IT<sup>1</sup> developments in the accounting field (Granlund, 2007). Although IT clearly plays an important role in accounting (Efendi et al., 2006) and management control (Dechow, Granlund, & Mouritsen, 2007; Berry, Coad, Harris, Otley, & Stringer, 2009), this relationship has not been studied enough. Existing research has focused mostly on the relation between IT investment (ITI) and company performance (Melville, Kraemer, & Gurbaxani, 2004; Kobelsky, Richardson, Smith, & Zmud, 2008), notably in studies that attempt to measure the level of ITI and company productivity (Chan, 2000; Dedrick, Gurbaxani, & Kraemer, 2003) or even the financial return on ITIs (Dehning & Richardson, 2002).

The impact of IT on accounting represents a highly fertile research area and the scarcity of studies in this area enhances the importance of the few existing studies.

The purpose of this paper is to contribute to the body of knowledge about to which extent IT affects the ability to solve different management accounting tasks. Hence, we will try to measure the impact of IT on user satisfaction, the impact of IT on accounting information use and, finally, the impact of IT usage on accountant tasks.

The chapter is organized as follows. First we briefly review the literature exploring concepts from management accounting and information theory, namely those related with the relationship between accounting and IT. Next, we describe the empirical study developed to answer the research questions. The main purpose of our approach is to understand the connections between our theoretical hypothesis and the perceptions of the managers taking part in our study. In the next section we discuss the results findings. Finally, conclusions are drawn in the last section and future opportunities for research are suggested.

## **LITERATURE REVIEW**

“The application of information technologies (IT) in organizations has evolved over just a few decades through a number of eras, from Electronic Data Processing (EDP) and MIS (Management Information Systems) in the 60s and 70s to Decision Support Systems (DSS) and End-User Computing (EUC) in the 80s” (Teng & Calhoun, 1996, p. 674).

Nowadays, the impact of modern IT in companies is broad and it manifests itself in the most varied ways. Integrated systems, such as ERP systems, Internet, Intranet, and so on, walk hand in hand with the most recent developments in company know-how. They affect and are affected by the most recent production technologies (MRP; JIT) and sales techniques (e-commerce). Some of these technologies, with their widespread use, especially the Internet, have altered the way companies work and their accounting organization (Granlund, 2007).

“Prior to the emergence of this environment, the presence of IT in the organization has typically taken the form of specific computer application systems, such as accounts payable and financial reporting systems, which either automate specific operational procedures or support certain managerial processes” (Teng & Calhoun, 1996, p. 674). It is usually argued that the first use of an information system was related to accounting (Rom & Rohde, 2007), because often IT was about the firm’s financial ledgers and reporting systems (Granlund & Mouritsen, 2003). Nowadays research within management accounting and information systems is coming alive with the advent of integrated information systems such as enterprise resource planning (ERP) systems (Rom & Rohde, 2007; Chien & Tsaur, 2007).

The information revolution multiplied the quantity of information that is gathered but it did not increase the number of hours available for assimilating that information (Simon, 1945). As a result, the time available for analyzing the information became a scarce resource (Bright, 1996; Mitchell & Volking, 1993). Some studies have shown that companies have a tendency to systematically gather more information than they use (Fahy & Murphy, 1996). Similarly, recent technological developments have allowed for a substantial increase in information access. The subsequent problem has been an information overload (Butcher, 1998), although studies such as that by March and Simon (1958) have already demonstrated the limitations of processing capacity for information on individuals. In this situation, it is very difficult to form an opinion based on a clear and synthetic vision of the main problems. Frequently, the managers, “drowning” in information, are unable to extract what they need to take the best decisions (Brandon & Drtina, 1997). In this panorama, IT can represent precious assistance in gathering, selecting, manipulating, and disseminating the data and information (Connor & Martinsons, 2006), especially for the accounting professional (Sutton, 2000; IFAC, 2006).

Far from passively giving in to the phenomena of information overload, many managers tend to develop real information management strategies. To do so, they build the information that they deem necessary and try to use

the information they receive in the most efficient way (Mendoza & Bescos, 1998). Generally, these situations lead to the existence of a true personal information system (Simon, Guetzkow, Kozmetsky, & Tyndall, 1954; Mckinnon & Bruns 1992, 1993). It seems that, while trying to become informed as quickly as possible, managers develop personal information sources,<sup>2</sup> generally through informal contacts<sup>3</sup> and verbal communication (Butcher, 1998). In addition, the fact that they have to deal with uncertainty and ambiguity (Choo, 1998) leads managers to look for richer channels of communication such as face-to-face contacts (Daft & Lengel, 1984). Despite the fact that managers prefer informal contacts, such as oral or face-to-face communication (Keegan, 1974; Anderson, 1983; Bruns & McKinnon, 1993), this type of channel is not always possible, especially with geographical distance. In these situations, e-mail and discussion groups could be a solution. Based on the Daft and Lengel (1984) “information richness continuum,” Butcher (1998) proposes a new model with some new information channels (Fig. 1).

The new information and communication technologies represent a vector of development (Kirwan, 1986), and an important component of the formal information system is represented by computerized information. The possibilities for sharing and exchanging information among those involved may lead to informal cognitive networks, like electronic discussion boards, and can reinforce relationships with economic partners. However, electronic information seems to continue to suffer from its abstract and artificial character and from the greater trust often attributed to less impersonal communications (McLeod, Jones, & Poitevent, 1984).

It is unrealistic to think that an information system, whatever it may be, can always supply the decision maker with relevant and timely information (Le Moigne, 1974). The decision maker would have to know in advance which information would be needed, when this type of prediction is, by definition, impossible within complex problem solving (Simon, 1945; March & Simon,

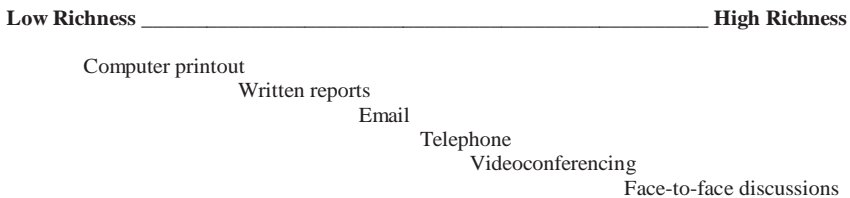


Fig. 1. Information Richness Continuum (Reprinted from Meeting Managers’ Information Needs. A Managing Information Report by H. Butcher (1998, p. 86) with permission of Aslib, The Association for Information Management).



1958). Nevertheless, IT represents a precious assistance in the search for and treatment of information needed in the decision-making process (Connor & Martinsons, 2006).

Traditionally, research in Information Systems has been focused on the study of information processing, on computer systems security, and on the development of new systems, leaving for further study the relationship between IT and accounting. Even those studies that have, in some way, covered this relationship fall short due to their focus on outdated tools. Also research on management accounting and integrated information systems has evolved across a number of different paths of research. Some place heavier emphasis on the management accounting side, while others emphasize the information systems side (Rom & Rohde, 2007). Nonetheless, to be able to understand emerging technologies and anticipate their effects on accounting, we must begin to understand the effects of the most up-to-date technologies (Hopwood, 1987; Granlund, 2007).

## METHODOLOGY AND HYPOTHESES FORMULATION

We have defined research methodology as the methodology adopted by a researcher that is the dominant influence on the research process and findings, rather than the methods employed. By discussing methodology, we reveal our choices of method and define the way these choices fit the research problem. “Research methodologies are the products of the social context in which they are invoked” (Doolin, 1998, p. 301). In our study the focus was on empirical research, defined as “research that uses qualitative or quantitative data as a basis for the investigation of research questions” (Benbasat & Nault, 1990, p. 211).

When deciding on which method to adopt for a study, there are a number of factors that should be considered. First, all methods have their strengths and weaknesses, so it is important to evaluate each method’s appropriateness regarding the research project at hand. Second, because a research project is usually made up of different types of data, namely primary and secondary data, a number of methods might be used in order to be able to address the research problem. As a consequence of the difference between these types of data, different collection methods have to be adopted when collecting it.

For the collection of data, a number of methods were evaluated, for example, experiments, surveys, and case studies (Ryan, Scapens, & Theobald, 2002).

Based on the purpose of our study we decided to start with a survey. Surveys are commonly used for research that are based on a descriptive and an exploratory research approach and would, hence, fit our purpose very well.

Collecting and processing information can be done in different ways, either by adopting a qualitative, quantitative, or triangulation (a combination of the two) method. “Multiple data sources or research methods (e.g., data analysis, interviews, and experiments), can be used to provide a consistent body of evidence that increase the reader’s confidence in the results” (Ittner & Larcker, 2001, p. 396). To successfully deal with the challenges identified in the literature review this study will require the researcher to invest in and conduct more integrative research (Shields, 1997). Quantitative data are primarily used when the aim of the research project is to answer questions like: Who, what, where, how often, how much, and how many (Yin, 2003). This sort of data are often used when analyzing data from a large population. On the other hand, qualitative data are better suited for research projects that use data that cannot easily be quantified, and qualitative data are often suited for research projects that aim to understand or find a specific pattern within the investigated area (Ohlsson & Ollfors, 2000). This study will use a combination of qualitative and quantitative data to address the research questions.

“The initial stage in the overall process is the identification of what might be termed the research question. Once identified, the next stage is usually the formulation of the research question as a single scientific hypothesis or set of hypotheses” (Ryan et al., 2002, p. 117). In this context, two research questions (RQs) are posed, for which three hypotheses have been formulated.

**RQ1.** Did IT developments improve the use of accounting information and the user satisfaction?

**H1.** The greater the degree of IT implementation and the frequency of computer use, the greater the use of accounting information is.

**H1.2.** The greater the frequency of computer use, the greater the use of accounting information is.

**H1.3.** The greater the degree of IT implementation and the frequency of computer use, the greater the use of accounting information is.

**H2.** The greater the degree of IT implementation and the frequency of computer use, the greater the level of satisfaction with accounting information is.

**H2.1.** The greater the degree of IT implementation, the greater the level of satisfaction with accounting information is.

**H2.2.** The greater the frequency of computer use, the greater the level of satisfaction with accounting information is.

**H2.3.** The greater the degree of IT implementation and the frequency of computer use, the greater the level of satisfaction with accounting information is.

**RQ2.** How have IT developments changed the accounting tasks?

**H3.** With the development of IT most accounting documents that support decision making began to be prepared locally.

## MEASUREMENT OF VARIABLES

“Empirical research is generally concerned with establishing the relationship between variables” (Ryan et al., 2002, p. 118). Because each hypothesis may be regarded as a statement of the empirical relationship between a set of variables (Ryan et al., 2002), we need now to define our variables. In social sciences most hypotheses are probabilistic in nature, which means that the hypothesized association between the independent variable and the dependent variable is expected to be true in general (Jaspers, 2007).

To test the hypotheses H1 and H2, some variables associated with organization theory and studies on information uses and information needs were defined, through which the following points would be studied:

- The influence of ITI and the frequency of computer use (FCU) on the use of accounting information items (UAII) on decision making;
- The influence of ITI and the FCU on the use of management accounting techniques (UMAT);
- The influence of ITI and the FCU on the level of satisfaction with accounting information (LSAI).

“The variables considered in empirical work may be dichotomized as dependent or independent variables. The independent variable in an experiment

is the variable that is manipulated by the researcher; it is the effect of this variable that is being studied by the experimenter. The dependent variable measures the response to the manipulation of the independent variable” (Ryan et al., 2002, p. 118). The variables can be classified regarding their roles or functions in a particular study. Usually, the assumptions of an investigation determine the role of the variables. In this study two independent variables were defined, ITI and FCU (see Fig. 2). ITI is measured by the degree of implementation of each of the items/technologies (see Table 3); FCU is measured directly from the frequency indicated by the respondents on the questionnaire (see Table 4).

“The internal validity of a specific study refers to the credibility of the causal relationships between independent and dependent variables inferred from data” (Modell, 2005, p. 236). Information system success is one of the most widely used dependent variables in information systems research. The usage dimensions usually found in information systems studies are “use” and “user satisfaction” (Chien & Tsaour, 2007). In this study, the dependent variables are “Accounting Information Use” and “Level of Satisfaction with Accounting Information.”

A framework (Fig. 2) was created to answer the first research question: Did IT developments improve the use of accounting information and the user satisfaction?

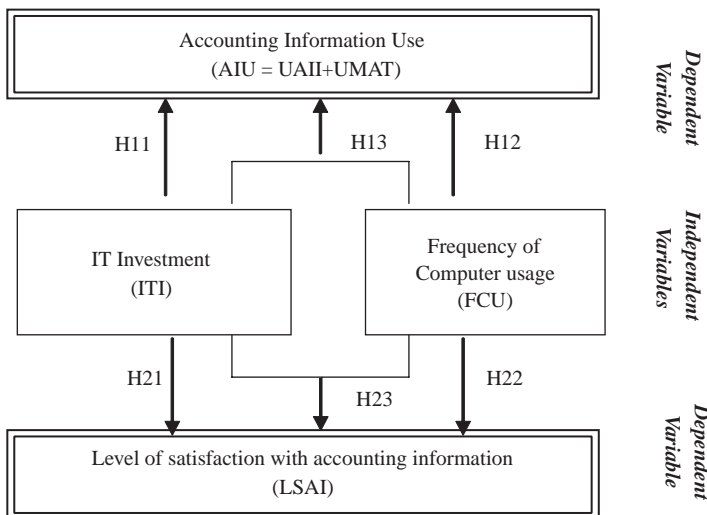


Fig. 2. Structure of the Hypothesized Relationship H1 and H2.

The impact of ITIs on productivity remains a topic of intense interest among managers and researchers. While organizations continue to invest in IT, studies report contradictory findings on the effect of these expenditures on organizational productivity (Grover, Teng, Segars, & Fiedler, 1998). Usually, these studies measure the IT variable in terms of dollar investment in technology. However, for the independent variables used in this study what really matters is the extent to which IT is effectively utilized by the organization. Therefore, for the independent variables we gauge actual IT utilization by assessing the extent of its diffusion and use in the organization. And, rather than considering one generic IT, we refine it into specific technologies (see Table 3). The intensity measure used falls in the category of measure known as “extent of system use,” which has been successfully used in past studies (Srinivasan, 1985) in predicting system success (DeLone & McLean, 1992).

“A wide variety of dependent variables in IS studies has been used by researchers over the decades” (Teng & Calhoun, 1996, p. 678). In a comprehensive analysis, Delone and McLean (1992) identified different types of dependent variables. Among them, we found use and user satisfaction. Variables such as user satisfaction are more suitable for examining effects of specific systems (Teng & Calhoun, 1996). User satisfaction or user information satisfaction is probably the most widely used single measure of information system success (Delone & McLean, 1992) and the system quality (Guimaraes, Staples, & Mckeen, 2007). “Additionally, the amount of use can affect the degree of user satisfaction – positively or negatively – as well as the reverse being true” (Delone & McLean, 1992, p. 83).

As in other studies (Thompson, Higgins, & Howell, 1991; Teng & Calhoun, 1996) the quantity dimension of computing intensity can be measured by frequency of use. For each of the items (see Table 4) the respondent indicates how frequently they use the computer. A five-point frequency-of-use scale was used.

## SURVEY

Nowadays, surveys grew to be popular tools because of the evolution of methods to collect systematic data cheaply and quickly (Groves et al., 2004). However, survey is, also, the most heavily criticized research method

employed by management accounting researchers with the central concern being the reliability of the obtained data (Stede, Young, & Chen, 2007).

The key issue with the survey method centers more on how it is deployed, rather than with the method itself (Stede et al., 2007). The design of our study was heavily influenced by the need to collect structured data in the same form from both users and preparers of accounting information. A further major consideration was the desire to collect data from managers concerning their perceptions of what happens in the management accounting area.

Thus, the first phase of the empirical study was carried out by means of a postal survey. A closed questionnaire<sup>4</sup> was sent to the senior managers of three working areas (finance/accounting; production; sales/marketing) of a group of large companies in the manufacturing industry. Each company received three questionnaires, and a total of 1,095 (365 × 3) questionnaires were sent. The point was to analyze the perspectives of the producer of information and that of its user, to avoid the limitations and deviations brought on by an analysis from just one point of view (Clarke, 1997; Pierce & O'Dea, 1998). The interest in measuring subjective states also had the effect of focusing attention on question wording and data collection methods (Groves et al., 2004). Data collected from surveys suffer from well-known problems. But, researchers can employ several techniques to curtail these problems, as for example, developing the "right" questions and their wording for a given purpose (Stede et al., 2007). To improve response rate, a promise of feedback about the study was included in the questionnaire.

Once drawn up, the questionnaire should be tested on a sample population (Javeau, 1988; Ghiglione & Matalon, 1992). Along this line, the questionnaire was tested on a group of academics and business people to perfect its content and vocabulary. None of the respondents considered the questionnaire difficult to complete. In these circumstances, and after correcting the initial questionnaire, the mailing began. Two weeks later, a follow-up was done to improve response rate. We achieved a 15% response rate, on average (19%, finance/accounting; 13%, production; 12%, sales/marketing).

Prevalent in the development of this instrument was the concern that the questionnaire could lead the respondents to provide responses that would be considered mainly correct. That is why neither the questionnaire nor the cover letter revealed more information than what was considered essential for its completion. The data obtained from the questionnaires were analyzed through a descriptive statistics application, named Statistics Packages for Social Sciences (SPSS).

## CASE STUDIES

Fundamental philosophical assumptions about the nature of reality, knowledge, and human behavior underlie any research and influence the researcher's notion of acceptable research methods (Chua, 1986; Hopper & Powell, 1985). "In recent years, management accounting research conducted within the positivist and functionalist paradigms has shown increasing recognition of the need to complement established quantitative methods with a greater or lesser element of qualitative, case study-based research" (Modell, 2005, p. 232). Calls for such a complementary approach, relying on method triangulation, combining elements of qualitative case studies and quantitative survey methods, have been made (Shields, 1997; Ittner & Larcker, 2001). "Theory triangulation implies that hypotheses or researchers interpretations are informed by more than one theoretical perspective" (Modell, 2005, p. 233). In this study, we used a mixed approach, which is generally advised in this research area (Sutton, 2000). The use of triangulation for addressing different validity issues should be assessed in relation to the types of research questions posed (Modell, 2005, p. 233).

Case research has been advocated as a valid research strategy in management information systems (Benbasat, Goldstein, & Mead, 1987) but less in the accounting field (Dul & Hak, 2008). However, case study research in managerial accounting is more popular than in other accounting area (Cooper & Morgan, 2008). In an editorial to *Accounting, Management and Information Technologies*, Boland and O'Leary (1991) emphasized the fruitfulness of studying IT in the field. Such studies enable an examination of the interrelationship of IT and management accounting practices (Doolin, 1996). While case study methods have typically been confined to a relatively limited role as vehicles for theory (or hypothesis) development, recent advances within this research tradition recognize their usefulness for broader purposes (Keating, 1995; Atkinson & Shaffir, 1998; Modell, 2005).

Usually, "the decision to use a case study approach is a strategic decision that relates to the scale and scope of an investigation ..." (Denscombe, 2003, p. 32). Hypothesis H3 obliges to a comparative analysis between pre- and post-"new technologies" to describe the manager's attitude toward their availability. In this sense, a qualitative research methodology was used to test H3 through case studies, given their application in situations in which the intervention should be described in a real context (Yin, 2003; Cooper & Morgan, 2008). "This close involvement with the organization means that interviews and direct observations of activities tend to be the primary means of data collection in case research" (Doolin, 1996, p. 23). To achieve our

purpose during the interviews we tried to collect the main accounting documents used in decision making. Due to “documents can be treated as a source of data in their own right” (Denscombe, 2003, p. 212), we used them to triangulate documents content with interviews.

“Case research designs can be categorised as case studies, multiple case designs and case surveys. Single case studies allow in-depth analysis of one setting concerning a large number of aspects, allowing a broad and detailed analysis of organisational dynamics, and the production of the rich descriptions favoured by interpretive researchers. A multiple case design usually sacrifices detail and richness of description for the opportunity to make comparisons across several settings. Multiple case designs are necessary for generating general theory under the replication logic of positivist case research (Eisenhardt, 1989; Yin, 2003). Case surveys are capable of generating information from a large number of settings, but are usually restricted to a small number of narrowly defined and often quantitatively expressed variables” (Doolin, 1996, p. 25).

Following a multiple case design, the next phase of our study consisted of face-to-face interviews in six manufacturing firms, composed by six companies, which had responded to both of the questionnaires. These companies were selected to provide a diverse range in terms of industry sector and geographical location, and another criterion was that in each company both the management accountant and the senior manager had indicated a willingness to participate. Semi-structured questionnaires were used as a basis for face-to-face interviews. The questions were deliberately open-ended so that points of particular interest or concern could be explored as appropriate in each case. In each firm, at least one manager and one management accountant were interviewed.

We did not attempt to make a random sample from the population of manufacturing managers. The leading principle in selecting the interviewees was rather that they showed interest in the study. Seven of the interviewees currently represent the accounting/finance function, seven are from the production department, and three are from the sales/marketing sector. As in other studies in the accounting field (Granlund & Lukka, 1998), the semi-structured questionnaire used during the interviews was a loose basis for the discussions. Interviews took more than 2 h each, on average. “They were tape-recorded and the tapes were later transcribed into literary form in order to facilitate the analysis of the data” (Granlund & Lukka, 1998, p. 119). We made brief notes during and after each interview, the primary aim of which was to record information that had not been possible to capture on tape (e.g., give-away facial expressions and off-the-record comments).



**Table 1.** Number of Interviews Conducted.

Case Study	Functional Area			Number of Interviews
	Finance/accounting	Sales/marketing	Production	
1	Dr. Pedro Ramos Sr. Sebastião Valezim	Eng. João Silva	Eng. António Abrantes Eng. Paulo Alves	5
2	Dr. Diogo Castelo	–	Eng. Júlio Costa	2
3	Dr. César Vicente	Dra. Clara Santos	Eng. Carlos Pinheiro	3
4	Dr. Miguel Resende	Eng. Manuel Janela	Eng. Marcelo Gonçalves	3
5	Dr. Júlio Chaves	–	Eng. Sérgio Runa	2
6	Dr. Nuno Jorge	–	Eng. Ricardo Soares	2
Total	7	3	7	17

Table 1 shows the number of interviews conducted during the case studies. The interviews questions were generally the same for all interviews, with certain emphases added for different user groups.

The first case study was done in a less-structured form and with more interviews (five) than the others. With this procedure, we attempted to obtain additional information to confirm the relevance and opportunity of the research subject.

In preparing for case studies, the very words of the interviewees are used to ground the positions taken. In methodological terms, we considered six to be a sufficient number of case studies to test the questions to be analyzed (Luoma, 1967; Yin, 2003).

In terms of reliability of the results, the organization of information in the form of case studies allows the veracity of the responses to be tested and a dynamic and encompassing analysis to be made of the use of accounting information in decision making. Case studies offer the researcher the possibility of understanding management accounting, in terms of reports, registers, techniques, and procedures, which make up the formal accounting system, as well as the way that these instruments are used by managers in their daily work. Nevertheless, the study of accounting information use in decision making requires that we consider a wide number of non-accounting aspects, which make it difficult to understand the function of accounting information in this process (Bromwich, 1986). That is why we had to distinguish the formal accounting system from the way it is put into practice, recognizing that the case studies that cover only the formal accounting system run the risk of not capturing the way accounting is really used in the day-to-day routine of a manager (Scapens, 1988).

A content analysis of the various interviews was carried out for analysis and comparison since, in economics, analysis of decision making and of the circulation of information within a company lies within the domains of content analysis intervention (Ghiglione & Matalon, 1992). However, a simple juxtaposition of individual interview analyses is not enough; synthesis is required to reach a single voice. This is carried out after having synthesized the main research questions and concerns of each case study in a vertical analysis, by performing a comparative analysis of all the case studies to point out the differences and similarities found in a horizontal analysis.

In this stage of the research, some of the hypotheses<sup>5</sup> were tested in the six case studies to strengthen or confirm some of the data gathered in the questionnaires. Thus, the information gathered in interview was used through an inductive approach<sup>6</sup> to test hypothesis H3.

## ANALYSIS AND DISCUSSION OF RESULTS

### *Accounting Information Utilization*

Hypothesis H1 was formulated to analyze the relation between ITI, computer use, and accounting information utilization (AIU). To test this hypothesis, the Pearson correlation coefficient was calculated (Table 2). With the AIU in mind, the correlation coefficients were calculated for each of its components.

A positive and significant correlation was found between the ITI and the use of accounting information and among the UMAT, ITI, and the FCU. Consequently, the hypothesis is partially confirmed given that the AIU

**Table 2.** IT and Accounting Information Utilization (AIU).

Variables		AIU	UAII	UMAT
ITI	Pearson correlation	0.210*	0.10	0.341**
	Significant (two-tailed)	0.01	0.23	0.00
	<i>N</i>	13	13	13
FCU	Pearson correlation	0.022	0.041	0.304**
	Significant (two-tailed)	0.79	0.63	0.00
	<i>N</i>	13	13	13

\*Correlation is significant at the 0.05 level (two-tailed).

\*\*Correlation is significant at the 0.01 level (two-tailed).

increases significantly with the increase in the degree of implementation of IT and that the UMAT increases significantly with the increase in the degree of implementation of IT and with the increase in computer use.

In a bit more detail, 82% of “contemporary” techniques and 42% of “traditional” techniques were positively and statistically significantly correlated with ITI. In addition, 55% of “contemporary” techniques and 33% of “traditional” techniques are positively and statistically significantly correlated with FCU. Therefore, there is a greater correlation of “contemporary” techniques with IT, which is understandable given the fact that “contemporary” techniques have arisen, recently, in the context of major strides of computer developments that have facilitated their implementation.

### *Satisfaction with Accounting Information*

To test hypothesis H2, we had to relate ITI to the FCU and with the LSAI. In this process, the first step was to determine ITI.

In the questionnaire, to determine ITI, the managers were asked about the degree of implementation of a set of information technologies using a progressive five-point frequency of implementation scale (see Table 3). On average, the set of IT analyzed is operational, at least in “some parts of the company,” the least implemented technologies are “message machines” and the most frequent are “central units” (Table 3). We also found that, in sales, significantly more laptops are used than in the other areas.

As for the FCU, the managers were asked about the intensity of use in four specific situations: to receive information from other sections, to send information to other sections, to respond to requests from other sections, and to carry out their own work (Table 4). A five-point frequency-of-use scale was used. The scale employed varies from “rarely or never” (1) to “always” (5), with the intermediate values representing “few times” (2), “sometimes” (3), and “frequently” (4).

As no sound basis for weighting is suggested in the research literature, a simple average of the five frequency scores was used as the measure for the intensity of computing usage (Teng & Calhoun, 1996).

We found that the computer is used “frequently” in each of the situations analyzed. In terms of differences between groups of decision makers, statistically significant differences were identified only in the first situation since, in production, the computer is used more to receive information. In general, the decision makers in the non-financial area (sales/marketing

**Table 3.** Information Technology Investment.

Technologies Implementation (a)	Functional Area							
	Accounting/ finance (n = 65)		Sales/ marketing (n = 36)		Production (n = 39)		Total (n = 140)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Central processing unit	4.89	0.31	4.61	1.05	4.56	0.97	4.73	0.78
Personal computer	4.82	0.39	4.64	0.76	4.74	0.44	4.75	0.52
Electronic mail	4.38	0.7	4.56	0.56	4.41	0.59	4.44	0.64
Local area network	4.49	1.12	4.64	1.05	4.44	0.85	4.51	1.03
Network computer	3.05	1.91	3.89	1.65	3.34	1.66	3.35	1.8
Laser printer	4.15	0.97	4.28	1	4.23	0.78	4.21	0.93
Ink-jet printer	4.43	0.68	4.36	0.96	4.36	0.96	4.39	0.84
Laptop*	3.54	1.02	4	0.72	3.62	1.09	3.68	0.98
Plotter	3.05	1.47	3.44	1.56	3.64	1.18	3.31	1.43
Fax	4.34	0.8	4.33	0.48	4.46	0.68	4.37	0.69
Message recorder	2.71	1.54	2.86	1.55	3.23	1.39	2.89	1.51
Modem	4.12	0.72	4	0.68	4.1	3.31	1.34	0.7
Computer aided design	3.09	1.44	3.36	1.25	3.64	1.2	3.31	1.34
Human resources software	4.49	0.62	4.44	0.81	4.51	0.56	4.49	0.65
Inventory management software	4.49	0.62	4.19	0.95	4.36	0.74	4.38	0.75
Spread sheet software	4.63	0.8	4.39	0.99	4.36	0.99	4.49	0.91
Other (project) management software	3.09	1.43	3.39	1.32	3.44	1.27	3.26	1.36
Text software	4.78	0.45	4.5	0.77	4.74	0.44	4.7	0.56
Data warehouse	4.31	0.86	4.33	0.83	4.31	0.8	4.31	0.83
Accounting software	4.45	0.59	4.39	0.8	4.21	0.77	4.36	0.7
ITI	4.07	0.43	4.13	0.4	4.14	0.46	4.1	0.43

(a) Scale: 1 = “does not exist in the company”; 2 = “is still not operational but its implementation is being studied”; 3 = “is being implemented throughout the entire company”; 4 = “is operational in some parts of the company”; and 5 = “is operational throughout the entire company.”

Kruskal Wallis Test: \*0.1 level of significance; \*\*0.05 level of significance; \*\*\*0.01 level of significance.

and production) use the computer to receive information significantly more often than the others.

The application of Student’s test *t* to find differences among the four use situations analyzed identified significant differences (0.05 level of significance) between the use of the computer to respond to internal and external

**Table 4.** Frequency of Computer Usage.

Computer Usage (a)	Functional Area							
	Accounting/ finance ( <i>n</i> = 65)		Sales/marketing ( <i>n</i> = 36)		Production ( <i>n</i> = 39)		Total ( <i>n</i> = 140)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
To receive information*	3.91	0.82	4.19	0.79	4.23	0.93	4.07	0.85
To send information	3.98	0.82	4.19	0.75	4.15	0.90	4.09	0.83
To respond to external requests	4.09	0.72	3.94	0.89	4.00	0.79	4.03	0.79
To respond to internal requests	4.22	0.82	4.11	0.82	4.08	0.81	4.15	0.81
FCU	4.05	0.66	4.11	0.72	4.12	0.73	4.08	0.69

(a) Scale: 1 = “rarely or never” to 5 = “always.”

Kruskal Wallis test: \*0.1 level of significance; \*\*0.05 level of significance; \*\*\*0.01 level of significance.

requests. In effect, the computer is used by managers significantly more often to respond to requests from their own sections than to respond to requests from other sections of the company.

Measures of user satisfaction with IT system have been widely used as measures for system quality. This measure is defined as the extent to which users believe the Information System available to them meets their information requirements. It measures users’ perception of the information system provided using Likert scales (Guimaraes et al., 2007). In this study, the LSAI was defined as follows:

$$\text{LSAI} = \text{average level of satisfaction} \\ + \text{level of precision of accounting information}$$

To measure the average level of satisfaction, the methodology followed on the questionnaire consisted of asking each informant to define “to what extent the accounting information produced internally satisfies your needs,” using a progressive scale of five points, from “1 = very badly” to “5 = very well.” The average and the standard deviation are presented in Table 5. A progressive scale of five points, from “1 = very incorrect” to “5 = very correct” was used to measure the level of precision of accounting information. The average and the standard deviation for each group of

**Table 5.** Satisfaction with Accounting Information.

Level of Satisfaction with Information About	Functional Area							
	Accounting/ finance (n = 65)		Sales/ marketing (n = 36)		Production (n = 40)		Total (n = 141)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Income for continuing operations**	4.37	0.52	4.03	0.65	4.30	0.65	4.26	0.61
Financial position	3.95	0.67	4.00	0.69	4.13	0.69	4.01	0.68
Operation's evaluation	3.97	0.61	4.00	0.80	4.03	0.62	3.99	0.66
Operation's liquidity	3.80	0.81	3.77	0.91	3.93	0.66	3.83	0.80
responsibility centers	3.32	0.87	3.56	1.13	3.48	0.88	3.43	0.94
Products	3.63	0.94	3.14	1.22	3.57	1.01	3.49	1.05
Projects	3.43	0.90	3.47	1.03	3.55	0.99	3.48	0.95
Costumers	3.80	0.85	3.75	0.97	3.75	0.74	3.77	0.85
Activities	3.75	0.81	3.56	0.91	3.59	0.88	3.66	0.85
Average level of satisfaction (a)	3.78	0.51	3.71	0.73	3.81	0.59	3.77	0.59
Accurateness of accounting information (b)**	4.12	0.57	3.97	0.45	3.72	0.85	3.97	0.65
LSAI	7.9	0.88	7.68	1.07	7.54	1.24	7.74	1.05

(a) Scale: 1 = "very badly" to 5 = "very well."

(b) Scale 1 = "very incorrect" to 5 = "very correct."

Kruskal Wallis test: \*0.1 level of significance; \*\*0.05 level of significance; \*\*\*0.01 level of significance.

managers are also presented in Table 5. To measure these perceptions we choose two ordinal scales because they are more precise than the nominal scale (Singh, 2006).

To study the relationship between the LSAI and the investment and use of IT, the Pearson correlation coefficient was calculated (Table 6). The results show that the LSAI is positively and significantly correlated with ITI which, for its part, is positively and significantly correlated with the FCU. There is not, however, a significant correlation between the FCU and the LSAI; the data gathered do not show that an increase in the FCU has a positive impact on the LSAI. Consequently, *the hypothesis is only partially confirmed: the greater the ITI, the greater the LSAI.*

Responding to RQ1, the development of IT was found to open new doors to satisfaction of information needs, with computer reaching the point of being presented as a mean of scientific preparation for decisions

**Table 6.** IT Investment (ITI), Satisfaction with Accounting Information (LSAI) and Computer Usage (FCU).

Variables		ITI	LSAI	FCU
ITI	Pearson correlation	1.000	0.244*	0.390**
	Significant (two-tailed)	0.00	0.035	0.001
	<i>N</i>	75	75	75
LSAI	Pearson correlation	0.244*	1.000	0.048
	Significant (two-tailed)	0.035	0.00	0.684
	<i>N</i>	75	76	75
FCU	Pearson correlation	0.390**	0.048	1.000
	Significant (two-tailed)	0.001	0.684	0.00
	<i>N</i>	75	75	75

\*Correlation is significant at the 0.05 level (two-tailed).

\*\*Correlation is significant at the 0.01 level (two-tailed).

(Vilaine, 1970). However, very little research has been carried out to determine whether managers are more informed today or whether they prefer to receive information through these systems (Kirwan, 1986). Some managers even express fear of not being able to understand the potential of these technologies in the success of their companies (Dutta & Evrard, 1999).

In this study, the companies are characterized by high levels of investment in information technologies used in, at least, some parts of the company. In terms of differences in utilization among the working areas, more laptops are used in sales/marketing than in the other areas. This is due to the nature of the activities carried out, especially the greater need to work outside of the company's facilities.

As for computer use, much like Murphy's study (Murphy, Currie, & Fahy, 1995), it was highly utilized to receive and send information and to respond to requests from the section itself or from other sections of the company. It is, however, significantly more used to receive information in sales/marketing and production than in accounting, which is, by nature, an area that produces information. It is even more significantly used to respond to requests from the section itself than to respond to requests from other sections.

The LSAI is positively and significantly correlated with the ITI. The satisfaction expressed by the user often represents a necessary condition for the success of IT in the organization (Premkumar & Bhattacharjee, 2008). The existence of many easy-to-use computer programs for accounting contributes to this situation (Bressler & Bressler, 2006). ITI is also positively

and significantly correlated with the FCU. There is not, however, a significant correlation between the FCU and the LSAI. Consequently, the hypothesis H2 is just partially confirmed, such that the greater the degree of IT implementation, the greater the LSAI is.

### *Information Technology and Accounting Tasks*

Hypothesis H3 was formulated to analyze the relationship between the ITI and the decentralization of some tasks, specifically those of a documental nature. As it has been noted, qualitative research methodology was used to test this hypothesis through case studies. Content analysis was carried out to analyze and compare the various interviews. We also used documentary research to triangulate documents content with interviews.

Some criticism traditionally raised against accounting point to: (1) the excessive perfectionism on the part of accountants, which makes it difficult to obtain and understand information in a timely fashion; (2) excessive data schemes, which make it difficult to understand; (3) conceptual divergence between accountants and other managers – accountants pay too much attention to formal aspects, neglecting a more dynamic accounting that would be more appropriate to the manager needs; (4) the lack of interest of other managers regarding accounting services that they see as a mere fiscal and legal condition. Given these criticisms, managers tend to try to construct their own accounting documentation, which they understand better and obtain more rapidly although it is more imprecise (Vilaine, 1970).

In the case studies, a lot of accounting documents used by sales/marketing and production directors are produced in the accounting department (60% to sales/marketing and 32% to production). However, in production, most of these documents are produced locally. In response to RQ2, the data gathered demonstrated that many of the most used documents with accounting information in the areas studied are produced locally, almost always with computer support, confirming hypothesis H3 for production managers. In some cases, this tendency for managers to try to construct their own documentation led to divergence between their documents and those from the accounting department. This is not a new situation and should be considered (Vilaine, 1970).

Analyzing the purpose of using these documents, accounting documents served primarily to make projections and to define corrective action and, similarly to what was found in Simon's study (Simon et al., 1954), they are more frequently used to “understand the current state of the company” and



to “identify problems” than to “solve problems.” Likewise, some documents were found to be elaborated because feedback should be well-established so that all the collaborators can exercise self-control by comparing expectations with results (Drucker, 1992). Nevertheless, documents elaborated for this purpose do not always fulfill their objective.

Just as in Burns’ study (Burns, Ezzamel, & Scapens, 1999) this study found a decentralization of tasks traditionally centralized in accounting, such as the creation of budgets.

## CONCLUDING REMARKS

The companies studied have high levels of ITI. The area of sales/marketing was found to use laptops more significantly than the other areas due to the nature of their activities, notably the greater need to work beyond the confines of the company.

The LSAI is positively and significantly correlated with ITI. This is important given that the satisfaction expressed by the user often represents a necessary condition for the success of IT in the organization (Premkumar & Bhattacharjee, 2008). This conclusion is reinforced by the fact that, in accounting, there are many easy-to-use computer programs, which contribute to this situation (Bressler & Bressler, 2006).

It was also found that the use of accounting information increases in a statistically significant manner with the implementation of IT, such that 82% of “contemporary” techniques and 42% of “traditional” techniques have a positively and statistically significant correlation with ITI. There is a greater correlation of “contemporary” techniques with IT. This is no surprise given that great strides in the development of computer systems facilitate their implementation.

The data gathered demonstrate that many of the documents with accounting information used in the areas studied are produced locally, almost always with computer support. Analyzing the purpose of the use of these documents, we found that, regardless of their origin, the accounting documents used basically serve to make projections and to define corrective actions and, similarly to what was found in Simon’s study (Simon et al., 1954), they are more frequently used to “understand the current state of the company” and to “identify problems” than to “solve problems.” Lastly, this study found a decentralization of tasks traditionally centralized in accounting department.

Although considerable attention was given to the literature review, however, some limitations exist. First some relevant publications might have been ignored. Like in other studies, our analysis is limited by both data and empirical specification concerns. The low survey response rate; only six case studies were investigated.

Based on the review of published studies and empirical data it seems that we have a limited understanding of IT effects on accounting settings.

Future research needs to examine the IT/-accounting relationship. Today accounting and IT are inseparable. Accountant's uses of sophisticated management accounting techniques are clearly dependent on IT existence. The configuration choices made in IT implementation are powerful in what they enable. The benefits for accounting from IT materialize only in uncertain ways and only after long implementations.

## NOTES

1. In this study, IT includes computing and communication technologies (Teng & Calhoun, 1996; Granlund, 2007).

2. "Personal sources are those sources which provide information directly to the managers, while impersonal sources are those sources which communicate information to a wide audience or through formal group activity" (Butcher, 1998, p. 83).

3. Often the unit of measure favored by managers is not the same as the one that is used in the reports they receive.

4. A closed questionnaire refers to the fact that the questions, their order and the range of possible responses are fixed (Ghiglione & Matalon, 1992).

5. As we agree with Maroy (Albarello et al., 1995), it seemed prudent to establish working hypotheses in the qualitative analysis right at the start.

6. Specifically incomplete or scientific induction to be able to induce, from a few adequately observed cases, that can be said of those remaining in the same category (Lakatos & Marconi, 1982).

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## REFERENCES

- Albarello, L., Digneffe, F., Hiernaux, J. P., Maroy, C., Ruquoy, D., & Saint George, P. (1995). *Pratiques et Méthodes de Recherche en Sciences Sociales*. Translated from French (L. Baptista, Trans.). Lisbon, Gradiva.
- Anderson, P. A. (1983). Decision making by objection and the Cuban missile crisis. *Administrative Science Quarterly*, 28, 201–222. Reprint in Hickson, ed. 1995. *Managerial Decision Making – History of Management Thought Series*, pp. 205–226.
- Atkinson, A., & Shaffir, W. (1998). Standards for field research in management accounting. *Journal of Management Accounting Research*, 10, 41–68.
- Benbasat, I., Goldstein, D., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly*, 11(3), 369–386.
- Benbasat, I., & Nault, B. (1990). An evaluation of empirical research in managerial support systems. *Decision Support Systems*, 6(August), 203–226.
- Berry, A., Coad, A., Harris, E., Otley, D., & Stringer, C. (2009). Emerging themes in management control: A review of recent literature. *The British Accounting Review*, 41(1), 2–20.
- Boland, R., & O’Leary, T. (1991). Technologies of inscribing and organizing: Emerging research agendas. *Accounting, Management and Information Technologies*, 1(1), 1–7.
- Brandon, C. H., & Drtina, R. E. (1997). *Management Accounting: Strategy and Control* (International ed.). Alfragide: MacGraw-Hill Portugal.
- Bressler, L. A., & Bressler, M. S. (2006). How entrepreneurs choose and use accounting information systems. *Strategic Finance*, 87(12), 56–60.
- Bright, J. (1996). The information dilemma: Finding the nuggets. *Australian Accountant*, 66(3), 30.
- Bromwich, M. (1986). Management accounting research: The state of the art. In: M. Bromwich & A. G. Hopwood (Eds), *Research & current issues in management accounting* (pp. 217–231). London: Pitman.
- Bruns, W. J., & McKinnon, S. M. (1993). Information and managers: A field study. *Journal of Management Accounting Research*, 5(Fall), 84.
- Burns, J., Ezzamel, M., & Scapens, R. (1999). Management accounting change in the UK. *Management Accounting*, 77(3), 28–30.
- Butcher, H. (1998). *Meeting managers’ information needs*. A Managing Information Report. The Association for Information Management, Aslib.
- Chan, Y. (2000). IT value: The great divide between qualitative and quantitative and individual and organizational measures. *Journal of Management Information Systems*, 16(4), 225–261.
- Chien, S., & Tsauro, S. (2007). Investigating the success of ERP systems: Case studies in three Taiwanese high-tech industries. *Computer in Industry*, 58, 783–793.
- Choo, C. W. (1998). *The knowing organization – How organizations use information to construct meaning, create knowledge, and make decisions*. New York: Oxford University Press.
- Chua, W. (1986). Radical developments in accounting thought. *The Accounting Review*, LVI(4), 601–632.
- Clarke, P. J. (1997). Management accounting practices in large Irish manufacturing firms. *IBAR-Irish Business and Administrative Research*, 18, 136–152.
- Connor, N. G., & Martinsons, M. G. (2006). Management of information systems: Insights from accounting research. *Informations & Management*, 43, 1014–1024.
- Cooper, D., & Morgan, W. (2008). Case study research in accounting. *Accounting Horizons*, 22(2), 159–178.

- Daft, R., & Lengel, R. (1984). Information Richness: A new approach to managerial behaviour and organisational design. *Research in Organizational Behaviour*, 6, 191–233.
- Dechow, N., Granlund, M., & Mouritsen, J. (2007). Management control of the complex organization: Relationships between management accounting and information technology. In: C. S. Chapman, A. G. Hopwood & M. D. Shields (Eds), *Handbook of management accounting research*. Oxford, UK: Elsevier Ltd.
- Dedrick, J., Gurbaxani, V., & Kraemer, K. (2003). Information technology and economic performance: A critical review of the empirical evidence. *ACM Computing Surveys*, 34(1), 1–28.
- Dehning, B., & Richardson, V. (2002). Returns on investments in information technology: A research synthesis. *Journal of Information Systems*, 16(1), 7–30.
- Delone, W., & McLean, E. (1992). Information systems success: The quest for the dependent variable. *Information System Research*, 3(1), 60–94.
- Denscombe, M. (2003). *The good research guide – For small social research projects* (2nd ed.). Maidenhead, UK: McGraw-Hill Education, Open University Press.
- Doolin, B. (1996). Alternative views of case research in information systems. *Australian Journal of Information Systems*, 3(2), 21–29.
- Doolin, B. (1998). Information technology as disciplinary technology: Being critical in interpretative research on information systems. *Journal of Information Technology*, 13, 301–311.
- Drucker, P. F. (1992). *Managing for the future*. Translation from English (F. Velez, Trans.). Difusão Cultural, Lisbon.
- Dul, J., & Hak, T. (2008). *Case study methodology in business research*. Oxford, USA: Elsevier Ltd.
- Dutta, S., & Evrard, P. (1999). Information technology and organisation within European small enterprises. *European Management Journal*, 17(3), 239–251.
- Efendi, J., Mulig, E., & Smith, L. (2006). Information technology and systems research published in major accounting academic and professional journals. *Journal of Emerging Technologies in Accounting*, 3, 117–128.
- Eisenhardt, K. (1989). Building theories from case study research. *Academy of management Research*, 14(4), 532–550.
- Fahy, M., & Murphy, C. (1996). Accounting information systems: The role of management developed systems. *Irish Accounting Review*, 3(2), 41–66.
- Ghiglione, R., & Matalon, B. (1992). *O Inquérito-Teoria e Prática*. Translation from French (C. Lemos Pires, Trans.). Celta Editora, Oeiras.
- Granlund, M. (2007). *On the interface between management accounting and modern information technology – A literature review and some empirical evidence*. Working Paper. Social Science Research Network. Available at <http://ssrn.com/abstract=985074>. Retrieved on 23 November 2009.
- Granlund, M., & Lukka, K. (1998). Towards increasing business orientation: Finnish management accountants in a changing cultural context. *Management Accounting Research*, 9, 185–211.
- Granlund, M., & Mouritsen, J. (2003). Introduction: Problematizing the relationship between management control and information technology. *European Accounting Review*, 2(1), 77–83.
- Grover, V., Teng, J., Segars, A., & Fiedler, K. (1998). The influence of information technology diffusion and business process change on perceived productivity: The IS executive's perspective. *Information & Management*, 34, 141–159.
- Groves, R., Fowler, F., Cooper, M., et al. (2004). *Survey methodology*. Wiley Series in Survey Methodology. New Jersey: Wiley.

- Guimaraes, T., Staples, S., & Mckeen, J. (2007). Assessing the impact from information systems quality. *The Quality Management Journal*, 14(1), 30–44.
- Hopper, T., & Powell, A. (1985). Making sense of research into the organizational and social aspects of management accounting: A review of its underlying assumptions. *Journal of Management Studies*, 22(5), 429–465.
- Hopwood, A. (1987). The archaeology of accounting systems. *Accounting, Organizations and Society*, 11, 207–234.
- IFAC – International Federation of Accountants. (2006). *Proposed International Education Practice Statement 2.1 – Information Technology for Professional Accountants*. International Accounting Education Standards Board, IFAC.
- Ittner, C., & Larcker, D. (2001). Assessing empirical research in managerial accounting: A value-based management perspective. *Journal of Accounting and Economics*, 32, 349–410.
- Jaspers, F. (2007). Case study research: Some other applications besides theory building. *Journal of Purchasing & Supply Management*, 13, 210–212.
- Javeau, C. (1988). *L'enquête par questionnaires, manuel à l'usage du praticien* (3rd ed.). Bruxelles: Editions de L'Université de Bruxelles.
- Keating, P. (1995). A framework for classifying and evaluating the theoretical contributions of case research in management accounting. *Journal of Management Accounting Research*, 7, 66–86.
- Keegan, W. J. (1974). Multinational scanning – A study of the information sources utilized by headquarters executives in multinational companies. *Administrative Science Quarterly*, 19(3), 411–421.
- Kirwan, M. (1986). Management accounting in practice – A consultant's view. In: A. Bromwich & A. Hopwood (Eds), *Research and current issues in management accounting* (pp. 52–63). London: Pitman.
- Kobelsky, K., Richardson, V., Smith, R., & Zmud, R. (2008). Determinants and consequences of firm information technology budgets. *The Accounting Review*, 83(4), 957–995.
- Lakatos, E., & Marconi, M. (1982). *Metodologia científica*. São Paulo, Brasil: Atlas editora.
- Le Moigne, J. L. (1974). *Les systemes de decision dans les organisations*. Paris: Presses Universitaires de France.
- Luoma, G. A. (1967). *Accounting information in managerial decision-making for small and medium manufacturers*. Research Monograph 2. New York: National Association of Accountants.
- March, J. G., & Simon, H. A. (1958). *Organizations* (2nd ed.). Translated from English (J. C. Rouchy & G. Prunier, Trans.). Bordas, Paris.
- McKinnon, S. M., & Bruns, W. J. (1992). *The information mosaic*. Boston, MA: Harvard Business School Series in Accounting and Control, Harvard Business School Press.
- McKinnon, S. M., & Bruns, W. J. (1993). What production managers really want to know management accountants are failing to tell them. *Management Accounting*, 74(7), 29–35.
- McLeod, R., Jones, J. W., & Poitevent, J. L. (1984). Executives' perceptions of their information sources. In: P. Gray (Ed.), Reprinted in 1994, *Decision support and executive information systems* (pp. 108–122). NJ: Prentice Hall.
- Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information technology and organizational performance: An integrative model of IT business value. *MIS Quarterly*, 28(2), 283–322.
- Mendoza, C., & Bescos, P. L. (1998). Décision et pilotage des performances: Quels sont les documents utilisés par les managers? Congrès de L'Association Française de Comptabilité-Performances et Comptabilité. 14–16 May 1998, Nantes, France: Association Française de Comptabilité.

- Mitchell, V., & Volking, Y. E. (1993). Analysing the quality of management information: A suggested framework. *Management Decision*, 31(8), 12–19.
- Modell, S. (2005). Triangulation between case study and survey methods in management accounting research: An assessment of validity implications. *Management Accounting Research*, 16, 231–254.
- Murphy, C., Currie, J., & Fahy, M. (1995). The role of the management accountant in implementing decision support systems: Some empirical evidence. *Irish Accounting Review*, 2(1), 133–155.
- Ohlsson, D., & Olfors, M. (2000). *ERP – More than just ones and zeros – Investigating the costs and benefits of enterprise resource planning systems*. Master thesis, Goteborg University.
- Pierce, B., & O'Dea, T. (1998). An empirical study of management accounting practices in Ireland. *Irish Accounting Review*, 5(2), 35–65.
- Premkumar, G., & Bhattacharjee, A. (2008). Explaining information technology usage: A test of competing models. *Omega – The International Journal of Management Science*, 6(1), 64–75.
- Rom, A., & Rohde, C. (2007). Management accounting and integrated information systems: A literature review. *International Journal of Accounting Information Systems*, 8, 40–68.
- Ryan, B., Scapens, R., & Theobald, M. (2002). *Research method and methodology in finance and accounting* (2nd ed.). London: Thomson.
- Scapens, R. (1988). Research into management accounting practice. *Management Accounting*, 66(11), 26–28.
- Shields, M. (1997). Research in management accounting by North Americans in the 1990s. *Journal of Management Accounting Research*, 9, 3–61.
- Simon, H. A. (1945). *Administrative behavior – A study of decision-making processes in administrative organizations* (4th ed. in 1997). London: The Free Press.
- Simon, H. A., Guetzkow, H., Kozmetsky, G., & Tyndall, G. (1954). *Centralization vs. decentralization in organizing the controller's department*. A Research Study and Report Prepared for Controllershship Foundation. New York.
- Singh, Y. (2006). *Fundamental of research methodology and statistics*. New Delhi: New Age International Limited Publishers.
- Srinivasan, A. (1985). Alternative measures of system effectiveness: Associations and implications. *MIS Quarterly*, 9(3), 243–253.
- Stede, W., Young, S., & Chen, C. (2007). Doing management accounting survey research. In: C. S. Chapman, A. G. Hopwood & M. D. Shields (Eds), *Handbook of management accounting research* (pp. 445–477). Oxford, UK: Elsevier.
- Sutton, S. G. (2000). The changing face of accounting in an information technology dominated world. *International Journal of Accounting Information Systems*, 1, 1–8.
- Teng, J., & Calhoun, K. (1996). Organizational computing as a facilitator of operational and managerial decision making: An exploratory study of managers' perceptions. *Decision Sciences*, 1996, 673–710.
- Thompson, R., Higgins, C., & Howell, J. (1991). Personal computing toward a conceptual model of utilization. *MIS Quarterly*, 15(1), 125–143.
- Vilaine, B. (1970). *Comptabilité et Informatique*. Paris: Dunod.
- Yin, R. K. (2003). *Case Study research – Design and method*. Applied Social Research Methods Series (Vol. 5, 3rd ed.). Thousand Oaks, CA: Sage.



# THE DIFFUSION OF MANAGEMENT ACCOUNTING SYSTEMS IN MANUFACTURING COMPANIES: AN EMPIRICAL ANALYSIS OF ITALIAN FIRMS

Paolo Carenzo and Andrea Turolla

## ABSTRACT

*Purpose – To analyze the diffusion of management accounting tools in Italian manufacturing firms and the impact of contingency factors with a particular focus on internationalization.*

*Design/methodology/approach – This study is based on a qualitative statistical analysis and two quantitative data analyses focusing on the effects of contingency factors. In particular, 274 questionnaires were analyzed. A questionnaire-based e-mail survey was used to collect data.*

*Findings – The results confirm positive relationships between management accounting systems and traditional contingency factors such as company size, organizational structure, and operational complexity. In addition, a positive correlation was found between the internationalization and implementation of activity-based costing and target costing.*

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Research limitations/implications – *In the context of internationalization, this exploratory study considers only the impact of foreign customers. Further research could include other factors such as foreign suppliers, joint ventures, and technological exchanges.*

Originality/value of paper – *This paper contributes to the analysis of the impact of internationalization, a contingency variable not yet fully investigated in management accounting system research.*

## INTRODUCTION<sup>1</sup>

The adoption and implementation of management accounting tools (Anthony, 1956), both from an operative and strategic point of view (Anthony, Dearden, & Vancil, 1965; Newman, 1975), is related to the diffusion of managerial rules in firm management.

Although scholars affirm the importance of management control systems to manage an organization (for instance, price fixing, product mix and investment decisions, employee and manager appraisals, alternative supplier choices, customer negotiations), these tools are not homogeneously adopted by companies (Horovitz, 1979; Goold & Quinn, 1990). Management accounting systems are usually implemented in large firms while they are only sometimes known or applied in small and medium organizations (Lombardi Stocchetti, 1996). In fact, in these enterprises, administrative, bureaucratic, and taxation issues are usually of greater importance than managerial matters (Vergara, 2004).

In addition, the empirical literature emphasizes the irregular diffusion of management accounting tools in companies adopting management control rules. Many scholars affirm that there is no unique and universal management control technical structure for all organizations, since this depends on internal firm characteristics and environmental features (Otley, 1980; Chenhall, 2003). In accordance with the previously established concepts, this paper aims to analyze the diffusion of management accounting tools in Italian manufacturing firms. In more detail, this study focuses on both traditional instruments (budget, variance analyses, cost accounting, and financial indicators) and “innovative” managerial tools (activity-based costing (ABC), balanced scorecard, target costing, benchmarking, throughput accounting, and non-financial indicators). The aim of this first step is to determine how broad the gap is between traditional and innovative tools in the firms analyzed.

In addition, using qualitative and quantitative data analysis, this research analyzes the impact of contingency elements on the adoption of management accounting systems. More specifically, this paper, as an exploratory study, investigates the role of internationalization, a variable not yet fully analyzed in management accounting studies.

Prior to presenting the empirical data, the following section briefly reviews previous research. More specifically, we examine the concepts of contingency, national culture, and internationalization. The third section (Methodology) outlines the research design, whereas the subsequent section describes our findings. The paper concludes with a summary and suggestions for further research.

## LITERATURE REVIEW

The diffusion of management control systems in private organizations is a significant point of debate for management scholars and experts. In the last three decades, many authors focused on the causes affecting the diffusion of management accounting systems in companies (Langfield-Smith, 1997; Chenhall & Langfield-Smith, 1998; Chenhall, 2003; Luft & Shields, 2003). However, these studies do not offer unanimous conclusions. In fact, many scholars have found a positive correlation between the diffusion of management control systems and internal firm characteristics, such as strategy (Gosselin, 1997), size, operational complexity, technology, organizational structure, or internal culture (Chenhall, 2003). Other researchers emphasize that the main variables refer to environmental factors, such as national culture (Hofstede, 1980; Ciambotti, 2001) or industry features (Khandwalla, 1972, 1977; Otley, 1980). In addition, in recent years, the globalization phenomenon, economic transitions, and financial turmoil have deeply influenced the diffusion and structure of management control systems.

Thus, in the following sections we focus attention, respectively, on traditional contingency factors, national culture elements and internationalization, and their impact on management accounting systems.

### *Contingency Theory*

The original contingency framework developed within organizational theory (Woodward, 1965), affirmed the absence of a unique and universal

organizational structure for all organizations. The impact of technology and the environment, typical contingency factors, influence the organizational structure (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Galbraith, 1973). Early accounting researchers drew on this theory to investigate the role of the environment, technology, organizational structure and size in the structure of management control systems (Hayes, 1977; Waterhouse & Tiessen, 1978; Otley, 1980).

The external environment, in terms of uncertainty and turbulence, is a powerful contextual variable in contingency-based research. Khandwalla (1972, 1977) and Imoisili (1985) stated that a turbulent and hostile environment is associated to formal management control systems, characterized by standard budgeting system and based on short-run financial indicators. Other studies (Merchant, 1984; Brownell, 1985) found that environmental uncertainty is positively correlated to the adoption of non-financial-based performance measurement systems. Moreover, concerning budgeting, if on the one hand, environmental uncertainty emphasizes formal processes (Ezzamel, 1990), then on the other hand, it encourages employee participation and integration between accountants and other managers (Merchant, 1990; Chapman, 1997; Hartmann, 2000).

More recently, Reid and Smith (2000) found positive relationships between the introduction of management accounting systems – especially cost management tools – in Scottish micro-firms and a turbulent environment characterized by cash flow crises, funding shortage, and technological innovation. Similarly, Tani (1995) suggested that Japanese firms adopted target costing as a response to increasing environmental uncertainty. Dekker and Smidt (2003) found the same phenomenon when analyzing Dutch manufacturing companies. In fact, these authors suggest that an unpredictable environment and perceived intensive competition can induce companies to adopt and develop target-costing techniques in order to cope better with these pressures.

Haldma and Lääts (2002) make the same deduction from the analysis of Estonian firms before and after the 1997 Asian crisis and the 1998 Russian crisis. In fact, the recession in Eastern markets intensified competition in the Estonian domestic market. This increase in competition and higher production quality standards required the adoption of more sophisticated and market-sensitive management accounting systems.

Technology has many connotations in contingency theory. In fact, it includes hardware (machines, tools, and materials), people (technical skills, knowledge), software, and the work processes of organizations. This section takes into consideration the following elements: complexity, task uncertainty,

and interdependence (Chenhall, 2003). Firms characterized by standardized and automated processes implement formal management control systems and tend to adopt traditional management accounting tools, such as budget, cost accounting, and financial indicators (Merchant, 1985; Dunk, 1992). As concerns the other two variables, the more technologies are characterized by high levels of task uncertainty and high levels of interdependence, the more traditional management control systems are informal, including less reliance on accounting performance measures and high participation in budgeting (Chenhall, 2003).

Moreover, technologies based on human activities and high-quality performance are linked to low reliance on traditional accounting techniques. This has been proven by research analyzing the impact of contemporary advanced technologies (Just in Time, Total Quality Management, and Flexible Manufacturing System) on management accounting systems (see Kalagnanam & Lindsay, 1999). These studies highlight a significant change in reporting variables: from financial indicators to more complex systems that also include productivity indices (Banker, Potter, & Schroeder, 1993; Sim & Killough, 1998), customer satisfaction (Perera, Harrison, & Poole, 1997), quality (Sim & Killough, 1998), time and timeliness (Foster & Horngren, 1988).

Organizational structure, the third contingency factor, includes several elements: from the roles and tasks of single members and groups to the outcomes of structure and structural mechanisms. This paper focuses specifically on organizational structure. Empirical studies on management accounting found that firms with an “elementary” organizational structure usually adopt informal management control systems, and therefore no explicit managerial tools, to a greater extent than companies with a functional or a divisional structure. For instance, Burns and Waterhouse (1975) and Merchant (1984) highlighted a positive correlation between decentralization and the introduction of formal management accounting systems. In his empirical analysis, Gosselin (1997) suggests that the implementation and use of ABC are significantly associated to mechanistic and centralized organizations. Moreover, he underlined a further correlation between these managerial tools and organizations and a high level of vertical differentiation.

Another contingency factor, company size, is currently the subject of further analysis in management accounting studies. Most contingency-based managerial accounting research has studied the effect of growth in terms of size on managerial tools. With growing company size, the need for managers to handle greater quantities of information increases up to a point where

they need to institute formal controls such as rules, documentation, specialization of roles and functions (Child & Mansfield, 1973). For instance, Haldma and Lääts (2002) suggest that the level of sophistication of a cost accounting system tends to increase in line with the company size.

However, Chenhall (2003) highlights the little attention paid in contingency-based studies to small- and medium-sized companies. In the last lustrum, however, many studies have focused on management control systems in small and medium firms. Davila (2005), analyzing 95 Californian technology-oriented small growing companies, found that a new CEO, company age, and rapid size increases are positively correlated to the adoption of formal management control systems. Similarly, Speckbacher and Wentges (2007) analyzed the role of management control systems in family firms. They found that informal control is still more widespread than formal control is; however, when external managers join the board, formal management control system usually need to be implemented.

Company size plays a crucial role also in the implementation of innovative managerial tools. Speckbacher, Bischof, and Pfeiffer (2003) found a greater adoption of the balanced scorecard in large-sized companies than in small firms. Baird, Harrison, and Reeve (2004) suggest that activity-based management practices are particularly associated to company size, firm innovation, and outcome innovation. The link between size and the adoption of modern management accounting practices can be explained with the following arguments. First, the demand for strategic information and activity management information to design, control, and coordinate the organization is greater in large companies; on the other hand, larger organizations have a greater ability to commit resources to the development and implementation of innovative accounting practices.

Another contingency factor, product life cycle (Moores and Yuen, 2001), has recently been applied to contingency-based management control system research. In fact, Hoque and James (2000) noted that the balanced scorecard is adopted especially in large-sized companies and in firms managing products in the development stages (birth and growth).

Contingency theory has also been applied more recently in order to better specify the open-book accounting theoretical framework (Kajüter & Kulmala, 2005). These two scholars suggest that the implementation of open-book accounting in networks is affected by both exogenous elements (a high degree of competition and positive economic trends), endogenous firm-specific factors (large size, long-term view, cooperative approach, accurate cost accounting systems), and network-specific factors (mature and hierarchical network, mutual trust, inter-organizational support in cost accounting).

### *“National Culture” Theory*

The basic proposition of the “national culture” theory is that different countries own particular cultural characteristics. The relationship between national culture and the design of management control systems has become increasingly important over the last 25–30 years, when many companies developed international and multinational operations.

The most important (and famous) analysis on cultural characteristics was developed by Hofstede (1980). He described culture as a set of five variables: power distance, individualism vs. collectivism, uncertainty avoidance, masculinity vs. femininity, and Confucian dynamism. As concerns the design of management accounting systems, many studies refer to cultural variables to explain the differences in financial accounting characteristics and purposes, cost accounting diffusion and cost management instrument implementation.

In financial accounting systems, the diffusion of economic and financial-based systems are correlated to cultures characterized by a high level of individualism and low uncertainty avoidance, such as those of the United States and Anglo-Saxon countries (Guilding, Cravens, & Tayles, 1998; Hill, 1988; Drury & Tayles, 1995). To the contrary, Japanese companies, typified by high levels of collectivism and uncertainty avoidance (Hiromoto, 1988), have developed a reporting system based on non-financial variables and qualitative-orientations (Morgan, 1992; Yoshikawa, 1994).

In cost accounting, empirical studies found a positive correlation between full costing and uncertainty avoidance. In fact, the allocation of overhead costs is in relation to the increasing level of awareness in managers’ choices, especially price fixing (Ciambotti, 2001).

Similarly, literature highlights the relationship between national culture variables and the adoption of standard/target costs in budgeting. More specifically, a culture characterized by low power distance, no uncertainty avoidance, individualism and masculinity is linked to standard costing. Empirical analysis shows this tendency in Anglo-Saxon (Clarke, 1992; Drury & Tayles, 1995; Cormick, Cooper, & Wilson, 1988) and Scandinavian companies (Ask & Ax, 1992; Lukka & Granlund, 1998). To the contrary, Japanese companies, characterized by the opposite cultural variables, are inclined toward target costing (Hiromoto, 1988).

Finally, this section analyzes the role of national culture in the diffusion of cost management tools. ABC is more often applied in Anglo-Saxon and Scandinavian companies than in Mediterranean and Latin America companies (Ciambotti, 2001). Bhimani, Gosselin, Ncube, and Okano (2007)

obtained the same result. They studied the diffusion of ABC in the United Kingdom, the United States, Canada, Japan, Italy, France, and Germany and noted that this technique is widespread in English-speaking countries and in France, whereas in Germany, Japan, and Italy, ABC is applied only in a small number of firms.

Target costing is primarily implemented in Japan and in countries with those same cultural characteristics (South Korea, Taiwan), and also in Germany, whereas in the other European countries, particularly Mediterranean countries, only a small group of companies (Ciambotti, 2001) have adopted it.

In conclusion, these studies highlight how the diffusion of cost management techniques is correlated to companies characterized by the following national culture variables: low power distance, low uncertainty avoidance, masculinity, individualism, and a long-run view.

### *Internationalization*

Internationalization is defined in many different ways in literature, based on different frameworks. Some researchers have taken into consideration various dimensions such as market, product, time, and performance (Ruzzier, Antonicic, & Hisrich, 2007). Other scholars affirm that measuring internationalization is possible through both foreign revenue over total revenue and foreign assets over total assets (Belkaoui, 1999). In addition, Fletcher (2001) identifies external impediments and external incentives as the key factors leading to firm internationalization.

In the management accounting field, some scholars have investigated the link between management accounting tools and internationalization: for instance, Granlund and Lukka (1998) outline how internationally oriented Finnish firms are deeply involved with innovative management accounting tools.

Other studies, such as Haldma and Lääts' (2002), highlight the importance of internationalization in the diffusion of management accounting systems. In fact, they state that economic transitions (e.g., from a closed economic system to an open one) play a strategic role in the implementation of management accounting tools, especially innovative tools.

In addition, Anderson and Lanen (1999) recognize the relevance of economic transitions and the increasing intensity of international competition in the adoption of management accounting tools in Indian companies.

The list of contingency factors and relationships in our theoretical framework should not be considered as exhaustive, as we were unable to identify and include all factors and impacts. Contingency-based studies assume a link between nature, use of the management accounting system, and subsequent enhanced performance (Haldma & Lääts, 2002). At the same time, other behavioral and organizational aspects also influence a greater achievement of goals (for instance, job satisfaction, working place environment, formal and informal control, participation in the budgeting process).

This paper therefore focuses only on the following classes of contingencies: size, organizational structure, operational complexity, internal culture, environmental impact, and internationalization.

## METHODOLOGY

This section provides an overview of the data used for this study and the main characteristics of the sample. As concerns the methodological approach, following recent examples (Baird et al., 2004; Sulaiman & Mitchell, 2005), a questionnaire-based survey (Corbetta, 1999) was implemented to gather information on the diffusion of managerial tools in Piedmont manufacturing companies. The survey method is often used since it is time and cost-efficient and allows carrying out a statistical analysis. In addition, the replication of questions is possible and thus consents a comparison of results and pattern analysis.

The first step was the definition of the sample. Using the Aida data bank,<sup>2</sup> we selected companies according to the following features:

- they belong to manufacturing industries<sup>3</sup> (banks, insurance companies, trade firms, service companies, and public organizations were excluded);
- they are located in Piedmont.

As far as the first feature is concerned, this choice is related to the fact that managerial instruments primarily originated, and were subsequently developed, in manufacturing companies.

The second feature was selected on the basis of the key characteristics of Piedmont manufacturing (Ferrero, Lanzetti, Marchi, Resegotti, & Vitelli, 2007; Buran, 1999; Lanzetti & Mutinelli, 1998):

- manufacturing companies are widespread in the entire region (not only in a restricted area);
- extensive production diversification;



- the industrial recovery following the early nineties with significant investments in R&D and education;
- the presence of heterogeneous companies from very small to multi-national companies, more specifically, the Piedmont environment is characterized by the prevalence of small firms;
- the presence of heterogeneous companies according to the period of foundation;
- the presence of listed companies;
- the presence of industrial districts evolving toward productive network relationships (from 1991 till today, 27 industrial districts were recognized by the regional laws in Piedmont);
- the presence of companies with international relationships (exchanges, investments, etc.);
- the presence of sound relationships with local universities and research entities.

These features, especially the predominance of small companies, the presence of industrial districts grouping very small firms and an increasing focus on foreign markets, are also the key elements that characterize the current Italian manufacturing context. In other words, the Piedmont area epitomizes the Italian manufacturing environment.

The target population consists of over 5,100 manufacturing companies. A random sample of 2,575 companies was drawn from the overall population (Tables 1 and 2).

The survey was conducted by sending a fully standardized questionnaire by e-mail to the company sample. A link to the electronic questionnaire was included in the e-mail.

**Table 1.** Sample and Responding Firms by Size.

Size <sup>a</sup>	Sample		Responding Firms	
	Absolute value	Percentage	Absolute value	Percentage
Small companies	1,875	72.82	213	77.74
Medium and large companies	700	27.18	61	22.26
Total	2,575	100	274	100

<sup>a</sup>According to European Commission standards a small company is classified as producing revenue of under 10 million Euros; in a medium company the revenue ranges from 10 to 50 million Euros; in a large company the revenue is over 50 million Euros.

**Table 2.** Sample and Responding Firms by Province.

Province	Sample		Responding Firms	
	Absolute value	Percentage	Absolute value	Percentage
Alessandria	288	11.18	30	10.95
Asti	118	4.58	8	2.92
Biella	199	7.73	27	9.85
Cuneo	266	10.33	26	9.49
Novara	275	10.68	39	14.23
Torino	1,230	47.77	121	44.17
VCO	95	3.69	9	3.28
Vercelli	104	4.04	14	5.11
Total	2,575	100	274	100

The questionnaire is structured in two parts (see [Appendix A](#)). The first part consists of over 20 questions concerning general information, whereas the second part focuses on management control systems and management accounting tools.

The questionnaire was pre-tested by a number of academics and then sent to several practitioners for further review. Minor adjustments in wording and layout were made in order to further understanding of the questionnaire. It was then sent to all 2,575 companies with an introductory e-mail clarifying the purpose and objectives of the research project. Moreover, a brief description of the general features of each management accounting tool was also provided in the questionnaire since it is conceivable that firms use similar techniques to those studied without being familiar with the concept. For instance, [Alnestig and Segerstedt \(1996\)](#) found that Swedish firms use costing techniques that have similar principles to ABC but without realizing it; [Dekker and Smidt \(2003\)](#) found that most Dutch companies adopt the target-costing system (using other names and descriptions), without being familiar with Japanese practice. Therefore, a short list of decoding information was attached to the questionnaire.

The questionnaire was sent exclusively to CEOs, CFOs, and controllers, or, in small companies, directly to the entrepreneur.

After the first posting at the end of 2007, a follow-up was required a few months later. At the end of June 2008, 274 completed questionnaires<sup>4</sup> were collected (response rate: 10.64%). The return quota is in accordance with previous studies implemented in Italy using the same method ([Abdel-Maksoud, Cerbioni, & Ricceri, 2005](#); [Lucianetti, 2006](#)). Moreover,

the data (Tables 1 and 2) shows no significant bias between the preliminary sample and collected questionnaires, both from a geographical and size perspective. In addition, using Kolmogorov–Smirnov and chi-square tests, we found no significant differences in the size of respondents and non-respondents, in many descriptive characteristics of early and late respondents, and in the adoption frequency of managerial tools between early and late respondents.

## FINDINGS

### *Diffusion of Management Control Systems*

The first empirical evidence of the survey emerged by way of descriptive statistics. We noted through the analysis of questionnaires that over 90% of companies (250 out of 274 firms) declared being acquainted with, and adopting, management control rules. However, this extremely positive aspect puts the full validity of responses in doubt. In fact, the diffusion percentage obtained is considerably higher than in previous Italian researches (Arena, Azzone, & Caimi, 2004; Abdel-Maksoud et al., 2005; Lucianetti, 2006).

Thus, focusing on management accounting tools, we noted that some of the companies claiming to adopt management control systems, actually only implement a financial accounting system. As a consequence, responding firms were divided into three groups:

- adopting management control systems;
- adopting only financial accounting systems;
- not adopting management control systems.

Table 3 shows that only 210 of the responding firms (76.64%) effectively adopt management control systems. As previously mentioned, we found only financial accounting tools in the remaining 40 companies. Financial

**Table 3.** Diffusion of Management Control Systems.

	Absolute Value	Percentage
Adopting	210	76.64
Only financial accounting system	40	14.60
Not adopting	24	8.76
Total	274	100

accounting is, in Italy, along with most other countries, an instrument required by law. This element may therefore be seen as a “data source” for managerial analysis rather than a managerial tool.

Moreover, this misunderstanding allows us to stress that still today many firms do not understand the difference between financial accounting and management accounting and exactly what management control is. This phenomenon was particularly observed in small family firms. In fact, in these organizations, where the owner usually directly manages all the company’s variables, financial accounting is often seen as a “sufficient condition” to monitor all firm elements and, therefore, to manage the organization.

*Diffusion of Management Accounting Tools*

Focusing on companies adopting management control rules, the following analysis investigates the diffusion of management accounting techniques. Table 4 shows that budget (64.21%), revenue and costs variance analyses (58.59%), and financial measures (55.05%) are the most frequently applied managerial tools in Piedmont firms, whereas ABC, balanced scorecard,

**Table 4.** Diffusion of Management Accounting Tools.

Tools	Diffusion (percentage)	Importance (mean) <sup>a</sup>	Importance (median) <sup>a</sup>	Variance
Budget	64.21	5.110	5	3.353
Variance analysis	58.59	4.880	5	3.313
Financial measures	55.05	4.762	5	3.656
Cost accounting (cost centers)	24.24	4.962	5	4.242
Simple cost accounting (no cost centers)	23.23	4.845	5	4.247
Productivity and quality indicators	20.71	4.667	5	3.831
Customer satisfaction indicators	15.66	3.690	3.5	3.902
Human resource indicators	13.64	3.431	3	3.934
Activity-based costing	12.63	3.714	3	4.708
Balanced scorecard	10.10	3.103	2	5.382
Target costing	9.09	3.733	4	5.306
Benchmarking	5.56	2.367	2	2.516
Throughput accounting	1.01	2.133	1	3.839

<sup>a</sup>Scale ranging from 1 (not applied) to 7 (systematically applied).

target costing, benchmarking, and throughput accounting are implemented the least. In other words, the companies analyzed, and generally Italian firms, mainly adopt traditional management accounting tools, whereas “innovative” techniques are implemented in a small number of enterprises. This would prove that Italian firms are behind in the adoption of managerial accounting tools and, generally, management control systems.

A first reason that could explain the gap between Italian and foreign companies could stem from a lack of knowledge: Italian companies, especially small firms, are not usually familiar with managerial instruments. A second reason could lie in the characteristics of the management accounting tools: they are primarily designed to solve homeland company issues; it is therefore difficult to adopt them to different contexts without making adjustments. Besides, the characteristics of Italian culture limit the adoption of new management accounting tools: the high level of uncertainty avoidance does not allow Italian companies to try out new management accounting instruments.

In addition, [Table 4](#) demonstrates that financial indicators are more frequently adopted than non-financial indicators. In fact, ROI, ROE, ROA, cash flow, etc., typically short-term indicators, are the most significant measures adopted by organizations to evaluate their own performances. This suggests that a short-term view, a typical European and North American cultural feature, influences firms in the choice and structure of performance measurement systems.

However, empirical evidence highlights an increasing group of companies adopting non-financial measures. In particular, productivity indicators are the most implemented (20.71%) when compared to the customer satisfaction index (15.66%) and human resources measures (13.64%). This proves the findings of previous studies ([Arena et al., 2004](#); [Abdel-Maksoud et al., 2005](#); [Lucianetti, 2006](#)): Italian firms focus their attention on financial and manufacturing performance, whereas human resource indicators are the least applied. This latter element suggests that, still today, Italian companies do not consider human capital as a strategic variable.

Finally, the empirical evidence demonstrates the low adoption rate (10.10%) of the balanced scorecard: most Italian firms monitor performance by using specific financial and non-financial measures, but without any logical links between them. In other words, only a small number of companies, especially those having a different perspective, actually understand the importance of cause–effect relationships between indicators (and obviously between the KPAs).

### *Contingency Factors: Qualitative Analysis*

As described in the first section, this research aims to analyze which factors deeply influence the adoption and use of management accounting tools in Italian manufacturing companies. Specifically, we investigate the correlation between the previously mentioned managerial tools and the following contingency factors:

- company size (in terms of revenue and number of employees);
- organizational structure;
- operational complexity (in terms of product lines, suppliers, and customers);
- internal culture (in terms of graduate employees, training expenditures, and R&D investments);
- industry.

Moreover, as its exploratory aim, this paper investigates the role of internationalization in management accounting implementation. The elimination of trade barriers, market globalization, and environmental turmoil has increased the level of competitiveness in local and international markets. In addition, these phenomena affect company strategies and therefore their strategic control systems. The search for new partners, new customers and new suppliers from foreign countries are only some of the recent trends resulting from the aforementioned elements. In this context, we analyze the effect of “internationalization” on management accounting tools.

Operatively, two statistical studies were implemented. In this section, we discuss the findings obtained through the qualitative data analysis. For each contingency factor, we pooled the sample into homogeneous groups; thereafter, we calculated the percentage of adoption of each tool in every group.

### *Company Size*

Company size is a traditional contingency element in management accounting research. Specifically, this paper studies the impact of two elements linked to company size: revenue and number of employees. In fact, these two indicators are usually the basis of company classifications. Using European Commission standards, companies were divided into four groups: very small, small, medium, and large. [Tables 5 and 6](#) show the percentages

**Table 5.** Diffusion of Management Accounting Tools by Size  
(Revenue – in Million Euros).

	Up to 2	From 2 to 10	From 10 to 50	More than 50
Activity-based costing	3.85%	7.00%	26.47%	58.33%
Variance analysis	63.46%	47.00%	76.47%	83.33%
Balanced scorecard	1.92%	7.00%	23.53%	33.33%
Benchmarking	0%	3.00%	23.53%	28.15%
Budget	51.92%	61.00%	76.47%	91.67%
Simple cost accounting (no cost centers)	28.85%	19.00%	29.41%	16.67%
Cost accounting (cost centers)	19.23%	22.00%	32.35%	41.67%
Financial measures	30.77%	62.00%	64.71%	75.00%
Customer satisfaction indicators	15.38%	14.00%	26.47%	30.12%
Human resource indicators	5.77%	14.00%	20.59%	25.00%
Productivity and quality indicators	13.46%	19.00%	32.35%	33.33%
Target costing	1.92%	10.00%	14.71%	16.67%
Throughput accounting	0%	1.00%	2.94%	0%

**Table 6.** Diffusion of Management Accounting Tools by Size  
(Number of Employees).

	Up to 9	From 10 to 49	From 50 to 249	More than 250
Activity-based costing	10.00%	12.84%	17.50%	50.00%
Variance analysis	70.00%	48.36%	75.00%	100%
Balanced scorecard	13.33%	3.28%	25.00%	33.33%
Benchmarking	0%	3.28%	15.00%	16.17%
Budget	70.00%	72.46%	85.00%	100%
Simple cost accounting (no cost centers)	20.00%	24.59%	22.50%	16.67%
Cost accounting (cost centers)	13.33%	21.31%	40.00%	43.33%
Financial measures	40.00%	54.92%	60.00%	100%
Customer satisfaction indicators	23.33%	14.75%	22.50%	26.67%
Human resource indicators	3.33%	12.30%	22.50%	31.08%
Productivity and quality indicators	3.33%	18.85%	37.50%	33.33%
Target costing	3.33%	6.56%	17.50%	36.72%
Throughput accounting	0%	0.82%	2.50%	0%

obtained from using respectively the “revenue” and the “number of employees” indicators.

As concerns revenue, empirical data demonstrates that medium and large firms adopt managerial instruments to a greater extent than small companies.

In addition, *Table 5* suggests a positive correlation between company size and the adoption of management accounting tools. For instance, focusing on budget, we noted that the percentage of diffusion increases from 51.92% in very small companies to 91.67% in large companies. In other words, the higher the revenue, the higher the adoption of a budget system. Similarly, we noted the same positive trend, even if with different percentages, for financial measurement, cost accounting and ABC, target costing, balanced scorecard, production indicators, and human resource measures.

Only in simple cost accounting (a cost accounting system characterized by a single-basis cost-allocation method and no cost centers) do the empirical result shows a negative trend. This suggests that when a company increases its size, and becomes more complex to manage, more reliable and quicker information is necessary and therefore requires analytical and advanced cost accounting tools. In this context, simple cost accounting becomes less productive for managers, whereas cost accounting and ABC meet the new needs of managers.

Focusing on ABC, *Table 5* highlights a gap between small and very small companies, and medium and large firms. In the first two groups, ABC is implemented only in a minority group: less than ten companies adopted activity-based logics, whereas this percentage increases in medium and large organizations. We noted the same in two other “innovative” instruments: the balanced scorecard and target costing.

The empirical data confirms the previous results when using the second variable (number of employees). In fact, we noted a positive link between company size and management accounting tools, both traditional and “innovative” (*Table 6*). For instance, the percentage of adoption of ABC, budget, financial indicators, benchmarking, balanced scorecard, and target costing grows with the increasing number of employees.

Moreover, empirical data highlights an opposite trend in cost accounting. The higher the number of employees, the higher the adoption of cost accounting with cost centers and the lower the implementation of simple cost accounting.

In conclusion, the empirical elements we obtained suggest that management accounting tools, especially “innovative” tools, are mainly implemented in medium–large organizations. In addition, qualitative studies show a positive correlation between company size and management accounting systems. The larger the company size, the higher the adoption of managerial techniques.



### *Organizational Structure*

The second contingency element studied through the qualitative analysis is the organizational structure. In particular, responding companies were pooled into three groups: elementary, functional, and divisional structures.

Table 7 highlights an evident gap between firms with an elementary structure, such as family firms in the early stages of life and others. In this first group, we noted that management accounting tools are less frequently adopted than in companies with a “complex” organizational structure. In fact, these companies, which are characterized by a lack of decentralized power and management by objectives, are managed directly by the owners who often consider formal management accounting system as useless and extremely expensive. This behavior confirms the traditional idea of small family firms: they are inclined to use informal management control systems.

Focusing on “innovative” tools, we found a further difference between the functional and divisional structures: in the latter, these managerial instruments are more frequently applied. For instance, ABC and the balanced scorecard attained a higher adoption percentage in divisional structures.

Unlike innovative tools, Table 7 demonstrates a narrower gap in traditional tools: budget and variance analysis are more frequently adopted in over 50% of the elementary structured companies, in over 60% of functional structured companies and in 83% of companies with a divisional structure. Similar results were obtained for the diffusion of financial indicators. In other words, this smaller difference confirms that the main

**Table 7.** Diffusion of Management Accounting Tools by Structure.

	Elementary	Functional	Divisional
Activity-based costing	7.59%	24.39%	83.33%
Variance analysis	48.10%	64.60%	83.33%
Balanced scorecard	12.66%	16.19%	50.00%
Benchmarking	5.06%	5.31%	16.67%
Budget	53.16%	69.03%	83.33%
Simple cost accounting (no cost centers)	21.52%	25.66%	26.20%
Cost accounting (cost centers)	18.99%	26.55%	50.00%
Financial measures	45.57%	59.29%	100%
Customer satisfaction indicators	17.72%	14.16%	16.67%
Human resource indicators	7.59%	18.58%	17.21%
Productivity and quality indicators	20.25%	20.35%	33.33%
Target costing	6.33%	10.62%	16.67%
Throughput accounting	0%	1.77%	0%

gap in companies we analyzed concerns the diffusion of managerial instruments: traditional tools are more widespread than new and innovative tools.

*Operational Complexity*

This subsection focuses on the effect of operational complexity on management accounting systems. More specifically, we measured the level of operational complexity with three indicators: the number of product lines, the number of suppliers and the number of customers.

The first variable, number of product families, is generally used to define the degree of diversification and therefore to quantify the organizational complexity. Responding companies were divided into two groups: firms managing only a single product line and those with two or more product families (multi-product companies).

The empirical evidence, summarized in Table 8, highlights a higher percentage of diffusion of managerial tools in companies managing two or more product lines. Only for cost accounting and human resources measures we found the opposite trend.

Therefore, the qualitative analysis suggests a positive relation between management accounting systems and internal complexity.

The number of suppliers is another common indicator to measure company complexity. However, for this and for the next element, the analysis focuses on average number of suppliers (customers) in the presence/absence of managerial tools, instead of the adoption percentage.

**Table 8.** Diffusion of Management Accounting Tools by Product Lines.

	A Single Product Line	Two or More Product Lines
Activity-based costing	8.51%	13.91%
Variance analysis	48.94%	61.59%
Balanced scorecard	8.51%	10.60%
Benchmarking	4.26%	5.96%
Budget	57.45%	64.90%
Simple cost accounting (no cost centers)	29.15%	14.50%
Cost accounting (cost centers)	23.66%	27.18%
Financial measures	57.45%	59.30%
Customer satisfaction indicators	10.64%	17.22%
Human resource indicators	14.89%	13.25%
Productivity and quality indicators	14.89%	22.52%
Target costing	6.38%	9.93%
Throughput accounting	0%	1.32%

**Table 9.** Number of Suppliers in the Presence/Absence of Managerial Tools.

	Mean		$\eta^2$
	With	Without	
Activity-based costing	321	215	0.004
Variance analysis	270	170	0.003
Balanced scorecard	466	200	0.711
Benchmarking	587	206	0.015
Budget	276	143	0.018
Simple cost accounting (no cost centers)	202	235	0.004
Cost accounting (cost centers)	313	225	0.024
Financial measures	293	156	0.001
Customer satisfaction indicators	358	205	0.002
Human resource indicators	333	205	0.001
Productivity and quality indicators	291	210	0.001
Target costing	553	195	0.302
Throughput accounting	1,530	214	0.023

Table 9 shows that the average number of suppliers is higher in companies adopting management accounting tools. At first sight, empirical data suggests a positive correlation between the number of suppliers and the adoption of managerial tools.

Nevertheless, the correlation index ( $\eta^2$ ) underlines a positive correlation only in the balanced scorecard and, partially, target costing. In other words, the quantitative index confirms that the increasing number of suppliers (and therefore the increasing level of operational complexity) only affects the implementation of these two instruments.

We implemented the same qualitative analysis using the “number of customers” element. However, Table 10 shows conflicting results when compared to the previous variable. In fact, in 6 out of 13 tools, the average number of customers is higher in companies without managerial tools than in companies adopting them. Moreover, the correlation index ( $\eta^2$ ) we calculated for each tool is extremely low. This suggests no explicit correlation between number of customers and management accounting tools.

### *Internal Culture*

Internal culture can be described as a set of internal rules governing relationships among employees, the emphasis on formality or on the

**Table 10.** Number of Customers in the Presence/Absence of Managerial Tools.

	Mean		$\eta^2$
	With	Without	
Activity-based costing	1,125	566	0.008
Variance analysis	615	683	0.005
Balanced scorecard	423	657	0.000
Benchmarking	883	616	0.002
Budget	569	737	0.005
Simple cost accounting (no cost centers)	800	580	0.009
Cost accounting (cost centers)	290	740	0.005
Financial measures	501	802	0.003
Customer satisfaction indicators	2,826	224	0.139
Human resource indicators	3,014	255	0.135
Productivity and quality indicators	1,513	401	0.019
Target costing	607	633	0.002
Throughput accounting	1,545	622	0.002

substance of tasks and the level of propensity to continuous improvement. This set of elements is usually adopted to identify and define this organizational trait. More specifically, our study focuses on the dichotomy between managerial culture and bureaucratic culture. The first focuses on essence, results and management by objectives; the second typology focuses especially on task formalization.

In accordance with the preceding concept, the three following elements – graduate employees, training expenditure, and R&D investments – were analyzed to define types of internal culture and their influence on management accounting systems.

The first element analyzed was the percentage of graduate employees in the organizations. Empirical data shows a discrepancy between companies without graduates and companies employing graduates. In fact, we noticed a lower percentage of adoption of managerial tools in the first group. In other words, qualitative results suggest that the presence of graduate employees, especially at managerial level, can affect the adoption and diffusion of management accounting techniques.

In addition, [Table 11](#) shows a gap between companies with a medium–high level (over 16%) and those with a low level of graduate employees. In the first group, the presence of management accounting tools is higher than in the second. In particular, this difference becomes extremely obvious

**Table 11.** Diffusion of Management Accounting Tools by Graduate Employees.

	No Graduate Employees	Up to 5%	From 6 to 15%	From 16 to 30%	More than 30%
Activity-based costing	4.41%	13.33%	11.11%	31.58%	44.44%
Variance analysis	48.53%	63.33%	59.72%	73.68%	77.78%
Balanced scorecard	7.35%	16.67%	9.72%	25.26%	22.22%
Benchmarking	0%	13.33%	8.33%	5.26%	7.10%
Budget	58.82%	73.33%	75.56%	78.95%	88.89%
Simple cost accounting (no cost centers)	23.53%	16.67%	26.39%	21.05%	22.22%
Cost accounting (cost centers)	16.18%	36.67%	29.17%	25.79%	22.22%
Financial measures	42.65%	56.67%	61.11%	63.16%	77.78%
Customer satisfaction indicators	8.82%	20.00%	16.67%	15.79%	44.44%
Human resource indicators	5.88%	30.00%	18.06%	15.26%	20.40%
Productivity and quality indicators	14.71%	36.67%	22.22%	15.79%	21.11%
Target costing	2.94%	4.33%	9.72%	20.53%	31.04%
Throughput accounting	0%	0%	1.39%	5.26%	0%

in ABC, balanced scorecard, and target costing. Therefore, this element suggests that managerial culture is a critical factor in the adoption of management control system, especially “innovative” tools.

Another appropriate indicator to measure internal culture is training and re-training investments. In particular, we focused on training and re-training programs with a “managerial” content in the last five years. For this qualitative analysis, companies were divided into two groups: companies investing in managerial training courses and companies without training costs. Table 12 demonstrates that companies investing in training, and therefore increasing employee managerial skills, show a higher level of diffusion of managerial tools with the exception of simple cost accounting. Therefore, qualitative data suggest a slight positive impact of training investments.

The last element that we analyzed, the presence/absence of R&D investments, is normally adopted to quantify and measure company propensity to product or process innovation. As already found in the previous variable, empirical data (Table 13) shows a gap in the percentage of diffusion of each managerial instrument between companies investing in R&D in last five years and other firms.

In conclusion, the qualitative analyses confirm the positive impact of “managerial culture” on the adoption of management accounting techniques. These preliminary results were analyzed in depth with two quantitative studies.

**Table 12.** Diffusion of Management Accounting Tools in Companies Investing/Not Investing in Training.

	Not Investing (%)	Investing (%)
Activity-based costing	15.75	19.70
Variance analysis	56.25	59.70
Balanced scorecard	7.81	11.19
Benchmarking	1.56	7.46
Budget	51.56	68.66
Simple cost accounting (no cost centers)	23.44	17.13
Cost accounting (cost centers)	17.19	27.61
Financial measures	37.50	63.43
Customer satisfaction indicators	15.63	15.67
Human resource indicators	10.94	14.93
Productivity and quality indicators	20.31	20.90
Target costing	4.69	11.19
Throughput accounting	0	1.49

**Table 13.** Diffusion of Management Accounting Tools in Companies Investing/Not Investing in R&D.

	Not investing (%)	Investing (%)
Activity-based costing	13.25	18.17
Variance analysis	59.04	63.26
Balanced scorecard	8.43	11.30
Benchmarking	3.61	6.96
Budget	56.63	67.83
Simple cost accounting (no cost centers)	24.10	19.61
Cost accounting (cost centers)	21.69	26.09
Financial measures	44.58	62.61
Customer satisfaction indicators	13.87	14.78
Human resource indicators	10.84	15.65
Productivity and quality indicators	19.28	21.74
Target costing	6.02	11.30
Throughput accounting	0	1.74

*Industry*

“Industry” is usually adopted to define and summarize the environmental characteristics in which a company operates. The diffusion of management control systems and managerial tools is closely linked to the specific industry, especially in the past (Khandwalla, 1972, 1977).

However, the empirical data reproduced in Table 14 shows no structural and significant differences between different manufacturing sectors. In fact, we found no clear and consistent trends in any sector. For instance, we noted the highest percentage of diffusion of budget and variance analysis in the lumber, wood, and furniture sector, but, at the same time, financial indicators are applied less frequently than in other sectors. In addition, the chemical industry has the highest percentage of diffusion of the balanced scorecard, but at the same time, a low percentage of ABC.

In summary, we noted no clear relationships between management accounting tools and the industries we monitored.

The only generalizations that the preceding empirical data suggests are the following:

- budget, variance analysis, and financial indicators are the most frequently adopted tools in each sector;
- simple cost accounting (without cost centers) is widespread especially in metallurgic companies, whereas cost accounting is mainly implemented in the paper and textile sectors;
- ABC is adopted in most electronics companies, whereas in the tap and valves sector, no firms confirm the use of explicit activity-based techniques.

### *Internationalization*

This subsection focuses on company internationalization and its potential links with management accounting systems.

Specifically, as regards the Piedmont region, the degree of internationalization was quantified only by using the “foreign customers” variable; the most recent studies indicate that more than 57% of Piedmont companies have foreign customers, while foreign relationships are very rare in purchasing and investment (Barberis, Iano, & Lanzetti, 2007).

Companies were divided in two groups according to the presence/absence of foreign customers.

The qualitative results demonstrate, as summarized in Table 15, that the diffusion of managerial tools is higher in companies with a higher number of foreign customers among their loyal customers. Moreover, the empirical evidence shows a significant difference in ABC, balanced scorecard, target costing, and non-financial indicators. In other words, the presence of foreign customers seems to be positively correlated especially to “innovative” managerial tools.

**Table 14.** Diffusion of Management Accounting Tools by Industry.

	Textile (%)	Food and Beverage (%)	Paper (%)	Chemical (%)	Electronics (%)	Lumber Wood (%)	Mechanical (%)	Metallurgic (%)	Taps and Valves (%)
Activity-based costing	5.88	18.18	10.00	6.25	42.86	20.00	10.45	22.22	0
Variance analysis	52.94	63.64	40.00	56.25	57.14	100	61.19	55.56	38.46
Balanced scorecard	5.88	9.09	0	25.00	0	20.00	10.45	11.11	7.69
Benchmarking	0	4.55	10.00	6.25	0	20.00	5.97	11.11	7.69
Budget	64.71	54.55	60.00	62.50	57.14	80.00	67.16	44.44	38.46
Simple cost accounting (no cost centers)	17.65	18.18	30.00	43.75	28.57	40.00	17.91	66.67	7.69
Cost accounting (cost centers)	47.06	18.18	40.00	25.00	0	20.00	25.37	22.22	23.08
Financial measures	52.94	63.64	80.00	81.25	28.57	40.00	56.72	22.22	53.85
Customer satisfaction indicators	5.88	31.82	10.00	31.25	14.29	40.00	11.94	11.11	23.08
Human resource indicators	5.88	18.18	20.00	31.25	14.29	20.00	11.94	22.22	15.38
Productivity and quality indicators	11.76	27.27	20.00	43.75	28.57	20.00	19.40	22.22	30.77
Target costing	0	0	10.00	6.25	0	20.00	13.43	22.22	7.69
Throughput accounting	0	0	0	0	0	0	0	22.22	0



**Table 15.** Diffusion of Management Accounting Tools in the Presence/Absence of Foreign Customers.

	Without (%)	With (%)
Activity-based costing	7.14	14.79
Variance analysis	55.36	59.86
Balanced scorecard	5.36	11.97
Benchmarking	1.79	7.04
Budget	46.43	69.72
Simple cost accounting (no cost centers)	21.43	23.94
Cost accounting (cost centers)	10.71	29.58
Financial measures	48.21	57.75
Customer satisfaction indicators	3.57	20.42
Human resource indicators	8.93	15.49
Productivity and quality indicators	10.71	24.65
Target costing	5.36	10.56
Throughput accounting	0	1.41

**Table 16.** Diffusion of Management Accounting Tools by Foreign Customer Percentage.

	Up to 10%	From 10 to 50%	More than 50%
Activity-based costing	6.00	16.67	23.68
Variance analysis	46.00	68.52	65.79
Balanced scorecard	10.00	14.81	10.53
Benchmarking	6.00	1.85	15.79
Budget	68.00	68.52	73.68
Simple cost accounting (no cost centers)	30.00	20.37	19.05
Cost accounting (cost centers)	34.00	29.63	23.68
Financial measures	42.00	68.52	63.16
Customer satisfaction indicators	18.00	18.52	31.58
Human resource indicators	20.00	12.96	13.16
Productivity and quality indicators	26.00	31.48	13.16
Target costing	8.00	9.26	15.79
Throughput accounting	0	1.85	2.63

The second step we implemented focused only on companies with foreign customers. Companies were divided in three groups: low level of foreign customers (up to 10% of total sales of revenue), medium level (from 10 to 50% of total sales revenue), and high level (over 50% of total sales revenue). The results we obtained (Table 16) show an increasing trend in ABC, target costing, and customer satisfaction indicators; whereas we noted a negative

trend in cost accounting and simple cost accounting. In other words, these trends indicate the following considerations:

- the higher the percentage of foreign customers, the higher the adoption of target costing and activity-based costing;
- the higher the percentage of foreign customers, the lower the diffusion of traditional cost accounting, both with and without cost centers;
- the higher the percentage of foreign customers, the higher the implementation of customer satisfaction indicators.

A possible explanation can be ascribed to the competitiveness that these kinds of companies have to face. By also operating in foreign markets, which are more open than domestic markets, these companies have to adopt managerial techniques oriented to jointly optimizing efficiency and effectiveness. Cost control techniques are required in this context, but are not sufficient to maintain and acquire competitiveness, whereas cost management tools become crucial.

In conclusion, as previously stated, a quantitative statistical analysis needs to confirm, through a qualitative statistical approach, the relationships we discerned between contingency variables and management accounting tools.

#### *Contingency Factors: Quantitative Analysis*

This section describes the impact of contingency variables on management accounting system through two quantitative analyses. More specifically, we applied a correlation analysis and a regression analysis.

In the first analysis, we calculated the Bravais–Person correlation index ( $r$ ) and the determination index ( $R^2$ ) with the following formulae:

$$r = \frac{\text{Codev}(x, y)}{\sqrt{[\text{Dev}(x) \text{Dev}(y)]}}$$
$$R^2 = \frac{[\text{Codev}(x, y)]^2}{\text{Dev}(y)}$$

where “ $x$ ” is the contingency element and “ $y$ ” refers to the managerial tools.

The second analysis focused on the dependence among the variables. In detail, managerial tools were identified as the dependent variable, whereas contingency factors were identified as the independent variable. In other words, we presupposed a one-way cause–effect relationship between

contingency factors and managerial accounting tools: the former can influence the adoption of the latter, but not vice versa.

Subsequently, the  $\beta$  coefficient was calculated through binary regression analyzing both a single independent variable and all the independent variables. In fact, using the previous instruments (qualitative analysis and correlation indices) we ascertained only the presence (or lack) of a link between a single managerial tool and a single contingency element. However, a firm can be seen as a system constituted by a set of related elements. The study of specific contingency elements in isolation can lead to erroneous conclusions (Fisher, 1998; Chenhall, 2003; Malmi & Brown, 2008). Therefore, we implemented both single-variable and multi-varied regression analyses.

As regards the diffusion of management accounting tools, a dummy variable was used in this analysis: 0 in the absence and 1 in the adoption of the managerial instrument.

The following three tables summarize the quantitative results obtained.

The correlation analysis, summarized in Table 17, suggests that size (in terms of both revenue and number of employees) is clearly correlated with both traditional managerial tools (budget, variance reporting, cost accounting, financial indicators) and with “innovative” instruments (ABC, balanced scorecard, productivity indicators, and human resource measures).

Moreover, the higher the number of product codes, the higher the diffusion of innovative tools, such as ABC and the balanced scorecard. Similarly, these two managerial techniques are positively correlated to the percentage of graduate employees: this suggests that a company with a high level of managerial culture and a high level of operational complexity is inclined toward the implementation of innovative management accounting systems.

As regards complexity, Table 17 highlights that number of suppliers correlates with benchmarking, throughput accounting, balanced scorecard, and customer satisfaction indicators, and unlike this variable, number of customers is only correlated with customer satisfaction measures.

Moreover, the correlation index suggests that training expenditure is correlated with the adoption of quality and productivity indicators, human resource measures, ABC, benchmarking, and balanced scorecard. In addition, the correlation analysis shows a high positive correlation between target costing and R&D investments.

As regards “internationalization,” the empirical results confirm the preceding observations: the implementation of “innovative” tools (more specifically, ABC, target costing, and balanced scorecard) and customer

**Table 17. Bravais-Pearson Correlation Index ( $r$ ) and Determination Index ( $R^2$ ).**

	Activity- Based Costing	Variance Analysis	Balanced Scorecard	Benchmarking	Budget	Simple Cost Accounting	Cost Accounting	Financial Measures	Customer Satisfaction Indicators	Human Resources Indicators	Product and Quality Indicators	Target Costing	Throughput Accounting
Revenue	0.358**	0.183**	0.363**	0.065	0.219**	-0.139	0.327**	0.264**	0.082	0.411**	0.144*	0.011	0.054
Number of employees	0.129	0.034	0.132	0.004	0.048	0.019	0.108	0.070	0.003	0.169	0.021	0.004	0.003
Number of product codes	0.304**	0.190**	0.440**	0.163*	0.204**	-0.128	0.309**	0.235**	0.067	0.529**	0.189**	-0.043	0.012
Number of suppliers	0.093	0.036	0.194	0.027	0.042	0.016	0.096	0.056	0.002	0.280	0.036	0.032	0.000
Percentage of graduate employees	0.209**	0.069	0.222**	-0.015	0.056	-0.039	-0.041	0.068	-0.030	-0.020	0.165*	-0.015	0.013
Number of customers	0.044	0.005	0.049	0.000	0.003	0.002	0.002	0.005	0.001	0.000	0.027	0.000	0.000
Number of suppliers	0.096	0.114	0.226**	0.200**	0.144*	-0.109	0.017	0.144*	0.385**	0.168*	0.108	0.081	0.302**
Number of customers	0.009	0.013	0.051	0.040	0.021	0.012	0.000	0.021	0.014	0.028	0.012	0.056	0.091
Percentage of graduate employees	-0.035	-0.019	0.002	0.026	-0.041	0.041	-0.072	-0.068	0.422**	-0.028	0.061	-0.003	0.039
Training expenditure	0.001	0.000	0.000	0.001	0.002	0.002	0.005	0.005	0.178	0.001	0.004	0.000	0.002
R&D expenditure	0.288**	0.114	0.322**	-0.002	0.110	0.002	0.045	0.087	0.087	-0.063	0.001	-0.044	0.085
Foreign customers	0.084	0.013	0.104	0.000	0.012	0.000	0.002	0.008	0.041	0.004	0.000	0.000	0.007
Training expenditure	0.204**	-0.069	0.247**	0.330**	0.099	-0.029	0.113	0.200**	0.088	0.222**	0.155*	0.111*	0.046
R&D expenditure	0.042	0.005	0.061	0.109	0.010	0.001	0.013	0.040	0.008	0.049	0.024	0.012	0.002
Foreign customers	0.102	-0.040	-0.043	-0.004	-0.043	-0.127	0.068	-0.004	-0.099	-0.019	-0.036	0.745**	-0.014
Training expenditure	0.010	0.002	0.002	0.000	0.002	0.016	0.005	0.000	0.010	0.000	0.015	0.555	0.000
Foreign customers	0.484**	0.011	0.320**	0.109	0.203	-0.228	0.194	0.169	0.325**	0.012	0.089	0.393**	0.057
Training expenditure	0.436	0.101	0.494	0.023	0.218	0.106	0.098	0.153	0.588	0.280	0.081	0.344	0.022

\*\*  $p < 0.01$ ; \*  $p < 0.05$ .

satisfaction indicators is positively affected by the “weight” of foreign customers.

Tables 18 and 19 show the results of the binary regression analysis. As in the correlation analysis, we noted two clear relationships between ABC and, respectively, managerial culture (the percentage of graduate employees) and company complexity (in terms of number of product codes). Moreover, the adoption of the balanced scorecard and benchmarking appear clearly correlated with the percentage of graduate employees.

In addition, the multi-varied analysis highlights a cause-effect relationship between training expenditure and the adoption of “innovative” tools, specifically, the balanced scorecard, benchmarking, and human resources measures. In other words, the empirical data demonstrates that a growing use of innovative managerial techniques is positively influenced by an increasing level of managerial skills within the organization. In this context, training and re-training courses can increase the level of managerial skills among employees.

Lastly, as already highlighted in the correlation analysis, we noted a clear dependence between research and development investments and the use of target-costing techniques. Similarly, empirical evidence suggests links between companies operating especially in foreign markets and the use of activity-based techniques and customer satisfaction indicators.

## CONCLUSIONS AND OUTLOOK

Management control systems, whose main aim is to help managers achieve goals in line with those of their organization, are a necessary element in all firms. However, management control systems, and specifically management accounting systems, are not consistently used in companies. In fact, companies with similar features adopt different managerial tools; moreover, most small and medium firms do not use these instruments at all.

Focusing on the contingency-based framework, this paper analyzes the diffusion of management accounting systems in Italian manufacturing firms and the role of contingency variables. The results we obtained through a specific questionnaire-based survey highlight the following considerations on the diffusion of management accounting tools in Italian manufacturing companies.

Management control rules are widespread in most Italian companies, even if there is a gap between medium-large and small firms. In fact, in the former, managerial tools are applied in a higher percentage of firms.

**Table 18.** Binary Regression Coefficient ( $\beta$ ) – Single-Variable Analysis.

	Activity- Based Costing	Variance Analysis	Balanced Scorecard	Benchmarking	Budget	Simple Cost Accounting	Cost Accounting	Financial Measures	Customer Satisfaction Indicators	Human Resource Indicators	Product and Quality Indicators	Target Costing	Throughput Accounting
Revenue	0.008*	0.003*	0.010*	0.000*	0.000	0.000	0.000	0.109*	0.000	0.000	0.000	0.006	0.000
Number of employees	0.007*	0.009	0.013*	0.011*	0.004	0.013	-0.008	0.009*	0.002	0.019*	0.004	-0.003	0.001
Number of product codes	0.340*	0.221	0.000	0.000	0.000	0.000	0.124	0.330*	0.000	0.000	0.001*	0.000	0.000
Number of suppliers	0.000	0.001	0.001	0.001	0.001	0.001	-0.001	0.000	0.002*	0.001	0.000	0.000	0.001*
Number of customers	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004*	0.000	0.000	0.000	0.000
Percentage of graduate employees	0.415*	0.033	0.321*	0.409*	0.045*	0.004	0.098	0.201	0.063	0.003	0.104	0.002	0.043
Training expenditure	0.138	-0.047	0.227*	0.166*	0.215*	0.089	-0.025	0.077	0.064	0.151*	0.106	0.124	0.083
R&D expenditure	0.052*	-0.017	-0.002	-0.034	-0.004	-0.018	-0.081	0.030	-0.075	-0.084	-0.019	0.531*	0.030
Foreign customers	0.207*	0.002	0.113*	0.013	0.009	-0.024	0.044	0.078	0.389*	0.016	0.011	0.165*	0.038

\*  $p < 0.05$ .

**Table 19. Binary Regression Coefficient ( $\beta$ ) – Multi-Variated Analysis.**

	Activity- Based Costing	Variance Analysis	Balanced Scorecard	Benchmarking	Budget	Simple Accounting	Cost Accounting	Financial Measures	Customer Satisfaction Indicators	Human Resources Indicators	Product Quality Indicators	Target Costing	Throughput Accounting
Revenue	0.000*	0.000	0.000	0.000	0.000	0.000	0.000	0.001*	0.000	0.000	0.000	0.000	0.000
Number of employees	0.006	0.007	0.005	0.011*	0.006	0.008	-0.003	0.006	-0.005	0.019*	0.004	-0.001	-0.007
Number of product codes	0.000*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001*	0.000	0.000
Number of suppliers	-0.001	0.000	0.001	0.001	0.001	0.001	-0.001	0.000	0.001	0.001	0.000	0.001	0.002
Number of customers	-0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004*	-0.001	0.000	0.000	0.000
Percentage of graduate employees	0.718*	0.459	0.429	0.750*	0.022	0.397	0.069	0.886	0.266	0.295	0.058	0.903	0.326
Training expenditure	0.096	-0.104	0.223*	0.138	0.220*	0.065	0.027	0.039	0.133	0.204*	0.110	0.112	0.055
R&D expenditure	0.124*	-0.004	-0.029	-0.008	-0.040	-0.027	-0.082	0.033	-0.081	-0.151	-0.011	0.534*	0.014
Foreign customer	0.155*	0.015	0.042	0.031	0.066	0.008	0.019	0.37	0.045*	0.019	0.005	0.080	0.014

\*  $p < 0.05$ .

In the latter group, we noted that the implementation of management accounting systems is usually seen as a lesser priority than administrative, taxation, and bureaucratic tasks.

Similarly, the organizational structure plays a significant role in the diffusion of managerial tools: small companies with an elementary organizational structure, without decentralized power and management by objectives, show a lower percentage of adoption than companies with functional or divisional structures.

A further important factor in the diffusion of management accounting systems is the internal culture: companies characterized by bureaucratic or entrepreneurial styles show low levels of adoption of managerial tools, whereas we noted a clear positive correlation between managerial instruments and companies with an internal managerial culture. In particular, we ascertained a positive correlation between these instruments and the presence of graduate employees.

The above-mentioned empirical evidence confirms the results of previous research concerning the diffusion of managerial instruments (Chenhall, 2003; Speckbacher & Wentges, 2007): size, organizational structure, and managerial culture are clearly linked to the use of management control systems. Moreover, according to the study of the two aforementioned Austrian scholars, a gap exists between small and medium–large companies: in the former, managerial tools are often used only to draw up the financial statement (for instance, for inventory evaluation); in the latter group, managers use them for operational and strategic decisions. As regards small companies, we also noted an evident gap between small growing companies and small stable firms: only the former implement managerial techniques. This confirms Davila's results (2005) on the relationship of cause and effect between company growth and the adoption of formal management control systems.

As regards the environmental context, and more specifically industry features, our study does not corroborate previous studies (Khandwalla, 1972, 1977). In fact, the empirical data shows no explicit correlation between companies belonging to a specific industry and the use of a specific managerial tool. Market globalization and increasing competitiveness, in global and in local markets, narrow the gap between companies and, therefore, the difference in the implementation of managerial techniques. In other words, in the current setting, the adoption of management control logics is becoming an inevitable choice for firm survival.

Moreover, empirical evidence highlights the high influence of the “internationalization” factor in the diffusion of management accounting



systems. In particular, we noted that companies numbering foreign customers among loyal customers demonstrate a higher percentage of diffusion of managerial tools, especially “innovative” instruments and non-financial indicators, than companies trading only in local markets do. In other words, these results are in line with [Khandwalla's study \(1977\)](#) concerning environmental characteristics. In fact, in a setting connoted by high levels of competitiveness, companies need an internal system to monitor also, and mainly, non-financial elements (customer satisfaction, quality, timeliness) in order to keep their current customers and, consequently, maintain their competitiveness.

Focusing on management accounting systems, the empirical evidence shows that traditional managerial tools are the most common in Italian companies, whereas only medium-large companies adopt “innovative” techniques. These results are in line with [Arena et al. \(2004\)](#), [Abdel-Maksoud et al. \(2005\)](#), and [Lucianetti's \(2006\)](#) studies of Italian companies. From a cultural point of view, the aforementioned phenomenon could be ascribable to the high level of uncertainty avoidance, a typical feature of Italian culture. This element curbs firm development. In fact, the attitude of Italian companies toward “innovative” managerial tools (and generally toward innovation) is often negative in the early stages.

Moreover, the data we obtained highlights that Italian companies measure their performance only with financial indicators, whereas only large companies systematically use non-financial indices. In addition, we noted an increasing level in the adoption of customer satisfaction indicators and productivity indices, whereas, as already observed by [Abdel-Maksoud et al. \(2005\)](#) and [Lucianetti \(2006\)](#), human resources measures are the least implemented. This allows us to affirm that Italian companies do not consider human resource as a crucial element of their strategies. Moreover, implementation of the balanced scorecard was only found in a small number of companies. Therefore, we can state that Italian companies perceive the importance of non-financial variables, especially from a strategic perspective, but do not yet consider the cause-effect relationship between the variables they monitor.

As regards contingency factors, empirical data indicates the following considerations:

- traditional managerial tools (budget, variance analysis, financial indicators, cost accounting) are positively correlated to company size: the larger the size, the higher the diffusion;
- ABC appears to be correlated with company size and company complexity. Moreover, there is a positive link between the presence of

graduate employees and the adoption of this technique. We also noted a positive correlation between ABC and companies trading in foreign markets. In fact, the higher the percentage of foreign customers, the higher the ABC adoption;

- similarly, the balanced scorecard is widespread, especially in medium–large companies, in firms characterized by high levels of complexity, managerial culture, and in organizations trading especially in foreign markets;
- the higher the number of suppliers and customers (the higher the complexity), the higher the diffusion of customer satisfaction indicators. Moreover, we noted a clear link with the “weight” of foreign customers;
- the implementation of human resource measures appears correlated with company size, in particular to the number of employees;
- the implementation of productivity indicators is positive correlated with the number of product lines implemented;
- target costing is applied in companies investing in research and development. Empirical evidence also highlights a positive correlation with companies trading in foreign markets and companies with a divisional structure.

In conclusion, although this study confirms the relationship between management accounting tools and traditional contingency variables, such as size, organizational structure, and operational complexity, we are aware that other contingency variables that we did not analyze, for instance the level of technology or the type of strategy, can affect the management accounting structure. In addition, this study did not extend the use of these tools–decision-making or control – to the organizations. Future research needs to investigate these issues.

“Internationalization,” in this exploratory study, highlights a cause–effect link between “innovative” managerial instruments (such as ABC, target costing, and balanced scorecard) and the increasing weight of foreign customers. However, the definition of internationalization only through foreign customers can be a limitation in capturing the broader meaning of internationalization itself. Therefore, the aim for future research will be to focus on a wider set of elements defining the level of internationalization. More specifically, we will investigate the impact of collaborations, joint ventures, technology exchanges, and direct investments in foreign trade and their link to the diffusion of management accounting systems.

## NOTES

1. This paper is the result of the joint work of the authors. However, the "Introduction" and the "Methodology" are ascribed to Andrea Turolla, whereas the other sections are ascribed to Paolo Carengo.
2. The AIDA database is developed and published by Bureau Van Dijk and offers information on the financial performance of over 200,000 Italian companies.
3. Italian Standard Industrial Classification (Ateco) codes: from D15 to D36.
4. All data available from the authors on request.

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## REFERENCES

- Abdel-Maksoud, A., Cerbioni, F., & Ricceri, F. (2005). Indicatori di performance, tecnologie avanzate e pratiche di management accounting nelle imprese manifatturiere italiane. *Budget* (41), 41–63.
- Alnestig, P., & Segerstedt, A. (1996). Product costing in ten Swedish manufacturing companies. *International Journal of Production Economics*, 46–47, 441–457.
- Anderson, S. W., & Lanen, W. (1999). Economic transition, strategy and the evolution of management accounting practises: The case of India. *Accounting, Organizations and Society*, 24, 379–412.
- Anthony, R. N. (1956). *Planning and control systems*. Harvard: Harvard University, Division on Research Graduate School of Business Administration.
- Anthony, R. N., Dearden, J., & Vancil, R. F. (1965). *Management control systems*. Homewood, IL: Irwin.
- Arena, M., Azzone, G., & Caimi, N. (2004). I sistemi di controllo di gestione nelle imprese italiane: Diffusione e determinanti. *Budget* (38), 47–56.
- Ask, U., & Ax, C. (1992). *Trends in the development of product costing practices and 3techniques. A survey of the Swedish manufacturing industry*. Working Paper, Annual Congress of EAA, Madrid.
- Baird, K. M., Harrison, G. M., & Reeve, R. C. (2004). Adoption of activity management practices: A note on the extent of adoption and the influence of organizational and cultural factors. *Management Accounting Research*, 15(4), 383–399.
- Banker, R. D., Potter, G., & Schroeder, R. G. (1993). Reporting manufacturing performance to workers: An empirical investigation. *Journal of Management Accounting Research*, 3, 34–55.

- Barberis, R., Iano, F., & Lanzetti, R. (2007). *PMI piemontesi e mercato mondiale: flussi di approvvigionamento e di fornitura*. Quaderno di ricerca no. 207. Torino: Ires Piemonte.
- Belkaoui, A. R. (1999). The degree of internationalization and the value of the firm: Theory and evidence. *Journal of International Accounting, Auditing & Taxation*, 8(1), 189–196.
- Bhimani, A., Gosselin, M., Ncube, M., & Okano, H. (2007). Activity-based costing: How far have we come internationally? *Cost Management* (May/June), 12–17.
- Brownell, P. (1985). Budgetary systems and the control of functionally differentiated organizational activities. *Journal of Accounting Research*, 23, 502–512.
- Buran, P. (1999). *Piemonte oltre il 2000. Uno scenario di tendenze e nodi problematici*. Quaderno di ricerca no. 90. Torino: Ires Piemonte.
- Burns, T., & Stalker, G. (1961). *The management of innovation*. London: Tavistock.
- Burns, W. J., & Waterhouse, J. H. (1975). Budgetary control and organizational structure. *Journal of Accounting Research* (Autumn), 177–203.
- Chapman, C. S. (1997). Reflection on a contingent view of accounting. *Accounting Organizations and Society*, 22, 189–205.
- Chenhall, R. (2003). Management control system design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting Organizations and Society*, 28(2–3), 127–168.
- Chenhall, R., & Langfield-Smith, K. (1998). Adoption and benefits of management accounting practices: An Australian study. *Management Accounting Research*, 9, 1–19.
- Child, J., & Mansfield, R. (1973). Technology, size and organizational structure. *Sociology*, 6, 369–393.
- Ciambotti, M. (2001). *L'influenza dei fattori culturali sul controllo manageriale*. Trieste: Lint.
- Clarke, P. J. (1992). *Management accounting practices and techniques in Irish manufacturing firms*. Working paper, Annual Congress of EAA, Madrid.
- Corbetta, P. (1999). *Metodologia e tecnica della ricerca sociale*. Bologna: Il Mulino.
- Cormick, M., Cooper, W. D., & Wilson, J. B. (1988). How do companies analyze overhead. *Management Accounting*, 69(12), 158–175.
- Davila, A. (2005). An exploratory study on the emergence of management control systems: Formalizing human resources in small growing firms. *Accounting Organizations and Society*, 30, 223–248.
- Dekker, H., & Smidt, P. (2003). A survey of the adoption and use of target costing in Dutch firms. *International Journal of Production Economics*, 84(3), 293–305.
- Dunk, A. S. (1992). Reliance on budgetary control, manufacturing process automation and production sub-unit performance: A research note. *Accounting Organizations and Society*, 17(3/4), 185–239.
- Drury, C., & Tayles, M. (1995). Issues arising from surveys of management accounting practice. *Management Accounting Research*, 6(3), 267–280.
- Ezzamel, M. (1990). The impact of environmental uncertainty, managerial autonomy and size of budget characteristics. *Management Accounting Research*, 1, 181–197.
- Ferrero, V., Lanzetti, R., Marchi, A., Resegotti, R., & Vitelli, M. (2007). *Gli investimenti diretti all'estero delle imprese piemontesi: tendenze, strategie e risultati*. Quaderno di ricerca no. 208, Ires Piemonte, Torino.
- Fisher, J. G. (1998). Contingency theory, management control systems and firm outcomes: Past results and future directions. *Behavioural Research in Accounting*, 10, 47–57.
- Fletcher, R. (2001). A holistic approach to internationalization. *International Business Review*, 10(1), 25–49.

- Foster, G., & Horngren, C. (1988). Flexible manufacturing systems: Cost management and cost accounting implications. *Journal of Cost Management* (fall), 16–24.
- Galbraith, J. (1973). *Designing complex organizations*. Reading, MA: Addison Wesley Publishing Company.
- Goold, M., & Quinn, J. J. (1990). The paradox of strategic controls. *Strategic Management Journal*, 11(1), 43–57.
- Gosselin, M. (1997). The effects of strategy and organizational structure on the adoption and implementation of activity-based costing. *Accounting Organizations and Society*, 22(2), 105–122.
- Granlund, M., & Lukka, K. (1998). Towards increasing business orientation: Finnish management accountants in changing cultural context. *Management Accounting Research*, 9, 185–211.
- Guilding, C., Cravens, K. S., & Tayles, M. (1998). Contabilità direzionale strategica: tre esperienze a confronto. *Amministrazione & Finanza Oro*, (4).
- Haldma, T., & Lääts, K. (2002). Contingencies influencing the management accounting practises of Estonian manufacturing companies. *Management Accounting Research*, 13, 379–400.
- Hartmann, F. (2000). The appropriateness of RAPM: Towards the further development of theory. *Accounting Organizations and Society*, 25(4–5), 451–482.
- Hayes, D. C. (1977). The contingency theory of managerial accounting. *The Accounting Review* (January), 22–39.
- Hill, G. (1988). Corporate control type, strategy, size and financial performance. *Journal of Management Studies*, 25(5), 403–417.
- Hiromoto, T. (1988). Another hidden edge. Japanese management accounting. *Harvard Business Review*, 66(4), 22–26.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. London: Sage.
- Hoque, Z., & James, W. (2000). Linking balanced scorecard measures to size and market factors: Impact on organizational performance. *Journal of Management Accounting Research*, 12, 1–17.
- Horovitz, J. H. (1979). Strategic control: A new task for top management. *Long Range Planning*, 12, 2–7.
- Imoisili, O. A. (1985). *Task complexity, budget style of evaluating performance and managerial stress: An empirical investigation*. Pittsburgh, PA: University of Pittsburgh.
- Kajüter, P., & Kulmala, H. I. (2005). Open-book accounting in networks. Potential achievements and reasons for failures. *Management Accounting Research*, 16(2), 179–204.
- Kalagnanam, S. S., & Lindsay, R. M. (1999). The use of organic models of control in JIT firms: Generalizing Woodward's findings to modern manufacturing practices. *Accounting Organizations and Society*, 24(1), 1–30.
- Khandwalla, P. N. (1972). The effect of different type of competition on the use of management controls. *Journal of Accounting Research*, 10(2), 275–285.
- Khandwalla, P. N. (1977). *Design of organizations*. New York: Harcourt Brace Jovanovich.
- Langfield-Smith, K. (1997). Management control systems and strategy: A critical review. *Accounting Organizations and Society*, 22(2), 207–232.
- Lanzetti, R., & Mutinelli, M. (1998). *L'internazionalizzazione produttiva dell'industria piemontese*. Quaderno di ricerca no. 96. Torino: Ires Piemonte.
- Lawrence, P., & Lorsch, J. (1967). *Organization and environment*. Homewood, IL: Irwin.

- Lombardi Stocchetti, G. (1996). *Il controllo di gestione nella piccola impresa*. Milano: Egea.
- Lucianetti, L. (2006). Le misure di performance delle aziende manifatturiere italiane: Prime evidenze empiriche. *Budget* (48), 59–79.
- Luft, J., & Shields, M. D. (2003). Mapping management accounting: Graphics and guidelines for theory-consistent empirical research. *Accounting, Organizations and Society*, 28(2–3), 169–249.
- Lukka, K., & Granlund, M. (1998). Cost accounting: Prima “tappa” in Finlandia. *Amministrazione & Finanza Oro* (2), 6–32.
- Malmi, T., & Brown, D. A. (2008). Management control systems as a package – Opportunities, challenges and research directions. *Management Accounting Research*, 19(4), 287–300.
- Merchant, K. (1984). Influences on departmental budgeting: An empirical examination of a contingency model. *Accounting Organizations and Society*, 9(4), 291–307.
- Merchant, K. (1985). Budgeting and the propensity to create budgetary slack. *Accounting Organizations and Society*, 10(2), 201–210.
- Merchant, K. (1990). The effects of financial controls on data manipulation and management myopia. *Accounting Organizations and Society*, 15, 297–313.
- Moore, K., & Yuen, S. (2001). Management accounting systems and organizational configuration: A life-cycle perspective. *Accounting Organizations and Society*, 26, 351–389.
- Morgan, M. J. (1992). Feed-forward control for competitive advantage: The Japanese approach. *Journal of General Management*, 17(4), 145–159.
- Newman, W. (1975). *Constructive control*. Englewood Cliffs, NJ: Prentice-Hall.
- Otley, D. T. (1980). The contingency theory of management accounting: Achievement and progress. *Accounting Organizations and Society*, 5(4), 413–428.
- Perera, S., Harrison, G., & Poole, M. (1997). Customer focused manufacturing strategy and the use of operations based non-financial performance measures: A research note. *Accounting Organizations and Society*, 22(6), 552–557.
- Reid, G., & Smith, J. (2000). The impact of contingencies on management accounting system development. *Management Accounting Research*, 11(4), 427–450.
- Ruzzier, M., Antoncic, B., & Hisrich, R. D. (2007). The internationalization of SMEs: Developing and testing a multi-dimensional measure on Slovenian firms. *Entrepreneurship and Regional Development*, 19, 161–183.
- Sim, K. L., & Killough, L. N. (1998). The performance effects on complementarities between manufacturing practices and management accounting systems. *Journal of Management Accounting Research*, 10, 325–346.
- Speckbacher, G., Bischof, J., & Pfeiffer, T. (2003). A descriptive analysis on the implementation of balanced scorecards in German-speaking countries. *Management Accounting Research*, 14, 361–387.
- Speckbacher, G., & Wentges, P. (2007). *The impact of firm size and family ownership on management control systems in small and medium-size enterprises*. Working paper, Eiasm 4th Conference on performance measurement and management control, Nice.
- Sulaiman, S., & Mitchell, F. (2005). Utilising a typology of management accounting change: An empirical analysis. *Management Accounting Research*, 16(4), 422–437.
- Tani, T. (1995). Interactive control in target cost management. *Management Accounting Research*, 6(4), 399–414.
- Vergara, C. (2004). *Il contributo della programmazione e del controllo al governo consapevole delle aziende*. Milano: Giuffrè.

- Waterhouse, J. H., & Tiessen, P. (1978). The contingency theory of managerial accounting: A comment. *The Accounting Review* (April), 523–529.
- Woodward, J. (1965). *Industrial organization: Theory and practice*. Oxford: Oxford University Press.
- Yoshikawa, T. (1994). Some aspects of the Japanese approach to management accounting. *Management Accounting Research*, 5(3–4), 279–287.

## APPENDIX A

This appendix indicates a selection of the questionnaire questions submitted to companies: the questions selected are those that are relevant to the research.

### General Information about the Company

(1) Province in which the company is located

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| <input type="checkbox"/> Alessandria | <input type="checkbox"/> Novara   |
| <input type="checkbox"/> Asti        | <input type="checkbox"/> Torino   |
| <input type="checkbox"/> Biella      | <input type="checkbox"/> V.C.O.   |
| <input type="checkbox"/> Cuneo       | <input type="checkbox"/> Vercelli |

(2) Industry

- |  |  |
|--|--|
| <input type="checkbox"/> Food and beverage | <input type="checkbox"/> Lumber and wood |
| <input type="checkbox"/> Textile           | <input type="checkbox"/> Mechanical      |
| <input type="checkbox"/> Paper             | <input type="checkbox"/> Metallurgic     |
| <input type="checkbox"/> Chemical          | <input type="checkbox"/> Taps and valves |
| <input type="checkbox"/> Electronics       |  |

(3) Number of product lines

(4) Number of employees

(5) Number of graduate employees

(6) Revenue (last year – in million Euros)

- Up to 2
- From 2 to 10
- From 10 to 50
- Over 50

(7) Number of suppliers

(8) Number of customers

(9) Foreign customers

- Yes
- No

(10) What is the percentage of foreign customers (in terms of revenue)?

(11) Training and re-training investments (in the last five years)

- Yes
- No

(12) If yes, what is the percentage (in terms of revenue)?

(13) R&D investments (in last five years)

- Yes
- No

(14) If yes, what is the percentage (in terms of revenue)?

(15) Organizational structure

- Elementary
- Functional
- Divisional

### **Information on Management Accounting Systems**

(1) Does the company implement management control systems?

- Yes
- No

(2) Since when has the company implemented management control systems?

- Less than 5 years
- From 5 to 10 years
- From 11 to 15 years
- More than 15 years

(3) What tools does the company use?

- Activity-based costing
- Variance analysis
- Balanced scorecard
- Benchmarking
- Budget
- Simple cost accounting (without cost centers)
- Cost accounting (with cost centers)



- Financial measures
- Customer satisfaction indicators
- Human resource indicators
- Productivity and quality indicators (lead time, etc.)
- Target costing
- Throughput accounting

(4) How often are the tools used?  
(scale: from 1 to 7; 1 = rarely; 7 = often)

- Activity-based costing
- Variance analysis
- Balanced scorecard
- Benchmarking
- Budget
- Simple cost accounting (without cost centers)
- Cost accounting (with cost centers)
- Financial measures
- Customer satisfaction indicators
- Human resource indicators
- Productivity and quality indicators (lead time, etc.)
- Target costing
- Throughput accounting

## APPENDIX B

*Activity-based costing:* This is a costing model that identifies activities in an organization and assigns the cost of each activity to all products and services according to the actual use of each. The measure of the use of a shared activity of each of the products is known as the cost driver (a cost driver is any activity that causes a cost to be incurred).

*Variance analysis:* In budgeting, a variance is the difference between a budgeted, planned, or standard amount and the actual amount incurred/sold. Variances can be computed for both costs (variable and fixed) and revenue.

*The balanced scorecard:* This is a strategic performance management tool jointly measuring financial, customer, internal process, and innovation/learning perspectives. It is usually seen as an instrument panel that jointly monitors financial and non-financial indicators.

*Benchmarking:* This is the process of comparing the cost, cycle time, productivity, or the quality of a specific process (or method) to another that is widely considered as the industry standard or best practice.

*Budget:* Generally refers to a list of all planned expenditure and revenue, investments and financial resources that a company plans for the following period. It contains estimated sales, estimated number of units that must be manufactured and estimated costs, estimated raw materials a company needs to acquire and the estimated cash flow trends.

*Simple cost accounting:* The cost accounting system is characterized by single-basis cost-allocation method and no cost centers.

*Cost accounting:* Cost accounting establishes budget and actual costs of operations, processes, departments or products and the analysis of variances, profitability or social use of funds. Managers use cost accounting to support decision-making, to cut a company's costs and to improve profitability. Costs are usually measured in units called "cost centers."

*Financial measures:* They are the traditional indicators used to monitor company performance. They include ROI, ROE, ROS, ROA, leverage, gross margin, EBIT, EBITDA, earnings per share, etc.

*Customer satisfaction indicators:* They include market share, percentage of loyalty, the number of new customers, the weight of specific customers, the number and type of complaints, etc.

*Human resources indicators:* They focus on human resources measures such as turnover ratio, level of absenteeism, the total number of training, re-training, and updating hours.

*Productivity and quality indicators:* They measure internal efficiency, especially in operational areas. They cover lead-times, number of faults and reprocessing, number of scraps, cost per unit of measure, productivity per unit of measure, cycle time of  $x$  per unit of measure or defects per unit of measure.

*Target costing:* This is a pricing method used by firms that determines the maximum amount of costs that can be incurred on a product and with which the firm can still earn the required profit margin at a particular selling price.

*Throughput accounting:* Conceptually, throughput accounting seeks to increase the speed at which throughput is generated by products and services with respect to an organization's constraints, whether the constraint be internal or external to the organization. Considering the laws of variation, only costs that vary entirely with units of output, for example, raw materials are allocated to products and services that are deducted from sales to determine throughput.



# THE IMPACT OF FIRM CHARACTERISTICS ON ABC SYSTEMS: A GREEK-BASED EMPIRICAL ANALYSIS

Odysseas Pavlatos

## ABSTRACT

*Purpose – The purpose of this paper is to examine the extent to which potential factors affect the use of activity-based costing (ABC) in a service context.*

*Design/methodology/approach – An empirical survey was conducted on a sample of 112 leading hotels enterprises in Greece.*

*Findings – Results show that the use of ABC is positively associated with business strategy and with chief financial officer's (CFO) educational background. In addition, ABC is negatively associated with CFO age. No association was found between the use of ABC and the quality of information technology, membership of multinational chain, and CFO tenure.*

*Research limitations/implications – This research was limited to the Greek hotel sector. Cross-sectional studies as the work presented here can establish associations, but not causality.*

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*Originality/value – This paper adds to the limited body of knowledge of the design of cost systems in a service context (service cost system design). Specifically, this paper adopted a contingency approach and used empirical analysis to identify the influence of specific organizational variables and CFOs characteristics on the use of ABC in service firms. The operational homogeneity of hotels enables powerful tests of the research hypotheses.*

## INTRODUCTION

Over the past three decades a number of innovative management accounting (MA) techniques have been developed across a range of industries. MA literature suggests that the “new” techniques have affected the whole process of MA (planning, controlling, decision making, and communication) and have shifted its focus from a “simple” or “naive” role of cost determination and financial control (CDFC), to a “sophisticated” role of creating value through improved deployment of resources (Abdel-Kader & Luther, 2008).

The contingency theory literature indicates that factors such as technology and environment affect the design and functioning of organizations (Covaleski, Dirsmith, & Samuel, 1996). Its central theme is that there is no unique best structure to all organizations under all circumstances; instead each organizational structure is a response to a set of contingencies. A company’s accounting system is a significant element of its organizational structure and the particular features of an appropriate system will depend upon the circumstances that the company faces (Otley, 1980). The literature shows that important characteristics (contingencies) affecting organizational structure include size, environmental uncertainty, production technology, corporate strategy, and market environment (Otley, 1995; Covaleski et al., 1996; Mitchell, 2002).

Activity-based costing (ABC) is considered to be one of the most important innovations in the field of cost and MA (Bjornenak & Mitchell, 1999; Bjornenak, 1997). Both traditional and ABC systems vary in their level of sophistication but, as a general rule, traditional systems tend to be simplistic, mainly because they are inexpensive to operate, make extensive use of arbitrary cost allocations, have a low level of accuracy and high cost or errors (see Al-Omiri & Drury, 2007, for a review). The optimal cost system is different for different organizations and is dependent on various contextual factors (Cooper, 1988).

Since the mid-1990s, researchers have started to examine the contextual factors that influence the adoption and the implementation of ABC (see Gosellin, 2007, for a review). According to Al-Omiri and Drury (2007) virtually all of this research has concentrated on the factors influencing the adoption or non-adoption of ABC systems. This research has generally been inconclusive and has been unable to establish strong links between the adoption of ABC and those contextual factors that have been identified in the literature and are conducive to the adoption of ABC systems. According to Al-Omiri and Drury (2007) two possible reasons may account for this situation. First, there may be no relations between the constructs of interest and thus any significant findings may have been spurious and not reproducible. Second, the methods adopted by previous research may have fatal flaws relating to poor measures, measurement error, and bias. The lack of consistent findings from previous research suggests that there is a need for continuing empirical research on this topic.

Chenhall (2003) reports that there is a need for more research into service organizations about cost system design and contextual variables, as these entities become increasingly important within most economies. Evidence about cost accounting and its use in tourism enterprises and especially in hotels is rather limited (Pellinen, 2003). However, there is an active interest in hospitality management and particularly in cost and MA practices of hotels and tourism enterprises (Pavlatos & Paggios, 2009a, 2000b; Guilding, 2003; Harris & Brown, 1998). Potter and Schmidgall (1999) assume that little innovation has occurred in hospitality cost and MA tools and there are many issues that deserve research attention. However, in recent years, important empirical research in MA for hotels and tourism has been published (Harris & Mongiello, 2006).

The purpose of this study is to examine the extent to which potential factors affect the use of ABC. I focus on the firm characteristics and on the characteristics of the organization's chief financial officer (CFO) to explain the use of ABC in a service context. This paper provides the first empirical evidence of the relation between ABC and contingent factors in hotels.

This study extends prior research on the following: First, it has provided additional insights into areas relating to factors influencing the use of ABC in services. Second, the operational homogeneity of hotels enables powerful tests of the research questions. In contrast, prior studies relied predominantly on small-sample field studies in diverse industries (e.g., Shields, 1995; Swenson, 1995).

The remainder of the paper is organized as follows. Literature Review section briefly sets out the review of the literature. The research hypotheses

are presented in Nypotheses Development section. The next section analyzes the research methodology. Research Findings section presents the survey results. Conclusions, limitations, and implications for future research are presented in the final section.

## LITERATURE REVIEW

The key concept in contingency-based research has been that of fit, whereby contextual factors and aspects of an accounting system must somehow fit together for an organization to be effective (Al-Omiri & Drury, 2007). Drazin and Van de Ven (1985) identify three forms of fit relating to structural contingency theory – the selection, interaction, and systems approaches (see Chenhall & Chapman, 2006, for a review). The former examines the relationship between contextual factors and organization structure without examining whether this context–structure relationship affects performance. In contrast, the interaction approach seeks to explain variations in organizational performance from the interaction of organizational structure and context. Thus, only certain designs are expected to give high performance in a given context, while different approaches are expected to give lower performance. Given that organizations are assumed to have varying degrees of fit the task of the researcher is to show that a higher degree of fit between context and structure is associated with higher performance.

As far as MA control systems research is concerned, the vast majority of studies have adopted the selection approach to fit (Chenhall, 2003; Luft & Shields, 2003). In this approach, characteristics of the accounting system represent the dependent variable. Accounting researchers have justified the selection approach based on the assumption that rational managers are unlikely to use accounting systems that do not assist in enhancing performance (Chenhall, 2003). Where the interaction approach to fit has been adopted, with a measure of organizational performance as the dependent variable, outcome measures such as satisfaction or usefulness of the management control system have been widely used as proxy measures of desired organizational performance.

Various survey-based studies use selection and interaction approaches (e.g., Bjornenak, 1997; Gosselin, 1997; Krumwiede, 1998; Malmi, 1999; Clarke, Thorley, & Stevens, 1999; Hoque, 2000; Cagwin & Bouwman, 2002; Abernethy, Lillis, Brownell, & Carter, 2001). Malmi (1999), Innes and Mitchell (1995), and Chenhall and Langfield-Smith (1998) report

associations between environmental uncertainty and the adoption of ABC. Bjornenak (1997), Innes and Mitchell (1995), and Krumwiede (1998) noted that organizations that face more competition tend to adopt ABC. Bjornenak (1997), Malmi (1999), and Krumwiede (1998) demonstrated that firms with more product diversity adopted ABC, while Krumwiede (1998) associated the complexity of the production process with ABC adoption and implementation. Bjornenak (1997) found that cost structure was positively associated with the adoption of ABC systems. He argued that companies with high overhead costs were among the first adopters of ABC, as compared to companies with total value added costs (direct labor and overheads). Many field studies and surveys have demonstrated that ABC is more frequent within large organizations rather than smaller ones (Innes, Mitchell, & Sinclair, 2000; Pierce & Brown, 2004; Bjornenak, 1997; Innes & Mitchell, 1995). Clarke et al. (1999) have shown that there is a tendency for subsidiaries of multinational to adopt ABC.

Moreover, Gosselin (1997) reported that centralization is associated with the implementation of ABC among firms that have adopted activity management (AM) approaches. These approaches are broken down into three levels: activity analysis, activity cost analysis, and ABC. Strategy was also another determinant of the adoption of ABC reported in Baines and Langfield-Smith (2003). Gosselin (1997) also found a significant association between competitive strategy and the adoption of an AM approach. He reported that prospectors are more likely to adopt one of the three AM approaches, followed by analyzers and defenders.

In addition, some researchers suggested that the influence of contextual and organizational factors depends on the stage of the innovation process (see Gosellin, 2007, for a review). Krumwiede (1998) used the six stages (initiation, adoption, adaptation, acceptance, routinization, and integration) proposed by Cooper and Zmud (1990) in the management information system literature, while Gosselin (1997) used the four stages taken from the innovation literature (Hage, 1980). Baird, Harrison, and Reeve (2003) reported an association between the stages of AM and size, decision usefulness of cost information and culture dimension of innovations.

According to Gosselin (1997) and Krumwiede (1998), the ABC studies based on a selection approach to fit have used bivariate statistics to examine whether the differences between adopters and non-adopters were statistically significant. In cases where the contextual variables are related to each other there is a danger that spurious relationships may be reported. Al-Omiri and Drury (2007) report that there is a need for tests to be undertaken using higher-powered multiple regression statistical tests that



express the unique contribution of each variable by systematically controlling for the impact of other variables in the model. For this purpose they used multiple regression statistical tests and found that the level of cost sophistication is positively associated with the importance of cost information, environment, size, and extent of the use of JIT/lean production techniques. No association was found between the level of cost system sophistication and cost structure, product diversity, and quality of information technology.

Kaplan and Cooper (1998) suggest that service companies are ideal candidates for ABC even more than manufacturing companies. Berts and Kock (1995) propose that ABC is suitable for market-oriented sectors such as the hospitality industry.

The development of uniform accounting systems (and uniform costing systems) is by no means a recent trend. For many years a significant hospitality accounting development has been the publication of uniform accounting systems for the key sector of the industry, notably hotels, restaurants, and clubs in the United States, while their first appearance for hotels traces back to 1926 (Harris & Brown, 1998). The *Uniform System of Accounts for the Lodging Industry* (USALI), now in its 10th edition, has become the industry standard, particularly for the large hotel businesses and international and global chains in Europe and the United States (Harris & Brown, 1998). It relates effectively to the operating characteristics of hotels and it is based on departmental accounting principles, reflecting the fact that rooms, food and beverage, and other services are produced in departments rather than in production lines, as in the case of manufactured products.

Studies in cost and MA applied in the lodging industry have been conducted both in tourism management as well as accounting. They cover various aspects of tourism industry. Apparently, however, most of the studies have focused on hotels (Harris & Brown, 1998). Aforementioned research covers the whole field of cost and MA.

As far as hotels are concerned, there are studies on cost structure and cost systems. Brignall (1997) concludes that most hotels have a high proportion of fixed cost with approximately three-quarters of the total cost of a hotel being fixed and uncontrollable. The room department has a fixed cost (mainly department wages and salaries) of 15–20% in relation to its sales volume, and a considerable lower proportion of variable costs (laundry, dry cleaning, domestic supplies, etc.). Hotel food and beverage operations carry relatively high fixed costs (mainly kitchen and restaurant wages) as well as high variable costs (food and beverage costs and energy). High fixed costs

mean high contribution margins and this, in turn, means that each addition to total revenue results in a substantial rise in net profit (Kotas, 1997).

Within the hospitality context ABC has been studied in connection with customer profitability analysis (CPA). In particular, Dunn and Brooks (1990), Noone and Griffin (1999), Karadag and Kim (2006), and Harris and Krakhmal (2008) implement CPA in an ABC context. Noone and Griffin (1997) propose that ABC is the most effective and accurate costing method for CPA in a hotel environment. They also suggest that overhead cost should be identified and then allocated to the respective market segment. There are certain types of customers that consume far more costs than others, with the longer the stay, the lower the overhead costs per room night incurred (i.e., check in and out costs).

Nevertheless, the use of ABC in the hotel industry is limited (Tai, 2000) with an informal survey by Graham (quoted in Tai, 2000) identifying no hotels in Europe to have adopted this approach. Tai interviewed a range of industry personnel in order to identify the reasons for this and found that, although there was considerable knowledge of the theory of ABC, there was a low understanding of how it might be used in hotels (Burgess & Bryant, 2001). Despite the aforementioned results, Pavlatos and Paggios (2009b) found that ABC diffusion in hospitality industry in Greece is considered very satisfactory. The survey revealed that only 23.5% of the hotels have adopted ABC, while 74.5% of the sample (65 firms) reported not to. In addition, Pavlatos and Paggios (2009c) found that hotels that have adopted ABC, apply it throughout all the core areas of MA, especially in pricing decisions and customer's profitability analysis. The non-adopters reported that the main reason for rejecting it is the satisfaction of the existing cost accounting system and the high cost of the ABC implementation.

This study expands prior research on the following: First, the research was restricted to including only service organizations. Prior research regarding the investigation of the factors that influence the use of ABC has been mainly related to large manufacturing companies (Sharma, 2002). Chenhall (2003, 2007) reported that there is a need for further research in service organizations (such as hospitality and tourism) about cost system design and contingent factors, as these entities become increasingly important within most economies. Finally, I have tested this model only to a particular service industry, the hotel industry. The operational homogeneity of hotels enables powerful tests of the research questions and hypothesis to be performed.

## HYPOTHESES DEVELOPMENT

### *Chief Financial Officer (CFO) Characteristics*

Research indicates that accountants differ in the extent to which they are open to MA innovation and take initiatives to improve operational and strategic decision-making processes (Hopper, 1980; Burns & Baldvinsdottir, 2005; Emsley, 2005). Studies that discuss the role of financial managers (CFOs, controllers, management accountants) in organizations generally argue that financial managers are, to some extent, reluctant to take a proactive role in managing the organization and prefer to see their own role as that of a relatively independent “watchdog” (Hopper, 1980; Pierce & O’Dea, 2003; Emsley, 2005). The literature proposes that demographic variables provide good proxies for underlying cognitive and affective characteristics that determine managers’ decision making and are therefore predictive of organizational outcomes (Hambrick & Mason, 1984; Finkelstein & Hambrick, 1996). In addition, Naranjo-Gil and Hartmann (2006, 2007) show that top management team characteristics are related to the design and use of management accounting systems (MAS).

Concerning age, several studies have examined the relationship between managers’ age and innovativeness and generally observe a negative relationship (e.g., Young, Charns, & Shortell, 2001). This is commonly attributed to the negative association between age and dynamic lifestyle, and age’s declining effect on cognitive capabilities and energy levels (Finkelstein & Hambrick, 1996). Older managers are less able to evaluate new ideas quickly and to integrate them effectively in decision making. As age increases, flexibility decreases and rigidity and resistance to change increase (Wiersema & Bantel, 1992). Concerning MAS, older CFOs will have had more traditional accounting education, and will have spent most of their career in a traditional function in which professional independence and bookkeeping were key performance variables (Hopper, 1980; Granlund & Lukka, 1998). Younger CFOs on the other hand, will have entered the profession more recently, and therefore have a greater chance of being familiar with contemporary MAS environments during their education.

Many studies that have found a negative effect of manager age on management control systems (MCS) have also found a negative effect of managers’ tenure in the organization (e.g., Wiersema & Bantel, 1992; Boeker, 1997; Young et al., 2001). Thus, managers who have spent a substantial part of their career in organizations are likely to have developed a power basis, social networks, and work routines that they do not want to put at risk, even

if they believed that innovation and change would be in the interest of the organization (Wiersema & Bantel, 1992; Finkelstein & Hambrick, 1996; Young et al., 2001).

Concerning educational background, literature suggests that the educational background of managers affects their decision processes (Wiersema & Bantel, 1992; Finkelstein & Hambrick, 1996). Moreover, Emsley, Nevicky, and Harrison (2006) found that management accountants' professional development is associated with the degree to which they initiate accounting innovations. Furthermore, Davila (2005) reports that the educational level of the CEO has been positively related with the use of formal MA systems.

Reflecting the discussion above, I test the following hypotheses:

- H1a.** There is a negative association between the CFO age and the use of activity-based costing.
- H1b.** There is a negative association between the CFO tenure and the use of activity-based costing.
- H1c.** There is a positive association between the CFO relatively business-oriented educational background and the use of activity-based costing.

### *Strategy*

Considerable attention has been paid to incorporating strategy as a contingent factor of the MAS design (e.g., Langfield-Smith, 1997; Gerdin & Greve, 2004). Three generic taxonomies have been employed in studying the strategy–MAS relationship: Miles and Snow's (1978) prospectors/analysts/defenders model, Gupta and Govindarajan's (1984) build/hold/harvest model, and Porter's (1980) product differentiation/cost-leadership classification. Arguably these taxonomies are not significantly different and can be reconciled with prospectors/builders/product differentiators at one end of a continuum and defenders/harvesters/cost-leaders at the other end. The literature (e.g., Langfield-Smith, 1997; Chenhall, 2003) suggests that certain types of MAS will be more suited to particular strategies. Empirical evidence indicates that strategies of defend/harvest/cost-leadership do not require sophisticated information systems, while those of prospect/build/product differentiate do (Langfield-Smith, 1997; Chenhall, 2003). Abernethy and Guthrie (1994) found that sophisticated MAS has a more positive effect on performance in firms that adopt a prospector strategy than in firms that adopt a defender strategy. Furthermore, Gosselin (1997) report that the type

of strategy an organization selects establishes the need for innovation in the AM area and the adoption of AM level.

Therefore, the following hypothesis is tested:

**H2.** Firms following a differentiation strategy use more activity-based costing than firms following a cost-leadership strategy.

### *Quality of Information Technology*

Massive investments in information technology have given rise to concerns about its contribution to the organization (McKeen & Smith, 1993). This has encouraged researchers to investigate situations within which extensive investments in information technology are likely to be most effective. Recently, it has been recognized that firms are faced with the challenge of integrating information technology into accounting practices (Olsen & Cooney, 2000).

The notion that there are important links between MA systems and information technology has been widely suggested (Chapman & Chua, 2000; Ittner & Larcker, 2001; Chenhall, 2003). As yet there is not much empirical evidence of the link between MA systems and information technology. Olsen and Cooney (2000) suggest that data warehousing has influenced the practice of accounting but the relationships were not tested empirically. As pointed out by Olsen and Cooney (2000), data warehouses are valuable for making market projections and investigating potential new markets, as well as performing dysfunction analysis regarding sales of particular items and the work of individual salespeople.

A recent study by Granlund and Malmi (2002) examined the effects of integrated, enterprise-wide information systems on MA. Their findings indicate that enterprise resource planning systems projects have led to relatively small changes in MA and control procedures. The literature investigates the relationship between ERP systems and different aspects of MA. To provide some examples, Booth, Matolcsy, and Wieder (2000) investigate tasks, and Quattrone and Hopper (2005) investigate the organization of MA, while Dechow and Mouritsen (2005) investigate the use, perceptions, and enactment of ERP systems.

Cooper (1988) report that the chosen level of cost system sophistication should be made on costs versus benefits criteria. Sophisticated costing systems become more beneficial as the cost of data collection and processing is reduced. The level of information technology can thus play an important role in influencing CMS design. The measurement cost associated with

using additional cost drivers depends on whether the data required by that driver are already available or have to be specifically determined. According to Al-Omiri and Drury (2007) organizations with high-quality information systems can provide detailed data that are easy to access relating to the cost driver information that is needed by more sophisticated costing systems. Companies with shared databases that track the detailed operational data needed for resource and activity analysis have an easier time implementing and maintaining a more sophisticated costing system to support decision needs.

Therefore, the following hypothesis is tested:

**H3.** There is a positive association between the quality of information technology the use of activity-based costing.

#### *Membership of Multinational Chain*

Prior studies have found positive associations between structural determinants and cost system design (Pizzini, 2006; Pavlatos & Paggios, 2009a). One of these structural variables is the hotel membership. Lawrence (1990) argues that firms that are members in multinational chains are more likely to attain higher performance. This is attributed to the fact that they can attract more capable managers, share knowledge across facilities, negotiate shared purchase agreements with suppliers, obtain quantity discounts, and negotiate more favorable labor contracts. Such enterprises will probably need more sophisticated ABC systems, which provide qualitative cost data. Therefore, the following hypothesis is tested:

**H4.** There is a positive association between the membership of multinational chain and the use of activity-based costing.

## **RESEARCH METHODOLOGY**

### *Sample Characteristics and Data Collection*

The sample surveyed included the leading Greek hotel enterprises. The criteria used for the selection of the hotels were their sales revenues for the year 2008. Hotels were selected from the ICAP's Directory 2007 (Gallup's subsidiary in Greece). The cut-off point for the sales revenues was €3.5 m.

The research was realized in two phases. In the first phase, a participation form was sent to the selected companies accompanied by a cover letter, which included a brief reference of the main goals of the study. CFOs were asked to indicate the type(s) of cost accounting practice(s) used by their hotels, as well as to fill in correspondence information in order to address the survey questionnaire, in case they were interested. In the second phase of the research, the survey questionnaire was designed and sent to the sampled hotels. Before the finalization of the questionnaire, a pilot test took place, with a group of managers and management accountants to refine the design and focus of the survey. More specifically, interviews were conducted with six chief accountants who had a long experience in cost and MA practices in order to make sure that the questionnaires' content was easy to understand. Three of them have had a long experience in hospitality accounting environment. Through this testing we managed to account for omissions or vagueness in the expressions used to formulate the questions.

The participation form was sent to 196 hotel companies and 132 of them responded positively in the first phase of the survey (67% response rate). Respondents were asked to complete the questionnaire from the perspective of the firm where they were employed. The companies that did not show interest in the research provided various reasons why they did not participate, such as lack of time and the fact that answering questionnaires was not one of their top priorities. Following, the questionnaire was sent to those hotels that completed the participation forms. 112 completed questionnaires were finally received during the second phase of the survey. The response rate was 57%.

Tests for non-response bias were performed to determine (a) whether the distribution of the 196 organizations in the response ( $n = 112$ ) or non-response ( $n = 84$ ) categories was independent of available demographic characteristics (sales revenues, number of beds, category, geographical area, management status), and (b) whether early and late respondents provided significantly different responses. Chi-square tests indicated no significant differences in the demographic characteristics. The Hotelling's  $T^2$  statistic also indicated no significant differences in the multivariate means of early versus late respondents.

The questionnaires were answered by CFOs that have firm knowledge of the cost accounting information used within their companies. Thus, I believe that the answers are reliable.

The financial, geographical, and company characteristics for the final sample of hotel enterprises are shown in [Tables 1 and 2](#).

**Table 1.** Category, Geographical Area, Management Status, and Type of Hotels that Participated in the Survey.

	<i>N</i>	%
Categories		
5 stars	39	34.8
4 stars	65	58
3 stars	8	7.2
Geographical area		
Athens	22	19.6
Crete	32	28.6
Aegean islands	29	25.9
Ionian islands	15	13.4
Macedonia	9	8
Other	5	4.5
Company management status		
Private company	58	51.8
Member of national chain	35	31.2
Member of multinational chain	19	17
Type of hotel		
Resort	42	37.5
City hotel	70	62.5

**Table 2.** Descriptive Statistics of the Variables in the Study.

Variable	<i>N</i>	Mean	Standard Deviation	Actual Minimum	Actual Maximum
Size (€ m)	112	10.1	11.4	3.5	101
Number of beds	112	637.4	319.5	205	1,671
CFO age	112	48.30	3.24	35	62
CFO tenure	112	9.24	2.21	2	14
CFO educational background	112	0.77	0.05	0.65	1
Quality of information technology	112	26.14	4.13	14	36
Strategy	112	0.28	0.52	-1	+1

### *Variable Measurement*

#### *CFO Characteristics*

“CFO characteristics” were measured as demographics, following the Upper Echelons tradition (Hambrick & Mason, 1984) and used by Naranjo-Gil,



Maas, and Hartmann (2009). Age (AGE) and tenure (TEN) refer to the CFO age and tenure in the organization, respectively. Regarding educational background (EDUC), managers were asked to indicate their educational degrees, both regular university degrees and postgraduate programs. I translated these into years of education in one of two directions: business-oriented (e.g., business, economics, accounting, law) or operations-oriented (e.g., medicine, nursing, biology, chemistry). Then, I created the variable educational background as the ratio of the years of business-oriented education to the total number of education years. Descriptive statistics for CFO characteristics are presented in Table 2.

#### *Strategy (STRA)*

“Strategy” was measured by Govindarajan and Fisher (1990) and used by Abdel-Kader and Luther (2008). Respondents were asked to indicate the percentage of their firms’s total sales accounted for by products representing use of either cost-leadership or differentiation. The overall cost-leadership was assigned a value of  $-1$  and a differentiation strategy was assigned a value of  $+1$ . Then the percentage breakdown a respondent provided for each item was used to construct a weighted-average strategy measure for the company. Descriptive statistics for strategy are presented in Table 2.

#### *Quality of Information Technology (TECH)*

“Quality of information technology” was measured by Krumwiede (1996, 1998) and used by Cagwin and Bouwman (2002) using a six-item five-point Likert scale anchored by (1) “strongly disagree” to (7) “strongly agree,” in which respondents were asked to indicate the extent to which they agree with statements regarding the hotels’ information technology. A factor analysis, as shown in Table 3, revealed that all items were loaded on a single factor with an eigenvalue of 3.928 explaining 67.8% of the variance in the underlying variable. The Cronbach alpha of 0.82 suggests that its internal consistency is satisfactory. Table 2 provides descriptive statistics for the measure.

#### *Membership of Multinational Chain (MULT)*

“Membership of multinational chain” was measured using a binary variable (1 = member, 0 = otherwise). Descriptive statistics for membership of multinational chain are presented in Table 1.

**Table 3.** Factor Analysis of Quality of Information Technology.

Items	Factor Loadings	Eigenvalue	Percent of Variance	Cronbach Alpha
The hotels' information systems (e.g., sales, reservations, etc.) are integrated with each other	0.714			
The information system offers user-friendly query capability	0.812			
The past year's detailed sales and operating data are available	0.792			
Many perspectives of cost and performance data are available	0.718			
Operating data are updated "real time"	0.805			
The quality of your cost management system is excellent	0.814	3.928	67.8	0.82

#### *Use of Activity-Based Costing*

The variable "use of activity-based costing" was measured using a binary (dichotomous) variable by [Chenhall and Langfield-Smith \(1998\)](#) and used by [Kallunki and Silvola \(2008\)](#). Respondents were asked to respond "yes" or "no" to the question of whether their firm was using an ABC system. I have chosen the same measure of the use of the ABC that has been used in earlier studies (e.g., [Chenhall & Langfield-Smith, 1998](#); [Gosselin, 1997](#); [Bjornenak, 1997](#); [Malmi, 1999](#)) to reduce potential response error described by [Dillman \(1999\)](#). ABC has been actively discussed in the Greek business literature and the media since it was originally suggested, and it is as commonly known in Greece as it is in other countries, where this measure has been used. In our sample, 26% (29 firms) of the respondents answered that they were currently using ABC, which is at the same rate if compared to that reported in earlier studies (e.g., [Kallunki & Silvola, 2008](#)).

[Table 4](#) provides a correlation matrix of the independent variables in the study. None of the correlation coefficients are high (no correlation exceeds 0.30 in absolute value), suggesting that multicollinearity is not an issue ([Lewis-Beck, 1990](#)).

Construct validity was tested primarily using principal component analysis. A confirmatory factor analysis is used to test unidimensionality of the multi-items construct TECH. Principal component analysis on the set of items comprising the scale of quality of information technology (TECH) resulted in a single-factor solution, explaining 67.8% of the total variance, as determined by the scree test, Bartlett's  $X^2$  test on the number of

**Table 4.** Spearman Correlation Matrix for the Independent Variables.

Variable	AGE	TEN	EDUC	STRA	TECH	MULTI	<i>N</i>
AGE	1						112
TEN	0.12	1					112
EDUC	0.15	0.07	1				112
STRA	-0.18	0.12	0.20	1			112
TECH	0.13**	0.15	0.24**	0.04	1		112
MULTI	0.10	-0.09	0.02	0.18	0.21	1	112

\*\*Correlations is significant at the 0.01 level (two-tailed).

factors, and the eigenvalue-greater-than-one rule (Gorsuch, 1983). The Cronbach alpha coefficient was 0.82, which is well above acceptable levels (Nunnally, 1978).

All scales, therefore, exhibited satisfactory levels of construct validity. Combined with content validity of the items and satisfactory measures of reliability, the analyses are supported of scales validity.

## RESEARCH FINDINGS

In order to test the hypotheses specified in Nypotheses Development section, the following model was applied:

$$Y = b_1 + b_2\text{AGE} + b_3\text{TEN} + b_4\text{EDU} + b_5\text{STRA} + b_6\text{TECH} + b_7\text{MULTI} + e$$

where *Y* is a dummy variable having a value of 1 if the firm is using ABC system, otherwise 0. Therefore, binary logistic regression was used and was applied to 112 hotels that have established formal costing systems. The above model contains six independent variables.

Green (1991) proposed a general rule of thumb for determining the minimum sample size to test the  $R^2$  and significance tests on the regression coefficients. He suggested that the minimum sample should be greater than  $50 + 8k$ , where  $k$  is equal to the number of independent variables. Therefore, the sample of 112 respondents exceeds the minimum requirement specified by Green for applying regression models.

Table 5 presents the results of the binary logistic regression. The two final columns of the table present the collinearity statistics. It can be seen that the variance inflation factors are well below the generally accepted critical threshold of 10 (an indication of high levels of multicollinearity) and



tolerances are above 0.2 (represent a more conservative estimate that multicollinearity may be a problem) (Hair, Anderson, Tatham, & Black, 1998).

The variables “CFO educational background” and “Strategy” are positively associated with the use of ABC, and the variable “CFO age” is negatively associated with the dependent variable as expected. The chi-square statistics shown in Table 5 is comparable to the overall  $F$ -statistics in multiple regression. The model is significant at the 0.000 level. The Hosmer and Lemeshow goodness of fit value (0.725) measures the correspondence of the actual and predicted values of the dependent variable. This statistic tests the hypotheses that the observed data are significantly different from the predicted values. Thus, a non-significant statistics indicates that the model does not differ significantly from the undeserved data (Hair et al., 1998). Nagelkerke  $R^2$  (0.55) attempts to quantify the proportion of explained “variation” in the logistic regression model. It is similar in intent to the  $R^2$  in a linear regression model (Norusis, 2000). The final entry in Table 5 indicates that the model correctly classified 84% of the respondents as users and non-users. Exp.  $B$  shown in the final column of Table 5 is an indicator of the change in odds resulting from a unit change in the indicator. Values greater than 1 indicate that as the predictor increases, the odds of the outcome occurring increase; conversely, a value less than 1 indicates that as the predictor increases, the odds of the outcome occurring decrease. This is consistent with the signs of the regression coefficients.

Table 5 also indicates that the following variable is statistically significant: CFO age ( $p < 0.01$ ), CFO educational background ( $p < 0.01$ ), and Strategy ( $p < 0.01$ ). On the contrary, the variables “CFO tenure,” “Membership of multinational chain,” and “Quality of information technology” are not statistically significantly associated with the use of ABC. Thus, we summarize that statistical analysis showed that only H1a, H1c, and H2 hypotheses are supported, while H1b, H3, and H4 are not supported by the data (Table 5).

## CONCLUSION AND DISCUSSION

The analysis of the survey data from 112 leading Greek hotel enterprises indicates that the use of ABC in hotels can be considered quite satisfactory. Twenty-nine of 112 hotels (26%) that participated in our survey currently use ABC. It also indicates that the extent of the use of ABC among Greek firms has increased, in comparison with earlier works (Ballas & Venieris, 1996; Venieris, Zоргios, & Cohen, 2000). Thus, I may

conclude that Greek companies show a growing interest toward ABC in recent years.

Prior research in MA has provided inconsistent findings related to factors influencing the adoption and the use of ABC systems. ABC studies based on a selection approach to fit have used bivariate statistics to examine whether the difference between adopters and non-adopters were statistically significant. [Al-Omiri and Drury \(2007\)](#) report that there is a need for tests to be undertaken using higher-powered multiple regression statistical tests that express the unique contribution of each variable by systematically controlling the impact of other variables in the model. In this study, a logistic regression analysis was used to test the hypotheses.

This study attempted to provide insights into the so-called ABC paradox ([Gosselin, 1997](#)). Despite the fact that academics and management accountants have showed a great deal of interest for ABC ([Bjørnenak & Mitchell, 2002](#)), surveys have revealed that the diffusion process for ABC has not been intense. It is the role of MA researchers to investigate the factors that might influence managers' decisions to adopt and use ABC. This holds true especially for service organizations. According to [Chenhall \(2003, 2007\)](#) there is a need for more research about cost system design and contingent factors in service organizations, as these entities become increasingly important within most economies. This study examines the extent to which different firm characteristics and CFOs characteristics influence the choice of ABC in hotels on the basis of the principle "ABC suits best" ([Anderson & Young, 1999](#); [Bjørnenak, 1997](#); [Innes et al., 2000](#)), using a sample of 112 hotels in Greece.

Evidence was presented to support the acceptance of four of the six hypotheses presented. The use of ABC is significantly associated with CFO characteristics. The survey revealed that the CFO's demographic (age and educational background) are predictors of the CFO's willingness to innovate.

I found that younger CFOs likely use more ABC. This is commonly attributed to the negative association between age and dynamic lifestyle, and age's declining effect on cognitive capabilities and energy levels. Older managers are less able to evaluate new ideas quickly and to integrate them effectively in decision making. In addition, older CFOs have more traditional accounting education and spend most of their career in a traditional function in which professional independence and bookkeeping were key performance variables.

Moreover, CFOs with a more business-oriented background found to be more familiar with the use of ABC and more open to changing existing systems than CFOs whose experience contains a dominant

operational background (e.g., in medicine, nursing, or pharmacy). This is in line with substantial evidence from prior literature, which suggests that the educational background of managers affects their decision processes (e.g., Finkelstein & Hambrick, 1996). CFOs with a business-oriented background are more receptive for institutional pressures to use sophisticated cost systems as their knowledge of these systems makes the apparent solutions that they offer more salient. According to Naranjo-Gil et al. (2009) "Although most CFOs will have received at least some education in the fields of accounting and finance, they will differ with regard to the extent to which their educational career has prepared them for operational work."

The findings indicate that strategy affect the use of ABC. I conclude that firms following a differentiation strategy use more ABC than firms following a cost-leadership strategy. This finding confirms Gosselin (1997), who reported that prospectors were more likely to adopt activity-based management techniques, not only because they had a higher need for these techniques, but also because their focus on flexibility and product innovation made it easier for them to adopt and implement new administrative systems. Prospectors are organizations that continually experiment with innovation. They are organizations that face a more unpredictable and uncertain environment than organizations following a defender strategy. Prospectors have structures that enable them to facilitate and coordinate numerous and diverse operations. Thus, the adoption of innovation would be easier for prospectors than for defenders. Prospectors' needs for information cover a much broader range than defenders due to their quest for product-market opportunities. Thus, they tend to adapt their cost management systems to user needs to a greater extent than defenders.

Interestingly, structural determinants, including membership of multinational chain and CFOs tenure, were not significant variables affecting the use of ABC. It is possible that the questionnaire used too simplistic measures; these measures failed to take into account the precise ways that influence the use of ABC. Moreover, I found that the quality of information technology is not significantly associated with the use of ABC. Thus, the quality of information technology may no longer a barrier to implementing more sophisticated costing systems.

The findings presented in this paper are subject to a number of limitations. Cross-sectional studies as this work presented here can establish associations, but not causality. Another factor that may affect these results is the noisiness of the measures. A mail survey prevents an assessment of the

respondent's actual knowledge of the cost accounting system, although the surveys were mailed to CFOs. A mail survey also prevents the respondent from effectively clarifying his or her understanding of the questions. Furthermore, the sample size was small and we could not split it for validation purposes into analysis and holdout samples. The ABC users group contains a little more than the minimum size of 20 observations required for logistic regression (Hair et al., 1998). Thus, we develop the function on the entire sample and then we use the function to classify the same group used to develop the function. This procedure results in an upward bias in the predictive accuracy of the function, but is certainly better than not testing the function at all. Finally, the use of ABC was operationalized as a binary variable. The use of a Likert scale would probably result in less noise. I have chosen the same measure of the use of the ABC that has been used in earlier studies (e.g., Chenhall & Langfield-Smith, 1998; Gosselin, 1997; Bjornenak, 1997; Malmi, 1999) to reduce potential response error described by Dillman (1999).

The study contributed to the current knowledge in cost and MA practices in hotels. The results provide the first empirical evidence of the relation between the use of ABC, CFOs characteristics and organizational factors in hotels.

This study extends prior research in several ways. First, this paper adds to the limited body of knowledge of the design of cost systems in a service context (service cost system design). While most prior research has focused on ABC in manufacturing firms, this study focuses on a service context and contributes to the meager knowledge that we have about contextual variables that influence the design of ABC systems in service industries. Specifically, this paper adopted a contingency approach and used empirical analysis to identify the influence of specific organizational variables and CFOs characteristics on the use of ABC in service firms. Finally, the operational homogeneity of hotels enables powerful tests of the research questions. In contrast, prior studies relied predominantly on small-sample field studies in diverse industries (e.g., Shields, 1995; Swenson, 1995).

Future research should consider incorporating other important variables that have been omitted from other studies and are likely to influence the use of ABC in a service context. The most notable omitted variables are organizational variables, such as top management support, service process type, organizational life cycle stage, satisfaction of the existing cost accounting system, lack of a perceived need by MA function to develop ABC systems, and lack of relevant employees' skills. Also, the cost



accounting systems of firms that use ABC could be studied in depth in order to examine the perceived benefits and problems that arise from their implementation. Moreover, the use of cost data (budgeting, decision making, and performance evaluation) by hotel enterprises could also be examined, in order to trace possible differences between firms that apply traditional and ABC systems.

## REFERENCES

- Abdel-Kader, M., & Luther, R. (2008). The impact of firm characteristics on management accounting practices: A UK-based empirical analysis. *The British Accounting Review*, 40(1), 2–27.
- Abernethy, M., & Guthrie, C. (1994). An empirical assessment of the “fit” between strategy and management information system design. *Accounting and Finance*, 34(2), 49–66.
- Abernethy, M. A., Lillis, A. M., Brownell, P., & Carter, P. (2001). Product diversity and costing system design: Field study evidence. *Management Accounting Research*, 12(2), 261–280.
- Al-Omiri, M., & Drury, C. (2007). A survey of factors influencing the choice of product costing systems in UK organizations. *Management Accounting Research*, 18(4), 399–424.
- Anderson, S. W., & Young, S. M. (1999). The impact of contextual and process factors on the evaluation of activity based costing systems. *Accounting, Organizations and Society*, 24(3), 459–525.
- Baines, A., & Langfield-Smith, K. (2003). Antecedents to management accounting change: A structural equation approach. *Accounting, Organizations and Society*, 28(7), 675–698.
- Baird, K., Harrison, G., & Reeve, R. (2003). Adoption of activity management practices: A note on the extent of adoption and the influence of organizational and cultural factors. *Management Accounting Research*, 15(4), 383–399.
- Ballas, A., & Venieris, G. (1996). A survey of management accounting practice in Greek firms. In: A. Bhimani (Ed.), *Management accounting: European perspectives* (pp. 123–139). Oxford: Oxford University Press.
- Berts, K., & Kock, S. (1995). Implementation considerations for activity based costing in service firms. *Management Decisions*, 33(6), 57–63.
- Bjornenak, T. (1997). Diffusion and accounting: The case of ABC in Norway. *Management Accounting Research*, 8(3), 3–14.
- Bjornenak, T., & Mitchell, F. (1999). *A study of the development of the activity-based costing journal literature 1987–1998*. Working Paper. University of Edinburgh.
- Bjornenak, T., & Mitchell, F. (2002). The development of activity based costing journal literature, 1987–2000. *The European Accounting Review*, 11(3), 481–508.
- Boeker, W. (1997). Strategic change: The influence of managerial characteristics and organizational growth. *Academy of Management Journal*, 40(1), 152–170.
- Booth, P., Matolcsy, Z., & Wieder, B. (2000). Integrated information systems (ERP systems) and accounting practice – The Australian experience. Paper presented at the 3rd European Conference on Accounting Information Systems, Munich, Germany, March 27–28.

- Brignall, T. (1997). A contingent rationale for cost system design in services. *Management Accounting Research*, 8(3), 325–346.
- Burgess, C., & Bryant, K. (2001). Revenue management – The contribution of the finance function to profitability. *International Journal of Contemporary Hospitality Management*, 13(3), 114–150.
- Burns, J., & Baldvinsdottir, G. (2005). An institutional perspective of accountants' new roles – The interplay of contradictions and praxis. *European Accounting Review*, 14(4), 725–757.
- Cagwin, D., & Bouwman, M. J. (2002). The association between activity-based costing and improvement in financial performance. *Management Accounting Research*, 13(1), 1–39.
- Chapman, C. S., & Chua, W. F. (2000). Technology, organizational form and accounting. 25th Anniversary Conference, Accounting Organization Society, Pergamon, Oxford.
- Chenhall, R. (2003). Management controls systems design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting, Organizations and Society*, 28(1), 127–168.
- Chenhall, R. (2007). Theorizing contingencies in management control systems research. In: C. Chapman, A. Hopwood & M. Shields (Eds), *Handbook of management accounting research*. Amsterdam: Elsevier Ltd.
- Chenhall, R., & Chapman, C. S. (2006). Theorising and testing fit in contingency research on management control systems. In: Z. Hoque (Ed.), *Methodological issues in accounting research: Theories and methods* (pp. 35–54). Oxford: Spiramus Press Ltd.
- Chenhall, R., & Langfield-Smith, K. (1998). The relationship between strategic priorities, management techniques and management accounting: An empirical investigation using a systems approach. *Accounting, Organizations and Society*, 23(1), 243–264.
- Clarke, P. J., Thorley, N., & Stevens, K. (1999). Activity-based costing in Ireland: Barriers to, and opportunities for change. *Critical Perspectives in Accounting*, 10(3), 443–468.
- Cooper, R. (1988). The rise of ABC – Part two: When do I need an ABC system? *Journal of Cost Management*, 1, 41–48.
- Cooper, R. B., & Zmud, R. W. (1990). Information technology implementation research: A technological diffusion approach. *Management Science*, 36(1), 123–139.
- Covaleski, M., Dirsmith, M., & Samuel, S. (1996). Managerial accounting research: The contributions of organizational and sociological theories. *Journal of Management Accounting Research*, 8(1), 1–35.
- Davila, T. (2005). An exploratory study on the emergence of management control systems: Formalizing human resources in small growing firms. *Accounting, Organizations and Society*, 30(1), 223–248.
- Dechow, N., & Mouritsen, J. (2005). Enterprise resource planning systems, management control and the quest for integration. *Accounting, Organization and Society*, 30(7/8), 691–733.
- Dillman, D. (1999). *Mail and internet surveys: The tailored design method*. New York: Wiley.
- Drazin, R., & Van de Ven, A. (1985). An examination of the alternative forms of contingency theory. *Administration Science Quarterly*, 30, 514–539.
- Dunn, K., & Brooks, D. (1990). Profit analysis: Beyond yield management. *The Cornell Hotel and Restaurant Administration Quarterly*, 31(3), 80–90.
- Emsley, D. (2005). Restructuring the management accounting function: A note on the effect of role involvement on innovativeness. *Management Accounting Research*, 16(2), 157–178.

- Emsley, D., Nevicky, B., & Harrison, G. (2006). Effect of cognitive style and professional development on the initiation of radical and non-radical management accounting innovations. *Accounting & Finance*, 46(2), 243–264.
- Finkelstein, S., & Hambrick, D. C. (1996). *Strategic leadership: Top executives and their effects on organizations*. St. Paul, MN: West.
- Gerdin, J., & Greve, J. (2004). Forms of contingency fit in management accounting research – A critical review. *Accounting, Organizations and Society*, 29(3/4), 303–326.
- Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Erlbaum, NJ: Hillsdale.
- Gosellin, M. (2007). A review of ABC: Technique, implementation and consequences. In: C. Chapman, A. Hopwood & M. Shields (Eds), *Handbook of management accounting research* (Vol. 2, pp. 641–672). New York: Elsevier Ltd.
- Gosselin, M. (1997). The effect of strategy and organizational structure on the adoption and implementation of activity-based costing. *Accounting, Organizations and Society*, 22(1), 105–122.
- Govindarajan, V., & Fisher, J. (1990). Strategy, control systems, and resource sharing: Effects on business-unit performance. *Academy of Management Journal*, 33(2), 259–285.
- Granlund, M., & Lukka, K. (1998). Towards increasing business orientation: Finnish management accountants in a changing cultural context. *Management Accounting Research*, 9, 185–211.
- Granlund, M., & Malmi, T. (2002). Moderate impact of ERPS on management accounting: A lag or permanent outcome? *Management Accounting Research*, 13, 299–321.
- Green, S. B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioural Research*, 26, 499–510.
- Guilding, C. (2003). Hotel owner/operator structures: Implications for capital budgeting process. *Management Accounting Research*, 14(1), 177–179.
- Gupta, A., & Govindarajan, V. (1984). Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. *Academy of Management Journal*, 27(1), 25–41.
- Hage, J. (1980). *Theories of organizations: Form, process and transformation*. New York: Wiley.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. G. (1998). *Multivariate data analysis*. New Jersey: Prentice-Hall.
- Hambrick, D. C., & Mason, P. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9, 193–206.
- Harris, P., & Brown, B. (1998). Research and development in hospitality accounting and financial management. *International Journal Hospitality Management*, 17(1), 161–181.
- Harris, P., & Krakhmal, V. (2008). Implementing customer profitability analysis using activity-based costing: A service industry context. In: *Proceedings of the Management Control Association Conference*, Paris, January.
- Harris, P., & Mongiello, M. (2006). *Accounting and financial management: Developments in the international hospitality industry*. Oxford: Butterworth-Heinemann.
- Hopper, T. M. (1980). Role conflicts of management accountants and their position within organisation structures. *Accounting, Organizations and Society*, 5, 401–411.
- Hoque, Z. (2000). Just-in-time production, automation, cost allocation practices and importance of cost information: An empirical investigation in New Zealand-based manufacturing organizations. *British Accounting Review*, 32(1), 33–159.
- Hosmer, D. W., & Lemeshow, S. (1989). *Applied logistic regression*. New York: Wiley.

- Innes, J., & Mitchell, F. (1995). A survey of ABC in UK's largest companies. *Management Accounting Research*, 69(1), 137–153.
- Innes, J., Mitchell, F., & Sinclair, D. (2000). ABC in UK's largest companies: A comparison of 1994 and 1999 survey results. *Management Accounting Research*, 11(2), 349–362.
- Ittner, C. D., & Larcker, D. F. (2001). Assessing empirical research in managerial accounting: A value-based management perspective. *Journal of Accounting Economics*, 32, 349–410.
- Kallunki, J., & Silvola, A. (2008). The effect of organizational life cycle stage on the use of activity-based costing. *Management Accounting Research*, 19(1), 62–79.
- Kaplan, R. S., & Cooper, R. (1998). *Cost and effect: Using integrated systems to drive profitability performance*. New York: Harvard Business School Press.
- Karadag, I., & Kim, W. (2006). Comparing market-segment-profitability analysis with department-profitability analysis as hotel marketing-decision tools. *Cornell Hotel and Restaurant Administration Quarterly*, 47(2), 155–173.
- Kotas, R. (1997). *Management accounting for hotels and restaurants*. London: Blackie Academic and Professional.
- Krumwiede, K. R. (1996). *An empirical examination of factors affecting the adoption of ABC systems*. Dissertation, University of Tennessee.
- Krumwiede, K. R. (1998). The implementation stages of activity-based costing and the impact of contextual and organizational factors. *Journal of Management Accounting Research*, 10(1), 239–278.
- Langfield-Smith, K. (1997). Management control systems and strategy: A critical review. *Accounting, Organizations and Society* (1), 207–232.
- Lawrence, C. H. (1990). The effect of ownership structure and accounting system type on hospital costs. *Research in Governmental and Nonprofit Accounting*, 6, 35–60.
- Lewis-Beck, M. S. (1990). *Applied regression: An introduction*. Newbury Park, CA: Sage.
- Luft, J., & Shields, M. D. (2003). Mapping management accounting practices: Graphics and guidelines for theory-consistent empirical research. *Accounting, Organizations and Society*, 28(1), 169–249.
- Malmi, T. (1999). Activity-based costing diffusion across organizations: An exploratory empirical analysis of Finnish firms. *Accounting, Organizations and Society*, 24(8), 649–672.
- McKeen, J. D., & Smith, H. A. (1993). The relationship between information technology use and organizational performance. In: R. Banker, R. Kauffman & M. A. Mahmood (Eds), *Strategic information technology management: Perspectives on organizational growth and competitive advantage* (pp. 405–444). Harrisburg, PA: Idea Group Publishing.
- Miles, R., & Snow, C. (1978). *Organizational strategy, structure and process*. New York: McGraw-Hill.
- Mitchell, F. (2002). Research and practice in management accounting: Improving integration and communication. *The European Accounting Review*, 11(2), 277–289.
- Naranjo-Gil, D., & Hartmann, F. (2006). How top management teams use management accounting systems to implement strategy. *Journal of Management Accounting Research*, 18, 21–53.
- Naranjo-Gil, D., & Hartmann, F. (2007). Management accounting systems, top management team heterogeneity and strategic change. *Accounting, Organizations and Society*, 32, 735–756.
- Naranjo-Gil, D., Maas, V., & Hartmann, F. (2009). How CFOs determine management accounting innovation: An examination of direct and indirect effects. *European Accounting Review*, 18(4), 667–696.

- Noone, B., & Griffin, P. (1997). Yield management and costumer profitability analysis. *International Journal of Contemporary Hospitality Management*, 9(2), 75–79.
- Noone, B., & Griffin, P. (1999). Managing the long term profit yield from market segments in a hotel environment: A case study of on the implementation of costumer profitability analysis. *International Journal of Hospitality Management*, 18(3), 111–128.
- Norusis, M. J. (2000). *SPSSi<sup>®</sup> 10. 0 guide to data analysis*. New Jersey: Prentice-Hall.
- Nunnally, J. D. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Olsen, D. H., & Cooney, V. (2000). The strategic benefits of data warehousing: An accounting perspective. *Information Strategy: The Executive's Journal, Winter*, 35–40.
- Otley, D. (1980). The contingency theory of management accounting: Achievement and prognosis. *Accounting Organizations and Society*, 4, 413–428.
- Otley, D. (1995). Management control, organisational design and accounting information systems. In: D. Ashton, T. Hopper & R. Scapens (Eds), *Issues in management accounting* (pp. 45–63). London: Prentice-Hall.
- Pavlatos, O., & Paggios, I. (2009a). A survey of factors influencing the cost system design in hotels. *International Journal of Hospitality Management*, 28(2), 263–271.
- Pavlatos, O., & Paggios, I. (2009b). Management accounting practices in the Greek hospitality industry. *Managerial Auditing Journal*, 25(1), 81–98.
- Pavlatos, O., & Paggios, I. (2009c). Activity based costing in the hospitality industry: Evidence from Greece. *Journal of Hospitality & Tourism Research*, 33(4), 511–527.
- Pellinen, J. (2003). Making price decisions in tourism enterprises. *International Journal of Hospitality Management*, 22(3), 217–235.
- Pierce, B., & Brown, R. (2004). An empirical study of ABC systems in Ireland. *Irish Accounting Review*, 11(11), 55.
- Pierce, B., & O'Dea, T. (2003). Management accounting information and the needs of managers: Perceptions of managers and accountants compared. *British Accounting Review*, 35, 257–290.
- Pizzini, M. (2006). The relation between cost-system design, managers evaluations of the relevance and usefulness of cost data, and financial performance: An empirical study of US hospitals. *Accounting, Organization and Society*, 31(2), 179–210.
- Porter, M. (1980). *Competitive strategy*. New York: The Free Press.
- Potter, G., & Schmidgall, R. (1999). Hospitality management accounting: Current problems and future opportunities. *International Journal of Hospitality Management*, 18(5), 387–400.
- Quattrone, P., & Hopper, T. (2005). A 'time-space odyssey': Management control systems in two multinational organizations. *Accounting, Organization and Society*, 30(7/8), 735–764.
- Sharma, D. (2002). The differential effect of environmental dimensionality, size, and structure on budget system characteristics in hotels. *Management Accounting Research*, 13(1), 101–130.
- Shields, M. D. (1995). An empirical analysis of firms' implementation experience with activity based costing'. *Journal of Management Accounting Research*, 7, 1–28.
- Swenson, D. (1995). The benefits of activity-based cost management to the manufacturing industry. *Management Accounting Research*, 7(2), 167–180.
- Tai, H. (2000). *The application of activity based costing in hotel context*. M.Sc thesis, unpublished. Oxford Brooks University, Oxford.

- Venieris, G., Zoraios, Y., & Cohen, S. (2000). Modeling the interrelationships between activity based costing and flexible manufacturing systems. Paper presented at the 23rd Annual Congress of the European Accounting Association, Munich, 29–31 March.
- Wiersema, M. F., & Bantel, K. A. (1992). Top management team demography and corporate strategic change. *Academy of Management Journal*, 35(1), 91–121.
- Young, G. J., Charns, M. P., & Shortell, S. M. (2001). Top manager and network effects on the adoption of innovative management practices: A study of TQM in a public hospital system. *Strategic Management Journal*, 22(10), 935–951.