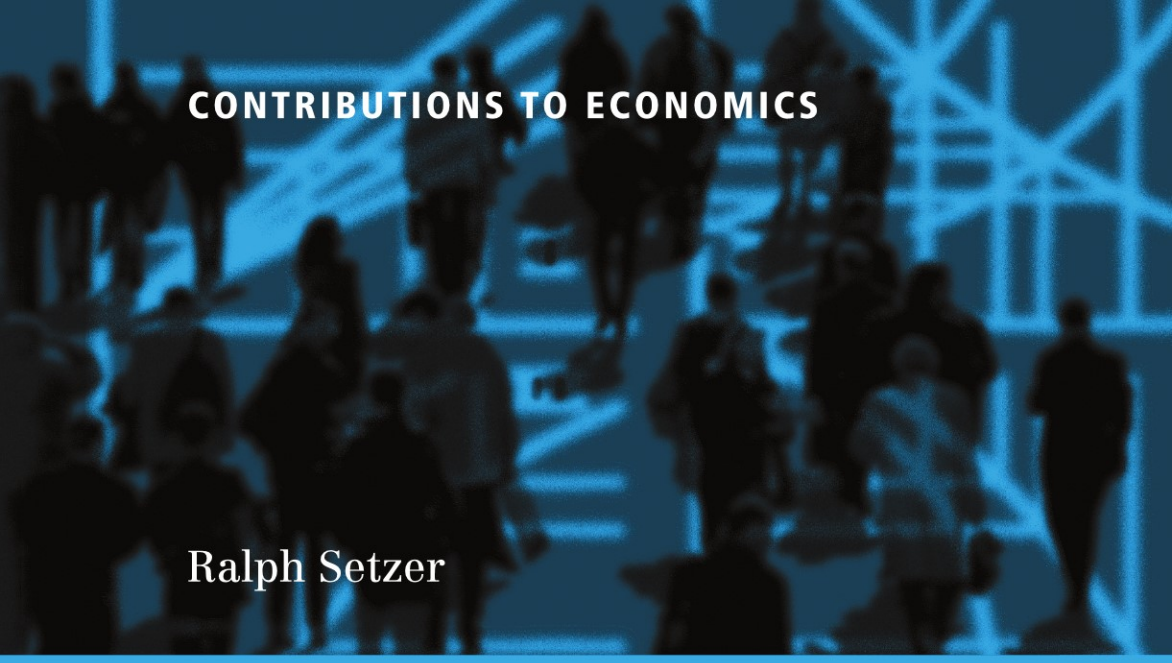

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Ralph Setzer

The Politics of Exchange Rates in Developing Countries

Political Cycles and Domestic Institutions

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February 2006 Ralph Setzer

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List of abbreviations

ADF	Augmented Dickey Fuller
AIC	Akaike information criterion
AR	autoregressive
AREAER	Annual report on exchange rate arrangement and exchange rate restrictions
BIC	Bayes information criterion
CALTECH	California Institute of Technology
CBI	central bank independence
CDP	Center on Democratic Performance
CEEC	Central and Eastern European country
CEPR	Centre for Economic Policy Research
CEPS	Centre for European Policy Studies
CES	Center for Economic Studies
CFA	Communauté Financière Africaine
CIA	Central Intelligence Agency
CID	Center for International Development
CV	critical value
DPI	Database of Political Institutions
ed.	editor
eds.	editors
ECB	European Central Bank
EUI	European University Institute
EMP	exchange market pressure
EMS	European Monetary System
EMU	European Monetary Union
GDP	gross domestic product
GMM	generalized method of moments
IADB	Interamerican Development Bank
IBRD	International Bank for Reconstruction and Development
IMF	International Monetary Fund
IV	instrumental-variable
LM	lagrange multiplier
LR	likelihood ratio

LSDV	least squares dummy variable estimator
LYS	*Levy-Yeyati/Sturzenegger*
Mass.	Massachusetts
MADF	Multivariate Augmented Dickey-Fuller
NAIRU	non accelerating inflation rate of unemployment
NBER	National Bureau of Economic Research
OCA	optimum currency area
OECD	Organisation for Economic Co-operation and Development
OLS	ordinary least squares
PBC	political business cycle
PPP	purchasing power parity
RR	*Reinhart/Rogoff*
sqr	square
SUR	seemingly unrelated regression
TSCS	time series cross section
WDI	World Development Indicator
ZEI	Zentrum für Europäische Integrationsforschung

1 General introduction

1.1 The context

What factors determine a country's exchange rate regime? Since the collapse of the Bretton Woods system of fixed exchange rates in 1973, economists have been increasingly interested in answering this question. Analysts focused primarily on the possible influence of optimum currency area (OCA) criteria, such as a country's size, openness to trade, or factor mobility. More recent approaches emphasized the nature and the sources of shocks to which an economy is exposed or explicitly took imperfections on financial markets into account. However, despite a large body of work, little consensus has emerged about the determinants of exchange rate regime choice. The existing empirical literature could not identify a single variable as a clear predictor of exchange rate regime choice and even among economically comparable countries large discrepancies in exchange rate policy have been observed (see, e.g., the survey on the literature in Juhn and Mauro 2002).

The inconclusiveness of traditional approaches to explain exchange rate regime choice is the stimulus for this dissertation. My main point is that political and institutional conditions help to account for differences in exchange rate policy. In other areas of economic policy, it has become standard to argue that government's macroeconomic preferences are an important determinant in economic policymaking and should not be neglected when analyzing macroeconomic outcomes. For instance, political-economic considerations have been quite successful in explaining trade policy and there are many studies on the political-economic aspects of monetary and fiscal policy. Possibly motivated by the financial crises in the 1990s that caused both economic and political turmoil, some economists have recently directed their attention to how different institutions influence exchange rate regime choice. It is in these studies that political-economic factors become important. Nonetheless, the produced empirical evidence is still scarce. Only a small number of authors, including *William Bernhard, Steven Block, Sebastian Edwards, Barry Eichengreen, Jeffry Frieden, Carsten Hefeker*, and *David Leblang* have highlighted the role of political

factors in exchange rate issues. This is surprising because the exchange rate is a key economic variable. Economic policy objectives such as low inflation, macroeconomic stability, high growth and employment are affected differently by each exchange rate regime. For developing countries (which are at the focus of this study), the exchange rate often plays a more prominent role than the interest rate in the transmission mechanism of monetary policy (Vitale 2003: 836). At the same time, conventional wisdom professes that a good macroeconomic performance, including low inflation, full employment, or high growth, increases the chances of re-election for the incumbent, while bad economic conditions increase the likelihood of a change of government (Lewis-Beck and Stegmaier 2000).[1] Thus, given its strong implications for macroeconomic fundamentals (see, e.g., the study by Eichengreen et al. 1995) and its impact on all other prices in the economy, the question of an appropriate exchange rate regime deserves particular attention by both policymakers and economists.

1.2 The aim of the thesis

The overall objective of this dissertation is to illustrate both theoretically and empirically how domestic political and institutional incentives shape exchange rate policy in developing countries. Questions derived from this objective are the following: What influences the relative value that a country puts on fixed versus floating regimes? Why do governments, during certain episodes, deviate from an officially announced exchange rate regime? How do policymakers' exchange rate preferences change during election periods? Do political parties from the ideological left advocate different exchange rate policies than their more conservative counterparts? Which roles do domestic institutional factors play, such as the type of political regime, the design of monetary policy, or pressures from interest groups in the process of formulating exchange rate policy? The answers to these questions may help provide a better understanding of which factors induce governments to choose certain exchange rate regimes over others and why large differences in exchange rate policy exist among countries with similar economic structures. Specifically, this thesis makes three main propositions that can be summarized as follows:

[1] These reactions are generally explained by the responsibility hypothesis, which states that voters hold the current government responsible for the economic situation.

- The common discrepancy in exchange rate regimes between the officially declared exchange rate policy and the actual behavior of policymakers hinges on political instability and the level of democracy.
- Political, institutional, and interest group factors determine the sustainability of currency pegs.
- Governments have an incentive to appreciate in the pre-electoral period and devalue in the post-election period.

The verification of each proposition requires four steps: First, I explain why politicians have an incentive to manipulate exchange rate policy. Second, I take stock of previous studies on the influence of political-economic factors on exchange rate policy and review them critically. Out of the literature review, I then derive hypotheses to test how politicians influence exchange rate policy. The propositions derived from the theoretical framework are then tested empirically with comprehensive datasets from developing countries.

In order to define an investigation's design, it is also helpful to clarify what one will not do. A first clarification concerns the difference between normative recommendations and reality. The process of deciding what exchange rate policy to adopt from the normative perspective is quite different from the process of analyzing which regime politicians will actually follow. In reality, the selection of an exchange rate regime does not necessarily mean that the best technical regime will prevail. Often exchange rate regime choice is subject to political (rather than economic) goals. Thus, this thesis is not meant to provide any value judgment as to whether a particular exchange rate regime means good policy. It does not directly cover the economic benefits of maintaining a currency peg with regard to growth, employment, or macroeconomic stability. These factors will be addressed only insofar as they impact upon the policymakers' incentive structure or the viability of an exchange rate regime.[2]

This thesis additionally does not attempt to analyze political-economic exchange rate issues in industrial countries. I thereby neglect the important role of political and institutional factors in the preparation of the European Monetary Union. The justification for this restriction is twofold. First, analyses for developing countries differ in many terms from studies on industrial countries. In fact, the heterogeneity between industrial and developing countries may even lead to opposing implications and incentives for policymakers, aggravating a joined cross-country analysis. In terms of economic differences, for instance, a major difference between developing and

[2] For good general work on exchange rate economics see Sarno and Taylor (2002).

industrial economies stems from a distinct relationship between exchange rates and interest rates. Contrary to classic textbooks economics, which argue that high interest rates promote capital imports and lead to an appreciating currency, in developing countries those countries with the greatest credibility problems have the most depreciated currencies and the highest interest rates. In addition, exchange rate volatility entails much higher political costs in developing countries than in industrial countries because hedging is more costly or even impossible. Moreover, exchange rate regime changes appear more often in developing countries than in industrial countries. Finally, when turning to political differences, intuition suggests that considerations surrounding the political economy should be particularly relevant for developing countries where institutional longevity is shorter lived and the system of checks and balances is less pronounced. Even more important, however, in explaining why I ignore exchange rate policymaking in industrial countries is the simple reason that this subject has already been elucidated by a number of authors (see, e.g., Eichengreen 1996; Frieden 1997a, 2002a; Bernhard and Leblang 1999; Hefeker 1997; Freeman et al. 1999; Martin-Das 2002). In contrast, this same research question has attracted much less attention in the study of developing countries.[3]

A third restriction of the research design concerns the methodology applied. In the realm of political economy, a qualitative narrative approach that relies upon anecdotal evidence is quite common. The central element of this approach is to emphasize the peculiarities of single countries or specific episodes of financial turmoil. This dissertation does not follow this methodology. Indeed, there are many studies on the political economy of exchange rate regimes that are richer in country-specific details than this thesis. However, what can be offered in this study is information on how the political and institutional conditions *typically* affect exchange rate policy. For that purpose, a panel of countries are emphasized, allowing me to draw some broader, more systematic conclusions about the power of the relevant political-economic variables in explaining exchange rate regime policymaking.

[3] Many of the points that will be made in the theoretical part of this study apply to both developed and developing countries. However, the dataset used in empirical sections concentrates exclusively on developing nations.

1.3 The structure of the thesis

This thesis is divided into eight chapters, including this introduction. Chapter 2 provides an overview of alternative approaches to the choice of an exchange rate regime. Chapter 3 analyzes why countries often deviate from their officially announced exchange rate regime. Chapters 4 and 5 set the scene for the subsequent empirical analysis on the duration of currency pegs. In doing so, chapter 4 illustrates a costs-benefit analysis of abandoning or maintaining a currency peg, while chapter 5 derives a number of hypotheses concerning the duration of currency pegs. Based on this theoretical framework, chapter 6 tests the hypotheses for a larger panel of developing countries using empirical methods. Chapter 7 investigates the path of the exchange rate surrounding elections and presents empirical evidence for political cycles in the exchange rate. The last chapter concludes and summarizes the results.

In the following, I will provide a brief overview of each chapter's content. Following this introduction, **chapter 2** makes the case for a political-economic consideration of exchange rate policymaking. In addressing this issue, it is essential to recognize what precisely are the costs and benefits of each exchange rate regime. Accordingly, the chapter begins with a short description of the main theoretical arguments regarding the choice of an exchange rate regime: the criteria of the OCA theory, the arguments of the Mundell-Fleming framework, and the more recent contributions of the credibility literature and the bipolar view. The second part of the chapter contrasts the economic view with a political-economic perspective, arguing that exchange rate policy is often made on the basis of largely political goals.

Recent research into exchange rate regimes has found that certain countries announce an exchange rate regime and then renege on it. In other words, the exchange rate regime of many developing countries is either less flexible ("fear of floating") or more flexible ("fear of pegging") than officially announced (Calvo and Reinhart 2000; Levy Yeyati and Sturzenegger 2002). **Chapter 3** identifies domestic institutional factors that influence a country's propensity to renege on its existing exchange rate regime. For this purpose, I follow Alesina and Wagner (2003) (to my knowledge the only empirical study in this field) and use the difference between the official exchange rate regime classification of the International Monetary Fund (IMF) and an alternative behavioral classification of exchange rate regimes as an indicator of the discrepancy between announced

and actual behavior. The aim is to enrich Alesina and Wagner's (2003) analysis with additional institutional data, namely the level of democracy and the degree of political stability. I argue that the magnitude of the political costs of currency devaluations and the associated incentive to deviate from an announced exchange rate regime should be influenced by domestic conditions. The most striking result, corroborated by a number of robustness and diagnostic checks, is that political instability results in an increased fear of pegging, while countries with a stable political environment are more likely to display a fear of floating. In contrast, I found only weak support for the hypothesis that democratic societies have a high incentive to reduce exchange rate uncertainty and should thus display more fear of floating.

In **chapters 4 to 6** I work out the determinants of a country's decision to abandon an existing currency peg and devalue their currency. Why do I focus on currency devaluations rather than on exchange rate regime choice? And, even if one is rooted in currency devaluations, why do I focus only on currency devaluations resulting from the context of a fixed exchange rate regime instead of considering all devaluations? I focus on currency devaluations because historically the exit from currency pegs and the associated sharp losses in a currency's value have been those exchange rate episodes with the strongest political effects. Currency devaluations have often been accompanied by political turbulence and changes in government. Ancient examples of political consequences in the course of devaluations can be found in the Interwar period (see Eichengreen 1996; Simmons 1997) or earlier, during times of the classic gold standard (Bordo 2003). Even today devaluations constitute one of the most controversial policy measures in the developing world. The Argentina crisis in 2001/2002 is a prominent example for this claim. The abandonment of the currency board system was marked by political upheaval and, as a result, five presidents governed the country within one month.[4] Mexico is another case in point. In election years, it typically experiences a severe economic crisis and, as a result, major political turbulence.[5] This rather anecdotal evidence suggests that currency devaluations are important events for political actors. Being aware of that danger, political authorities in countries

[4] See the literature in Setzer (2003) for an overview of the Argentina crisis 2001/2002.

[5] An exception from this "rule" was the last presidential election in 2000. Bussière and Mulder (1999: 4) display the coincidence of elections with exchange rate depreciations for Mexico over the period 1978-1997.

with a currency fix often resist devaluing their currencies even in the face of severe and unsustainable macroeconomic imbalances.[6]

Chapter 4 begins by documenting the fact that political considerations can influence economic policy and the probability of speculative attacks through several different channels. While early work on currency crises considered speculative attacks as the inevitable consequence of an inconsistent economic policy, the more recent literature on currency crises argues that policymakers have some capacity to avoid the abandonment of a currency peg. However, the maintenance of a misaligned currency peg is related to opportunity costs in terms of higher interest rates, loss of foreign reserves, or restrictions on capital flows. Therefore, the existence and the success of a speculative attack do not only depend on the ability of the government to maintain the currency peg, but also on its willingness to accept the related costs. The loss of reserves or increasing unemployment due to rising interest rates do not inevitably lead to the abandonment of a currency rate peg if policymakers show the willingness to pursue necessary reforms (Frieden 1997: 87). This implies that the decision to abandon a peg (or to defend it) depends on policymaker's cost-benefit analysis. If the political costs of devaluing are high and possible long-term economic benefits of the exit are heavily discounted, the peg will be maintained.

Following these theoretical considerations, the second part of chapter 4 is devoted to a survey of previous literature on the political economy of exchange rate regimes in developing countries. Research on this subject has only recently developed; yet, it is increasingly acknowledged among economists that a political-economic perspective is a useful complement to the traditional economic theory on exchange rate regimes and currency crises. Still, very few clear predictions have evolved from this literature.

After having described the pattern of risk that currency pegs face, the goal of **chapter 5** is to explain this pattern from a political-economic perspective. I will make a case for the important role that political, institutional, and interest group factors play in fixed exchange rate regime duration. Specifically, I will derive hypotheses from three broad areas: First, I combine the theory of political cycles with exchange rate policymaking, then I argue that institutional determinants are important to control for. Finally, I emphasize the role of different interest groups.

Political cycles can be classified according to the political motivations of opportunism and ideology. The opportunistic branch of the literature, the political business cycle (PBC) theory, provides the theoretical basis for analyzing exchange rate policy around elections. The voluminous literature

[6] In many cases even when the International Monetary Fund (IMF) recommended countries the move to a more flexible exchange rate arrangement.

on this subject has predominantly emphasized fiscal and monetary policy as the driving force for a PBC. Yet, it will be shown that there are a variety of reasons why opportunistic intervention in exchange rate policy might be attempted (and succeed). Applying the partisan perspective, it is hypothesized that the decision about the abandonment of a currency peg depends on the ideological orientation of the political parties in power. The goal is to highlight the relevant features of political parties that are necessary to discern differences in the exchange rate preferences of different parties. As will become clear, different conclusions about the relationship between political parties and exchange rate policy can be drawn from partisan theory.

A second area of interests involves domestic political institutions. Questions specific to this section are: Does the underlying veto structure influence the sustainability of a fixed exchange rate regime? Which role does central bank independence play? Is democracy or autocracy more compatible with spells of exchange rate stability? What are the implications of political instability for the duration of currency pegs? Some of these issues have not been addressed in the literature so far and thus, the answers to these questions may provide interesting new insights into the political economy of exchange rate regimes.

In a third set of hypotheses, I examine the role of the private sector. I first make a case for interest group pressure on governments to seek to influence exchange rate policy. I then specify the exchange rate preferences of private groups and assess the impact of different constellation of these groups on the duration of currency pegs.

Chapter 6 tests the validity of these hypotheses using a survival analysis approach. I characterize and model the times to abandon a fixed exchange rate regime using a discrete Cox model. Although a number of empirical studies have been concerned with similar questions, this study differs from previous research on this subject in at least three significant ways: First, my sample consists of 49 countries within the time period from 1975 to 2000, and it is thus larger and more diverse than most other studies that have been conducted. This enables me to not only test the structure of one particular theory (as most previous research has done), but allows me to ask, when looking at a large set of data, whether different sets of political and institutional variables systematically influenced the duration of currency pegs in a number of developing countries. While a number of empirical studies already exist, none of them has provided such a comprehensive analysis of a wide array of institutional and political factors. Thus, one of this chapter's innovations is to use a comprehensive set of indicators and test it against the background of the theoretical framework.

The use of a Cox (1972) model in the context of exchange rate regime duration is a second innovation to the literature and establishes greater empirical meaning than standard probit or logit models. Specifically, this method of estimation optimally exploits the data's nature of time dependency; that is, it accounts for the fact that the length of time already spent on a currency peg is an important determinant of the probability of exit into a more flexible exchange rate regime. Another convenient feature of this model is that it allows for time-varying covariates. This means that the model estimates the risk of abandoning an existing currency peg at any point of time as a function of these covariates.

The exit from a currency peg may be orderly, meaning that the monetary authority may undertake such a move when internal and external conditions are favorable, or it may be disorderly, meaning that it is provoked by a speculative attack. My empirical approach differs again from previous studies in that it provides an explicit comparison between the determinants that result in the abandonment of a currency peg and factors that cause speculative attacks (defined as episodes of extreme exchange market pressure). Previous research has analyzed either the likelihood of abandoning a currency peg or the probability of a speculative attack, but not both in the same study or with the same dataset.[7] However, interesting implications can be drawn from a conjoined analysis. For this purpose, the empirical section is split into several parts. First, results of the Kaplan-Meier estimates are presented. This section is purely descriptive and merely serves to identify characterizing patterns in the data. I then proceed with more formal tests of the developed hypotheses based on Cox's (1972) semiparametric approach. Then further evidence on the importance of political and institutional factors is gleaned from an analysis of the determinants of currency crises in exchange rate regimes that involve some kind of nominal exchange rate fixity. In sum, the findings in the empirical analysis are both positive and negative—some of the hypotheses derived are confirmed, others are put into question, and others are deemed spurious or contrary to what has been suggested in theory. The empirical analysis also reveals that a number of (primarily institutional) variables change sign depending on whether one applies the currency peg duration or the speculative attack specification is applied. These results suggest that those factors that lead to an increased likelihood of abandoning a currency peg are not those that increase a country's vulnerability to speculative attacks.

For domestic policymakers, the question of the appropriate exchange rate *regime* deserves attention, as does the *level* of the exchange rate, which may be of strategic importance as well. Specifically, policymakers must

[7] An exception are Eichengreen et al. (1995).

decide whether they prefer a strong or weak currency. Currency appreciations may be costly because they reduce a country's international price competitiveness. On the other side, a depreciated currency reduces the purchasing power of the domestic population. **Chapter 7**, which focuses on election cycles in the real exchange rate, sheds further light on this trade off and concentrates on exchange rate movements rather than the exchange rate regime.

Many economists would probably be skeptical about the possibility that politicians could influence the level of the exchange rate. In times of growing international capital flows, policymakers' efforts to affect the exchange rate may not be successful in the long run. However, the following points justify the focus on the formation of the exchange rate: First, while the market's determination of exchange rates undoubtedly plays a role, it is not so strong that it renders a political-economic analysis of exchange rate levels meaningless. As pointed out by Calvo and Reinhart (2000), no freely floating exchange rate regimes exist in developing countries. As such, central banks always intervene in some form on the foreign exchange market in order to deviate the exchange rate from its market-determined level. Most of this intervention is sterilized; that is, the effects of a shift in official foreign asset holdings on the monetary base and interest rates are neutralized. While empirical evidence on the effectiveness of sterilized intervention is very mixed,[8] some support for interventions by central banks in developing countries comes from recent research on multiple equilibria. In developing countries, where exchange rate swings often reflect unstable market conditions or herding behavior, several equilibrium exchange rate values may be consistent with the same set of macroeconomic fundamentals. The jump from one equilibrium to the next is triggered by a shift in private market expectations (see, for example, Obstfeld 1994). If such multiple equilibria are indeed a possibility, sterilized intervention may play an important role since markets adjust their expectations according to the information provided by official interventions and thus move the exchange rate toward the desired position (Fatum and Hutchison 2003: 391; Hutchison 2003: 111). Admittedly, these considerations support only short-term effectiveness of intervention. Over a sustained period, more fundamental policy action is required. However, given that the time restraints faced by

[8] Unsterilized intervention, or intervention where the central bank allows the purchase (or sale) of domestic currency to have an effect on the monetary base, affects the nominal exchange rate in the same way as any other form of monetary policy. However, a central bank's engagement in international financial transactions is usually sterilized.

politicians are typically dictated by the electoral calendar, some short-term influence on the exchange rate may be enough to fool voters.

Existing theoretical and empirical literature linking exchange rate movements to politics concentrates largely on the effect of elections. I follow this literature and analyze exchange rate effects surrounding elections using a cross-country panel dataset consisting of 17 Latin American countries over the 1985-2003 period. The empirical question asked here is: How much of exchange rate movements can be attributed to electoral stimulus? The results suggest that there is indeed a characterizing feature of exchange rates surrounding elections that is characterized by appreciation prior to the election and a strong devaluation following—a finding that is consistent with previous work on this subject.

Earlier studies have failed to provide a clear picture of the driving forces of this result. As an innovative addition to the literature, this chapter conducts a number of sensitivity analyses in order to understand how variations in the said sample affect the result. The main insights from this analysis can be summarized in the following points: First, the characterizing exchange rate pattern of pre-electoral appreciation and post-electoral depreciation is more pronounced in countries with a floating exchange rate regime, suggesting that fixed regimes aggravate electoral manipulation of the real exchange rate. Second, I show that independent central banks are less likely to be involved in electoral manipulation of the real exchange rate than central banks that are directly controlled by the government. Third, the sensitivity analysis reveals that there is a political exchange rate cycle for Latin American countries even when controlling for the effects of US elections. Fourth, I find that the closeness of the election results only marginally affects the magnitude and significance of the estimation result.

The final part of the thesis (**chapter 8**) summarizes and comments on the main findings of both the theoretical and empirical chapters. This chapter also includes a discussion of open questions and issues for future research.

2 The normative and the positive view on exchange rate policy

2.1 Introduction to chapter 2

Choosing an exchange rate regime is a relatively new challenge for countries. At least for industrial countries, the classical answer to the exchange rate regime question was obvious. With some notable exceptions during periods of economic or political turmoil, nations maintained the value of their currencies by securing convertibility with an external asset like gold or silver (Cordeiro 2002: 2; Bordo 2003: 5). Only since 1973 has a country's choice of exchange rate regime not been governed by an international agreement, like the Gold standard or Bretton Woods, but by unilateral decisionmaking by domestic policymakers. Today, countries can opt from a variety of different exchange rate regimes ranging from purely floating exchange rates through a broad choice of intermediate regimes to irrevocably fixed exchange rate regimes in the form of currency boards (a fixed regime with a fully convertible domestic currency and full coverage of the monetary base by foreign reserves, usually established by law), dollarization (the official unilateral adoption of a foreign currency as legal tender), or currency unions (agreement of different members of a union to share a common currency and a single monetary policy).

Despite such variety in alternative regimes, the standard debate on exchange rates largely centers on the general question of whether a country should have a fixed or a flexible exchange rate regime. This simplified dichotomy is justified by the fact that regardless of their stringency, fixed exchange rate regimes always include some concern for stability.[9] By fixing the exchange rate, the monetary authority makes a commitment to maintain the domestic currency's predetermined value. This implies abandoning an independent domestic monetary policy: Interest rates are determined by the central bank in the country to which the currency is pegged.

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[9] In this thesis the terms "pegged" and "fixed" exchange rate regime are used interchangeably, although pegged exchange rates could refer to loosely fixed exchange rate regimes.

Since for developing countries this is usually a country with a low inflation and a high reputation in monetary policy, fixed exchange rates provide an anchor for price stability. Accordingly, cross-country studies document that countries with fixed exchange rates experience lower inflation rates than countries that float (Ghosh et al. 2002: chapter 6; Levy Yeyati and Sturzenegger 2003). Thus, if successfully implemented, the main advantage of fixed exchange rates is that they may deliver both internal stability (a stable price level) and external stability (a stable exchange rate).

The characteristic feature of flexible exchange rate regimes is that they preserve the autonomy to use monetary policy as a stabilization tool. At least theoretically, the government retains the option to engage in countercyclical policies.[10] Empirical studies analyzing the link between exchange rate regimes and growth report that in developing countries floating regimes are associated with higher growth rates than fixed regimes (Bailliu et al. 2002; Levy Yeyati and Sturzenegger 2003; Calderón and Schmidt-Hebbel 2003). Additionally, there is some evidence that flexible exchange rate systems can help countries to cope with terms-of-trade shocks and thereby provide less volatile growth rates (Chang and Velasco 2000; Broda and Tille 2003).

In sum, and at the risk of oversimplification, the question of an appropriate exchange rate regime comes down to a choice between credibility and flexibility. The monetary authorities must trade off stabilizing the exchange rate and giving up control of monetary policy on the one hand and greater flexibility to cope with domestic or external disturbances at the cost of higher exchange rate volatility on the other. How this trade off is manifested is subject to a voluminous research. Section 2.2 will briefly review the most important contributions to this literature. Section 2.3 explores the weakness in these theories and presents a political-economic extension. It will be argued that the choice between floating and fixed exchange rate regimes may not only depend on economic circumstances, but envelop political considerations as well.

[10] Whether or not developing countries can conduct countercyclical policy has been a matter of theoretical and empirical debate among economists. Gavin and Perrotti (1997) argue that due to imperfections in international credit markets and a failure to produce budget surplus in boom phases, macroeconomic policy in developing countries is doomed to be procyclical.

2.2 Economic treatment of exchange rate regime choice

2.2.1 The optimum currency area hypothesis

A useful starting point for explaining exchange rate regime choice is the OCA theory. This literature discusses the role of exchange rates in stabilizing aggregate demand and avoiding balance of payments crisis. The conditions in which a fixed exchange rate is deemed optimal depend on the function of various structural parameters that determine the symmetry of external shocks and the capacity of a country to absorb them. The benefits of a currency peg increase with the extension of economic integration as the elimination of exchange rate volatility leads to a high reduction in transaction costs with strong external linkages, thereby encouraging trade and investment (McKinnon 1963). The costs of a currency peg are based on the loss of the exchange rate as an adjustment mechanism in the case of asymmetric shocks. Assuming sticky prices, it follows that the economy has to rely on other adjustment mechanisms to avoid substantial output swings due to structural differences or unsynchronized business cycles with the country of the anchor currency. Accordingly, if the danger of asymmetric shocks is low (Kenen 1969) or if there are alternative adjustment mechanisms, such as a high interregional labor or capital mobility (which effectively substitutes for the loss of the exchange rate mechanism (Mundell 1961)), the costs associated with a fixed exchange rate regime will be low and the economy can forego monetary and exchange rate policy as an adjustment mechanism. Later on other criteria emerged, like inflation differentials, the degree of business cycle synchronization between the domestic country and the anchor currency country or the ability to make fiscal transfers.[11]

Some authors have pointed out that in reality, OCA criteria are not static, but may evolve over time, indicating that the criteria are endogenous to the exchange rate regime. For example, a stable exchange rate may promote trade integration with the anchor country that, in turn, may influence openness and the correlation of shocks. This allows for the possibility that a country that does not meet the criteria ex ante, or when choosing a fixed regime, may satisfy them ex post, or when the currency peg has been maintained for a period of time. There is, however, a large debate on how quickly such endogenous changes in country characteristics occur and whether more trade integration always means a higher correlation of shocks (Krugman 1993; Frankel and Rose 1998; Persson 2001).

[11] For recent contributions to the OCA literature see Bayoumi and Eichengreen (1993); de Grauwe (2003: chapters 1-4); Willett (2003).

2.2.2 The Mundell-Fleming framework

A second theory on exchange rate regime choice, developed in the 1970s, emphasizes the nature and source of shocks that an economy typically faces (Fleming 1962; Mundell 1963; Poole 1970). The literature distinguishes between the effects of nominal shocks (originated in the domestic monetary and financial system) and real shocks (originated in the goods markets) to the economy. If shocks to the good market are more prevalent than shocks to the money market, under capital mobility floating regimes are preferable. The logic behind this finding is that real shocks require a change in the relative prices to restore competitiveness (or to reduce inflationary pressure) in case of a negative (positive) real shock. By allowing the nominal exchange rate to depreciate or appreciate, floating exchange rates provide a faster and less costly mechanism to produce the necessary price changes than fixed regimes, where the adjustment process has to rely on the slow changes of domestic prices.

The results are the opposite if nominal shocks are the main source of disturbance. In this case, countries with fixed regimes are better off. Under fixed regimes and in case of an exogenous fall in money demand, the domestic monetary authority is obliged to sell foreign exchange in order to maintain the exchange rate commitment. The sale in reserves, unless sterilized, leads directly to a corresponding change in high-powered money in circulation, which compensates for the shift in money demand, thereby insulating the domestic economy from the original shock. The application of the same reasoning to flexible exchange rates shows that the resulting lower interest rate leads to capital outflows and a potential deficit in the balance of payments. This causes the domestic currency to depreciate, reducing imports and increasing exports, and thus amplifying the shock to money demand. Hence, while in the case of fixed regimes, balance of payment movements automatically help to prevent further costs in terms of output without requiring interest rate or price level changes, the adjustment process in the case of floating regimes aggravates the shock.

If there is a combination of both types of shocks, which is a likely scenario for most economies, some type of intermediate regime is preferable. Hence, the Mundell-Fleming approach will lead the country to adopt a highly discretionary exchange rate system.

2.2.3 Credibility, reputation, and time consistency

Most analysts nowadays consider the OCA theory inadequate for explaining exchange rate regime choice (Krugman 1995). Since most countries

peg their currencies to the US dollar or the Euro, natural differences in the economic structure between developed and developing countries will always expose the developing country to asymmetric shocks à la Mundell (1961). This would imply that a developing country should not fix its currency to another unless it has approximated its industrial structure to the anchor currency country. Moreover, the focus on the real side of the economy and the need for an adjustment mechanism in case of asymmetric shocks neglects the important issue of the properties of exchange rate regimes in the context of financial fragility. Research on exchange rate regimes in the 1980s explicitly took imperfect financial markets into consideration and emphasized gains in anti-inflationary credibility by fixing to a low-inflation foreign currency. In this view, countries with a low reputation for price stability (e.g., due to poor inflation records) fix their currency to that of a larger trading partner as a commitment to monetary stability. The argument behind this proposition is related to the time inconsistency problem of monetary policy, originally formulated by Kydland and Prescott (1977) and later applied to monetary policy by Barro and Gordon (1983, 1983a). Time inconsistency refers to the fact that an optimal policy path may change over time because the factors on which the policy decision is based will change depending on the actions of the economy's private sector. In terms of monetary policy, this implies that governments have an incentive to announce a low rate of money growth and inflation (inducing high demand for real money holdings if the announcement is believed) and to choose a higher inflation ex post; that is, after assets have been allocated and wages have been set subject to the announced monetary policy. Such incentive makes it difficult for monetary authorities with discretionary authority to credibly commit to low inflation rates. The moment that private agents believe political promises to follow stable policies, the monetary authorities have an incentive to induce surprise inflation. Worsening the situation, attempting to disinflate in such an environment may be extremely costly, as an incredible disinflation will generate high ex post real wages and correspondingly high employment and output costs. For developing countries in particular, which often have a track record of several years (or even decades) of very expansive and loose monetary policy, the time inconsistency problem is a pervasive feature of monetary policy. If such an inflation-prone country fixes the exchange rate to a low-inflation country with a stronger reputation for monetary stability, the authorities demonstrate that they are truly determined to commit to low inflation (Giavazzi and Pagano 1988). As a consequence, the inflation of this country will, at least theoretically, converge to the relatively lower inflation bias of the stable anchor currency country.

2.2.4 The bipolar view[12]

Several authors have pointed out that, contrary to what has been suggested by the credibility approach, a fixed exchange rate does not eliminate the underlying incentive to time inconsistent behavior (Hefeker 2000: 162). The announcement of maintaining the exchange rate fixed, is not more credible than a promise of low inflation per se. Since the decision to retain the peg is itself endogenous, the expectation of lower inflation does not necessarily hold if it lacks commitment to maintain the peg (Drazen and Masson 1994). The incentive to break the rule and abandon the currency peg might arise because the use of the exchange rate as a device for obtaining commitment has the apparent drawback that the rigidity of the rule, while increasing credibility, makes it difficult for policymakers to react to changing macroeconomic disturbances. For example, a persistent inflation differential (due to price rigidities in the nontradable sector or an only stepwise price liberalization process) combined with the fixity of the nominal exchange rate results in a real appreciation of the domestic currency. Hence, the chosen parity may become economically inappropriate and authorities may find it optimal to renege on its commitment to a nominal anchor. In such a situation, inflation expectations rise because price setters rationally fear that the authorities will try to abandon the exchange rate peg in order to depreciate the real exchange rate. Doubts about the persistence of a currency peg may become self-fulfilling as they provoke capital outflows that further reduce the foreign reserves and may eventually make the peg unsustainable. The result is a sudden devaluation to reset the real exchange rate to a sustainable level, which is usually accompanied by high inflation rates.

Based on these considerations and the experiences of the deep currency crises in the 1990s, a fashionable current view on exchange rate regime policymaking claims that in a world of increasing financial instability, only "corner solutions", i.e. either hard pegs (dollarization or currency unions) or free floats, are feasible (Fischer 2001). Intermediate regimes and all loosely pegged regimes in which the exchange rate is not credibly fixed are seen as vulnerable to speculative attacks.[13] The argument is based on the inherent trade offs imposed by the impossible trinity. According to this framework, a country cannot fulfill all of its three policy goals monetary

[12] Other notations for this school of thought are corner hypothesis, the missing middle, or hollowing-out view.

[13] Eichengreen (2001a: 267) states: "Intermediate regimes are fragile. Operating them is tantamount to painting a bull's eye on the forehead of the central bank governor and telling speculators to 'shoot here'."

policy autonomy, exchange rate stability, and free capital flows.[14] Given the general trend of financial integration, which prevents countries from effectively restricting cross-border capital flows, two options would remain for economic policy: the country can either constrain monetary policy (and irrevocably fix) or give up on exchange rate stability (and float). If it wants to control both exchange and interest rates, international capital flows will either render monetary policy ineffective (since after adjusting for risk premia real interest must be the same across borders) or result in an abandonment of the currency peg.[15]

The bipolar view has been challenged both theoretically and empirically. Theoretically, the framework of the impossible trinity does not imply that complete dominance need to be given to either domestic monetary policy or a fixed exchange rate. Instead, monetary and exchange rate policy can be jointly determined in a consistent manner. Empirically, there has been no solid evidence to support the view that intermediate regimes would eventually vanish (Masson 2001; Levy Yeyati and Sturzenegger 2002).

2.3 The political and institutional hypothesis

What is common to these conventional models of exchange rate regime choice is the idea of policymakers' idea that they are motivated by a desire to serve the public by doing what is "right". This purely normative view treats the government's objective of welfare maximization as given and builds upon the simplistic concept of an undefined entity that decides exchange rate policy. The emphasis is placed on identifying the optimal policy, given an economic objective function that includes price stability and employment (or economic growth). Even the literature on time inconsistency follows this view. Although the role of credibility and reputation is emphasized, in this approach politicians are modeled as benevolent social planners who have no other motivation than to maximize aggregate social welfare.

According to this perspective, one would expect countries with similar economic structures to pursue similar exchange rate policies. However,

[14] Other problems include the difficulty in identifying the sources of economic changes and time lags in implementing policies.

[15] Another reason why the unholy trinity can be reduced to a dilemma between exchange rate stability and monetary autonomy is that capital controls cannot effectively limit capital flight. For example, Gros and Thygesen (1992: 132-137) argue that capital controls are always easy to evade.

even among economically comparable countries large differences in exchange rate policy have been observed. How can such diversity be explained? One explanation is that non-economic variables have been severely neglected in current models of exchange rate regime policymaking. There is no reason to assume that policies made by representatives pursuing their own interests will be in the interests of society.

In the field of public choice theory it is conventional wisdom that political and institutional constraints have a major influence on economic policymaking. In this view, differences in macroeconomic policy can be explained by such factors as different parties having distinct macroeconomic preferences, incumbents' efforts to increase their re-election prospects, or interest groups that influence policy choice. Political instability may prove important as well. Frequent changes in government shorten a politician's time horizon, causing politicians to heavily discount the long-term benefits of a particular policy. As such, modeling policymakers as maximizers of social welfare appears incomplete at best. As Frieden (2002: 1) writes, "the social welfare implications of economic policies are notoriously poor predictors of the probability of their adoption."

There are good reasons to assume that exchange rate policy will be influenced by political constraints as well. Exchange rate policy is the outcome of a political process with strong distributional and welfare implications (Frieden 1997: 81; Broz and Frieden 2001: 318). If it is true that a politician's popularity crucially depends on the state of the economy, as a number of studies suggest, exchange rate policy provides policymakers with a valuable tool to promote their political goals. In this context, political judgments about what tradeoffs may be tolerable to policymakers play a decisive role. Different types of actors involved in the policymaking process each have their own preferences. Hence, each government weighs the costs and benefits entailed by an exchange rate regime differently. Some politicians prefer the boost in credibility associated with fixed exchange rate regimes; others value the greater flexibility under flexible exchange rate arrangements. Stressing the importance of political factors in exchange rate issues is not to say that policymakers inevitably ignore the normative recommendation made by economic approaches to exchange rate policy. However, one must account for the fact that decisions in exchange rate policy have both economic *and* political implications. Clearly, such a position differs fundamentally from that of a benevolent dictator who knows what is best for the population and radically imposes and enforces the respective policies to attain it.

But what determines political preferences? Why prefer some countries monetary policy autonomy to manage the domestic economy while other, economically comparable countries are more willing to subordinate mone-

tary policy to exchange rate stability as a signal to price commitment? What political conditions and circumstances lead domestic policymakers to opt for one alternative or another? The following chapter argues that the political costs associated with the abandonment of an exchange rate commitment may be an important determinant of exchange rate regime choice.

3 Fear of floating and fear of pegging: How important is politics?

3.1 Introduction to chapter 3

A striking insight from recent research on exchange rates in developing countries reveals large deviations in the actual exchange rate regime policy from the announced framework. Many countries officially announce to float, but monetary authorities then regularly intervene on the foreign exchange rate market in order to minimize exchange rate fluctuations. They display, as Calvo and Reinhart (2000: 2) have called it, a "fear of floating". Another group of countries officially announces to maintain fixed exchange rates, while in fact frequently devaluing their currencies (Ghosh et al. 2002: 42). Consistently, these countries are labeled as having a "fear of pegging".

Why do countries announce a particular exchange rate regime and then renege on it? Present literature on this issue is scant. Calvo and Reinhart (2000a: 8-15) suggest that restricted access to international capital markets and a chronic lack of credibility are causes of regime discrepancies. Zhou and von Hagen (2004) argue that deviations from the officially announced exchange rate policy reflect an error-correction mechanism and find that discrepancies of regime choice are highly persistent over time. So far, only Alesina and Wagner (2003) have emphasized the importance of a country's institutional setting in explaining regime discrepancies. Their empirical findings suggest that countries with relatively good institutions demonstrate a fear of floating, while countries with poor institutional quality display fear of pegging. This chapter tests whether other institutional factors are important causes of regime discrepancies as well. For this purpose, I will use Alesina and Wagner's (2003) study as benchmark and enrich their analysis with additional institutional data. I include two variables: the level of democracy and the degree of political stability. Specifically, I will argue that democracy increases the probability that a country displays a fear of floating, but decreases the probability of a fear of pegging. Political instability is expected to increase fear of pegging but to decrease fear of floating.

The chapter is organized as follows: Section 3.2 argues that devaluations within a fixed exchange rate regime are associated with significant economic and political costs and that the magnitude of these costs should influence a country's probability to display a fear of pegging. To avoid these costs, countries could simply let their currencies float. However, as section 3.3 suggests, there are good reasons why countries may be reluctant to allow large swings in their exchange rates (thereby displaying fear of floating). Based on these theoretical considerations, section 3.4 develops four hypotheses that relate democracy and political instability to exchange rate regime discrepancies. Section 3.5 presents the dataset to test the hypotheses. Section 3.6 reports the regression results and section 3.7 provides conclusions and discusses the most important findings.

3.2 Fear of devaluing

One of the most interesting findings in research on the political economy of exchange rates is that currency devaluations significantly increase the likelihood of a subsequent change in government. In a much-cited work, Cooper (1971) finds that in seven of the 24 devaluation episodes he reviewed the government fell within the following year. This figure is more than twice as high as in the years without devaluation. Updated statistics for the 1980s and 1990s confirm the view that devaluations carry sizeable costs for political leaders. Remmer (1991) presents evidence for high electoral costs of rapid exchange rate depreciation in the Latin American context of the 1980s. Her results suggest that exchange rates and inflation account for roughly 70 percent of the variation in the total loss of votes for the incumbent. Frankel (2004), looking at a sample of 103 countries, finds that sharp devaluations (i.e. at least 25 percent on a yearly basis) increase the risk that political leaders will lose their jobs by 45 percent.[16] Why are devaluations so costly for politicians?

[16] Famous recent examples of this include Argentina in 2001/2002, where the breakdown of the currency board system was accompanied by four government turnovers within one month, and Indonesia in 1998 where President *Suharto*, after having remained in power for 31 politically turbulent years marked by ethnic and military conflicts, lost his office in the aftermath of the Asian financial crisis.

3.2.1 Economic effects of devaluations

From an economic point of view, the rationale for avoiding devaluations is twofold. It springs from contractionary effects of devaluation on aggregate demand and from underdeveloped capital markets. In terms of aggregate demand, it is important to see that a nominal devaluation affects the economy through two types of channels: On one hand, a devaluation tends to have a positive expenditure-switching effect. To the extent that the nominal devaluation succeeds in altering the real exchange rate, it increases the price of imports relative to domestic goods, thereby lowering imports and stimulating the demand for exports and nontradables.

On the other hand, devaluations have an expenditure-reducing effect. As a result of the devaluation, the domestic price level will go up. The rise in the price level has in turn two consequences. First, it reduces private spending and aggregate demand. Second, it also provokes the redistribution of income because it shifts income from wage earners to profit recipients. However, spending and saving propensities differ between those receiving profits and wages. Since profit recipients have a higher marginal propensity to save than wage earners, the distributional effect places an additional contractionary effect on the domestic economy.

The domination of either of the two channels — the expenditure-switching or the expenditure-reducing effect — crucially depends on the sensitivity of trade flows to changes in relative prices. The combination of both effects will be positive if quantities respond a change in the prices between domestic and foreign goods (terms of trade). In the short term this is clearly not a realistic scenario. Due to fixed contracts, it takes time until the shift in the terms of trade results in an improvement of the current account. As described by the well-known J-curve effect, which suggests a worsening in the trade balance shortly after a devaluation and a gradual improvement thereafter, it is more likely that with sticky prices, a devaluation first leads to negative effects on aggregate demand, employment, and growth.

Indeed, the bulk of the empirical evidence suggests that devaluations are contractionary in developing countries, i.e. the negative real income effect dominates the positive substitution effect (see e.g. Edwards 1989: 311; Calvo and Reinhart 2000a: 26).[17] In the short-run in particular, effects are negative since increases in the prices of import goods are passed through to consumers rather quickly, while the positive effects of higher export demand lag. However, even if devaluations are contractionary in the short

[17] See also the experience of Mexico in 1995 or Argentina in 2002 where output collapsed after the devaluation.

run, this does not mean that they are necessarily costly for politicians. Rational economic agents could anticipate the longer-term favorable effects of a devaluation and refuse to punish policymakers who devalue. Although it is unlikely that political effects generated by the sheer expectation of a future economic expansion will be strong enough to compensate for the immediate reduction in aggregate demand, the effects of devaluation on the good market can certainly not explain the whole issue.

The second motivation for policymakers to defend a currency peg stems from adverse effects of devaluations on balance sheets.[18] Due to extensive periods of macroeconomic instability and several failed stabilization efforts, the currencies of emerging market economies generally suffer from a lack of credibility. Households and firms in these countries find it extremely difficult to borrow abroad in their own currencies ("original sin"), and foreigners respond to the questionable credibility of these currencies by a reduced willingness to take long positions in domestic currency denominated assets. As a logical consequence, when domestic firms have longer-term investment projects, they can either borrow in their own currency in the form of rolling short-term loans (thereby generating a maturity mismatch between assets and liabilities) or long-term in a foreign currency (thereby generating a currency mismatch on balance sheets since earnings are usually denominated in local currency). Even the public sector suffers from low creditworthiness mirroring unwillingness by investors to provide loans in emerging markets' currencies or to make medium or long-term commitments in hard currency.[19] With large amounts of unhedged foreign exchange denominated debts, devaluations increase the debt-servicing burden of the domestic economy. Aware of this danger, the authorities will be reluctant to abandon a fixed exchange rate arrangement and avoid devaluing.

3.2.2 Political costs of devaluations

Not every emerging market economy is highly indebted in foreign currency; thus, the economic effects of devaluations are hardly cause for a 45 percent increase in political leaders' job risk following a devaluation, as suggested by Frankel (2004). The most important reason for devaluation

[18] The first to refer to the importance of balance-sheet effects in emerging markets was Hausmann (1999). For a recent survey on the literature see Eichengreen et al. (2003). Schnabl and McKinnon (2004) also provide a good overview.

[19] To the extent that a government bond market in domestic currency exists at longer terms of maturity, interest rates are typically adjusted to changes in the short-term interest rate.

increasing the chance for government turnover is political. A fixed exchange rate is closely associated with official promises to guarantee the stability of the domestic currency. The establishment of credibility by fixing the exchange rate has been a central element of the stabilization efforts made by many developing countries. In contrast to monetary policy rules, such as the money growth rule, fixing the exchange rate is a very transparent form of commitment. Deviations from the exchange rate rule are immediately detected by the public and force the currency peg to an agreement that is costly to ignore. In many cases, one can observe that although policymakers understand that eventually there may be no other solution than abandoning the peg, they reaffirm their explicit commitment to exchange rate stability when the currency is under strong downward pressure. Since the policymaker has so much invested in the peg, his credibility is closely connected to maintaining the fixed exchange rate. Violating the commitment and abandoning the peg is seen as a defeat for the government and denotes severe damage to the reputation of the politicians who are involved. As Remmer (1991: 784) states, devaluations are "indications of fundamental policy failure and serious overall economic disequilibrium." The associated loss of credibility is not solely attributed to the actual economic performance after the devaluation. This means that even if the economy recovers soon after the devaluation, some form of retribution by the electorate would be inevitable. Uncertainty plays a crucial role as well because it is difficult for a policymaker to estimate the private sector's reaction in the aftermath of the devaluation. In fact, given the credibility problems associated with a devaluation, policymakers cannot be sure that a devaluation will not trigger further capital flights and initiate a vicious cycle of devaluation and losses of reputation.

Edwards (1996, 1996a) was the first to combine the preceding theoretical ideas with the backdrop of some specific notion. He developed a simple model of exchange rate regime choice in which the abandonment of a fixed exchange rate regime bears political costs. The costs are associated with a poor reputation as the abandonment of a peg signals blatant failure by part of the authority. The magnitude of the political costs depends on a country's political and institutional characteristics, including its degree of political instability. The costs of abandoning the peg increase with political instability because an instable political environment increases the likelihood that the devaluation will cause further political turbulence and eventually lead to the government's collapse. In times of political stability, however, government instability is less of a threat and thus, the political costs of a devaluation are lower.

Collins (1996) develops a similar model in which devaluations entail different political costs under alternative exchange rate arrangements. The

stronger the political investment in the peg, the higher the political costs associated with the devaluation. In a fixed exchange rate regime, devaluations involve significantly higher political costs than the same nominal depreciation in a more flexible exchange rate arrangement. The reason for this is that devaluations in fixed exchange rate systems are considered a breach of a public promise to guarantee the domestic currency's value. This leads to the politicization of an issue that would otherwise have been regarded as mainly economic in character.

An interesting implication of Collins's (1996) model is that the recent trend toward more flexible exchange rates can be viewed as a decision to "depoliticize" exchange rate adjustments. Given the risk that the abandonment of a currency peg may cause political turmoil, a more useful strategy for policymakers is to remove the political nature of exchange rate policymaking and keep from pegging the exchange rate. Under floating regimes, exchange rate adjustments that reflect government decisions are much easier to disguise and are therefore less easily perceived by economic agents. Moreover, since the authorities never announced to maintain an exchange rate level, shifts in the exchange rate are removed from the realm of political accountability. Accordingly, by floating the exchange rate, exchange rate movements are depoliticized giving policymakers an advantage because the political costs of exchange rate adjustments are lower, thereby providing them with greater flexibility to react to exogenous shocks (Collins 1996: 119). In the same way, Aghevli et al. (1991) explain the incentive to peg the domestic currency to a basket of currencies, arguing that "given the political stigma attached to devaluations under a pegged regime, an increasing number of countries have found it expedient to adopt a more flexible arrangement for adjusting the exchange rate on the basis of an undisclosed basket of currencies. Such an arrangement enables the authorities to take advantage of the fluctuations in major currencies to camouflage an effective depreciation of their exchange rate, thus avoiding the political repercussions of an announced devaluation" (Aghevli et al. 1991: 3).

For all these reasons, governments heavily resist devaluing their currencies even when facing major external disequilibria.

3.3 The economic rationale for exchange rate stabilization

The previous section has demonstrated that abandoning a peg is far less costly in terms of politics when there is no official commitment to sustain exchange rate parity. However, the move away from fixed exchange rates

and toward more flexible exchange rate arrangements, as typically displayed in exchange rate regime classifications based on IMF data, does not indicate benign neglect toward the exchange rate. In fact, the exchange rate in most developing countries with such a flexible arrangement is not solely determined by the market, as it is often claimed. Few central banks are truly indifferent to exchange rate movements. Most of the exchange rate regimes publicly declared as floating are more or less tightly managed arrangements. There is widespread fear of floating: "Countries that say they allow their exchange rate to float mostly do not — there seems to be an epidemic case of 'fear of floating'. Relative to more committed floaters — such as the United States, Australia, and Japan — observed exchange rate variability is quite low. The low variability of the nominal exchange rate does not owe to the absence of real or nominal shocks in these economies — indeed, relative to the United States and Japan most of these countries are subject to larger and more frequent shocks to their terms of trade" (Calvo and Reinhart 2000: 15).

There are several reasons why developing countries do not allow for large exchange rate movements, even in the presence of considerable shocks. One is that exchange rate variability is an impediment to trade. Other reasons that I will discuss are the inflationary impacts of exchange rate volatility and high degrees of liability dollarization.

Recent research by Rose (1999) suggests that two economies that effectively eliminate all exchange rate uncertainty by sharing the same currency demonstrate trade levels three times that which a gravity model of international trade would suggest.[20] For developing countries, this strong negative impact of exchange rate volatility on foreign trade can be explained by the pattern of trade invoicing: Since exports in these countries generally have a high share of dollar-invoiced primary commodities, the domestic currency prices of their exports will vary proportionally to the exchange rate. Thus, large swings in the exchange rate have a significant impact on those sectors that are heavily engaged in foreign business, making them more vulnerable to high exchange rate volatility.

Financial market imperfections make the case for exchange rate stabilization even stronger. Forward or future markets that mitigate the exposure

[20] Not surprisingly, these strong results have attracted some criticism. For instance, Nitsch (2002) has questioned the general applicability of the results by Rose (1999) due to his focus on small and poor countries. Still, subsequent contributions (see, e.g., Engel and Rose 2002; or Frankel and Rose 2002) have provided further extensions and have reinforced the argument that lower exchange rate variability reduces uncertainty and risk premia in developing countries, thereby considerably encouraging greater cross-border trade.

to foreign trade risk are nonexistent in most developing countries. An exporter who is expecting to receive a fixed amount of foreign currency, say in US dollars, at some future point of time cannot effectively hedge himself against changes in the dollar because market activity is so low that there are no domestic bonds traded at all terms to maturity. In the absence of liquid future markets, central banks have strong incentives to intervene in the foreign exchange market to provide stable market conditions for exporters and importers.[21]

A second reason why central banks may limit exchange rate movements is due to the greater openness of emerging market economies. When imports make up a large share of the domestic consumption basket, the pass-through of nominal exchange rate swings onto domestic prices is high and typically asymmetrical (Calvo and Reinhart 2000: 3). The level of the exchange rate pass-through also depends on market competitiveness and the inflation environment. With fewer competitive markets and high inflation, both of which are common features in emerging markets, the strength of the exchange rate pass-through will increase, implying that movements in the exchange rate place more pressure on the domestic price level.

A third rationale for monetary policy intervention is that the accumulation of external liabilities over the last twenty years has led to high degrees of dollar-denominated credits (liability dollarization) in many developing countries. This has become a distinguishing feature of the conduct of exchange rate policy because the revaluation of these liabilities drastically increases the carrying costs of the dollar debts, in the context of underdeveloped financial markets in particular. By stabilizing the exchange rate, the monetary authority provides insurance against significant reduction in net worth.

Thus, on the large scale, it is possible that rather than stabilizing the economy in terms of real shocks, flexible exchange rates set the scene for increased market instability. Therefore, from an economic point of view, it is quite rational for monetary authorities to try to counteract or smooth out unwarranted movements in exchange rates.

[21] For a description of the imperfections in financial markets of developing or transition countries, see Duttagupta et al. (2004) and Schnabl and McKinnon (2004).

3.4 Political reasons for reneging on exchange rate policy

3.4.1 The study by Alesina and Wagner (2003)

Until now, few empirical efforts have been devoted to the question whether political or institutional factors influence the propensity to deviate from an officially announced exchange rate policy. A notable exception is the recent study by Alesina and Wagner (2003), which uses a wide array of institutional data to measure a country's accountability, political stability, government effectiveness, regulatory burden, rule of law, level of corruption as well as operational and political risk. The same data are then used to determine whether a country's actual exchange rate policy differs from what it has declared. Based on a binary logit model, the results suggest that countries that display a fear of floating tend to have relatively good institutions. Alesina and Wagner (2003) interpret this as a confirmation of the view that stable exchange rates signal political strength, whereas exchange rate volatility (and devaluations in particular) is often perceived by the market as a signal for macroeconomic mismanagement and political failure.

Alesina and Wagner (2003) also analyze the inverse behavior of many countries; those, that announce a peg but do not keep to it. This phenomenon, which they analogously call "fear of pegging"[22], is more prevalent in countries with relatively weak institutions. The conventional explanation is that weak institutions are associated with poor economic performance and an inability to commit to monetary stability and a fixed exchange rate regime. By contrast, countries with better institutions display less fear of pegging because better economic management enables them to keep to an exchange rate commitment when they announce it.

Such an explanation for the correlation between the quality of institutions and fear of floating is not, however, completely satisfying. If policymakers use exchange rate policy to signal stability, why do they disguise the peg rather than officially announcing a fixed exchange rate, which, by virtue of being more transparent, acts as a better coordinating device? Alesina and Wagner (2003) argue that announcing a peg allows some room to maneuver: In "relatively 'calm' periods with no exchange rate crises the fear of floating may not be to [sic!] high so this hypothetical coun-

[22] Alesina and Wagner (2003) admit that this term is misleading because it reflects more an "inability" to peg than a "fear". Levy Yeyati and Sturzenegger (2002), who first used the term, define fear of pegging in a different way: In their study, fear of pegging is associated with countries that have a de facto pegged exchange rate regime but claim another regime.

try may use a bit of flexibility allowed by floating. On the other hand in turbulent periods it may be especially important to 'signal' and keep the exchange rate constant, that is the fear of floating is especially high" (Alesina and Wagner 2003: 5).

If this is true, then one should consider not only the quality of institutions (as analyzed by Alesina and Wagner 2003), but other institutional characteristics as well as having a significant impact on a country's propensity to deviate from a preannounced exchange rate policy. In the following sections, I will concentrate on two other important institutional details, namely a country's political instability and its level of democracy.

3.4.2 Democracy and the propensity to renege

The first institutional detail that I will analyze is the type of a country's political regime. I argue that the political costs of devaluation are particularly high for leaders in democratic societies because competitive elections and the open recruitment of the executive in these countries increase the probability that a political leader will lose office in the aftermath of devaluation. This implies that democratic governments have a high incentive to remove exchange rate policy from the political agenda by choosing a flexible exchange rate. At the same time, a second major concern of exchange rate policy in democratic countries is to stabilize the exchange rate. Efforts to avoid large exchange rate fluctuations are particularly strong in these countries because exchange rate stability benefits concentrated economic interests, such as the exporting and importing industry, which are politically more effective than the larger number of dispersed economic interests in the nontradable sector that has no (or less) interest in exchange rate stability and to which the costs of this policy, the loss of monetary policy autonomy, accrue.

In view of the preceding, neither a free float nor a public commitment to a fixed exchange rate is the ideal choice for democratic policymakers who must concern themselves with maximizing the vote. A disguised peg provides a solution to this dilemma. By intervening in foreign exchange rate markets to stabilize exchange rates, the government favors interest groups through higher exchange rate predictability. However, since the authorities do not announce a commitment to a fixed exchange rate, they denounce responsibility for changes in the exchange rate and do not have to pay the political costs when the currency collapses. The situation is different in the case of authoritarian regimes. Political leaders in these countries are less affected by the abandonment of the peg. Since they have a lower risk of being punished by the electorate (if elections take place at all) and since

political decisionmaking is more obscure in these countries, autocratic governments have a higher incentive to use the exchange rate as a nominal anchor, thereby removing the inflationary bias in monetary policy.

Hypothesis 1: Democracy and a country's propensity to display fear of floating are positively correlated.

In view of the preceding, it is permissible to argue that the magnitude of political costs also affects a country's likelihood to have fear of pegging. Since it is more costly politically for democratic than autocratic incumbents to adjust a fixed exchange rate, democratic policymakers have a higher incentive to defend a currency peg and should thereby display less fear of pegging. But do democratic governments not only have the willingness but also the ability to avoid currency devaluations? The answer depends on the linkages between democracy, transparency, and speculative attacks; that is whether one assumes that democratic institutions increase or decrease political uncertainty. While some scholars argue that democratic characteristics such as elections or changes in government create political uncertainty, an increasing number have argued that this uncertainty is "contained within clear institutional boundaries" (Leblang and Willett 2003: 12). Accountable politicians and a transparent institutional framework suggest that compared to autocratic regimes, policymakers in democracies make better policy choices. The misuse of state power in authoritarian regimes creates problems in terms of credibility. Goodell (1985) and Hays et al. (2003) argue that autocratic regimes generate unpredictable economic conditions because there is no check on the autocracy's ability to change the "rules of the game" at any time. The model by Calvo and Mendoza (2000) and subsequent models of currency crises (see e.g., Banerjee 1992) are also suggestive here. Calvo and Mendoza (2000) argue that when information about international investments is costly, currency traders base their decisions on rumors rather than on fundamentals. In this case, capital flows are highly volatile and are more likely to result in speculative attacks. These effects are less prevalent, however, in countries that have more transparent macroeconomic policies. When more accurate information is provided by the authorities, as is typically the case in democratic societies, political and economic rumors can be easily verified, uncertainty is reduced, and capital inflows are more sustainable. Hence, the expectation is that because in democratic countries political processes are more transparent, political uncertainty is lower. As such, these countries are less likely to adjust a fixed exchange rate.

Hypothesis 2: Democracy and a country's propensity to display fear of pegging are negatively correlated.

3.4.3 Political instability and the propensity to renege

Alesina and Wagner (2003) find that weak institutions decrease the fear of floating but increase fear of pegging. Will similar results be found in terms of political instability? To begin with, do politically instable governments display less fear of floating?

As described previously, significant economic reasons make developing countries avoid large exchange rate fluctuations even when the official exchange rate regime is a float. The excessive exchange rate volatility observed under freely floating exchange rate regimes is a major concern for countries whose debts are denominated in foreign currency and where there are substantial pass-through effects from exchange rate swings to the inflation rate.

However, not all policymakers have the ability to stabilize the exchange rate. Strong governments are in a better position to avoid large exchange rate fluctuations. The basic idea is that governments with a more stable political environment are associated with higher competence. This assumption is made quite often in the political-economic literature. Cukierman et al. (1992: 547) show that a higher degree of political instability leads to higher inflation rates. In their model, politically unstable countries have less sophisticated tax systems (i.e. one that facilitates tax evasion) and will thus rely more heavily on inefficient taxes like seigniorage.[23] Many other models emphasize the notion that political instability (and frequent government changes in particular) shortens the time horizon of political decisionmakers. The shorter the expected time in office, the greater the incentive to time inconsistent behavior.

Another important contribution to the literature is the work by Persson and Tabellini (1990) who argue that in a politically unstable system the incentive to build up reputation by delivering price stability is low because governments are not certain that they will keep their posts during the next period. Alesina and Tabellini (1990) distinguish two types of policymakers that are characterized by their preferred spending composition. If reelection is certain, policymakers will run a balanced budget. However, if policymakers expect to be replaced after the next election, they will produce suboptimal high deficits in order to burden the successor with the need to service the debts. The basic conclusion of all these models is that incumbents that have a low chance of being reelected follow suboptimal (i.e. overexpansionary) economic policies.

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[23] Seigniorage is a revenue for the government resulting from the difference between the value of the money and the cost of producing it and thus, is effectively a tax on the public (see, e.g., Schobert 2001).

Even if a weak government were to pursue prudent economic policy, markets could cause a correlation between political instability and fear of pegging — either by the postponement of investment or by capital flight (Obstfeld 1994). The idea behind this proposition is that higher political instability (or uncertainty) will lead to a decreased demand of the domestic currency because investments will be riskier. If a country is going to experience political turmoil for an extended period of time, private actors anticipate future devaluations and will be particularly unwilling to invest in that country. It is hard to imagine that governments in such a situation can signal strength to the markets and manage the exchange rate to a greater extent than announced (displaying a fear of floating).

The opposite would be true if political instability decreases. The investment climate becomes more attractive and therefore the demand for the domestic currency increases, making it easier for the government to stabilize the exchange rate. Hence, politically strong governments have a greater capacity to indulge in short-term policy inconsistencies without increasing the likelihood of crisis and large exchange rate volatility.

As a whole, the effect of political instability on a country's propensity to fear floating is unambiguous. Although the economic costs of large exchange rate fluctuations are important for all governments, a lower competence and a lack of credibility make it more difficult for weak governments to stabilize the exchange rate.

Hypothesis 3: Political instability and a country's propensity to display fear of floating are negatively correlated.

In terms of political instability and the fear of pegging, the basic question is whether weak or strong governments are more likely to abandon an existing currency peg and devalue. According to Edwards (1996: 6), there are two offsetting forces: First, the abandonment of a currency peg involves political costs, which increase with political instability. Unstable governments have a stronger bias against breaching an official exchange rate commitment because the abandonment of a currency peg is more likely to cause further political risk that in turn endangers the government's survival. Strong governments, in contrast, suffer fewer political losses from devaluation and, as a result, are more willing to announce fixed exchange rates.

The second, opposing link between political instability and fear of pegging has its roots in time asymmetries of adjustment policies to avoid speculative behavior. Fixed exchange rates need to be supported through the completion of policy reforms that increase a country's adjustment to shocks. Although the implementation of such strategies provides for the greater viability of fixed regimes, this comes at the expense of short-term

costs. For example, a tax reform designed to end with an inconsistent fiscal policy stance requires both time and resources. Whether governments are willing to accept these short-term costs or not depends on the importance they place on the future. The crucial assumption by Edwards (1996: 6) is that in the case of political instability policymakers highly discount the future in favor of short-term gains. Politically unstable governments with a shorter time horizon will be unwilling to proceed with necessary reforms because they know that they are unlikely to reap the future gains of the reform. This behavior is rational because, as Obstfeld (1994) has shown, short-term political inconsistencies will not necessarily lead to speculative behavior. Thus, weak governments will exploit the short-term benefits of policy inconsistencies and postpone the required adjustments, hoping that the current imbalances will not lead to the (immediate) abandonment of the peg. In sum, weak governments trade off the risk of costly devaluations for the possibility of muddling through current turbulence.[24]

Governments in a less volatile political environment, by contrast, are more insulated from short-term political pressure and can make credible commitments more easily. Since they can expect to remain in power, they have a longer horizon to plan for and are thus more concerned with reputation and longer-term efficiency. They do not have to worry about the short-term costs associated with necessary adjustment policies to sustain a peg. Since they run a lower risk of being punished by the electorate, the costs of needed reforms are less threatening.

Thus, the way that political instability will affect the fear of pegging is an empirical question. Most previous research emphasizing the relevance of political instability for exchange rate policymaking has come to the unambiguous conclusion that politically instable governments are more likely to abandon an existing currency peg (Méon and Rizzo 2002) and to choose flexible exchange rates (Edwards 1996; Berger et al. 2000; Poirson 2001). The application of these findings to the question of exchange rate regime discrepancies leads to the conclusion that the probability that a government announces a peg but finds it difficult to hold on to it increases with political instability. Hence, the expectation is to find a positive correlation between political instability and a country's propensity to display fear of pegging.

Hypothesis 4: Political instability and a country's propensity to display fear of pegging are positively correlated.

[24] Willett (2004: 27) describes this behavior as "gambling for redemption."

3.5 Presentation of the dataset

The remaining part of the chapter tests the impact of democracy and political instability on a country' propensity to renege on exchange rate policy in an empirical fashion. My dataset consists of political and economic variables for a sample of 49 developing countries.[25] Given that I use the same sample for a more comprehensive economic analysis in a later chapter of this thesis, the main criteria for choosing the countries were the availability and reliability of comparable economic time series data. Country characteristics are coded by year beginning in 1975 and ending in 2000. For the Central and Eastern European countries (CEECs), no observations before 1992 are included because the early years of transition may represent the simultaneous effect of the shift to democracy and the collapse of central planning rather than the political manipulation of economic variables.

The empirical part of this chapter proceeds as follows: In order to detect whether a country reneges on exchange rate policy, I compare different exchange rate regime classifications that are either based on a country's officially announced exchange rate policy or on the de facto behavior of exchange rates. Section 3.5.1 presents these classifications and section 3.5.2 explains the coding of the dependent variable that emerges from the comparison of the different exchange rate regime evaluations. In section 3.5.3, the explanatory variables are introduced, including a country's level of democracy and degree of political instability. Section 3.6 shortly explains the estimation methodology and presents the regression results. Finally, Section 3.7 summarizes and discusses the most important findings.

3.5.1 Exchange rate regime classifications

The inconsistencies between the stated commitments of the national authorities and their actual behavior have resulted in different exchange rate regime classifications. Traditionally, most studies on exchange rate regime choice (see, e.g., Collins 1996; or Edwards 1996) have relied on the IMF classification published every year in the IMF Annual Report on Exchange

[25] The countries included in the sample are: Algeria, Argentina, Belarus, Bolivia, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Cote d` Ivoire, Croatia, Cyprus, Czech Republic, Dominican Republic, Ecuador, El Salvador, Estonia, Guatemala, Guyana, Haiti, Honduras, Jamaica, Latvia, Lebanon, Lithuania, Malaysia, Mexico, Moldova, Morocco, Nicaragua, Nigeria, Panama, Paraguay, Peru, Philippines, Poland, Republic of Korea, Romania, Russia, South Africa, Slovakia, Slovenia, Santa Lucia, Suriname, Thailand, Turkey, Ukraine, Uruguay, and Venezuela.

Rate Arrangement and Exchange Rate Restrictions (AREAER). The IMF classification is "de jure", i.e. it basically builds on the official statements of the monetary authorities in the member states. Though this classification provides long and comprehensive time series, a major drawback of the IMF evaluation is that it is misleading when the observed exchange rate data validate the announced regime. Countries are even classified as floaters when the monetary authorities have frequently and extensively intervened in the foreign exchange market, i.e. when countries have displayed fear of floating. The IMF classification is also unable to highlight those countries, which despite announcing a fixed exchange rate regime frequently adjusted their exchange rate and devalued (i.e. have a fear of pegging).

Recent research into exchange rate regimes therefore moves beyond pure de jure classifications. The two most common new classification schemes are Levy Yeyati and Sturzenegger (2002) and Reinhart and Rogoff (2002).[26] The measure by Levy Yeyati and Sturzenegger (LYS thereafter) (2002) avoids the shortcomings of the formally declared IMF classification by providing a "de facto" classification for the 1974-2000 period. Levy Yeyati and Sturzenegger (2002) explicitly look at the *actual* behavior of exchange rates and completely ignore the official classification. The authors use three variables to test for the observed behavior of exchange rates: the monthly percentage change in the nominal exchange rate, the standard deviation of monthly percentage changes in the exchange rate, and the volatility of reserves. Based on a cluster analysis technique, currencies are then classified as "flexible", "intermediate", or "fixed". In this grouping, currencies are considered to be floating when there is high exchange rate volatility together with little intervention in the exchange rate market. Conversely, a country has a fixed exchange rate regime when exchange rate changes are low but changes in official reserves are high. Finally, currencies are rated as intermediate when they exhibit moderate exchange rate volatility and a moderate to high rate of foreign exchange intervention. Although the LYS classification has also been subject to considerable criticism, it has been established as a valuable addition to the official IMF classification and has frequently been used in empirical studies on exchange rate regime choice.[27] [28]

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[26] There are a number of further exchange rate regime classifications based on observed behavior of the authorities, see Ghosh et al. (2002: chapter 4); Bubula and Ötker-Robe (2002); and Shambaugh (2005).

[27] The most important shortcoming of the LYS classification is that it is difficult to determine whether a stable exchange rate has resulted from frequent intervention in the foreign exchange market or from the absence of shocks. The problem

The natural classification by Reinhart and Rogoff (RR in the following) (2002) groups countries into a detailed taxonomy of 15 categories. It has two characterizing features: First, it distinguishes between floating rates and freely falling rates. The latter results during episodes of macroeconomic instability associated with high currency devaluation. The combination of these two categories means that one incorrectly attributes macroeconomic distress and high inflation rates to floating regimes. A second innovation of this classification is that it takes into account the potentially important role of dual or parallel markets. In countries that had some form of parallel rates, Reinhart and Rogoff (2002) use the market-based exchange rate instead of the official rate to gauge actual exchange rate policy. For the purpose of the present study, this distinction is a valuable feature because market rates provide a better indicator of deviation from announced exchange rate policy than the official rate.

3.5.2 Dependent variable

A comparison of the IMF and the de facto exchange rate regime classifications offers a number of important insights about the divergence between legal and actual exchange rate policy.[29] It also provides a way to measure fear of floating and fear of pegging. In a broad sense, fear of floating applies to all cases in which the de facto exchange rate regime (measured by either the LYS or the RR classification) is less flexible than the officially announced regime (documented by the IMF classification).[30] Conversely,

exists because data on foreign reserves are difficult to interpret. A higher amount of foreign reserves is not necessarily caused by foreign intervention but can reflect simple valuation adjustment or debt repayment.

[28] Recognizing the drawbacks of its own measure, the IMF significantly revised its own classification in 1997. Since then it has begin to publish a more detailed classification that addresses the original shortcomings and includes judgments by IMF experts. Still, it heavily depends on official announcements of the member countries.

[29] The alternative de facto classifications are quite uncorrelated with each other. Frankel (2003) classifies the LYS and the RR classification in three categories and finds that the RR classification coincides with the LYS classification only in 40 percent of the cases. The coincidence between the de jure and the de facto classifications is even lower. In less than a third of the cases countries are classified identically under the IMF and the two de facto classifications. For different economic outcomes under alternative exchange rate regime classifications see Reinhart and Rogoff (2002) or Rogoff et al. (2004).

[30] See Zhou (2002: 30) or Alesina and Wagner (2003: 10) for this definition of fear of floating. Calvo and Reinhart (2000: 2) define fear of floating in a narrow

fear of pegging is defined as a situation where the actual behavior of the exchange rate is more flexible than the stated policy. The construction of the dependent variables, fear of floating and fear of pegging, respectively, is then rather simple: I regroup the classifications so that each classification has four different categories that increase with flexibility.[31] To capture fear of floating and fear of pegging, I take the difference between the de jure and the de facto classifications. Whenever the RR or the LYS classifications classify a country in a lower (i.e. less flexible) category than the IMF classification, I define a country as having fear of floating. Whenever the RR or the LYS classifications classify a country in a higher (i.e. more flexible) category than the IMF classification, I define a country as having fear of pegging. In this way, I get four dummy variables. They are coded in the following manner: If a country displays a fear of floating, the variable *fearflrr* is denoted 1 when comparing the IMF and the RR regimes and the variable *fearfllys* is denoted 1 when comparing the IMF and the LYS regimes. As follows, if a country displays a fear of pegging, the variables *fearpegrr* and *fearpeglys* are analogously labeled 1, respectively.[32] Table A3.1 (upper part) defines the coding of the dependent variables. Table A3.2 shows summary measures for the four variables. It confirms the finding by Frankel (2003) that fear of pegging and fear of floating are common phenomena in developing countries. Both the LYS and the RR classification identify a country as having fear of floating in 27 percent of the cases. As displayed by the table, fear of pegging is more common under the RR classification.[33]

sense as de jure floaters that intervene in the foreign exchange market to smooth fluctuations in the nominal exchange rate.

[31] The four categories are: peg, limited flexibility, managed floating, and freely floating. Since I do not want to analyze possible linkages between exchange rate regime choice and macroeconomic performance, the distinction between freely falling and flexible exchange rates as provided by Reinhart and Rogoff (2002) is not of crucial importance for the present study. Therefore, I summarize these two categories under one group (thereby following the grouping in Alesina and Wagner 2003: 7).

[32] Both the LYS and the RR classification are used as measure of the actual exchange rate policy because this increases the robustness of the results.

[33] The dependent variables based on the LYS dataset has a larger number of missing values since some observations could not be classified due to missing data or due to pegs to undisclosed baskets.

3.5.3 Explanatory variables

As stressed in the analytical framework, democracy and political instability are the primary explanatory variables. The following section describes the coding of these two variables in the empirical section.[34]

Democracy: The summary measure to proxy for the level of democracy, *polity*, is a country-year's "political score" from the Polity IV dataset (Marshall and Jaggers 2002). These scores are used extensively in international relations and comparative politics. They are computed as the difference of two non-overlapping subindices: *democracy* (which measures each country's democratic characteristics) and *autocracy* (which measures each country's autocratic characteristics). Both subindices range between 0 and 10, with the overall measure extending from -10 (for a very autocratic regime) to +10 (for a very democratic regime). The single regime score is compiled by data based upon five factors that capture the institutional differences between democracy and autocracy: 1.) the competitiveness of the executive recruitment, 2.) the openness of this process, 3.) the existence of institutionalized constraints on the exercise of power by the executive, 4.) the competitiveness of political participation, and 5.) the extent to which there are binding rules on when, whether, and how political preferences are expressed.

In sum, these measures are closely related to my emphasis on the political costs of exchange rate adjustment and as such, I feel confident to use *polity* as the primary measure for democracy. In addition to the aggregated index, further estimations rely on the variable *democracy* to measure a country's level of democracy. The intention is to increase the robustness of the results.

Political instability: In the literature various measurements of political instability have been suggested.[35] Early studies used measures for changes in the political system, such as the number of revolutions, riots or politically motivated assassinations.[36] More recently, a number of studies used the frequency of government change as a measurement for political instability. This measure has been criticized because it views all government changes as signs of political instability, neither discriminating between regular and irregular changes nor considering whether the new leader belongs to the same political party as his predecessor or not. A second problem is that

[34] See table A3.1 for a definition of all explanatory variables.

[35] For a comprehensive overview of the various indicators of political instability see Siermann (1998: 27-44).

[36] A similar measure is used by Alesina and Wagner (2003) as part of their aggregated institutional quality index (Alesina and Wagner 2003: 20).

such frequency measurements may also lead to an underestimation of the true level of political instability. This is the case when there is serious political turmoil that does not result in a change of government (Siermann 1998: 30). In fact, it could be argued that the mere expectation of a change in government will induce politicians to proceed with shortsighted policies that could, in turn, deter such change. In view of these difficulties, the number of irregular government changes has been proposed as a better measurement of political instability. However, in many developing countries even regular changes in government pose a threat to political stability. Moreover, Cukierman et al. (1992: 546) show that the *actual* frequency of government change is highly correlated to the *estimated* frequency of government change. Thus, despite its drawbacks, the frequency of (regular *and* irregular) government changes is still the most widely used variable to measure political instability in developing countries. The appeal of this variable for the present study lies in its close relation to the theoretical framework. In the political economy literature it is very common to argue that frequent changes in government increase the short-sightedness of politicians (Edwards 1996: 6). I therefore prefer to use a measurement that does not differentiate between different types of government changes and construct a variable termed *govinst*, which measures a country's five-year moving average government turnover. To further increase the robustness of the results, I form a second variable, *partyinst*, which includes only those instances where a transfer of power from the largest government party to another party formerly in the opposition took place. Again, I construct this measure for a rolling five-year period.[37] Data for both government and party turnover is taken from Zárate's political collection (Zárate 2004).

As suggested by the literature on exchange rate regime choice, a number of economic and financial variables are included as controls in the empirical model. Like Alesina and Wagner (2003), I use external debt, gross domestic product (GDP), and the standard deviation of real export growth.[38] Additionally, I include a measure for capital controls. The following paragraphs provide a short justification for the inclusion and the coding of each of the variables.

External debt: The stock of external debt is expected to have an important impact on a country's fear of floating because exchange rate movements change the relative values of liabilities and assets. When a country

[37] To calculate the value of political instability for Argentina in 1990, e.g., I aggregate all government party turnovers within the years from 1986 to 1990.

[38] Alesina and Wagner (2003: 11) use the standard deviation of terms of trade instead of real export growth. Both variables are, however, intended to capture the degree of asymmetric shocks.

has a large proportion of foreign debt and is exposed to a significant currency mismatch, sharp devaluations increase the domestic currency value of foreign liabilities and put into question the sustainability of the debt burden. Accordingly, the expectation is that in countries where foreigners hold large amounts of public and private debts, national authorities have a greater fear of floating and should favor policies that maintain a stable value of the domestic currency.

The external debt variable, *debt*, is collected from the World Development Indicators (World Bank 2003). It is defined as the outstanding amount of debt owed to nonresidents by residents of an economy. The variable is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt.

Economic size: Statistics on total external debt do not completely summarize the fear of floating through balance sheets effects. This is because the destabilizing effects of exchange rate volatility do not only depend on the amount of debt, but also on the currency composition of debt. However, data on the composition of external debt is not available on a cross-country basis. As a proxy for total foreign currency denominated liabilities, I use a country's size, measured by the logarithm of real GDP (*gdp*). The idea is that large countries are less likely to suffer from currency mismatch because the large size of their financial markets and the high liquidity of their currencies make international investors willing to hold assets in these currencies. Accordingly, large countries are less vulnerable to the balance sheet effects of a sharp devaluation.

By contrast, it is difficult to imagine that global investors manage a portfolio that includes the currencies of many small countries. Each additional currency adds an opportunity for diversification, but it also adds risks. Thus, the optimal portfolio has only a limited number of currencies. Since financial markets in small countries lack depth and efficiency, the currencies of these countries are typically not represented in the portfolios of international investors (Calvo and Reinhart 2000a: 8-15). Accordingly, smaller countries are more dependent on financing in foreign currency, implying that the economic costs of devaluation are higher. Moreover, the low turnover in volume on small countries' financial markets makes them more vulnerable to herding behavior. Hence, the expectation is that smaller countries have a greater degree of intolerance to exchange rate fluctuations and thus exhibit a higher likelihood of fear of floating.

Openness: Turning to trade openness, countries with a high degree of economic integration are generally considered more likely to fix their exchange rate since large and unpredictable changes in the nominal exchange rate might hamper international trade (McKinnon 1963). Moreover, in open economies exchange rate fluctuations strongly affect the inflation rate

as changes in the exchange rate are passed through to prices. These two factors should enhance the fear of floating and lead to the hypothesis that more open economies show a higher greater fear of floating (Zhou and von Hagen 2004: 16). Exposure to international trade is measured in the standard manner as exports plus imports as a proportion of GDP (*open*).

Standard deviation of export growth: It is well-established that a country's ability to cope with external shock variability is an important factor in terms of decisions regarding the exchange rate regime. Theory predicts that countries with flexible exchange rate regimes are better able to cope with terms of trade volatility than countries with fixed regimes. In a country with a flexible exchange rate, the negative effects of large and frequent sudden shifts in the demand for the country's exports will be offset by movements in the exchange rate, eliminating much of the impact on economic activity. This possibility is ruled out for countries with a fixed exchange rate regime. As a result, these countries will experience a higher output response for a given terms of trade shock (Broda and Tille 2003). Edwards and Levy Yeyati (2003) use a sample of annual observations for 183 countries over the period from 1974 to 2000 and find that under flexible exchange rates the effects of terms of trade shocks on growth are approximately one half of those under pegged regimes. To measure the extent of external shock variability, *sdexport* measures the logarithm of the standard deviation of the real export growth. It is expected that *sdexport* is positively related to a greater propensity to float and thus to a lesser degree of fear of floating.

Capital controls: Following the insight of the Mundell-Fleming macroeconomic model, which portends that with restricted capital flows countries can, at least theoretically, maintain both exchange rate stability and monetary autonomy, it is expected that decisions about capital controls and exchange rate policy are closely related. Even more important in this context is the recognition that capital controls should enhance the sustainability of a fixed exchange rate regime because it is less likely that a lax fiscal policy or an expansive monetary policy, which are both incompatible with the proclaimed level of a fixed rate, provoke capital outflows, forcing monetary authorities to give up their defense of the original parity (Berger et al. 2000).

Again, there is a wide range of possible codings for this variable, ranging from indirect measures (such as calculating the differences across states in the rate of return to capital) through Kraay's (1998) and Swank's (1998) indicators, which use actual capital inflows and outflows as a percentage of GDP as a measurement of the freedom of capital movements to more direct measures. More direct measurements are usually based on raw data provided by the IMF's AREAER. Until 1996, the IMF compiled a

dummy variable to indicate whether a country imposed restrictions on capital account transactions. Since 1997 and in order to provide a more sophisticated measure for capital controls, the IMF has identified 10 categories of capital transactions that may be subject to controls.[39] Unfortunately, the old and the new classification cannot be easily merged. Following Glick and Hutchison (2000: 14), I define the capital account to be restricted for the 1997-2000 period if controls were in place in 5 or more of the AREAER subcategories of capital account restrictions and if financial credit was one of the categories restricted.[40]

A common problem with respect to capital controls and the exchange rate regime decision is the issue of causality. Are countries with capital controls better able to maintain a pegged exchange rate regime? Or is it merely that pegging the exchange rate increases the likelihood of imposing capital restrictions? Causality might run both ways and *Eichengreen* (2001) argues that the question of causality remains unresolved because existing studies cannot decisively separate cause and effect. Thus, as with all other control variables in the empirical model, I include the lagged values of the respective variable in an attempt to minimize problems of simultaneity.

Table A3.2 presents descriptive statistics for each of the explanatory variables. The explanatory variables do not account for all economic impacts on fear of floating and fear of pegging. In principle, failing to condition relevant variables may lead to bias due to omitted variables, which could lead to violations of assumptions governing the underlying model. The reason why I still have excluded some variables that are usually mentioned in the literature on exchange rate regime choice (such as, e.g., inflation) is that I only want to include variables that are clearly exogenous to the two institutional determinants. A theory about the relationship between institutional factors and a country's probability to deviate from legal exchange rate policy must include only those economic variables that are not correlated to the institutional variables. Since inflation is strongly correlated with *govinst*, an insignificant outcome for *govinst* could be due to multicollinearity problems between both variables. Inflation is also correlated

[39] The ten categories are: (1) capital market securities, (2) money market instruments, (3) collective investment securities, (4) derivatives and other investments, (5) commercial credits, (6) financial credits, (7) guarantees, sureties, and financial backup facilities, (8) direct investment, (9) liquidation of direct investments, and (10) real estate transactions.

[40] In merging the old and the new capital control restriction data, data discrepancies emerged in a small number of cases. The discrepancies were reconciled by giving the new classification priority.

to a number of other variables, and, as such, I dispensed with the idea to include this variable in the empirical model. The pairwise correlation matrix of the explanatory variables is given in table A3.3.[41] The most interesting point is that correlations among the economic control variables tend to be relatively low.[42] The highest correlations are measured for the variable *debt*, which is positively correlated with *open* (0.30) and *sdexport* (0.40). The latter variable also has the highest correlation with one of the two institutional variables; *sdexport* and *polity* are negatively correlated (-0.24).

Of course, the pairwise correlations give us just a taste of the correlations between the variables. The next section focuses on a formal multivariate econometric analysis of the data to further explore them.

3.6 Estimation method and regression results

3.6.1 Methodological issues on binary response models

The selection of an appropriate regression model must take into consideration that the dependent variable is represented by a dummy variable (Wooldridge 2002: 454; Box-Steffensmeier and Jones 2004: 72).

The expected value E of a dichotomous variable $y_i \in \{0,1\}$

$$E(y_i) = 0 \cdot \Pr(y_i = 0) + 1 \cdot \Pr(y_i = 1) = \Pr(y_i = 1) \tag{3.1}$$

is the probability *Pr* that it takes the value 1. The subindex i denotes the value of the variable for country i (time indices are omitted). Using ordinary least square (OLS) regression would lead to special estimation problems. Most importantly, since the model can lie outside the interval between 0 and 1, it does not represent a probability. A popular solution to this problem begins with transforming the probability into the odds.

$$\Omega(x_i) = \frac{\Pr(y_i = 1 \mid x_i)}{\Pr(y_i = 0 \mid x_i)} = \frac{\Pr(y_i = 1 \mid x_i)}{1 - \Pr(y_i = 1 \mid x_i)} = \frac{\kappa_i}{1 - \kappa_i}, \tag{3.2}$$

[41] The significance of the correlations between variables is not reported because this would require an implausible assumption of independence throughout panel units (Cox 2004: 1).

[42] Exceptions are the high pairwise correlations between the alternative measures for democracy and political instability, respectively. However, these variables are not included in the regression at the same time.

is defined as the ratio of the probability to its complement. The function $\Omega(x)$ maps real values within 0 to ∞ into the 0-1 interval. The natural way to remove the lower range restriction is to calculate the log of the odds, or logit.[43] This suggests the following model:

$$\kappa_i = \text{logit}(\kappa_i) = \log\frac{\kappa_i}{1-\kappa_i}. \tag{3.3}$$

The logit model with the vector of explanatory variables x_i, is then defined as

$$\log\frac{\kappa_i}{1-\kappa_i} = \Pr(Y=1) = G(x_i\beta) = \frac{\exp^{x_i\beta}}{1+\exp^{x_i\beta}}, \tag{3.4}$$

where β are the coefficients.

3.6.2 Estimation results

Results of the estimations are presented in tables 3.1 through 3.4. The structure for presenting the regression results is the same for each table. Different specifications are used for each dependent variable of interest. Along with estimated coefficients, test statistics are reported that can be used to evaluate the empirical relevance of the specifications. Every regression includes both institutional variables. The reason for this is that if democratic countries have a higher political turnover rate *and* a greater likelihood to display fear of floating, then a correlation between political instability and fear of floating that does not control for the level of democracy is spurious. All regressions use year dummies to account for a possible time trend. Thus, the results are not driven by a coinciding trend toward higher levels of democracy and an intensified fear of floating.[44] Note also

[43] An alternative statistical model is the probit that also achieves the objective of delivering predictions inside the 0-1 range. Given that logit and probit are only distinguishable from each other in the extreme tails, the choice of the function is arbitrary.

[44] Results for the time dummies are not reported in the tables. As expected, when "fear of floating" is the dependent variable, coefficients are mostly negative (positive) for the first (final) years of the period under consideration. As follows, when fear of pegging is the dependent variable, coefficients are positive at the beginning and negative in the second half of the sample period. This reflects the view that fear of floating was less prevalent during the 1970s and 1980s, while fear of pegging was less common in the 1990s.

that the Huber-White estimator of variances clustered on country basis is used (Wooldridge 2002: 56). Robust variances give accurate assessments of the sample-to-sample variability of the parameter estimates even when the model is misspecified. Clustering specifies that observations be independent across countries while allowing for serial correlation within the country.

Table 3.1. Determinants of fear of floating (dependent variable *fearflrr*)

Variable	(1)	(2)	(3)	(4)
polity	0.034 (0.03)	0.034 (0.03)	0.037 (0.03)	0.038 (0.03)
govinst	-0.407*** (0.13)	-0.406*** (0.13)	-0.417*** (0.13)	-0.425*** (0.14)
log gdp (lagged)		0.055 (0.12)	0.028 (0.13)	0.086 (0.17)
debt (lagged)			0.140 (0.11)	0.120 (0.12)
log open (lagged)				0.027 (0.42)
sdexport (log)				0.376 (0.46)
capop (lagged)				-0.392 (0.41)
LR chi^2	539.67	1178.21	984.11	879.70
Prob>chi^2	0.000	0.000	0.000	0.000
Link test	0.12	0.38	0.13	0.11
Hosmer-Lemeshow test	0.35	0.12	0.67	0.70
Count R^2	0.74	0.73	0.75	0.75
Adjusted count R^2	0.108	0.086	0.137	0.152
AIC	1021.82	1022.66	970.29	964.82
No. of observations	921	921	891	879

Notes: Regression results are obtained from a logit model with robust standard errors clustered on country basis. For definition of dependent variable see text. Time dummies are not listed. Standard deviations are reported in brackets. *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. The computed values for the link test and the Hosmer-Lemeshow test are p-values. The Hosmer-Lemeshow test is distributed as a chi-squared with J-2 degrees of freedom, J being the number of quantiles (J=10). Adjusted count R^2 displays gains from using the estimated logit model instead of a naïve forecast model with forecast "no discrepancy from de facto and de jure exchange rate regime classification".

I will first analyze the regression results for the comparison between the IMF and the RR classification because the RR classification is more appropriate for the purpose of detecting deviations from official exchange rate policy than the LYS classification (Alesina and Wagner 2003: 6; Zhou and von Hagen 2004: 12).[45] Table 3.1 begins by displaying the results for logit estimations with *fearflrr* as the dependent variable.

The second column presents the results for the specification with only the two institutional variables included. A Wald test shows that one can reject the null hypothesis that the effect of democracy and political instability is conjointly zero. The coefficients of both institutional variables bear the expected sign. Democratic societies display more fear of floating, supporting the idea that these countries are more threatened by high exchange rate volatility.

However, the coefficient for *polity* is not significant (p-value: 0.22). Politically unstable governments have less fear of floating, lending support to the notion that weak governments have no capacity to stabilize exchange rates. The parameter estimates for *govinst* are highly significant (p-value: 0.00). Including control variables into the model does not change the basic result. As displayed in columns (2) to (4), *govinst* remains highly significant while *polity* misses statistical significance throughout all regressions. Nonetheless, it maintains its positive sign.

In terms of economic variables, no variable is statistically significant at standard levels. Larger countries tend to demonstrate more fear of floating, which is contrary to the expectation. This may reflect the propensity of some small and open countries, such as the Baltic States, to opt for irrevocably fixed exchange rate arrangements (e.g. in form of a currency board system). Countries with a higher share of external debts tend to greater fear of floating supporting the idea that indebted countries fear the balance sheet effect of devaluations. The positive coefficient of *sdexport* (as a proxy for asymmetric shocks) suggests that for countries subject to stronger external shocks de facto exchange rate stability is more desirable. The negative sign on the capital control dummy is consistent with the expectation that fear of floating is less prevalent when capital flows are restricted.

In table 3.2, I report empirical results for the fear of pegging specifications.

[45] The reason for this is that the RR classification uses actual exchange rates, while LYS look at official exchange rates.

Table 3.2. Determinants of fear of pegging (dependent variable *fearpegrr*)

Variable	(5)	(6)	(7)	(8)
polity	-0.047 (0.03)	-0.050* (0.03)	-0.046 (0.03)	-0.040 (0.03)
govinst	0.376*** (0.10)	0.378*** (0.10)	0.395*** (0.10)	0.370*** (0.10)
log gdp (lagged)		0.120 (0.11)	0.160 (0.11)	0.133 (0.17)
debt (lagged)			0.051 (0.13)	0.037 (0.14)
log open (lagged)				-0.012 (0.51)
sdexport (lagged)				0.131 (0.52)
capop (lagged)				0.633 (0.44)
LR chi^2	113.62	108.76	105.64	115.42
Prob>chi^2	0.000	0.000	0.000	0.000
Link test	0.43	0.30	0.29	0.69
Hosmer-Lemeshow test	0.47	0.68	0.62	0.88
Count R^2	0.73	0.73	0.73	0.73
Adjusted count R^2	0.116	0.116	0.149	0.170
AIC	1041.19	1037.71	1001.46	986.48
No. of observations	921	921	891	879

Notes: Regression results are obtained from a logit model with robust standard errors clustered on country basis. For definition of dependent variable see text. Time dummies are not listed. Standard deviations are reported in brackets. *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. The computed values for the link test and the Hosmer-Lemeshow test are p-values. The Hosmer-Lemeshow test is distributed as a chi-squared with J-2 degrees of freedom, J being the number of quantiles (J=10). Adjusted count R^2 displays gains from using the estimated logit model instead of a naïve forecast model with forecast "no discrepancy from de facto and de jure exchange rate regime classification".

As hypothesized, both institutional variables change their sign. More democratic countries have less fear of pegging, reflecting the higher political costs of exchange rate adjustments under this type of political regime. Results are significant in one specification and marginally miss the 10 percent level of significance in the remaining three specifications. In the case of political instability, results are supportive for the hypothesis that high

political turnover increases the fear of pegging. As expected, politically unstable countries have difficulties in providing the stable macroeconomic conditions that are required to sustain a fixed exchange rate regime. This relationship is highly significant and is not affected by the inclusion of control variables.

Table 3.3. Determinants of fear of floating (dependent variable *fearfllys*)

Variable	(9)	(10)	(11)	(12)
polity	0.029 (0.03)	0.025 (0.03)	0.024 (0.03)	0.030 (0.03)
govinst	-0.199** (0.09)	-0.204** (0.09)	-0.206** (0.09)	-0.214** (0.10)
log gdp (lagged)		0.138 (0.12)	0.135 (0.12)	0.140 (0.14)
debt (lagged)			0.073 (0.11)	0.050 (0.11)
log open (lagged)				-0.086 (0.41)
sdexport (lagged)				0.372 (0.41)
capop (lagged)				0.016 (0.36)
LR chi^2	132.22	171.66	212.86	217.21
Prob>chi^2	0.000	0.000	0.000	0.000
Link test	0.85	0.33	0.27	0.26
Hosmer-Lemeshow test	0.63	0.23	0.11	0.97
Count R^2	0.70	0.70	0.70	0.70
Adjusted count R^2	0.025	0.021	0.013	0.026
AIC	973.35	968.32	937.47	937.15
No. of observations	819	819	796	786

Notes: Regression results are obtained from a logit model with robust standard errors clustered on country basis. For definition of dependent variable see text. Time dummies are not listed. Standard deviations are reported in brackets. *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. The computed values for the link test and the Hosmer-Lemeshow test are p-values. The Hosmer-Lemeshow test is distributed as a chi-squared with J-2 degrees of freedom, J being the number of quantiles (J=10). Adjusted count R^2 displays gains from using the estimated logit model instead of a naïve forecast model with forecast "no discrepancy from de facto and de jure exchange rate regime classification".

Turning to the economic variables, we see that the larger and less open countries display greater fear of pegging. Countries subject to many asymmetric shocks and those with restricted capital flows are also associated with greater fear of pegging. At first glance, the latter result is surprising because capital controls should protect a country from sudden capital outflows and should thereby reduce the need for exchange rate adjustments. However, Leblang (2003: 551) finds results consistent with the outcome in the present study, arguing that capital controls increase the probability of speculative attacks. A possible explanation for this is provided by Drazen (1997). In Drazen's model, countries introduce capital controls when they are confronted with large capital outflows. This may send a negative signal to currency and financial markets, further undermining confidence and increasing the likelihood of capital flight.[46]

Results are similar when exchange rate regime discrepancies are defined by using the LYS instead of the RR classification (table 3.3).

Again, democratic countries display greater fear of floating. However, results are still insignificant and the magnitude of the coefficients for *polity* is somewhat lower than when using the RR classification, providing support for the notion that the RR classification is better able to detect a country's deviation in exchange rate policy. Table 3.3 also provides further support for the interpretation that political instability decreases fear of floating. The coefficients on *govinst* show the expected sign and are always significant. In terms of the control variables, again, none of the variables is significant. Two control variables change the sign in comparison to the specification with the RR indicator: First, more open economies now have a slightly lower likelihood of fear of floating, which is contrary to the expectation. Second, the capital control dummy is now positive, suggesting that countries with capital controls display greater fear of floating.

Finally, I rerun the regression for the dependent variable *fearpeglys*.

[46] This outcome suggests that the reverse causality problem is not entirely solved even though lagged values of the capital openness indicator are used.

Tabelle 3.4. Determinants of fear of pegging (dependent variable *fearpeglys*)

Variable	(13)	(14)	(15)	(16)
polity	0.029 (0.03)	0.022 (0.03)	0.025 (0.03)	0.015 (0.03)
govinst	0.268*** (0.09)	0.264*** (0.08)	0.273*** (0.08)	0.271*** (0.08)
log gdp (lagged)		0.273** (0.11)	0.317*** (0.11)	0.289* (0.16)
debt (lagged)			0.162 (0.12)	0.189 (0.13)
log open (lagged)				0.235 (0.41)
sdexport (lagged)				-0.767 (0.49)
capop (lagged)				0.444 (0.38)
LR chi^2	115.49	269.09	443.33	453.27
Prob>chi^2	0.000	0.000	0.000	0.000
Link test (_hatsq)	0.56	0.60	0.52	0.77
Hosmer-Lemeshow test	0.66	0.27	0.54	0.44
Count R^2	0.73	0.75	0.75	0.74
Adjusted count R^2	0.034	0.078	0.075	0.062
AIC	993.53	968.97	933.01	921.64
No. of observations	843	843	819	808

Notes: Regression results are obtained from a logit model with robust standard errors clustered on country basis. For definition of dependent variable see text. Time dummies are not listed. Standard deviations are reported in brackets. *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. The computed values for the link test and the Hosmer-Lemeshow test are p-values. The Hosmer-Lemeshow test is distributed as a chi-squared with J-2 degrees of freedom, J being the number of quantiles (J=10). Adjusted count R^2 displays gains from using the estimated logit model instead of a naïve forecast model with forecast "no discrepancy from de facto and de jure exchange rate regime classification".

The most striking result of this specification is that, compared to table 3.2, *polity* changes sign. The results under the LYS classification suggest that more democratic countries have greater fear of pegging. However, the magnitude of the effect is not significant and much smaller than under the RR classification. In contrast, results for *govinst* are again highly supportive of the claim that political instability aggravates the sustainability of a peg. Country size is now also significantly associated with a higher proba-

bility of fear of pegging. Again, two of the economic control variables change sign compared to previous specifications. More open economies and countries with a lower standard deviation of real export growth both display greater fear of pegging.

3.6.3 Regression diagnostics and robustness checks

In order to assess the accuracy of the regressions, a variety of specification tests is performed after each estimation to check for misspecification, overfitting properties, and to assess the robustness of the results.

The overall assessment of the model yielded highly significant results. The Wald test in all cases allows us to reject the null hypothesis that the variables are statistically unrelated to the explanatory variables at the 0.0 level of confidence.[47] Pregibon's (1980) link test is used to detect a specification error in the regression model.[48] The idea behind this test is that if the model is correctly specified, additional variables will have no (or only little) explanatory power. In Stata, the link test command uses the predicted values (*_hat*) and predicted values squared (*_hatsq*) as the only predictors for a second round model. The expectation is that the variable *_hat* is significantly different from zero because it is the predicted value from the model. However, the variable *_hatsq* should fail to be significant. If not, this would indicate the presence of omitted variables (or a misspecification of the link test). As displayed by the tables, in all specifications one cannot reject the null hypothesis, which indicates that the model is correctly specified and we have no omitted variable bias.[49]

The Hosmer-Lemeshow goodness of fit test is used to check whether observed binary responses are consistent with predictions. The test relies on a grouping of the observations in ten groups with each group containing 10 percent of the total observations. The grouping depends on the percentiles of the estimated probabilities from the model. Observed and expected outcomes are then compared for each of the groups. A model that fits well will have low discrepancies between observed and expected outcomes.

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[47] Since data are clustered on country basis, a Wald test is preferable to a likelihood ratio test. When there is clustering, individual observations are no longer independent, and the "likelihood" does not reflect this. In this case, one should not use the conventional likelihood-ratio test (Korn and Graubard 1990).

[48] Cleves et al. (2004: 175) write: "The first test that we strongly recommend — and we recommend this test for all models, [..] not just survival models — is called a linktest. This test is ... remarkably powerful."

[49] As expected, the variable *_hat* (not reported in the tables) has been significant in all specifications.

Simulations have shown that the test statistic is distributed as chi-squared when the number of covariate patterns approaches the number of observations.[50] In the present study, test statistics with eight degrees of freedom show that the null hypothesis "predicted values are close to the observed ones" cannot be rejected. Thus, the Hosmer-Lemeshow statistics confirm that there are no problems concerning the fit of the model.

In light of the different specifications for each dependent variable, a reasonable question to ask is which specification fits the model best. Due to the nonlinearity of the logit estimator, the traditional R^2 is a very poor estimation criterion. An appealing alternative measure to determine the goodness of fit of a regression model is the proportion of correct predictions, referred to as the count R^2. In the present study, every specification correctly predicts at least 70 percent of the cases. However, this overall measure is to be interpreted with caution. In a binary model, without knowledge about the independent variables, it is possible to correctly predict a large number of cases simply by choosing the outcome category with the largest percentage of cases (Wooldridge 2002: 465). For example, all dependent variables are coded in more than two thirds of the cases as *0* and in the remaining cases as *1* (see table A3.2). Thus, one can correctly predict more than 66 percent of the observations by always predicting the negative outcome. To adjust for this bias, the adjusted count R^2 is also displayed in the tables. This measure indicates that including information on the value of the independent variables improves the prediction of the state of the dependent variables by up to 17 percent over what one could have achieved knowing only its marginal distribution (see last column in table 3.2).

When models are not nested, a common approach to discriminate between them is to use the Akaike Information Criterion (AIC). The AIC involves a trade off between minimizing the sum of squared errors and the number of explanatory variables. If more regressors are added to the model, the model fit improves, but the number of covariates goes up. This relationship can be used to declare the model with the lowest AIC optimal. Results for the AIC indicate that there is no overfitting of the model with too many explanatory variables. The inclusion of control variables yields a better approximation of the data than the pure institutional specification.[51]

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[50] When the number of covariate patterns is lower than the number of observations, the Hosmer-Lemeshow test is inappropriate. In this case, it is recommended to use the Pearson test.

[51] However, one problem with the AIC is that if the number of observations varies across different specifications, as presently is the case, small differences are probably not of any consequence.

Tabelle 3.5. Determinants of fear of floating (dependent variable *fearflrr*)

Variable	(17)	(18)	(19)	(20)
democracy	0.072 (0.05)	0.071 (0.05)	0.070 (0.05)	0.069 (0.06)
partyinst	-0.512** (0.17)	-0.52** (0.17)	-0.467** (0.16)	-0.495** (0.17)
log gdp (lagged)		0.045 (0.11)	0.033 (0.11)	0.034 (0.16)
debt (lagged)			0.167 (0.11)	0.161 (0.12)
log open (lagged)				-0.166 (0.42)
sdexport (lagged)				0.148 (0.45)
capop (lagged)				-0.420 (0.42)
LR chi^2	566.46	632.13	602.48	481.16
Prob>chi^2	0.000	0.000	0.000	0.000
Link test	0.18	0.27	0.15	0.14
Hosmer-Lemeshow test	0.66	0.43	0.81	0.78
Count R^2	0.73	0.73	0.74	0.75
Adjusted count R^2	0.058	0.046	0.077	0.121
AIC	1001.77	1001.91	958.57	953.21
No. of observations	900	899	871	859

Notes: Regression results are obtained from a logit model with robust standard errors clustered on country basis. For definition of dependent variable see text. Time dummies are not listed. Standard deviations are reported in brackets. *, **, *** indicate significance at the 10%, 5%, 1% level respectively. The computed values for the link test and the Hosmer-Lemeshow test are p-values. The Hosmer-Lemeshow test is distributed as a chi-squared with J-2 degrees of freedom, J being the number of quantiles (J=10). Adjusted count R^2 displays gains from using the estimated logit model instead of a naïve forecast model with forecast "no discrepancy from de facto and de jure exchange rate regime classification".

A number of sensitivity analyses lent support to the robustness of the results. In further empirical specifications, I experimented with the five-year moving average government party turnover (*partyinst*) as an alternative measure for political instability. Additionally, I substituted the variable *po-*

lity with the variable *democracy* from the polity IV dataset (Marshall and Jaggers 2002).[52]

Tabelle 3.6. Determinants of fear of pegging (dependent variable *fearpegrr*)

Variable	(21)	(22)	(23)	(24)
democracy	-0.089* (0.05)	-0.095* (0.05)	-0.083 (0.05)	-0.071 (0.05)
partyinst	0.319** (0.14)	0.330*** (0.13)	0.301*** (0.12)	0.279*** (0.13)
log gdp (lagged)		0.128 (0.11)	0.153 (0.11)	0.132 (0.17)
debt (lagged)			0.014 (0.13)	0.003 (0.14)
log open (lagged)				-0.039 (0.48)
sdexport (lagged)				0.218 (0.54)
capop (lagged)				0.625 (0.44)
LR chi^2	137.28	177.62	194.14	328.61
Prob>chi^2	0.000	0.000	0.000	0.000
link test (_hatsq)	0.02	0.01	0.02	0.39
Hosmer-Lemeshow test	0.53	0.26	0.13	0.89
Count R^2	0.70	0.70	0.70	0.72
Adjusted count R^2	0.039	0.046	0.050	0.129
AIC	1053.26	1045.09	1017.02	999.18
No. of observations	900	899	871	859

Notes: Regression results are obtained from a logit model with robust standard errors clustered on country basis. For definition of dependent variable see text. Time dummies are not listed. Standard deviations are reported in brackets. *, **, *** indicate significance at the 10%, 5%, 1% level respectively. The computed values for the link test and the Hosmer-Lemeshow test are p-values. The Hosmer-Lemeshow test is distributed as a chi-squared with J-2 degrees of freedom, J being the number of quantiles (J=10). Adjusted count R^2 displays gains from using the estimated logit model instead of a naïve forecast model with forecast "no discrepancy from de facto and de jure exchange rate regime classification".

Tables 3.5 and 3.6 present the results for the fear of floating and fear of pegging specifications based on the comparison of IMF and RR exchange

[52] See table A3.1 for a definition of these variables.

rate regime classifications. The results are strikingly robust to the alternative measures of the institutional variables. Political instability is correctly signed and remains significant in all specifications. The new variable *democracy* also always has the expected sign. However, it is only significant in some specifications when *fearpegrr* is the dependent variable.[53]

Finally, I want to provide a sense of the economic effect of the results. The exponentiated coefficients in logit can be interpreted as odds ratios for a one-unit change in the corresponding variable (Long and Freese 2003: 146). For instance, the coefficient for *govinst* in column (3) of table 3.1 is highly significant. The point estimate of -0.417 implies that, ceteris paribus, every additional government turnover within a five-year period decreases the odds that a country displays fear of floating by 34 percent. A one standard deviation increase of *govinst* would even increase a country's chances to have fear of floating by 45 percent. The results reach an even higher magnitude for *govinst*'s impact on the fear of pegging. The point estimate of 0.376 in column (5) of table 3.2 indicates that a one-point increase of *govinst*, all else equal, results in a 46 percent greater likelihood of fear of pegging. A one standard deviation rise increases the odds that a country falls into the fear of pegging category by 73 percent. Results are lower, but still non-negligible for the economic impact of *polity*. In the case of fear of floating (table 3.1), the highest statistical significance is obtained for model (3). The coefficient of 0.037 means that whenever *polity* goes up by one point (on a scale from –10 to +10), the probability of fear of floating increases, ceteris paribus, by 4 percent. A one standard deviation rise in this variable increases the odds that a country falls into the fear of floating category by more than 29 percent. In the case of fear of pegging (column (5) in table 3.2), the coefficient of –0.047 suggests that, all else equal, a one standard deviation increase in *polity* decreases the odds of displaying fear of pegging by more than 27 percent. Again, this is a quite considerable contribution, but not unusual. Alesina and Wagner (2003) report similar results for their institutional quality variables.

3.7 Discussion of findings

In this chapter, I empirically studied institutional determinants of a country's probability to deviate from its announced exchange rate policy.

[53] In unreported analysis, I performed the same robustness tests using the LYS instead of the RR classification. Again, results hardly changed compared to the baseline specification. The only notable change was that the coefficient of *democracy* gains statistical significance in one fear of floating specification.

With respect to the four hypotheses elaborated in the theoretical part of this chapter, the following conclusions can be drawn:

The logit estimations provide some weak support for hypothesis 1 — that democracy increases fear of floating. In all specifications, the coefficient of *polity* had the expected positive sign. This suggests that democratic societies have indeed a high incentive to reduce exchange rate uncertainty, but fear punishment by the electorate when they have to devalue from an officially announced peg. However, results were not statistically significant and thus the effect may be not as strong as it is theoretically assumed.

Regarding hypothesis 2, no clear picture emerged. While the use of the RR classification lends support to the hypothesis of a negative relationship between democracy and fear of pegging, the sign of the coefficients is reversed when using the LYS classification. Thus, one cannot say whether democracies or autocracies contribute to a greater fear of pegging.

I found stronger empirical relevance for the impact of political instability. As predicted, weak governments have a significant negative impact on the fear of floating (hypothesis 3). This result implies that the inability to stabilize the exchange rate in politically turbulent times plays an important role in explaining a country's de facto exchange rate policy.

The regression results also found strong support for hypothesis 4, corroborating the view that political instability increases a country's probability of fearing pegging. The magnitude of the coefficients was very large and coefficients were always highly significant. This result confirms the finding of a strong relationship between political and macroeconomic turmoil.

Three further points are worth emphasizing: First, it is interesting to see that precisely democratic countries (which are supposed to be more accountable to the voters than autocratic ones) tend to act differently than they declared. Policymakers in democratic countries will be reluctant to announce a fixed exchange rate because they fear the punishment by the voters if the commitment has to be abandoned. Since the national authorities also favor exchange rate stability, they often rely on a disguised peg, which combines their preferences for low exchange rate volatility with low political costs if the exchange rate is subject to frequent adjustments. Moreover, if one assumes that democracies are associated with better institutions, the political costs of exchange rate adjustment can also provide an additional explanation for the results by Alesina and Wagner (2003). However, why did the empirical study reveal no stronger effect of democracy on fear of floating? A possible explanation is that political leaders are interested in a stable economic development, regardless of the political regime type. Even in non-democratic settings, incumbents face political insecuri-

ties and the threat of losing power. One could even argue that since losing power has more serious consequences for dictators than for democratic leaders, the incentive to engage in opportunistic behavior is greater. In any case, even authoritarian regimes need some form of political support and thus the view of the citizens still matters. All this implies that the public sets at least informal limits on what governments can do.

Second, the attempts by authorities to stabilize the exchange rate without officially declaring a fixed regime reflects the reduced importance of the exchange rate as a nominal anchor (Leblang 2003). In the 1970s and 1980s, a common belief was that developing countries could only achieve price stability when they subordinate their monetary policy under exchange rate policy. In recent years, however, central banks in a number of developing countries have been successful in achieving low and stable inflation rates by using monetary rules in the form of inflation targeting. The fact that they have accomplished this goal without diminishing economic growth and employment suggests that even for developing countries there are alternative solutions to the risky strategy of using the exchange rate as nominal anchor.

The third interesting implication of this study is that it confirms the results by Alesina and Wagner (2003) in various ways: Like Alesina and Wagner (2003), I obtain remarkably different results for the two sides of deviation, suggesting that in many cases institutional and economic characteristics that increase the probability to deviate on one hand, decrease the probability to deviate on the other. Also consistent with Alesina and Wagner's (2003) findings is that the pattern of results is stronger for fear of pegging than for fear of floating. Finally, and also in line with Alesina and Wagner (2003), the use of the LYS classification essentially demonstrates the robustness of the basic results; yet, results are less consistent and exhibit fewer significant variables than if the arguably more meaningful RR classification is used.

3.A Appendix to chapter 3

Table A3.1. Data description and sources

Variable	Description	Source
fearflrr	dummy variable, value equals 1 when difference between IMF- and RR-grouping is positive, 0 otherwise.	IMF AREAER (various issues); Reinhart and Rogoff (2002)
fearpegrr	dummy variable, value equals 1 when difference between IMF- and RR-grouping is negative, 0 otherwise.	IMF AREAER (various issues); Reinhart and Rogoff (2002)
fearfllys	dummy variable, value equals 1 when difference between IMF- and LYS-grouping is positive, 0 otherwise.	IMF AREAER (various issues); Levy Yeyati and Sturzenegger (2002)
fearpeglys	dummy variable, value equals 1 when difference between IMF- and LYS-grouping is negative, 0 otherwise.	IMF AREAER (various issues); Levy Yeyati and Sturzenegger (2002)
polity	index that captures essential democratic elements, from –10 (highly autocratic) to 10 (highly democratic)	Marshall and Jaggers (2002)
democracy	index variable for democracy, from 0 (low democracy) to 10 (high democracy)	Marshall and Jaggers (2002)
govinst	5-year moving average government turnover rate	Zárate (2004)
partyinst	5-year moving average ruling party turnover rate	Zárate (2004)
gdp	gross domestic product (in billion US dollar)	World Bank (2003)
debt	outstanding amount of debt owed to nonresidents by residents of an economy as percentage of GDP	World Bank (2003)
open	share of exports and imports over GDP	World Bank (2003)
sdexport	standard deviation of real export growth	IMF (2003)
capop	dummy variable, value equals 1 when capital flows are restricted, 0 otherwise	IMF AREAER (various issues)[a]

[a] I thank Gian Maria Milesi-Ferretti for providing me with the data in electronic form.

Table A3.2. Summary statistics of variables

Variable	Mean	Std. Dev.	Min.	Median	Max.	Observations
fearflrr	0.29	0.45	0	0	1	972
fearpegrr	0.32	0.47	0	0	1	972
fearfllys	0.28	0.45	0	0	1	886
fearpeglys	0.26	0.44	0	0	1	886
polity	2.40	6.88	-10	6	10	1039
democracy	4.91	3.86	0	6	10	926
govinst	1.24	1.45	0	1	12	1225
partyinst	0.74	1.21	0	0	8	1225
gdp	52.21	99.73	0.10	14.71	808.11	1011
debt	0.65	0.85	0.001	0.46	10.64	982
open	67.78	36.84	9	60	282	1035
sdexport	0.19	0.08	0.07	0.17	0.57	1043
capop	0.75	0.43	0	1	1	1023

Table A3.3. Correlation matrix

	polity	demo-cracy	govinst	partyinst	gdp	debt	open	sdexport
polity	1.00							
democracy	0.97	1.00						
govinst	0.19	0.17	1.00					
partyinst	0.32	0.33	0.70	1.00				
gdp	0.14	0.12	-0.02	0.03	1.00			
debt	-0.08	-0.09	-0.08	-0.08	-0.17	1.00		
open	0.14	0.13	-0.08	-0.11	-0.24	0.30	1.00	
sdexport	-0.24	-0.23	-0.06	-0.17	-0.13	0.40	0.34	1.00

Note: Dummy variables are not included (*capop* and dependent variables).

4 Political uncertainty and speculative attacks

4.1 Introduction to chapter 4

Currency devaluations are important events for political actors. Large devaluations are often followed by political turbulence and changes in government (Cooper 1971). Being aware of this danger, policymakers in countries with a currency peg often resist devaluing their currency despite large and unsustainable macroeconomic imbalances. Still, a fixed exchange rate regime is seldom intended to provide a permanent solution. There exist several possible reasons why a country could decide to abandon an existing fixed exchange rate system. For instance, it can make good economic sense for countries to abandon an exchange rate peg in response to structural change. Gros (2001) argues that fixing exchange rates brings substantial benefits to two types of countries: First, there are countries that suffer from high inflation rates, low monetary credibility, and weak institutions. These countries would gain in terms of greater confidence in financial markets with a resulting lower risk premium on foreign debt and a stable currency. Countries with low inflation rates and a similar economic structure to developed economies would also benefit from an external anchor. Pegging the exchange rate results in lower transaction costs and leads to an expansion in trade volume with the anchor currency country. However, the "in-between countries", i.e. countries with a relatively small, but non-negligible inflation differential to developed economies and a greater need for exchange rate adjustments in case of asymmetric shocks are better candidates for floating. The implication of this U-shaped relationship between economic strength and a country's interest to use an external anchor is that if a country with high inflation rates fixes its exchange rate and the benefits of pegging materialize, it will reach a point where abandoning the currency peg makes economic sense.

However, an orderly exit from a fixed exchange rate system is difficult to achieve. There are two possibilities: The first is to move gradually toward exchange rate flexibility, e.g. by shifting from a fixed exchange rate against a single currency to a (crawling) peg against a basket and further to an exchange rate band with continuous increases in bandwith. The second,

more rapid approach is to abandon exchange rate parity and introduce a flexible exchange rate system without (or with short and few) intermediate steps. In either case, an appropriate abandonment of the peg requires careful preparation, good timing, and the build up of adequate financial markets and institutions to contend with the loss of the exchange rate as nominal anchor (Eichengreen and Masson 1998: 10-12; Asici and Wyplosz 2003: 220; Duttagupta and Ötker-Robe 2003: 21). The political economy of exchange rates suggests that the fear of floating prevents countries from abandoning a fixed exchange rate regime when external and internal conditions are favorable (e.g., when there are strong capital inflows). Typically, the exit option is only considered in circumstances surrounding pressure for devaluation. In fact, the transition from fixing to floating has often been driven by speculative attacks. Thus, a realistic picture of a country's decision to abandon a peg must include the view that countries devalue in response to weakness rather than strength.

If most exits from currency pegs are induced by speculative attacks, the critical question is what causes these events: Under what conditions are countries subject to speculative pressure? The currency crisis literature consists of three generations of theoretical models that have identified a variety of factors for investor pessimism — all of which allow for the inclusion of political variables. Section 4.2 summarizes these three different types of models and argues that political uncertainty in particular can provoke or exacerbate a speculative attack. Even under speculative pressure, policymakers can take actions to defend the exchange rate parity. The cost-benefit analysis of defending the peg (or abandoning it) is highlighted in section 4.3. There is also growing empirical literature on this subject. A review of studies relating political and institutional aspects to exchange rate regime choice and speculative attacks is presented in section 4.4.

4.2 A political-economic perspective on currency crises

The early work on currency crises, initiated by Krugman (1979), is characterized by inconsistencies in fundamental macroeconomic variables with the maintenance of a currency peg. In these *first-generation models,* the government is running a lax fiscal policy and finances the deficit by printing money. Consequently, the money supply grows in a way that is incompatible with the proclaimed level of the fixed exchange rate. Individuals realize this inconsistency and seek to convert large amounts of their holdings in domestic currency into foreign-denominated securities. As a result, the domestic currency experiences downward pressure. In order to

defend its exchange rate commitment, the central bank is forced to purchase the excessive supply of domestic currency on international financial markets, thereby reducing its foreign exchange reserves. Finally, if the central bank's foreign reserves run low, the monetary authority is forced to give up its defense of the original parity.

According to this early work, currency crises are perfectly foreseen. This implies that the devaluation does not occur at the date when all reserves are exhausted, but in the form of a speculative attack at some earlier date. Rational market participants, observing the inconsistency between monetary expansion and the exchange rate peg, act in anticipation of the devaluation and will start a speculative attack on the currency when the stock of reserves is still relatively high.

Although the main determinants of the Krugman's first-generation crisis model are economic (fiscal deficit, level of foreign reserves, money growth), it is easy to demonstrate the importance of political conditions as well. Specifically in developing countries, it has been frequently observed that a pegged exchange rate regime is combined with clearly inconsistent economic policy. If the abandonment of a currency peg is taken to mean the move away from clearly inferior policy, the main question from a political-economic view is why these countries did not stabilize once it became obvious that the macroeconomic policy would be inconsistent with the proclaimed exchange rate parity. And, if the government cannot react to these inconsistencies, why can private agents? The answer is that a government's propensity to resort to monetary expansion for financing persistent budget deficits is dependent on the country's political environment and institutional setting. It follows that governments are subject to stronger institutional and political constraints than private actors. Institutional constraints force policymakers to obey to the rules. For example, they impede changes in the government budget on a quarterly or monthly basis. Political constraints result from the myopic behavior of policymakers. Overexpansionary economic policy, e.g., is more likely to happen during election periods (because policymakers have strong incentives to reduce high unemployment rates at these times), when a party with a lower preference for fiscal stability is in office, or when the government is subject to the lobbying of powerful interest groups. Accordingly, the likelihood of a crisis should be highest in these periods.

Although first-generation models explained the causes of currency crises in the 1970s and 1980s quite well, more recent crises indicated that the link between unsustainable economic policy and the abandonment of an exchange rate peg is not as mechanical as presumed. In practice, political authorities do not wait until the level of reserves falls below a critical threshold and then retreat from the currency peg. Rather, they take a much

more active role in trying to defend the peg or adjust their policies when confronted with deteriorating fundamentals (Drazen 2000b: 48). Even in the context of a speculative attack, monetary authorities are often able to stick to an exchange rate commitment, e.g. by raising interest rates. Thus, the decision about the maintenance of the peg is better characterized by a trade off between the costs of higher interest rates (when the central bank decides to defend the exchange rate parity) and the costs in terms of lower political credibility (when the central bank abandons the peg). The question of when it is better to fail than to succeed in a currency's defense is then a political one and not the inevitable outcome of the exhaustion of foreign exchange reserves. Incomplete information about government objectives in making this decision is often crucial to the appearance of speculative pressure (Hefeker 2000: 169).

In the *second-generation models* of currency crises attention therefore shifted to government behavior and how changes in market expectations cause crises. The models contain a loss function to balance the policymakers' decision to devalue or not. The key point is that these models question the view of a single correct equilibrium. Different outcomes can result depending on the expectation of economic agents (see in particular Obstfeld 1986, 1994). A situation where policies are largely consistent with an exchange rate commitment, resulting in strong fundamentals and a sufficient stock of foreign reserves, can suddenly change as markets create the conditions for a speculative attack. The sudden shift in market expectations from optimism to pessimism may be due to uncertainty about the future path of economic policy, or more specifically the willingness or the ability of the government to maintain the exchange rate parity. For instance, a rising unemployment rate increases the cost of the exchange rate commitment for policymakers. Under such circumstances, investors may anticipate a future loosening of monetary policy and the abandonment of the currency peg. This in turn triggers a speculative attack as market participants convert their domestic assets into foreign currency.[54]

The key result is that crises leave the economy in a suboptimal, inefficient equilibrium. Crises are self-fulfilling as the expectation of devaluation makes it more likely. However, if the markets believe that the political authorities will maintain the peg, capital will not flow out of the country and the peg will persist. Again, the breakdown of the fixed exchange rate is dictated by political factors. A crisis is likely to happen if markets expect the government to lack the political commitment to defend the currency peg. However, a government's readiness to resist pressure to devalue is

[54] The classic reference here is Diamond and Dybvig's (1983) model of a bank run.

not directly observable. Markets may only derive future economic policy from different political events. Uncertainty associated with policy changes then plays a central role in the shift of market expectations. The most common form of political uncertainty is that surrounding election periods. Other typical forms include uncertainty about a policymaker's objectives (the policymaker's type) or uncertainty about a possible regime shift. All these different forms may change a government's costs and benefits of the exchange rate arrangement and therefore may also change market expectations and provoke pessimism among investors. For instance, partisan models suggest that high unemployment rates are particularly costly for leftist politicians. Knowing this, rational investors will expect a loosening of monetary or fiscal policy under left-wing governments and will sell the domestic currency in such a situation. The resulting interest rate increase leads to lower output and employment that makes it more difficult for the government to support the peg. This induces even more people to pull their financial assets out of the country. Finally, the opportunity costs of the peg exceed any stability gains and the government will retreat from the exchange rate commitment. However, this outcome is not inevitable. Since private agents do not know a government's objective function, they may underestimate its willingness and ability to defend the currency peg. In such a context, the speculative attack will not result in the abandonment of the peg, even though it could be provoked by the rational behavior of speculators (Willett 2004: 11).

While the above considerations stress the role of economic policy and the psychology of private agents in the foreign exchange market, an additional source of "financial stress" is provided by theoretical approaches to the capital investment decision. Most of these models have emphasized the effects of some specific form of uncertainty. A high uncertainty of future earnings raises the "option value of waiting" with decisions that concern investment projects (Dixit 1989; Belke and Gros 2001). The analytical basis is that foreign direct investment is to a large extent irreversible. This implies that uncertainty increases the incentive for investors to postpone investments, thereby reducing the demand for local currency. This view is supported by a number of empirical studies using different measures of macroeconomic volatility as a measurement for economic uncertainty. For instance, *Belke* and various co-authors find a negative relationship between exchange rate volatility and labor market performance, the latter being regarded as an investment project with high irreversible costs in countries with strong labor market rigidities (Belke and Gros 2001; Belke and Setzer 2003, 2003a). The concept of uncertainty was also broadened to include political uncertainty. A seminal paper is the study by Barro (1991), which reports evidence that political instability (measured by the number of mili-

tary coups, revolutions, and politically motivated assassinations) is negatively related to growth.

A *third generation* of the currency crisis literature was developed after the Asian financial crisis of 1997/1998. In these studies it is argued that the two crisis models outlined above oversee two important features that have characterized recent currency crises. First, recent financial turmoil shows that the sudden stop or reversal of capital inflows causes severe international illiquidity and sharp economic downturns generally associated with high exchange rate volatility. This induced several authors to emphasize the importance of a well-regulated banking sector (Kaminsky and Reinhart 1999). Second, a common feature of recent crises episodes has been the fast transmission of shocks across many countries ("contagion"). Various explanations of currency crises were extended to take into account contagion effects. Calvo and Mendoza (2000) argue that as the world becomes more globalized, optimal portfolio diversification results in a higher degree of contagion and financial volatility. The authors develop a model of an integrated financial market with incomplete information and identical mean-variance optimizing investors. The investors can choose whether or not to pay for relevant country-specific information to eliminate the idiosyncratic uncertainty of an investment in an emerging market economy. Calvo and Mendoza (2000) show that the willingness of global investors to acquire and process country-specific information declines as global market integration progresses and the number of countries on the market increases. With greater uncertainty, investors have imperfect information about the willingness and the ability of the government to defend exchange rate parity. In such a context, demand for emerging market's assets is likely to be highly sensitive to rumors that may result in rumor-initiated contagion.[55] Contagion also has political aspects, as emphasized by Drazen (2000b). In his model the political costs of the abandonment of an exchange rate commitment are lower when other countries also devalue. In such a context, the loss of reputation associated with the devaluation will be lower for each country and the willingness to give up exchange rate parity higher. Hence, the probability of devaluation rises with an increase of other countries devaluing.

[55] The effect is aggravated by an incentive structure that incurs a cost to asset managers when they underperform in the market. It is then rational for a risk-averse investor to imitate the given benchmark.

4.3 To devalue or to defend?

Despite the differences of the currency crisis models, a common feature to the explanation of currency peg breakdowns revolves around the policy trade off between the (short-term) political losses incurred if the political authorities resort to the devaluations option and the (long-term) macroeconomic gains achieved by doing so. The political losses arise because politicians fear that voters punish governments that violate exchange rate stability. The benefits are largely due to higher international price competitiveness. By making exports cheaper and imports more expensive, devaluations promise to provide relief from unsustainable current account deficits, low employment and low output growth. Additional economic gains are expected due to the possibility to pursue a more relaxed economic policy stance.

In Drazen's (2000b) model of political contagion the crucial point is that the decision to retreat from a fixed exchange rate regime cannot simply be attributed to a technical incompatibility of economic policy with the currency peg. Rather, the exit from a fixed exchange rate regime is the result of a political cost-benefit analysis reflecting the careful balancing of conflicting objectives. What follows is that the existence and the success of a speculative attack do not only depend on the capacity but also on the willingness of the political authorities to sustain the exchange rate peg. In two influential papers, Eichengreen et al. (1995: 39) and Eichengreen and Rose (2003: 61-82) fail to find significant differences in the behavior of economic and financial variables prior to successful and unsuccessful speculative attacks — a result that suggests that the sustainability of currency defense depends not only on economic fundamentals, but also on political factors. Drazen (2000b) argues that from a theoretical point of view, every currency peg is feasible, i.e. policymakers can always maintain certain exchange rate level even when there is an excessive demand for foreign currency. The maintenance of a misaligned currency peg is, of course, associated with some opportunity costs. However, the loss of reserves, higher interest rates, negative terms of trade shocks, or credibility problems do not inevitably lead to the abandonment of an exchange rate peg if the peg is politically acceptable and if policymakers show the willingness to pursue necessary reforms (Frieden 1997: 87; Leblang 2003: 534). In principle, pressure to devalue leaves the political authorities with three options to meet the excess demand for foreign currency and sustain the fixed exchange rate regime: spending central bank's foreign currency reserves to buy up domestic currency, introducing (or amplifying) capital controls, or raising interest rates.

Currency market intervention by using a central bank's foreign reserves to buy the excess demand of foreign currency is a common tool used by monetary policymakers both in developed and developing countries. However, as suggested by first-generation currency crisis models, the scope is limited to the level of liquid foreign exchange reserves available. As long as no external credit lines are provided, rising capital flows are likely to lead to a fast exhaustion of foreign exchange levels. This implies that official intervention in the foreign exchange market will be more effective in countries where access to international capital markets is restricted. In fact, a number of studies have found out that capital controls increase the probability of a fixed exchange rate regime (Edwards 1996: 18; Bernhard and Leblang 1999: 89). If capital movements are becoming more costly, the argument goes, authorities have a greater capacity to influence conditions in the foreign exchange market by directly buying or selling foreign exchange. However, the negative side effects of capital controls are that they further destroy investor confidence, which in turn increases rather than restricts capital flight. Moreover, a review of experience with capital controls shows that governments usually face severe administrative difficulties in enforcing and policing capital controls since they can be easily evaded by a variety of means (Gros and Thygesen 1998: 128-137). A third instrument to sustain an exchange rate peg in face of a speculative attack is to increase interest rates. Higher interest rates make it more attractive to invest in the domestic currency. Although there is no natural limit as in the case of foreign reserves, four other important economic effects countervail this benefit (Drazen 2000b: 56; Mussa et al. 2000: 22). A first immediate problem with the "interest rate defense" argument is its detrimental effect on key economic variables (such as the level of unemployment). Higher interest rates soak up liquidity, which in turn depress economic activity. This problem is aggravated by the fact that the domestic economy is supposed to be in a recession when exchange rate pressure occurs. Second, rising interest rates increase the cost of borrowing and thereby increase government debt service. A third factor that, particularly in industrial countries, limits the ability of the authorities to increase interest rates, is the close connection between short-term interest rates and mortgage rates. Increases in the short-term rate are passed on to mortgage rates and sometimes mortgage rates are even directly indexed to money markets, which is particularly problematic if defense of the exchange rate requires holding market rates high for significant periods. Finally, policymakers should be concerned about the adverse consequences of rising interest rates on the banking sector. Emerging market countries, which generally have less well regulated banking systems than developed countries, are often vulnerable to maturity mismatches provoked by sudden interest rate hikes.

These considerations show that an excessive reliance on high interest rates as the primary mechanism to sustain the peg is a risky strategy. However, if successful, both the sale of foreign reserves and the use of the interest rate as the variable of adjustment may help to modify the expectation of other market participants, thus affecting also the level of private supply and demand in the market and strengthen its credibility for the future.[56] This view is also corroborated by the data: In an empirical analysis by Leblang (2003), only 42 out of 88 speculative attacks on developing countries' currencies were successful, that is that they led to an abandonment of the peg. In the other 46 cases (52 percent) the exchange rate commitment was maintained.

The question is if Drazen's (2000b) model, which was basically developed against the background of the European crisis in 1992 can also be applied to emerging markets. Reinhart (2000: 68) claims that for emerging market economies devaluation is in the majority of cases no matter of political choice. The central bank cannot borrow reserves without restrictions because access to international credit lines is limited. Moreover, if there are fundamental doubts about the sustainability of the peg, the interest rate that would be necessary to sustain the peg is prohibitively high in emerging markets.[57] Another caveat is that devaluations in emerging market countries are contractionary rather than expansionary, especially if due to worries about inflation pass-through and liability dollarization in the domestic financial system markets expect subsequent depreciations.

What can be concluded from this discussion is the following: Continuing inconsistencies between the exchange rate commitment and the domestic economic policy as described by the first- generation crisis models will result in an abandonment of the peg. In the short term, however, governments have some measures to deal with these imbalances. That is, even if policymakers fail to defend the currency peg, there exists at least a period of time to defend the system. For example, the Bank of Thailand devalued the Thai Baht on July 2, 1997 — long after the speculative attack on its currency began in 1996 (Chan et al. 2002: 2). Thus, while macroeconomic conditions may be useful for predicting *whether* a country is like-

[56] This is not true for the capital controls, especially if they are designed to avoid massive outflows of capital.

[57] Leblang (2002: 82) presents statistical support for the view that raising interest rates reduces the probability of a speculative attack. Although significant, the magnitude of the results indicates that interest rates must increase drastically to successfully avoid the abandonment of the currency peg. For example, an increase of interest rates by 500 percent would reduce the probability of a speculative attack by approximately 7.5 percent.

ly to devalue, they are less valuable in anticipating the precise timing of the devaluation. Since not all speculative attacks result in the (immediate) abandonment of a peg, the central point in any discussion on the "survival" of currency pegs must be related to the question what determines the willingness of the government to defend the exchange rate. Governments regularly pursue difficult policy adjustments for the purpose of maintaining the exchange rate commitment and signaling competence to the voters despite objections that these policies may bring about a recession. For example, under the Argentinean currency board system there was lengthy broad national support for low inflation rates even with the understanding that this was connected to a negative output growth and rising unemployment rates. The reason has been the recognition that the alternative, the abandonment of the currency peg, would entail much higher political costs. In other times or under other circumstances there may be strong lobbying for devaluation. Thus, if one assumes that in the short term governments have the ability to maintain a fixed exchange rate, the central question concerns the conditions that increase or lower the willingness of policymakers to sustain the exchange rate commitment.

4.4 Previous research on the political economy of exchange rates

This section provides a concise review of previous research into the political economy of exchange rate regimes.[58] The intention is not to explain in detail the theoretic considerations behind these findings. This challenge will be reserved for chapter 5. Instead, the aim of this section is to give an idea of previous empirical findings. Broadly speaking, political-economic

[58] I will review only those studies that analyze a larger number of countries. Political-economic studies of exchange rate regime choice that emphasize the peculiarities of single countries (typically in a case study form and often based on descriptive rather than econometric analysis) are Aboal et al. (2003) for Uruguay, Bonomo and Terra (1999, 2001) for Brazil, Starr (2001) and Diáz-Bonilla and Schamis (2001) for Argentina, Jaramillo et al. (1999) for Columbia, Larraín and Assael (1997) and De Gregorio (2001) for Chile, Lucinda and Arvate (2002) for Bolivia, Brazil, Mexico and Peru, Magaloni (2000) for Mexico, Pascó-Font and Ghezzi (2001) for Peru, and Roubini and Setser (2005) for China. All of these studies provide valuable insights into the decisionmaking process of exchange rate policy and the relationship of the government to different social and economic groups (especially because some political effects are more prevalent in some countries than in another), but they have not been designed to yield an explanation of cross-country similarities in exchange rate policymaking.

research on exchange rates can be grouped into two strands. First, studies that enrich the literature on exchange rate regime choice, and second, articles that take inspiration from the recent currency crises literature. The former typically builds on the basic exchange rate trade off between stability and flexibility and argues that the way the trade off is solved depends upon domestic political and institutional conditions. The second branch of the literature is concerned with the political-economic explanations of speculative attacks and compares devaluation and no-devaluation episodes. The basic idea is to combine second-generation currency crisis models that give the government some scope to defend a speculative attack, with insights from comparative political analysis. Both strands of the literature find some evidence in support of the underlying theories. Including political variables in econometric models improves the power of these models to explain a country's exchange rate regime and the likelihood of a currency crisis. An overview of all reviewed studies is presented at the end of this chapter in table 4.1.

4.4.1 Literature on the political economy of exchange rate regime choice

The literature on the political economy of exchange rate regime choice has been substantially influenced by Simmons (1997), who analyzed the policy trade off in the Interwar period between devaluing and remaining in the gold standard. As has become standard practice in the modeling of exchange rate regime choice, she uses a binary regression model (probit) and codes the dichotomous dependent variable with *1* if the country has a fixed exchange rate regime (that is, in this context, if the country abides by the rules of the gold standard) and *0* otherwise. Simmons identifies three political variables that significantly affected a country's gold standard adherence. The absence of democracy, politically independent central banks and a strong left-wing representation in governance were all positively correlated with a country's duration on the gold standard. In contrast, neither political instability nor labor unrest significantly impacted gold-standard fragility (Simmons 1997: 112-118).

In the modern era, one of the first important papers to include political-economic aspects into the analysis of exchange rate regime choice, is Eichengreen et al. (1995). Although the main focus of their study is on macroeconomic fundamentals (fiscal deficits, current account deficits, money growth, inflation), the authors also include a number of political variables to explain a variety of developments in financial markets such as devaluations, revaluation, flotations, and speculative attacks (measured by a

weighted average of exchange rate changes, interest rate changes, and reserve changes). Eichengreen et al. (1995) find no clear links between changes in government or finance minister and exchange rate episodes. The sole exception to this is that recent government defeat significantly increased the likelihood of exchange rate realignments and speculative attacks. Based on this weak evidence for the impact of political factors on exchange rates, Eichengreen et al. (1995: 289) draw the conclusion that "political phenomena are rarely linked to exchange rate episodes."

Subsequent political-economic studies in the 1990s found stronger support for the impact of political variables on the exchange rate regime. These studies primarily emphasized how political instability and government's temptation to inflate affect exchange rate regime choice. The empirical results in Edwards (1996) are particularly interesting given that his theoretical model predicts ambiguous conclusions concerning the impact of political instability on a fixed exchange rate regime. On one hand, political instability decreases the propensity to peg by increasing the political costs of currency devaluation; on the other hand, political instability reduces the importance of the future, which can either increase or decrease the likelihood of a fixed regime. In the empirical part of his paper, Edwards (1996) uses the frequency of government change in the 1970s as a measure for a country's inherent political instability. An alternative index includes only those events in which there has been a transfer of power from one political party to another. He uses these measures to explain the exchange rate regime for the 1982-1990 period. Regardless of the measure, he finds strong support for the hypothesis that politically unstable countries are less likely to adopt a pegged exchange rate regime. Additionally, he introduces three indicators to measure the strength of the government (i.e. its ability to implement unpopular decisions). The results for these variables are, however, not straightforward. Only the dummy variable, which captures whether the government coalition has an absolute majority in the lower house of parliament or not, is marginally significant. This result provides some evidence that stronger governments (i.e. countries where the government coalition has a majority in parliament) have a greater likelihood of selecting a fixed exchange rate regime. An indicator measuring the number of political parties in the governing coalition and a dummy variable for coalition vs. single-party government are not significant.

A different approach in determining the degree of political instability is used by Berger et al. (2000). In this study, a time-invariant measure of political instability is constructed based on the frequency with which certain political events such as assassinations, strikes, guerrilla problems, government crises, purges, riots, revolutions, and anti-government demonstrations occur. The authors find for the majority of their specifications that count-

ries lacking political stability are significantly less likely to adopt a pegged exchange rate regime.

Klein and Marion (1997) present a theoretical and empirical investigation to the determinants of the duration of fixed exchange rate systems. The basic assumption of their theoretical framework is that the retreat from a currency peg is not the consequence of a speculative attack, but the deliberate decision of an optimizing government that trades off the economic costs of real exchange rate misalignment against the political costs of a devaluation. In the empirical part of their study, they employ logit regressions and denote the dependent variable with *0* in any month when a currency peg is in effect and *1* in the month that the spell ends. Their results, based on a panel of 17 Latin-American countries between 1957 and 1991, support the view that government transfers increase the probability of exit from a currency peg. Interestingly, the effect is stronger for irregular than for regular executive transfers.

Méon and Rizzo (2002) also analyze both theoretically and empirically the relationship between political unrest and the choice of an exchange rate regime. They assume that the defense of a currency peg under pressure entails short-run costs and long-term benefits. Since they ignore the political costs associated with the abandonment of an exchange rate commitment, they reach the unambiguous conclusion that unstable governments with shorter time horizons have a greater incentive to float. When they test their conclusion empirically, Méon and Rizzo (2002) differentiate between a country's structural degree of political instability (measured by the political turnover averaged over the observation period 1980-1994) and punctual episodes of political instability (measured by a dummy variable that is *1* for each year a change is observed either in the name of the executive or in the names of the executive party, the prime minister, and the prime minister party). While they detect a robust statistical link between structural political instability and a country's probability that it will adopt a flexible exchange rate, they observe mixed evidence regarding the influence of their punctual (i.e. time variant) measures of political instability on exchange rate regime choice. This basic result remains unchanged when the authors control for the degree of democracy.

Poirson (2001) controls for a larger number of potential explanatory variables of exchange rate regime choice. She corroborates previous empirical results finding that the number of revolutions is an important determinant of a country's de jure exchange rate regime. As an innovation to the literature, Poirson (2001: 8) additionally uses an exchange rate flexibility index that ranks countries on a continuous scale of exchange rate flexibility rather than grouping them into discrete categories. Interestingly, if this

de facto exchange rate measure is used as dependent variable, the political instability indicator loses significance and even changes sign.[59]

A number of recent studies put a stronger emphasis on a broader range of political variables. Political-institutional factors are emphasized in the study by Bernhard and Leblang (1999). The authors argue that the configuration of domestic political institutions affects the willingness of the government to fix the currency and relinquish control over monetary and exchange rate policy. To test this hypothesis, they devise a taxonomy with four basic domestic institutional conditions. The vertical axis describes whether the electoral system is majoritarian or proportional representation. The horizontal axis describes whether the costs of servicing in the opposition are high or low. If the electoral system is majoritarian and if the opposition plays a negligible role in the political process, stakes in the elections are high. This means that small swings in votes may have dramatic consequences for the distribution of power. Under these conditions, politicians will prefer a floating regime that retains the flexibility to engage in expansionary monetary policy in the pre-election period. In contrast, elections are less decisive for the distribution of power in systems where coalition governments are common and politicians can influence policy even while serving in opposition. Politicians in these systems may be more willing to fix the currency. The commitment to a stable exchange rate may provide them with a focal point for policy agreement; that is, it helps to settle conflicts about policy (Bernhard and Leblang 1999: 93). Multinomial and binomial logit estimations for 20 industrial countries confirm this hypothesis. Countries with proportional election systems and a high opposition influence have a higher likelihood to fix. By contrast, in countries with majoritarian regimes where stakes in the elections are assumed to be higher, politicians have a lower incentive to give up control over monetary and exchange rate policy. In addition, Bernhard and Leblang (1999: 90) show that industrial countries with exogenous election timing are more likely to float. This reflects the view that politicians who cannot manipulate the election date will be unwilling to restrict their policy discretion with a fixed exchange rate. According to further results, other political variables, such as the occurrence of elections or partisanship do not play an important role in the choice of an exchange rate arrangement.

Another important paper that addresses a large number of political determinants of exchange rate regime choice is that by Frieden et al. (2001). They find that Latin American countries with authoritarian regimes and strong governments (measured by the share of government seats in the le-

[59] Unfortunately, Poirson (2001) does not comment on this interesting result in the text of her paper.

gislature and the effective number of parties in the legislature) have a higher likelihood of adopting a fixed exchange rate regime.[60] Somewhat surprisingly, political instability measured by the number of government changes also seems to be associated with a higher likelihood to fix. This result contradicts the research discussed above (Edwards 1996; Klein and Marion 1997; Berger et al. 2000; Poirson 2001; Méon and Rizzo 2002). Additionally, they present evidence that a low degree of central bank independence is associated with a fixed exchange rate regime. Frieden et al. (2001) are also the first to systematically analyze the impact of interest groups on exchange rate regime choice. Each sector's influence in exchange rate policymaking is assumed to be proportional to its share in the country's GDP. The inclusion of these variables in the ordered logit specifications brought mostly insignificant results. The only exception is the variable that proxies for the importance of the manufacture sector in the economy. Economies with an important manufacturing sector favor greater exchange rate flexibility.[61] This result is even stronger when trade is liberalized, demonstrating that the importance of a competitive exchange rate (i.e. weaker currency) for this sector is particularly strong under these conditions (Frieden et al. 2001: 43).

4.4.2 Literature on the political economy of speculative attacks

The second strand of the literature has stressed the importance of political variables in explaining emerging markets' currency crises. These studies suggest that the inclusion of political variables significantly improves the ability to predict whether a country devalues or whether it continues to commit to the currency peg. The dependent variable in these studies is typically operationalized by a weighted index of exchange market pressure, consisting of changes in the exchange rate and international reserves.[62] If the exchange market pressure exceeds certain threshold, such as plus two or three standard deviations from the mean, the dependent variable is coded *1*, and *0* otherwise. Since it only makes sense to analyze speculative attacks on pegged regimes, countries with floating regimes are usually excluded from the studies.

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[60] The effective number of seats is calculated by taking the square of the share of seats of parties. Thus, it gives larger parties more weight.

[61] This result contradicts with theoretical reasoning by Hefeker (1996: 363), who argues that the manufacturing sector will prefer exchange rate stability.

[62] Due to many missing data for developing countries, interest rate changes are usually not included in the index.

These studies were primarily interested in the contribution of political uncertainty to financial turmoil in developing countries. Bussière and Mulder (1999) study the impact of political uncertainty and indecision on economic vulnerability during the financial crises in Mexico in 1994 and Asia in 1997. The structural features that contribute to politically driven indecision and uncertainty are operationalized by the effective number of parties in parliament, coalition fragility (the number of coalition partners), volatility of voting preferences (changes in the shares of seats held by various parties), and election dates. The authors find that countries are more economically vulnerable during election periods and that political volatility is significantly related to currency crises. In contrast, coalition stability and the effective number of parties in parliament seem to have only a weak impact on currency crisis. Not surprisingly, political instability matters most for countries with poor fundamentals and a low level of foreign reserves. The results are based on a sample of 23 countries that is limited to two five-month periods in the context of the Mexican crisis and the Asian crisis. Due to this restricted empirical setting, questions of sample selection become relevant if one seeks to generalize the results beyond those two particular periods.

In a related work, Mei (1999) comes to the conclusion that the assessment of Bussière and Mulder (1999) can be confirmed for her dataset limited to annual observations for the 1994-1997 period. In this study, political risk is defined simply as the period surrounding elections. Mei (1999) finds that eight out of nine financial crises (defined by a sharp reversal of capital inflows) in her sample occurred during election years. However, as in Bussière and Mulder (1999), the short time period under consideration makes a generalization of the results more difficult. The hypothesis of increased political risk in times surrounding elections was tested for a larger observation period by Block (2002). Contrary to Mei (1999), he finds no higher likelihood of currency crises in election periods. Even when only elections with executive change were included in the probit regressions, the point estimate fell short of significance. Similar to Bussière and Mulder (1999), Block's (2002) results suggest the importance of more "structural political conditions". Right-wing governments and stronger governments (measured by both their share of seats in the legislature and the fragmentation of opposition parties) are associated with a lower vulnerability to currency crisis. The estimate for the level of democracy remains insignificant and ambiguous.

Leblang (2002) also studies the importance of partisanship and elections on the occurrence of speculative attacks in a large sample of developing countries. In his rare event logit estimations, the probability of a speculative attack increases marginally (but is statistically significant) during the

three-month period following an election compared to non-election periods. In terms of partisanship, he finds that left and center governments are significantly more likely to experience speculative attacks than right-wing governments. Interestingly, the pattern of result changes when only election periods are considered. The interaction between partisanship and the timing of elections suggests that in pre-election periods left-wing governments have a *lower* probability of experiencing a speculative attack than right-wing governments.[63] The argument here, which will be more elaborated upon in the next chapter, is that left-wing governments have low credibility and, therefore, under certain conditions, a greeter need for the disciplinary effects provided by fixed exchange rates. Gains in credibility are particularly important in the pre-election period, which induces left-wing governments to use all policy tools available at their disposal to prevent an attack. By contrast, right-wing governments have already certain degree of credibility and thus, have less incentive to sustain an exchange rate peg at any cost.[64]

Leblang (2003) draws on his earlier research and examines which factors influence the government's willingness and ability to resist a speculative attack and defend the currency peg. In this attempt he explicitly distinguishes between successful and unsuccessful attacks. The former are defined by a speculative attack that results in the abandonment of a pegged exchange rate regime ("devaluations"). The latter occur when a speculative attack takes place but does not lead to the end of a pegged regime ("defenses"). His empirical estimations rely on strategic probit, primarily because examining instances of devaluations and defenses would be subject to selection bias. The use of this empirical procedure enables him to explicitly model the strategic interaction between governments (which are faced with a trade off between defending and devaluing) and markets (which take into consideration the expected governmental reaction when deciding whether to attack or not). His results confirm the hypothesis that the policymaker's incentive to avoid devaluation depends upon electoral considerations. However, the election dummy variables suggest not only a lower likelihood of devaluing *before* the election but also *afterward.* This result questions the generality of findings by Mei (1999); Bussière and Mulder (1999), and

[63] There is no significant difference between left and center governments, however.

[64] In the literature this phenomenon is known as the Nixon-goes-to-China syndrome. Only a conservative president such as then US president Richard Nixon could afford to reestablish diplomatic relations with the People's Republic of China because nobody would accuse him of being a communist.

Leblang (2002).[65] Partisanship also has a somewhat unexpected effect on the government's trade off between defending the parity and devaluing. Governments with ties to the left are significantly more likely to defend an exchange rate commitment than right-wing governments. Sectoral interests (measured by the size of the export sector) and the strength of the government (measured by the executive's party influence in the legislative branch) are not relevant in explaining successful or failed speculative attacks.

Most of the studies summarized here have employed probit or logit. While these approaches are useful because they consider multiple explanatory variables simultaneously in the prediction, one of their major shortcomings is the implicit assumption of a constant hazard rate. As such, these studies ignore the possible time dependence of exchange rate regimes. In other words, what these studies assume is that the time in which a certain exchange rate regime exists does not determine the likelihood of its abolition. However, failing to account for time dependence can only be justified under two crucial assumptions: First, time should not matter. That is to say that depending on the economic and political covariates in the model, the probability of a regime shift in any year must be the same as in any other year. Second, one must assume that the model is correctly specified. Since time can be used as a proxy variable for unmeasured occurrences, no uncontrolled variables should exhibit an impact on exchange rate regime duration. If one (or both) of these assumptions is not fulfilled, the regression result may be biased. However, both assumptions are hard to justify. For example, it seems inappropriate to assume that the probability that a country abandons an exchange rate peg is the same for a peg that has been in existence for one year than for a peg that has been maintained for ten years. As argued by Masson (2001), the choice of an exchange rate regime is not a once-and-for-all decision, but is likely to change over time. Hence, it seems particularly useful to think of exchange rate regime choice in terms of the likelihood of the abandonment of the prevailing exchange rate regime. Studies of survival analysis account for these time effects and test for duration dependence, i.e. if exchange rate regime duration is a function of time. The strength of the survival (or duration data) approach lies not solely in the explicit modeling of time dependence. The support of time varying covariates, i.e. explanatory variables that can take on diffe-

[65] The surprising effect of a higher government's willingness to defend an exchange rate commitment in the post-election period (compared to the rest of the legislation period) results only when controlling for macroeconomic fundamentals. The unconditional relationship between electoral periods and speculative attacks shows no significant differences between these two periods.

rent values throughout the duration of an event, is another advantage of this kind of models compared to standard logit or probit estimation methods.[66]

Until now, few economists have used survival analysis methods to explain political determinants of exchange rate regimes. To the best of my knowledge, the only notable exceptions are Bodea (2003) and Blomberg et al. (2004).[67] Both studies use political variables in the framework of survival analysis to estimate the sustainability of fixed exchange rates. Both also report that time is an important determinant for the analysis of transition between exchange rate regimes. Currency pegs tend to be most vulnerable when they are introduced. As time goes on, the probability of devaluation decreases, presumably because monetary policymakers gradually acquire reputation and thus the credibility of the peg improves.

Blomberg et al. (2004) analyze political determinants of exchange rate regime duration for 26 Latin American countries for the period from 1960 to 1999. Their dataset is similar to the one used by Frieden et al. (2001). In terms of political data, the dataset covers a variety of variables such as changes in government (constitutional and otherwise), elections dates, the number of effective parties in parliament, the government's vote share, political instability, and central bank independence. However, only two of these variables significantly affect the duration of fixed exchange rate regimes. Countries with a larger manufacturing sector are less likely to maintain a peg. The explanation for this result is that a country's manufacturing sector is exposed to international competition and therefore manufacturing interest groups lobby for a relatively weak currency that increases international price competitiveness. Since floating regimes in developing countries are associated with more depreciating currencies (Frieden et al. 2001: 28; Schuler 2002), this increases the likelihood of exit from a currency peg for countries with a large tradable sector. Additionally, Blomberg et al. (2004: 25) find substantial evidence for the proposi-

[66] The popular procedure by Han and Hausman (1990), e.g., allows only for the inclusion of variables that are explicit functions of time (time *dependent* variables), such as age or years. It does not support time *varying* covariates such as inflation or the degree of openness.

[67] Studies that account for the time dependence property of exchange rate regimes without including political or institutional variables include Tudela (2004) and Wälti (2005). Other studies that explicitly account for the inertia in exchange rate regime choice are Masson (2001) and Calderón and Schmidt-Hebbel (2003). The latter studies measure the probability of exchange rate regime transitions by Markov chains examining transition matrices for different time periods. However, this methodology, while appropriate for their special case of examining regime transitions, fails to take into account time varying covariates.

tion that in pre-election periods governments are more likely to sustain a peg.

The study by Bodea (2003) estimates partisan differences in exchange rate commitment duration in a sample of six CEECs. Bodea (2003) finds that partisan differences in the probability of leaving an exchange rate commitment depend on the type of pegged regime. While in the case of crawling regimes (crawling pegs and bands) socialist governments have a lower probability of leaving the regime, hard pegs have the longest duration under more conservative governments. In addition, the impact of party ideology on exchange rate regime duration depends on past inflation. If past inflation has been high, fixed regimes last longer under right-wing governments. In contrast, at low levels of past inflation, left-wing governments show a stronger commitment to the exchange rate target that is consistent with the view that right-wing governments value the credibility gains delivered by exchange rate pegs less, given that inflation is under control. Other policy variables included, such as the number of seats in the legislature that belongs to the largest party in cabinet, the number of coalition partners in executives, and a dummy variable with a value of *1* for coalition majority are not significant.

Undoubtedly, the allowance for time dependence in these studies is an important improvement compared to previous research. However, what is missing in both studies is a clear picture of a serious discussion of the most adequate econometric model for this type of analysis. For example, the parametric specifications used by both Bodea (2003) and Blomberg et al. (2004) assume a very restrictive shape of the underlying risk function—an assumption that is not easy to justify in the present context. Another possible area of improvement is the application of the survival analysis approach for a global sample of developing countries. I will take up both of these issues in chapter 6. First, however, chapter 5 will derive some hypotheses for the subsequent empirical study.

Table 4.1. Empirical studies on the political economy of exchange rate regimes

Author(s)	Country coverage/ period (frequency)/ model	Dependent variable	Political variables included
Simmons (1997)	17 industrial countries/ 1923-1939 (annual)/ binomial probit	dummy variable taking a value of 1 if country is on gold standard, 0 otherwise	central bank independence (+) left-wing government (+) democratic (-) frequency of cabinet changes (^) labor unrest (-)
Eichengreen et al. (1995)	20 OECD countries/ 1959-1993 (quarterly)/ multinomial logit	number of exchange rate "episodes" (e.g. speculative attacks, devaluation, revaluation, flotation); speculative attacks identified by weighted average of drop in reserves and increases of real exchange rate and interest rate.	past government defeat (+) past government victory (-) future government defeat (^) future government victory (+) past new finance minister (+) new future finance minister (^)
Edwards (1996)	63 countries/ 1980-1992 (yearly)/ binomial probit	dummy variable taking a value of 1 for countries with pegged regimes and 0 for more flexible regimes (IMF classification)	transfer of power (-) frequency of government change (-) coalition majority in parliament (+) coalition government (+) large number of parties in governing coalition (-)
Berger et al. (2000)	65 developing countries/ 1980-1994 (annual)/ binomial probit	dummy variable taking a value of 1 for countries with fixed regimes (or fixed weight basket of currencies) and 0 for more flexible regimes (IMF classification)	summary measure indicating socio-political unrest (-)

Table 4.1. (continued)

Klein and Marion (1997)	16 Latin American countries/ 1957-1991 (monthly)/ binomial logit	dummy variable taking a value of 0 for months in which peg is in effect and 1 in the month that the spell ends	irregular executive transfer (+) regular executive transfers (+)
Méon and Rizzo (2002)	125 countries/ 1980-1994 (annual)/ binomial probit	dummy variable taking a value of 1 for countries with fixed regimes and 0 for more flexible regimes (IMF classification)	average turnover in heads of state (-) average political turnover (-) frequency of legislative elections (-) episode of political turnover (-) transfer of executive power (-) dictatorship (+)
Poirson (2001)	93 countries/ 1990-1998 (annual)/ ordered probit, OLS	four different specifications: three IMF based exchange rate regime classifications (with varying subgroups), one "de facto" classification based on a continuous scale; higher values indicate in all cases more exchange rate flexibility	number of revolutions (1990-93) (+) number of government changes (1990-93) (?)
Bernhard and Leblang (1999)	20 industrial countries/ 1974-1995 (annual)/ binomial and constrained multinomial logit	1.) binomial logit: dummy variable taking a value of 1 for countries with pegged regimes and 0 for flexible regimes, 2.) multinomial logit: in a second step additional differentiation between fixing and participation in multilateral currency arrangement, both specifications use IMF data	proportional representation system with high opposition influence (+) majoritarian system with low influence of the opposition (-) exogenous election timing (-) election year (-) left-wing government (?)

Table 4.1. (continued)

Frieden et al. (2001)	26 Latin American countries / 1960-1994 (annual)/ ordered logit	index variable taking on four different values, from 0 (fixed) to 3 (backward-looking crawl or band)	dictatorship (-) share of government seats in legislature (-) effective number of parties in legislature (-) number of government changes (-) central bank independence (+) share of manufacturing in GDP (+) share of agriculture in GDP (+) share of mining in GDP (+)
Bussiére and Mulder (1999)	23 emerging countries/ 1994, 1997 (five months periods)/ OLS	dummy variable taking a value of 1 if crisis occurs, 0 otherwise; crisis defined by an index of exchange rate pressure (weighted average of drop in reserves and increase of real exchange rate)	change of seats in parliament (+) election dates (+) effective number of parties in parliament (+) coalition fragility (-)
Mei (1999)	22 emerging market countries/ 1994-1997/ probit	dummy variable taking a value of 1 if crisis occurs, 0 otherwise; crisis defined by a sharp shift from capital inflow to outflow	election dates (+)

Table 4.1. (continued)

Block (2002)	23 emerging market countries/ 1975-1997 (monthly)/ probit	dummy variable taking a value of 1 if crisis occurs, 0 otherwise; crisis defined by an index of exchange rate pressure (weighted average of drop in reserves and increase of real exchange rate)	concentration among opposition parties (+) government share of seats in legislature (+) right-wing government (-) democracy (^) election (+) executive change (+)
Leblang (2002)	78 developing countries/ 1975-1998 (monthly)/ rare event logit	dummy variable taking a value of 1 if crisis occurs, 0 otherwise; crisis defined by an index of exchange rate pressure (weighted average of drop in reserves and increase of nominal exchange rate)	left-wing government (+) left-wing government and pre-election period (-) center government (+) pre-election period (-) post-election period (+)
Leblang (2003)	90 developing countries/ 1995-1998 (monthly)/ strategic probit	In addition to the coding in Leblang (2002), a third value for the dependent variable is specified when a speculative attack does not lead to the exit of a pegged exchange rate regime. Definition of crisis follows Leblang (2002).	pre-election period (-) post-election period (-) government majority of seats in legislative branch (?) large size of export sector (?) left-wing government (-)

Table 4.1. (continued)

Blomberg et al. (2004)	26 Latin American countries/ 1972-1999 (monthly)/ survival analysis (Weibull)	duration of fixed regime (IMF classification)	pre-election period (+) post-election period (-) large industrial sector (-) number of effective parties (?) government vote share (?) central bank independence (?) changes in government (?)
Bodea (2003)	6 CEECs/ 1989-1999 (monthly)/ survival analysis (Weibull)	duration of government commitment in exchange rate policy; breach of exchange rate commitment (IMF classification) identified by - devaluation of a pegged currency even if the country remains within a pegged exchange rate regime - transition between currency regimes - change in the composition of the basket of currencies or the width of the fluctuation band	largest party in government is left-wing (+) pre-election period (+) coalition majority in parliament (+) share of seats of largest party (+) number of coalition partners in executive (-)

Notes: Bold letters indicate the coefficient is statistically significant (at least) in some specifications. +(-) indicates that the coefficient is mostly positive (negative), ^ indicates that results are inconclusive, ? indicates that the coefficient is not reported by the author.

5 Developing a theory of currency peg duration

5.1 Introduction to chapter 5

For policymakers, both abandoning a currency peg and living with a misaligned real exchange rate may be costly. Which of the two alternatives (stable exchange rates or monetary policy autonomy) the government chooses to sacrifice may also depend on political and institutional factors. What are the political factors that increase or lower the probability of the "survival" of a fixed exchange rate regime? This question is crucial because it helps in understanding why countries often deviate in terms of exchange rate policy from recommendations from a purely normative view. To answer the question, this chapter identifies eleven political, institutional, and interest group factors that are supposed to provide explanatory power with respect to the maintenance of currency pegs. The first four hypotheses are built on the theoretical framework of political cycles developed by Nordhaus (1975) and Hibbs (1977). I will argue that the timing of elections and the political affiliation of the party in power influence the duration of pegs (section 5.2). The literature review in section 4.4 has further suggested that political institutions may mediate the effect of politics on currency markets. Therefore, I enrich the insights of the political cycle theory with mainly institutional considerations that construct hypotheses 5 through 8 (section 5.3). Interest groups may also play a role. Section 5.4 considers the potentially important role of varying exchange rate preferences across different sectors of an economy and derives implications for currency peg duration (section 5.4). [68]

5.2 Elections and changes of policymakers

The large literature on political cycle models can be classified by two branches: First, the political business cycle (PBC) literature, which argues that politicians pursue certain policy solely in order to win elections and,

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[68] I thank *Rainer Schweickert* for a useful discussion to this chapter.

second, the partisan cycle literature which claims that politicians want to gain elections in order to pursue certain policy. The underlying question behind this conflict is if politicians are primarily motivated by a desire to retain in office, i.e. driven by re-election requirements, or ideologically motivated, i.e. driven by different macroeconomic goals. The aim of this section is to give a brief overview of the two main variants of political cycles and, based on this theoretical framework, derive policy implications for the discussion on the probability of abandoning a currency peg.[69]

5.2.1 The political business cycle theory

Nordhaus (1975) was the first to formalize the concept entailing an incumbent who attempts to boost the economy before the election in an attempt to improve his chances of re-election.[70] His model is based on adaptive expectations, assuming that naive voters heavily discount past observations. The implication of voter short-sightedness is that the economic situation immediately prior to polling day plays a crucial role for the outcome of the election (responsibility hypothesis). This feature provides the incumbent with an exploitable Phillips curve trade off between inflation and unemployment:

$$u_t = u^* - \gamma(\pi_t - \pi_t^e) + \varepsilon_t \tag{5.1}$$

where u is unemployment, u^* is the steady state "natural" level of unemployment, π is the inflation rate (which is under the direct control of the incumbent), π_t^e is the expected period t inflation rate based on information available in period $t-1$, ε_t is a random shock with zero mean, and γ is a positive parameter.[71] According to equation (5.1), if policymakers wish to keep the unemployment rate below its natural rate, they can do so in the short term by forcing the actual inflation rate to exceed the public's expected rate.[72] In such an environment, governments have an incentive to

[69] For comprehensive analyses of political cycles see Belke (1996: chapters 2-4, Alesina et al. (1997); Drazen (2000: chapter 7, 2000a).

[70] Lindbeck (1976); MacRae (1977); and Tufte (1978) have presented similar models of the political business cycle.

[71] Alternatively, the same model can be written in terms of output growth instead of unemployment.

[72] The natural rate of unemployment, called NAIRU (non-accelerating inflation rate of unemployment), is the unemployment rate that prevails when all unemployment is voluntary and no upward or downward pressure on prices exists. Its level is determined by the economy-wide real wage, which, in turn, critically

create inflation by using expansionary monetary policies immediately prior to the election. With individuals locked into wage contracts, nominal wages are fixed prior to the start of the period, and thus the inflationary effects of this policy lead to lower real wages, increasing labor demand and lower unemployment and creating by this the appearance of a strong economy. Under the validity of the responsibility hypothesis, voters will reward this policy by reelecting the incumbent government.

After the election, the government pursues contractionary policies that lower inflation, but also cause an economic downturn or recession. The motivation behind this is that lower inflation facilitates the initial conditions for surprise inflation in the course leading to the next elections.[73] The lower the rate of inflation when a government initiates a pre-election expansion, the higher the attainable level of popularity and the greater the chance of electoral success. As a result, the policymaker's opportunistic attempt to impact electoral outcomes creates an unnecessary and economically inefficient political cycle with a booming economy leading up to election day and a bust immediately afterward. The cycle will repeat such a course with each legislative period.

The prototype of political business cycle à la Nordhaus (1975) has been subject to considerable criticism and has little supporting empirical evidence. In second-generation models of PBCs that incorporate rational expectations of all political and economic agents, electoral cycles are caused by asymmetric information between the policymaker and the voters. While the former knows its own competence to run the government, the latter do not. Voters try to extract the competence of a government by rationally observing the actions of the party in power. However, incumbents take advantage of the voters' imperfect information about policymakers' competence and try to appear as competent as possible, thereby generating a political cycle in economic variables. The most prominent contributions in this area are the models by Persson and Tabellini (1990); Rogoff and Sibert (1988), and Rogoff (1990).

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depends on labor market institutions. Countries that are characterized by extensive unemployment benefit systems, strong trade unions or minimum wages generally have a higher real wage, resulting in lower labor demand and a higher natural rate of unemployment. Moreover, structural conditions also play a role to the extent that they affect the consistency between the needs of employers and the skills that exist in the workforce.

[73] In the traditional Nordhaus (1975) model inflation begins to increase moderately before the election and continues to increase after the election when inflation expectations begin to rise. Lindbeck (1976) builds a model in which inflation appears with a lag, i.e. after the election.

While first studies on political cycles exclusively referred to OECD countries, a number of more recent studies cover the case for political cycles in developing countries. A priori, one can identify a number of differences in the political sphere when comparing emerging market economies to industrial countries, which, at first glance, would possibly cast doubt on the applicability of the PBC theory to developing countries. First of all, some developing countries are not democracies. If elections are not competitive the incumbent logically has no (or less) motivation to create political cycles in economic activity as the theory predicts. Other developing or transition economies, such as the CEECs, have only recently undergone transitions to democracy. In these nascent democracies one could expect voters to lack the experience of voting that is required based upon to the model's characterization of voters. Yet, there are several reasons to believe that political uncertainty and electoral manipulation should be more prevalent in emerging market economies. First, the relative inexperience of the (less educated) electorate with choosing between candidates from competing political parties makes it easier for the incumbent to produce electoral manipulation. For example, voter buying and backroom dealing are often more rampant in these countries. Second, voters in many developing countries have less access to a free press and other instruments to monitor the policymaker, making them more vulnerable to economic manipulation. Finally, policymakers in developing countries enjoy a higher discretionary power to directly control policy instruments because the system of checks and balances is less pronounced in these countries (Mei 1999: 4; Fidrmuc 2000: 199; Bender and Drazen 2004: 3).[74]

5.2.2 Political opportunism and exchange rate policymaking

The original PBC exists in two forms — political budget cycles, meaning that there is a cycle of government spending, transfers, or taxes before and after the election day and political monetary cycles, which argue that a cycle is generated by manipulation of the money growth rate around the election day. Recent research indicates that a political cycle might be also observed with regard to the exchange rate. The idea of a political exchange rate cycle springs from three points: First, as in traditional PBC models, elections change the government's behavioral incentives. The incumbent has an incentive to work toward polices with visible benefits and hidden

[74] Consistent with these considerations, results of both cross-country studies and single-country PBC tests in developing countries are rather strong (see e.g., Schuknecht 1996; Shi and Svensson 2002, or Hallerberg et al. 2002).

costs, while he is typically inactive when dealing with necessary long-term economic problems (resulting, e g., from a misaligned exchange rate). Thus, to the extent that devaluations impose significant political costs, it follows that these costs should affect the government's incentives to influence the timing of exchange rate adjustments. A second factor relating elections to exchange rates is that elections present a major source of uncertainty to both domestic and foreign investors. Second-generation currency crisis models have shown that even when there is no change in economic policy, elections can create speculative pressure via a change of expectations. Uncertainty surrounding elections means that future economic policy cannot be predicted with certainty. Since the results of elections are unknown, elections obscure government preferences and influence public's ability to process relevant information. The government's incentive to distort the economy may itself shift market expectations in a direction that aggravates exchange rate movements caused by the real distortions (Block 2002: 10). A third factor providing a linkage between elections and exchange rates is that government changes have important implications for a country's future political and economic course (Leblang 2002: 73). Hence, elections are a major political event for the redistribution of political power that could, in turn, influence exchange rates.

What are the implications of these theoretical considerations for the viability of a currency peg? It is conventional wisdom that the state of the economy at the moment of an election has a major impact on voters' decisions (Tufte 1978; Remmer 1991). Good macroeconomic conditions help incumbents to get reelected. In view of recent severe economic crises in developing countries, one can even argue that the economic situation is often identified as the single most important problem facing these countries. As a result, an electorate's assessment of the government's capacity to improve the economic situation may significantly affect the outcome of the election. If the government can signal its competence in economic issues by providing good macroeconomic fundamentals, it should increase public support and increase its chance for re-election.

Based on these considerations, there are two political-economic arguments that justify the departure from a currency peg in pre-election periods. First, given that macroeconomic conditions significantly affect the election outcome, incumbents may have an incentive to remove the constraints on monetary policy imposed by the currency peg. Floating the exchange rate increases monetary policy autonomy and thereby widens the scope for the incumbent to manipulate the economy (e.g. via higher money growth rates) (Gärtner and Ursprung 1989; Bernhard and Leblang 1999: 83; Hefeker 2000: 168). Second, increased uncertainty in election periods could induce economic agents to move from domestic-

denominated assets to foreign-denominated assets, thereby generating (or increasing) pressure on the domestic currency to devalue. With an upcoming election, politicians may be less willing to tighten monetary policy to maintain the peg.

However, it is questionable if these arguments (which were basically developed for industrial economies) can be applied to developing countries. Abandoning an exchange rate commitment entails significant political costs (see chapter 3) and, at least in the short term, is usually accompanied by contractionary effects. Given that with an upcoming election the time horizon of governments is particularly short, incumbents will have a strong bias against devaluation in the pre-election period. Moreover, any potential gains from devaluing are presumably more than outweighed by the fact that devaluations cast doubt on the competence of the incumbent and its ability to govern. Maintaining a fixed exchange rate regime that delivers monetary stability is seen as an important signal for successful economic policy. Thus, required exchange rate adjustments are likely to be delayed until after the election. The classical rule is, as Edwards (1994: 28) put it, to "devalue immediately and blame it on your predecessors." The incentive to delay devaluations is particularly strong in countries where the currency peg is part of an inflation-reducing exchange rate stabilization program. In such a case, the decision to abandon a fixed exchange rate regime and devalue is often interpreted in a way that other complementary parts of the stabilization program (such as a sound fiscal policy, liberalization of trade flows, or the privatization of state-owned companies) will not be maintained either. As a result, risk premium and public debt increase.

Additionally, market expectations that the government is eager to defend the exchange rate parity in the pre-election period should reduce the likelihood of a crisis in that period. Speculators with rational expectations will anticipate that policymakers have a higher willingness to defend an exchange rate peg prior to an election. Hence, they will delay a speculative attack until after polling day, when the political authorities will undertake fewer efforts to maintain the fixed regime (Leblang 2003: 72). This behavior reduces the likelihood of the exit from a currency peg for the pre-election period and increases its likelihood for the post-election period.

This leads to hypotheses 1a and 1b:

Hypothesis 1a: In pre-election years, the probability of exit from a currency peg is lower than in non-election years.

Hypothesis 1b: In post-election years, the probability of exit from a currency peg is higher than in non-election years.

5.2.3 The partisan theory

The original formulation of the partisan theory is due to the prominent paper by Hibbs (1977). Hibbs argues that political parties represent different core constituencies. Accordingly, parties pursue policies that favor only a subgroup of the population and thus maximize different objective functions. Parties from the ideological right traditionally have strong ties to the business and financial sectors. Since these social groups retain more wealth and are more secured from unemployment, the classical partisan theory presupposes that in terms of a stable Phillips curve trade off, right-wing parties attach a high priority to maintaining price stability while they are willing to tolerate certain level of unemployment rate because they dispose of safe jobs.

Parties from the ideological left, on the other hand, have closer links to workers and trade unions, whose income strongly depends on employment opportunities. At the same time, inflation aversion is lower. Therefore, left-wing parties give priority to employment and distributional aspects, accepting a certain degree of inflation.[75] Consequently, they are more inclined to use expansionary macroeconomic policy to manage the domestic economy.

The second generation of partisan models, formulated by Alesina (1987, 1988) and various co-authors (e.g., Alesina and Sachs 1988; Alesina and Roubini 1992), expanded the strong partisan model to be consistent with the school of rational expectations. So-called rational partisan models assume fully rational economic agents that operate in markets where labor contracts are signed at discrete intervals with start dates preceding an election. Consequently, prices and wages adjust only sluggishly to new information (as assumed by neo-Keynesian theorists). This results in a less-exploitable Phillips curve compared to classical partisan models. As individuals can no longer be fooled systematically, only unanticipated policy produces (temporary) real effects.

Empirical studies of macroeconomic policy have shown that parties indeed adopt positions on important macroeconomic issues that reflect their partisan location: left-wing parties seem to prefer policies that increase government spending and reduce unemployment, while right-wing parties favor policies that induce lower government expenditure and lower inflation (see Alesina et al. 1997 for an overview).

[75] A tolerance toward inflation is also justified by Hibbs (1987), who found that price increases improve the relative income position of the lower classes.

5.2.4 Partisan interests and exchange rate policymaking

Does exchange rate policy also reveal differences among parties? If left- and right-wing governments discern differences in fiscal and monetary policy, it is natural to argue that such differences should also occur in terms of exchange rate policy. Indeed, the political attractiveness of different exchange rate arrangements varies according to the macroeconomic preferences of the party in power. Since left-wing governments are generally more inclined to use expansionary macroeconomic policy to manage the domestic economy, the danger of devaluation grows. As a consequence, left-wing parties are expected to experience the more short-lived duration of a currency peg. In contrast, right-wing governments, being more concerned about stabilizing the economy and securing the real value of investment and creditor savings, should have a greater incentive to maintain a currency peg.

Even if governments do not initially act along partisan lines, market adjustments to inflationary expectations can create a self-fulfilling prophecy. Since a lax economic policy, which leads to higher overall spending, is more likely to occur under a left- rather than a right-wing government, left-wing governments are generally seen as less credible with respect to commitments to avoid inflation. When market participants anticipate pressure on the exchange rate because they expect a change in the government from right to left, they will exchange their money holdings in domestic currency into foreign-denominated securities. This run on the remaining reserves serves as the beginning of a currency crisis and finally causes the collapse of the fixed exchange rate system. In contrast, rightist governments can pursue their preferred policies without endangering the maintenance of the fixed exchange rate. A promise to secure price stability is more credible and, all things equal, pressure for devaluation is less likely to occur.

However, the literature review in section 4.4 has documented that when partisan influences are found in about half of the studies partisanship worked the opposite of what theory would predict: i.e. that right-wing parties are less prone to currency pegs. While Block (2002: 21) and Leblang (2003) find that right-wing governments are associated with a greater willingness to defend a currency peg than more leftist parties, results by Simmons (1997) and Bodea (2003) suggest that more conservative parties are less committed to currency pegs. In the following, I will argue that such an opposing political cycle in the exchange rate regime may occur if one combines the partisan approach with the insights of the political business cycle theory. This alternative theoretical consideration is based on work by Frey and Schneider (1978), which shows that assuming that parties care only about ideology or re-election is not very useful. Frey and Schneider

(1978) include both a popularity function and a policy function in their model. The former explains a party's support as a function of a number of macroeconomic variables. Following the notion of the responsibility hypothesis, it is assumed that better economic performance relates to greater popularity of the government in power. The policy function accounts for the ideological preferences of the incumbent government and describes how "governments use policy instruments to steer the economy in a desired direction" (Frey and Schneider 1978: 174). They conclude that governments may be motivated to behave opportunistically and pursue a vote-maximizing policy when they are afraid of losing an election, but switch to ideological policies when their popularity is high and re-election is not endangered.

When applying these considerations to exchange rate policymaking, it might be precisely these left-wing governments that seek to maintain a fixed exchange rate in the period prior to elections to signal concern for price stability. To illustrate this point, consider a left-wing government that has subsequently devalued its currency and is approaching an election. If this government cares about both remaining in office and setting policy, it would be unproductive to devalue even more in the election year. In fact, it could be useful to show some anti-inflationary concern and avoid devaluation. In this way, the government builds on an anti-inflationary reputation and increases its chances for re-election. Analogously, right-wing governments, which possess greater anti-inflationary reputations ex ante, can possibly afford to devalue in election years. The perceived political costs of an exchange rate adjustment will be lower because of their reputation of being tough with inflation.

Cukierman and Tommasi (1998) present a simple model that very clearly illustrates the basic mechanism involved. Substantial policy changes are more credible if they are implemented by a party that would be expected to have a partisan bias against such policies. By proposing a policy that does not correspond to its ideologically preferred policy, the party proves that the policy is motivated by concern for social welfare. Accordingly, a recognized right-wing government is more likely to implement very leftist policies and left-wing politicians are more able to implement very right-wing policies. The prediction for currency peg duration is that because the electorate thinks the abandonment of a currency peg is ideologically motivated if proposed by a left-wing party, left-wing parties that devalue will be punished at the ballot box. The same move toward a more flexible arrangement would be interpreted as motivated by concern for social welfare if pursued by a right-wing party. Since voters assume a partisan bias in the motivation to change the exchange rate system, policymakers from the left cannot credibly claim that a flexible exchange rate is

made in the interest of social welfare (see also Drazen and Masson (1994) who distinguish between the credibility of policies and credibility of policymakers).

A similar picture results from the theoretical model by Milesi-Ferretti (1995), which begins with the idea that in the period prior to elections governments with stronger skills and higher reputation in some policy area may avoid implementing reforms that constrain the government's discretionary influence in that same policy area.[76] Carrying these considerations to exchange rate policy, right-wing governments prefer to float even though they would have chosen to sustain the exchange rate parity in the absence of elections. The reason behind this behavior is that only with a flexible exchange rate system can they make use of their comparative advantage in monetary discipline. Under a fixed exchange rate regime (and under the assumption that there are fixed costs with changing the exchange rate system), the problem of inflation would be solved, benefiting the left-wing government with weaker monetary credibility. Left-wing governments, in contrast, being more prone to inflation and thus suffering more from the time inconsistency problem of monetary policy, will seek a binding exchange rate commitment to clear its comparative disadvantage in the eyes of the voters.

In summary, the hypothesis in this study, which has also been put forward by Leblang (2003), is that partisan differences depend on the electoral calendar. In non-election periods, there is a strong incentive for the government to implement its own desired exchange rate policy goal. This implies that in these periods left-wing governments have a higher probability of abandoning a currency peg than right-wing governments. These implications are modified in the presence of electoral uncertainty, i.e. when the government might expect electoral defeat. Under these circumstances, left-wing governments are less likely to retreat from a peg since such a move would be interpreted as a sign of weakness in the eyes of the voters and would thereby decrease the prospects of re-election. Hence, left-wing governments will deviate from their preferred policy stance and maintain a currency peg. Right-wing governments also face an opposing incentive if re-election is threatened. In this situation, the probability of abandoning a currency peg is higher since the political costs of such a shift are less than for left-wing parties. Moreover, there are additional gains if the following

[76] Persson and Svensson (1989) were the first to emphasize the strategic use of political variables in restricting future governments' latitude. The authors show that a right-wing incumbent who prefers a low level of government spending, but expects that it will be replaced by a government in favor of higher spending levels, will run higher deficits than when it is certain to he will stay in office.

period of flexible exchange rate regime is associated with a stronger concern for price stability — an instance when right-wing parties are traditionally considered as more competent and reliable.

Hypothesis 2a: In non-election periods, countries with a left-wing government have a higher probability of exiting from a currency peg than countries with governments from right-wing or center parties.

Hypothesis 2b: In pre-election periods, countries with a left-wing government have a lower probability of exiting from a currency peg than countries with governments from right-wing or center parties.

Having illustrated the predictions that follow from the opportunistic and partisan theory, the following sections now turn to the potential role that political institutions may play in determining exchange rate regime duration.

5.3 Institutions and processes

5.3.1 Categories of theories

A currency peg constrains political choices in economic policy and thus commits the future path of policy. The announcement to fix the exchange rate is, however, not in itself credible. Aside from the degree of exchange rate commitment, the credibility of such a policy is determined by the institution's organization. Under some circumstances, policymakers have no incentive to make credible commitments. Other institutional settings enhance the credibility of the economic policy because they raise the costs of reneging on the exchange rate commitment. This section focuses on how salient features of the political system (such as the extent to which the political environment is stable or to which political decisionmaking is subject to multiple vetoes) provide policymakers with the ability and the willingness to commit to fixed exchange rates. The hypothesis being tested is that domestic political institutions shape the process through which economic policy is made and that this, in turn, influences the duration of currency pegs. On one hand, the expectation is that institutional features have an important impact on policymakers' willingness to make credible commitments. On the other hand, we should also observe that domestic institutions that cannot guarantee macroeconomic stability negatively affect the viability of a peg because they make it more difficult to maintain conditi-

ons compatible with the exchange rate commitment. Thus, institutions are expected to influence both the willingness and the capacity of policymakers to maintain exchange rate stability.

This is important to the present study because the maintenance of a fixed exchange rate regime is usually linked to the successful implementation of a number of further complementary reforms that increase the economy's response to shocks (Eichengreen 2000; Castrén et al. 2004). For instance, the absence of domestic credit by the central bank under a currency peg implies that seigniorage income is typically lower under fixed than under floating regimes. Accordingly, fiscal policy must aim to reduce unsustainable deficits by cutting expenditures or by raising revenues in the form of taxes. Strengthening the banking sector is also essential so that authorities' more limited capacity to provide lender-of-last-resort facilities does not increase the economy's vulnerability to a financial crisis. Labor market deregulation is often regarded as another necessary complement to a fixed exchange rate regime. Rigid and inefficient labor markets pose a serious threat for the sustainability of a peg because with fixed exchange rates both monetary and exchange rate policy are absent as an instrument of adjustment in the case of asymmetric shocks.

How are these factors related to a country's institutional setting? That is, which politicians cannot credibly commit to a fixed exchange rate? The different theories of the importance of political institutions that I consider fall into four general categories, each providing an explanation why policymakers may renege on the exchange rate commitment. I begin in section 5.3.2 with the implications of the veto player theory for currency peg duration. The rationale for the inclusion of this approach is that the veto player theory provides an interacting framework between different political regimes, electoral systems, and party systems. In addition, the theory serves as an underlying framework for the following sections. In section 5.3.3 I discuss different arguments concerning the relationship between independent central banks and exchange rate policymaking. A competing political institution approach, discussed in section 5.3.4, is less general than the veto players approach and stresses the importance of a single criterion: the political regime type, i.e. the difference between democratic and authoritarian regimes. Similar to the first two categories, the predictions derived from this theory draw heavily on game theoretic aspects, but come to sharper conclusions than the first two theories. Section 5.3.5 analyzes the impact of political instability on the duration of a fix. Political stability is defined here as the stability of the political regime (that is, the likelihood of a change in government).

5.3.2 Veto players

The veto players approach is based on work by George Tsebelis, who developed a comprehensive scheme to classify political systems in terms of their ability to enforce a change in policy. The fundamental idea of his theory is to consider every actor that may directly hinder the political process a veto player. In Tsebelis' words, veto players refer to the number of individual or collective actors whose agreement is necessary for a change of the status-quo (Tsebelis 2002: 19). The primary difference between collective (e.g., a parliament) and individual veto players (e.g., a president) is that with collective veto players, internal decision rules and political cohesion have to be taken into account. In addition, *Tsebelis dis*tinguishes between institutional and partisan veto players. Institutional veto players include different chambers of the parliament and the president. They are constitutionally specified and do not change over time (although their properties may change, e.g., due to the replacement of a single party majority by a two-party majority). Partisan veto players are generated inside institutional veto players by the political game. Their number represents the intra-governmental dynamics and depends on the composition of the government coalition.[77] Tsebelis comes to the formal conclusion that the probability of policy change decreases with the number of veto players. A political system with a low number of veto players is expected to alter policy quickly to changing circumstances, while countries with more veto players are relatively inflexible and are thus expected to produce a status quo bias.[78]

The veto player theory contains important implications for economic policy. The main prediction is that the number of veto players correlates positively with the maintenance of the status quo. Societies characterized by many veto players can be plagued by indecision and gridlock and hinder many issues from being addressed for long periods of time because political consensus is more difficult to achieve. Countries in which there is a separation of powers, where the government coalition consists of multiple parties, where different relevant legislative chambers exist, and where states or provinces have authority over spending, taxes, or legislating, will find it hard to implement the necessary policy packages to sustain the exchange rate commitment in a timely fashion. Decisionmakers in these

[77] A partisan veto player is any actor (political party) that is member of a government coalition and has to agree on policy change.

[78] This prediction is simplifying because not only the absolute number of veto players but also the "distance" between veto players affects the outcome of the policy-making process.

countries are more likely to have different views regarding the required policy that will lead to the postponement of unpopular decisions. Delays in decisionmaking will in turn hamper effective policy adjustments in the face of adverse economic shocks or an unfolding crisis. In the absence of many veto players, however, political decisionmaking addresses sources of conflicts faster and conflicting positions can be better resolved. Alesina and Drazen (1991) argue that reforms are delayed because coalition governments disagree on how to allocate the cost of policy change. In their model, they abstract from uncertainty about the net benefits of stabilization, meaning that all political parties acknowledge the necessity for reform and all realize losses while reforms are delayed.[79] However, each party has an incentive to delay reforms, hoping that the other party will give in first and bear a disproportionate share of the burden associated with the implementation of the stabilization program. The result will be a "war of attrition" in which the expected date of stabilization is a function of the number of veto players and the society's political cohesion.

A related line of work, the collective action approach, is equally based on the finding by game theorists that cooperation becomes more difficult as the number of parties involved in the game increases. Unlike the "war of attrition" model by Alesina and Drazen (1991), in which the degree of political cohesion is crucial for determining a country's capacity to change the status quo, the key notion of the common pool problem is an *n*-persons prisoner dilemma. Roubini and Sachs (1989) first analyzed the impact of government fragmentation on budget deficits. They categorize governments as single, coalition, minority, or majority and find that a large number of parties correlate positively with higher deficits and debts. One can easily apply the findings by Roubini and Sachs (1989) to exchange rate policy, arguing that incumbents in political systems with a high number of parties in the coalition (i.e. many veto players) are more suited to target special constituencies and, thus, have a higher reliance on the inflation tax. The implication is that more fragmented party systems are expected to be unable to implement the required macroeconomic policy adjustments of a currency peg and will therefore abandon the peg and choose to float.

Thus, both the war of attrition model and the collective action approach come to the same conclusion about the relationship between veto players and exchange rate regime duration. If these effects are present, more veto players should lead to a lower persistence of currency pegs.

Although it is reasonable to argue that eliminating macroeconomic disequilibria is more difficult with many veto players, the problem with a low

[79] For a model that explains delays in reforms by including uncertainty, see Fernandez and Rodrick (1991).

number of veto players is that a policy commitment could suffer from credibility problems because it is too easy to change. Lohmann (1998) argues that the credibility of an independent central bank increases with the number of veto players in government. A high number of veto players make it more difficult for the government to renege on the delegation of monetary policy. Conversely, if the number of veto players is low, it is less costly for politicians to revoke the policy commitment. In such a context, the time inconsistency problem of monetary policy is not solved because the benefits for political actors to deviate from the announced policy might be higher than the costs associated with the revocation of the commitment.[80]

The question is whether the argument by Lohmann (1998) can also be applied to currency pegs. A possible explanation parallels the idea with respect to central bank independence: A system of checks and balances with many veto actors should make it more difficult to override the commitment to exchange rate stability. More veto players lead to more inertia, which quite directly leads to the hypothesis that the duration of a peg increases with the number of veto players (meaning that all must agree to float).[81] However, Keefer and Stasavage (2002) suggest that the effectiveness of exchange rate pegs does not increase with the number of veto players. Their main argument is based on the observation that countries with high inflation typically peg to countries with low inflation. From here they claim that the inflation outcome under a pegged regime is lower than the preferred inflation outcome for even the most inflation-averse domestic veto player. Accordingly, there would always be an incentive to renege on the exchange rate commitment regardless of the number of veto players.

Additionally, Keefer and Stasavage (2002) argue that decisions about exchange rate policy are typically made by the executive branch and are therefore not subject to (legislative) veto power. Thus, they conclude that no matter how many veto players are present, currency pegs are no more credible when there are multiple veto players "because the decision to abandon the peg will be the prerogative of a single veto player" (Keefer and Stasavage 2002: 763). However, for the purpose of this study, I will make some qualifications to both of these arguments. Although there is evidence that countries with fixed exchange rates experience lower inflation rates than countries that float (Ghosh et al. 2002; Levy Yeyati and

[80] The question whether it is optimal to have one or many veto players is similar to the exchange rate regime trade off between flexibility and stability. A low number of veto players adjusts quickly to changing circumstances and thus produces high policy flexibility. Countries with a large number of veto players are usually characterized by greater political stability.

[81] At the same time, countries with a floating regime will continue to float.

Sturzenegger 2002), it would be misleading to conclude that the inflation rate in countries with a currency peg necessarily equals the one in the anchor currency country. It has been frequently observed that the disinflation process comes to a halt after one-digit inflation rates have been achieved (see, e.g., Diehl and Schweickert 1997 or the country studies in Frieden and Stein 2001). However, inflation rates between 5 and 10 percent are still unsatisfactory for inflation-averse policymakers and are therefore no reason to opt for an exit from a currency peg because inflation is "too low". The second argument of Keefer and Stasavage (2002), that executive policymaking is not affected by the number of veto players, ignores the case of government coalitions. With many parties, even the executive includes veto players who can block decisions of the political leader and lead to a status quo bias in exchange rate policy.[82] Moreover, veto players are definitely important in the case of hard pegs, such as currency board systems, which require legislative approval to change the parity. Thus, it seems reasonable to assume that the underlying veto player structure influences the ability to make credible commitments.

What can be concluded from the previous considerations for the discussion on currency peg duration? Obviously one can interpret the insights of the veto player approach in several ways. It is possible to think about many veto players as a credible commitment to not interfere in exchange rate matters. In this case, the existence of many veto players increases the sustainability of a fix. The assumption of the status quo bias in exchange rate policy is motivated by the idea that all veto players have to agree to the abandonment of the peg. But the belief of a longer duration of currency pegs with many veto players becomes more difficult to justify when exits from currency pegs are regularly enforced by the failure to respond to unfolding macroeconomic disequilibria. Alternatively, the status quo bias generated by many veto players can also lead to delays in the adjustment to economic shocks. Political fractionalization may limit government's ability to undertake economic reforms that are necessary for the sustainability of a currency peg. In this case, political inertia increases exchange rate instability and leads to a lower persistence of currency pegs.

What factors decide which effect will dominate? When will the direct effect of a stronger commitment device with many veto players prevail,

[82] Elsewhere Keefer and Stasavage (2002) seem to make a point against their own argument, writing that "in a coalition government, the party controlling the finance ministry may nominally have full control of monetary policy, but in practice other coalition members can threaten to leave the coalition when confronted with finance ministry actions to which they are strongly opposed" (Keefer and Stasavage 2002: 758).

and when will the indirect effect of the inability for political reforms take place? I argue that the relationship between veto players and the sustainability of currency pegs is U-shaped. A government's ability to maintain a currency peg is highest when there is an average number of veto players. A low number of veto players have difficulties to credibly commit. If political leaders face too few constraints to renege on the exchange rate commitment, markets cannot be confident that the exchange rate parity will not be subject to unpredictable changes. Therefore, with no (or few) institutional veto power options, currency pegs are expected to endure only briefly. By contrast, incompatible economic policy, which is more likely to persist with an institutional framework divided by a large number of veto players, has undoubtedly been at the core of most currency crises and large devaluations in the past. Inconsistent fiscal policies lead to real overvaluation, losses in reserves and to a more rapid exit from the currency peg.

Hence, the expectation with respect to the impact of veto players on the duration of currency peg can be summarized as follows:

Hypothesis 3: *The probability of exit from a currency peg in relation to the number of veto players is U-shaped. A low number and a high number of veto players increase the probability of exit.*

5.3.3 Central bank independence

Tsebelis (2002: 3) predicts that the difficulty of effecting significant changes in the status quo may lead bureaucrats to be more active and independent from the political system. The degree of central bank independence is a related case in point. Much has been written explaining why politicians willingly relinquish a sizeable part of their power and delegate policy tasks to an independent agency. Most of the authors see the inflation bias time inconsistency problem as rationale for such delegation.[83] The time inconsistency problem exists because ex post politicians have a strong incentive to deviate from a preannounced monetary policy and surprise voters with inefficiently high inflation (see chapter 2). Such a policy generates greater growth and employment and thereby improves the incumbent's re-election prospects. Rational forward-looking agents, however, will anticipate this loose monetary policy and adjust their inflation expectations. The result of this behavior is higher inflation, but not higher growth (Barro and Gordon 1983, 1983a).

[83] See Drazen (2000: 142-149) and Sturm and de Haan (2001) for surveys on this issue.

Granting independence to central banks or pegging the exchange rate to country with low inflation provides a solution to this dilemma. If successfully implemented, both forms of monetary commitment ensure a predictable and stable monetary policy that keeps inflation down and signals to economic agents that monetary policy will be insulated from short-term electoral manipulation (see Rogoff (1985) for central banks and Giavazzi and Pagano (1988) for currency pegs). In the case of independent central banks, monetary policy is delegated to a conservative central banker that has a longer time horizon and is more inflation averse than the government. In the case of pegged regimes, monetary policy is pursued by a foreign central bank with a high reputation of price stability. The implication is that independent central banks can be considered a substitute for a fixed regime to provide credibility. If the elimination of the inflation bias is achieved by an independent central bank, there is no need for countries with independent central banks to fix the exchange rate and give up domestic control over monetary policy. Proponents of this view suggest that countries with independent central banks have a lower propensity to peg than their more dependent counterparts (Broz 2002: 864).

Another argument holds that fixed exchange rates and central bank independence are not perfect substitutes. A currency peg has the advantage of simplicity. Exchange rates are watched closely by the markets, making fixed regimes a highly transparent way to demonstrate the government's commitment to price stability. For this reason the abandonment of a peg bears considerable political costs. In contrast, a violation of central bank independence cannot be easily observed. Economic agents will barely recognize deviations of actual independence from legal independence. The lower costs of revoking the commitment increase the probability of it being abandoned for short-term political gains. Particularly in the case of developing countries where central banks often have a poor record in economic management, a currency peg provides a more effective solution to the credibility problem than the rather opaque commitment to simply separate monetary policy from the political system by granting independence to the central bank. However, the fact that the numerous financial crises in the 1990s were all characterized by collapsing pegged regimes shows that fixing provides inappropriate insurance against currency risk. Furthermore, there is some evidence that although pegged regimes have led to lower inflation, this has come at the cost of lower growth (Chang and Velasco 2000: 72; Ghosh et al. 2002: 75-106; Calderón and Schmidt-Hebbel 2003: 9). In contrast, central bank independence is not correlated with lower growth rates (Alesina and Summers 1993). These differences between central bank independence and exchange rate fixing do not necessarily contradict with Broz (2002). A possible implication of this is that in

countries where achieving low inflation is the main policy concern, a currency peg would be more efficient, while for countries with a greater preference for growth, an independent central bank would be the solution.

Bernhard et al. (2002: 13) report another point against a substitutive relationship between central bank independence and pegged regimes. In their view, the country's readiness to adopt fixed regimes and to implement an independent central bank is both driven by domestic institutions and the country's disposition toward price stability. Hayo (1998), e.g., shows that the creation of an independent central bank is more likely in countries with strong anti-inflationary social interests. Thus, both central bank independence and exchange rate commitments might be driven by underlying factors, such as the preference for a stability-oriented monetary system, that differ between countries. If this holds, one would expect countries that are more attached to price stability and have a strong inflation aversion to make their central bank independent *and* to peg the exchange rate.

However, even the argument by Bernhard et al. (2002) provides no satisfying answer to the question why it should be a good idea to combine central bank independence with currency pegs or whether currency peg duration increases or decreases with central bank independence. A political-economic argument suggesting a negative impact of central bank independence on the duration of fixed exchange rate regimes is as follows: If the currency is fixed and capital is mobile, the constraints of the Mundell-Fleming model render monetary policy ineffective. Since the central bank is committed to a stable exchange rate, there is no leeway to use monetary policy for stabilizing output or adjusting the balance of payments. Whether the central bank is independent or not plays no role in this case. From a political-economic view, an independent central bank has its own interests that are likely to prefer a retreat from the peg. Such a change maximizes the central bank's influence on monetary policy on which it otherwise has (quite irrationally) hardly any influence. Only with flexible exchange rates can the central bank effectively use its policy instruments (discount rate, purchase and sale of government securities, and foreign currencies) and pursue its policy goals.

This argument implies that the duration of a currency peg decreases with the implementation of central bank independence. This view is also consistent with Broz's (2002) argument for a substitutive relationship between central bank independence and currency pegs.

Hypothesis 4: The probability of exit from a currency peg increases with the independence of the central bank.

5.3.4 Democratic and authoritarian regimes

The veto players approach is rather abstract to the extent that it does not differentiate between different political institutions. The absolute number of veto players may conceal important differences in a country's institutional setting. In fact, it is possible that two countries have different political regimes, as well as different party and electoral systems, and still have the same constellation of veto players (Tsebelis 2002: 5). Another problem is that the majority of the models discussed assume free elections and a democratic decisionmaking process. However, in many developing countries, this assumption is not fulfilled.

These two problems imply that, independent of the number of veto players, it is useful to distinguish between different institutional structures. In the following, I take on the traditional comparative political analysis and single out the effects of a country's political regime (democratic versus authoritarian) on its preferences in exchange rate policy. The political regime (and not other institutional details such as, e.g., the electoral system) is picked out since the former is arguably the most fundamental distinction among the traditional institutional variables and the existence (or absence) of democracy may be more important than the exact number of veto players.

Theoretic reasoning by Broz (2002) emphasizes the role of the type of political regime in exchange rate policymaking and comes to the conclusion that the lack of transparency in autocratic countries causes political leaders in these countries to rely more heavily on pegged regimes than in democratic countries. Since the political decisionmaking process in autocracies is generally less transparent than in democracies, autocracies find it particularly difficult to convince economic actors that its monetary authorities will not deviate from the announced policy ex post to generate higher inflation than expected. Broz (2002: 863) argues that in such a context central bank independence is a too opaque a commitment to solve the time inconsistency problem.[84] Instead, in countries where popular participation and institutions are weak, a stronger commitment technology that better ties the hands of policymakers is needed. Thus, an external constraint in the form of a fixed exchange rate is a superior (because of its transparency) commitment mechanism than a domestically based policy commitment technology such as central bank independence. In the words of Broz (2002: 863), "the transparency of the monetary commitment devi-

[84] In addition to the problem to determine the actual degree of central bank independence, another reason for this claim is that the issuance of monetary policy data is often subject to long lags.

ce substitutes for political system transparency to assist in engendering low inflation expectations." In contrast, political decisionmaking in democracies has greater transparency. The system of checks and balances in the structure of the government promotes accountability. Transparency on the part of the government makes even an opaque commitment such as central bank independence credible and effectively solves the time inconsistency problem at lower costs.[85] Consequently, democratic societies have a lower need to fix the exchange rate.

The previously-mentioned theoretical proposition has found empirical confirmation. Broz (2002) finds that central bank independence improves inflation performance only in countries with high levels of political system transparency. In contrast, an exchange rate peg as a more transparent commitment mechanism constrains inflation even in the absence of democratic institutions.

While the preceding considerations provide interesting insights into the relationship between political regimes and exchange rate regime *choice*, it is difficult to draw conclusions about the impact of the level of democracy on the *duration* of a currency peg. The fact that autocratic countries are more likely to choose fixed regimes does not mean that the duration of fixed regimes will also be longer under this type of political regime. Frieden et al. (2001: 37-43) propose an argument that supports a link between politics and the duration of currency pegs. Again, the idea is that fixing the exchange rate requires a multitude of complementary reinforcing strategies to foster financial stability, develop the banking system or increase labor market flexibility. Since authoritarian political regimes give the incumbent higher autonomy from distributional pressure, they increase the government's ability to impose the short-term costs associated with these necessary policy changes. Democracies, in contrast, are vulnerable to pressure for economic redistribution from different interest groups and find it difficult to impose unpopular policy packages. As a result, the duration of a peg should be longer under authoritarian than under democratic regimes.

Although both Frieden et al. (2001: 37-43) and Broz (2002) come to similar conclusions, a puzzling contradiction arises. According to Frieden et al. (2001), the credibility of the currency peg depends on the implementation of an additional policy package and, thus, they expect exchange rate commitments to be more credible under more authoritarian regimes. To some extent, this argument is at odds with the underlying assumption by Broz (2002). Broz (2002) argues that autocratic regimes have a higher probability of choosing an external nominal anchor, precisely because they

[85] That is, without abandoning exchange rate flexibility and domestic monetary policy autonomy.

have less of an ability to credibly commit internally (e.g. via an independent central bank). Most previous research is supportive of the latter argument. As argued in chapter 3, uncertainty in democratic societies (generated by elections or changes of government) is typically contained within certain boundaries (Leblang and Willett 2003: 12). Accountable politicians and a transparent institutional framework suggest that policymakers in democracies make better policy choices than those in autocracies. Since they provide markets greater quantities of accurate information, speculative attacks due to imperfect information (as suggested by Calvo and Mendoza 2000) are less prevalent. In sum, this study argues that greater transparency and accountability can be thought to increase the duration of a fixed exchange rate regime. This claim is consistent with Bonomo and Terra (1999) who argue in their analysis of political cycles for the Brazilian Real, that "contrary to widespread belief, a dictatorship may be less able to take necessary bitter measures than a democratic regime" (Bonomo and Terra 1999: 9). Cukierman et al. (1992) also provide evidence for this claim, concluding that totalitarian regimes are more prone to inflation than their democratic counterparts.

Moreover, democracies cannot only be expected to have a greater ability to maintain an exchange rate peg. Indeed, I would argue that they also have a higher willingness to do so. As outlined in chapter 3, democratic governments face higher political costs when a peg is abandoned. Government instability and the possibility of electoral defeat pose a much higher threat to decisionmakers in democratic countries than to the political leaders in authoritarian regimes. This implies that democratic governments have a large incentive to stabilize the exchange rate and maintain a currency peg.

Thus, the findings about the link between the political regime type and a fixed exchange rate regime can be summarized in the following hypothesis:

Hypothesis 5: The probability of exit from a currency peg decreases with the level of democracy.

5.3.5 Political instability

With regard to the relationship between a country's institutional setting and exchange rate policymaking, the number of veto players *per se* is important, as is the degree of political instability. Both terms are, however, closely related. Instable governments are often associated with a fragmented and polarized government coalition and thus resemble a situation with many veto actors. In the meaning of Tsebelis (2002: 4), fractionalization

and polarization refer to the "distance" or "political cohesion" between different veto players.[86] Fragmented political systems lead to what *Tsebelis* calls "political stability", defined as the difficulty of effecting significant changes in the status quo. Political stability leads in turn to government (in parliamentary systems) and regime (in presidential systems) instability, which is exactly what is often referred to as a second definition of political instability. According to this view, politically unstable governments are characterized by a short tenure of office; in other words, they have a good chance of being thrown out of office (Siermann 1998: 31). This section emphasizes the second definition of political instability. The reason is twofold: First, Tsebelis's interpretation of political instability and its impact on currency peg duration has already been covered in section 5.3.2. Second, by defining political instability in terms of the stability of the government, I follow the previous literature on the relationship between political instability and exchange rate policy.

Political instability is a key ingredient for Edwards (1996). In his model, two offsetting effects between political instability (or uncertainty) and the duration of a currency peg can be derived. First, the political costs of abandoning a currency peg increase with political instability. Faced with the prospect of being thrown out of office, unstable governments must fear major political consequences when they breach their promise to keep the exchange rate stable. Moreover, since they are more desperately in need of the anti-inflationary credibility that accompanies a currency peg, weak governments are expected to undertake large efforts to maintain exchange rate stability. Strong governments, on the other side, are more likely to withstand possible political and economic upheaval in the aftermath of a devaluation. With high political popularity and a low danger of being thrown out of office, they are more prepared to retreat from an exchange rate commitment in the face of adverse economic shocks.[87]

A second, opposing effect is that political instability leads to a horizon-shortening effect that in most cases operates against the sustainability of currency pegs. This impact is intuitive. A more stable government should be more willing to pursue long-run economic goals than a less stable one. Fragile governments will heavily discount the future benefits of economic reforms that increase the long-run sustainability of currency pegs. A government's myopia will promote policies determined by short-term considerations. This behavior is rational because, as second-generation currency

[86] Tsebelis (2002: 48) introduces these two terms to capture the fact that the absolute number of veto players is crucial as are the ideological differences between them.

[87] See also chapter 3 for a justification of this claim.

crisis models have shown, short-term political inconsistencies will not necessarily lead to speculative behavior.

Méon and Rizzo (2002) expand Edwards's (1996) modeling of the influence of political uncertainty on the credibility of a fixed exchange rate regime. They emphasize the second effect and describe the choice of an exchange rate regime as a repeated game between the policymaker and the private sector in which the policymaker is subject to a time-inconsistency problem as in Barro and Gordon (1983). In their model, only policymakers who can be assured that they will remain in office for an infinite amount of time, will resist the temptation to devalue and be able to defend the peg. Once political instability is taken into account and a policymaker's life expectancy shrinks, policymakers will choose to surprise the private sector and abandon the currency peg because the relief in the short-run through an unexpected devaluation exceeds the fear of an inflationary bias. Unlike Edwards (1996), Méon and Rizzo (2002) come to the unambiguous conclusion that political instability is correlated with a greater likelihood of abandoning an exchange rate commitment.[88]

Research on the political economy of inflation and public debt supports this view, arguing that political instability causes higher inflation and public debt. Persson and Tabellini (1990) assert that in a politically unstable system the incentive to improve reputation by delivering price stability is low because governments are not certain that they will reap the rewards of sound economic policy. Cukierman et al. (1992) show that politically unstable governments prefer short-term relief from inefficient tax collection like seigniorage to long-term benefits from structural change. Even if economic reforms are costless, incumbents may choose not to undertake structural adjustments. Alesina and Tabellini (1990) model two types of policymakers that have different preferences over the optimal allocation of public revenues. If re-election is certain, policymakers will run a balanced budget. However, with uncertainty about re-election, they will produce suboptimal high deficits in order to burden the successor with the need to service the debt.

Another problem is that uncertainty engendered by political instability may cause markets to expect future economic turmoil. This may result in higher risk premia and capital flight. Investor pessimism may thus lead to a self-fulfilling crisis that makes it difficult for the government to maintain a stable exchange rate.

In view of the preceding information, there is ample reason to expect that political instability is harmful to macroeconomic stability. Accor-

[88] However, a drawback of their model is that they do not include the political costs associated with a devaluation.

dingly, it is questionable whether politically unstable governments can credibly commit to a fixed exchange rate. As the literature review in chapter 4 has documented, empirical research is in line with these considerations. Edwards (1996) and a number of subsequent studies (Klein and Marion 1997; Berger et al. 2000; Poirson 2001; Méon and Rizzo 2002) have encouraged conventional wisdom that political instability and currency risk are positively correlated. This leads me to derive the following hypothesis:

Hypothesis 6: The probability of exit from a currency peg increases with political instability.

5.4 Private groups and interests

5.4.1 Characteristic features of interest group lobbying

The previous discussion has left out the important issue of pressure from special interest groups. The reason for this is that interest groups have no formal veto power and thereby do not fall into the veto player theory. However, one of the key factors in maintaining a currency peg is to have a domestic political environment supportive of the fixed exchange rate system, despite the costs associated with its operation. Weakening popular support undermines the currency peg's credibility and creates doubts about the government's ability to sustain the peg, making it extremely difficult for authorities to implement the necessary policies to maintain the fixed exchange rate system. As a result, former allies of the peg may distance themselves from the exchange rate commitment. This may start a vicious circle, ending in the abandonment of the fix.

How likely is social pressure in exchange rate issues? Undoubtedly, the broad distributional impacts of exchange rate movements reduce the incentive for lobbying (Broz and Frieden 2001: 328). Stable exchange rates increase exchange rate predictability for *all* internationally oriented industries, implying that the incentive to adopt a free rider position is large. On the other hand, the growing trade liberalization that has taken place in both developing and developed nations increases the importance of international price competitiveness. One question that follows immediately from this is whether the effects of devaluation will replicate the imposition of tariff protection. Is a nominal devaluation successful in accomplishing the same objectives as an import tariff and/or export subsidies? Indeed, both policies are close substitutes. A combined policy of an import tariff and an export subsidy will result in increases in the domestic prices of importable goods

and exportable goods. If both instruments are implemented with the same rate, the relative price between importables and exportables (the tradables) will not change. However, their relative price with respect to nontradables will increase. In this way, the domestic relative price of tradables as a group will increase, which is exactly what will happen in the case of a real devaluation (Edwards 1989: 81). In both cases, the domestic economy is shielded from external competition. In countries with protectionist trade policies, lobbying in trade policy is often regarded as more fruitful; in more liberalized and open economies the exchange rate becomes a more important policy variables. Nowadays, however, with an eye on the comprehensive trade liberalization reforms, the implementation of protectionist measures in trade policy is severely restricted. Thus, devaluations can be regarded as a measure to compensate internationally oriented producers for the loss of tariff protection.

5.4.2 Limitations of interest group lobbying

Government decisions in exchange rate policy differ from political intervention in foreign trade in several important ways. First, while free trade is generally regarded as superior from a benevolent point of view, no exchange rate regime is superior to another from this perspective. Countries have to weigh the benefits from exchange rate stability against the benefits from more exchange rate flexibility (Frankel 1999: 2). Second, while the degree of tariff protection typically differs across industries, an important characteristic of devaluation is that it increases the domestic price of *all* imported products.[89] Thus, while import tariffs can be targeted at special products, groups, or countries, devaluations have much broader distributional implications. However, the fact that the exchange rate is the same for the whole economy does not mean that the effects of exchange rate movements are felt equally among all sectors of the economy. The real economic consequences of exchange rate movements differ for sectors that produce international tradables and nontradable goods (Broz and Frieden 2001: 326). Thus, important distributive implications of devaluations relate to specific sectors over factors of production or industries.

The channels through which interest groups influence the decisionmaking process are of great importance from a political-economic point of view. Interest groups may express their policy preferences to the authorities through the transmission of information or campaign contributions

[89] This will not be true if there is a dual exchange rate with some transactions subject to the free rate and the devaluation is restricted only to the official rate.

(Olson 2004: 10). These forms of lobbying may also aim to influence policymakers to pursue a particular exchange rate policy.[90] Policymakers will be willing to follow the demands of interest groups because otherwise they risk electoral defeat. However, this theory provides little insight into which of the competing sectors is the most influential and which exchange rate preferences are ultimately chosen. It would be straightforward to argue that the weights attributed to each policymaker's preferences should vary according to the political influence of a sector. A country's exchange rate policy is then a combination of each sector's preferences over exchange rate policy weighted by this sector's importance. As a sector's political importance increases, the chosen exchange rate regime is more likely to resemble its exchange rate regime preferences.

Two implications follow from this balance of power: First, exchange rate policy will fall between extreme solutions. Corner solutions such as hard pegs or free floats would not be optimal. One could even argue that since the nontradable sector usually has the highest number of votes, its relative strength should be the greatest[91] and the authorities would implement an exchange rate policy that more closely resembles the preferences of this sector (Blomberg et al. 2004: 12). A second implication is that the interest group approach of exchange rate policy comes to a similar conclusion to the traditional OCA approach. While the former predicts that the likelihood of a fixed exchange rate regime increases with the weight of internationally oriented groups, the latter argues that more open economies (that are characterized by a higher share of the tradable sector compared to the nontradable sector) tend to fix. In contrast, policymakers in relatively more closed economies face a lower pressure to fix the exchange rate.

[90] However, lobbying in exchange rate policy is not expected to be permanent. Pressure on exchange rate policymaking occurs only occasionally, e.g. in a crisis situations or in times of high exchange rate volatility (Frieden 1997: 85). In addition, only those who are hurt by changes in the exchange rate are likely to react negatively. The beneficiaries of exchange rate policymaking do not usually become politically active. These lobbying asymmetries create some status quo bias, possibly preventing a major shift in exchange rate policymaking (Willett 2004: 17).

[91] The argument here is that the median voter is from the nontradable sector. However, Frankel (2004) provides some evidence that producers of tradables have more political power than producers of nontradables.

5.4.3 Specifying interest groups' exchange rate preferences

The broad distributional impacts of exchange rate changes imply that lobbying in exchange rate policy is not affected by non-economic groups. Since efforts to devalue (or appreciate) the domestic currency against a foreign currency always produce devaluations (or appreciations) against all other currencies in the world, the exchange rate cannot be used to punish other governments for uncooperative behavior. Thus, even a careful analysis of exchange rate preferences can be restricted to purely economic interest groups.[92]

The theoretical framework to analyze each sector's exchange rate preference is the classical exchange rate policy trade off: Floating exchange rates preserve the possibility to conduct countercyclical policies, but increase the danger of exchange rate uncertainty and inflation. Fixed exchange rates tend to increase monetary stability, but create fears of a loss of competitiveness and flexibility. Accordingly, the role of interest groups in exchange rate policymaking is based on the notion that different sectors will possess different exchange rate preferences depending on the vulnerability to exchange rate swings and the exposure to international competition.[93]

Frieden (1991) has identified four economic sectors (import-competing producers, export-oriented producers, nontraded goods producers, and financial services industry). The preferences of each sector in terms of the exchange rate *regime* are determined by the extent to which the particular sector is hit by exchange rate volatility. Large exchange rate swings create uncertainty about future prices, aggravate price calculations, and thus increase the transaction costs of international trade (Krugman 1989).

As a result, sectors whose activities are strongly oriented toward the global market and are thus particularly affected by large and unpredictable exchange rate movements will favor a fixed exchange rate regime. These sectors, typically the primary goods (raw materials, agricultural industry) and manufacturing sectors, value most the reduction in transaction costs that a fixed exchange rate regime promises to deliver (Hefeker 1996: 363). Moreover, these sectors benefit from increasing capital inflows from foreign investors that are also concerned about exchange rate stability.

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[92] By contrast, it has been very common in trade policy for non-economic interest groups to demand protectionist measures to specific countries for their unpopular policy stance, such as, e.g., a violation of human rights. Consequently, the omission of non-economic interest groups in a positive analysis of trade policy may pose a problem.

[93] For overviews of the link between interest groups and exchange rate policymaking, see also Hefeker (1996) and Destler and Henning (1989: 117-144).

The financial sector has more ambivalent preferences. In developing countries banks often have large liabilities denominated in foreign currency, while assets are usually denominated in domestic currency. Thus, in the presence of large international lending, excessive exchange rate volatility could possibly weaken their balance sheets. In such a context, banks will favor a stable exchange rate. However, banks may also benefit from a floating exchange rate. Hedging currency risks, which is more important under floating than under fixed exchange rate regimes, is an important source of profits for many banks (Destler and Henning 1989: 133). In addition, only under floating exchange rate regimes can central banks provide lender-of-last-resort services that reduce the risk of a liquidity crisis for the banking industry.

Similar conclusions can be derived for the import-competing sector and the nontradable sector. Since their products are priced in domestic currency, exchange rate volatility has few direct consequences for them and therefore persons employed in these sectors will typically prefer a floating regime (Hefeker 1996: 365). Such a system increases domestic monetary policy autonomy and allows the policymaker to adjust the domestic economy to external shocks with less disruption of real activity.

In addition, the interest group theory of exchange rate policymaking also delivers predictions regarding the preferences of various sectors of the desired exchange rate *level*. Central to this discussion are the effects of exchange rate movements on the real income and the price competitiveness of the different sectors. Internationally oriented producers (both in the exporting and import-competing industry) favor a weak or undervalued currency, which enhances the international competitiveness of their industry. A nominal depreciation that is not matched by higher inflation benefits exporters because, by lowering the prices of domestic exports relative to those of foreign goods, it tends to increase the demand for a country's tradable goods. A devaluing currency also favors import-competing producers because the change in relative prices leads to a higher competitiveness compared to foreign producers in the domestic market.[94]

The price competitiveness of firms based in the nontraded goods sector does not depend on the level of the exchange rate. However, exchange rate movements still affect overall demand for nontradables. This implies that nontradable producers should favor a more depreciated exchange rate because the expenditure-switching effect causes a substitution in consumpti-

[94] A different pattern arises in countries with a high level of tariff protection. In this case, a real appreciation does not hurt the import-competing sector, but would improve the profitability of this industry since imported inputs would become cheaper.

on from tradables to nontradables. At the same time, however, the expenditure-reducing effect leads to a decline in demand for these goods. Moreover, a devaluing currency causes an increase of the domestic currency price of imported intermediate products, thereby increasing the final goods price of nontradables and reinforcing the expenditure-reducing effect. Hence, whether demand for nontradables will increase or decrease with a devaluing currency is not theoretically deducible. Additionally, effects of appreciations or depreciations on the real income of persons employed in the nontradables sector must be taken into consideration. To the extent that foreign goods become cheaper, the purchasing power of their income increases with an appreciating currency. Thus, on balance, the general expectation is that people employed in the nontraded goods sector prefer a strong or overvalued currency.

Preferences for the financial sector are again ambivalent. On one hand, banks and other financial institutions, especially if indebted in foreign currency, benefit from a strong currency. As explained above, a depreciating currency increases the real value of their (foreign currency-denominated) debt but leaves the real value of their (local currency-denominated) assets unchanged. On the other hand, financial institutions must also worry about the repayment of their loans. If banks have provided a large share of their loans to firms in the tradable sector, an appreciating currency deteriorates the balances of these firms and endangers the repayment of loans.

5.4.4 Implications for the sustainability of currency pegs

Based on the previous discussion, this section distinguishes three sectors of an economy (manufacturing, service, and banking sector); groups them into export-oriented, import competing, and nontraded activities; and derives hypotheses concerning the interests of these sectors in the maintenance of a currency peg. The expectation is that as a sector's importance for the domestic economy increases, the chosen exchange rate regime is more likely to resemble its exchange rate regime preferences. This view of politics is based upon the idea of a vote-maximizing incumbent who increases his chances for re-election if more actors approve of the policymaker's policy choices (O'Mahony 2002: 5).

Manufacturing sector: The manufacturing sector is typically classified as either export-oriented or import-competing: If export orientation dominates, manufacturing producers must trade off between their preferences for higher exchange rate stability, usually delivered by pegged exchange rates, and their interest in a weak currency inherent in a flexible exchange rate regime. The trade off is most likely to depend on the price elasticity of

their export products. Producers of specialized or luxury goods will prefer exchange rate stability to a weaker domestic currency. The reason is that goods with high product differentiation have lower price elasticity and thus less need for a competitive exchange rate. Furthermore, these goods often require a substantial share of imported intermediate inputs, reducing this sector's benefits from a weak currency. Thus, the primary concern for producers of specialized products is to secure exchange rate stability, alleviating the calculation of prices. For export-oriented producers of standardized goods, however, competition is based on price dimensions and price elasticity is therefore high. In such a context, a weaker currency that increases the competitiveness of the domestic products is more valuable than higher exchange rate stability.[95] Given the low share of specialized export products in developing countries, the expectation is that an export-oriented manufacturing sector in these countries demands for a weak currency, which, ceteris paribus, results in a higher probability of exit from a currency peg.[96] This result is also expected if the manufacturing sector is dominated by import-competing interests. Firms producing products in the import-competing industry benefit from an undervalued currency to increase price competitiveness. At the same time, they want to achieve this objective with high domestic monetary policy autonomy, which clearly shapes their preference for the abandonment of a currency peg.

Hypothesis 7a: The probability of exit from a currency peg increases with a strong manufacturing sector.

Service sector: Despite a high degree of heterogeneity, services are usually classified as nontradables (Langhammer 2002). Producers of nontradable goods have an interest in retaining monetary policy control in the hands of the domestic authorities because flexible exchange rates help stabilize the economy. This preference for floating exchange rates should prevail over possible preferences for a strong currency due to positive real income effects. An exception to this is a situation when firms based in the nontradable sector have policy goals that differ from those of domestic policymakers, but are similar to those of the potential anchor currency country. In such a situation, nontradable producers may favor a fixed exchange rate that adjusts monetary policy to the policy pursued in the anchor currency country. For instance, for producers of nontradable goods

[95] This claim is conditional on a low share of imported intermediate products, which increase production costs under an appreciated currency.

[96] Frieden et al. (2001: 33) report that in Latin American the only sector with international market power were coffee growers during the period when the International Coffee Agreement was in force.

who attach a high priority to low inflation, the anti-inflationary monetary policy of a fixed exchange rate regime comes closer to their preferred policy. Yet, the service sector has little to gain from a fixed exchange rate regime and thus I predict a weak positive link between a strong service sector and the probability of abandoning a fixed exchange rate regime.

Hypothesis 7b: The probability of exit from a currency peg increases with a strong service sector.

Banking sector: As described above, exchange rate preferences in the financial services industry are difficult to classify. Of the preferences regarding exchange rate regime and level, cross-cutting interests arise. On one hand, banks prefer a floating exchange rate regime because they benefit from greater hedging activities. On the other hand, they fear a depreciating currency that causes an unsustainable debt burden. All in all, I would expect the latter effect to dominate given that a high debt level is a significant determinant of currency crises (Dreher et al. 2005: 23). Thus, the final hypothesis predicts the following:

Hypothesis 7c: The probability of exit from a currency peg decreases with a strong banking sector.

5.5 Overview of hypotheses

In sum, this chapter has derived eleven hypotheses concerning the role of political, institutional and interest group actors in terms of currency peg duration (see table 5.1 for an overview). All of these hypotheses will guide the empirical investigation in the next chapter.

Table 5.1. Overview of hypotheses on currency peg duration

1a:	In pre-election years, the probability of exit from a currency peg is lower than in non-election years.
1b:	In post-election years, the probability of exit from a currency peg is higher than in non-election years.
2a:	In non-election periods, countries with a left-wing government have a higher probability of exit from a currency peg than countries with governments from right-wing or center parties.
2b:	In pre-election periods, countries with a left-wing government have a lower probability of exit from a currency peg than countries with governments from right-wing or center parties.
3:	The probability of exit from a currency peg in relation to the number of veto players is U-shaped. A low number and a high number of veto players increase the probability of exit.
4:	The probability of exit from a currency peg increases with the independence of the central bank.
5:	The probability of exit from a currency peg decreases with the level of democracy.
6:	The probability of exit from a currency peg increases with political instability.
7a:	The probability of exit from a currency peg increases with a strong manufacturing sector.
7b:	The probability of exit from a currency peg increases with a strong service sector.
7c:	The probability of exit from a currency peg decreases with a strong banking sector.

6 The determinants of fixed exchange rate regime duration: A survival analysis

6.1 Introduction to chapter 6

This chapter tests in an empirical manner the eleven hypotheses derived from the theoretical discussion in chapter 5. In order to follow the theoretical propositions closely, I apply the methodology of duration models[97] to a unique dataset for 49 developing countries for the period from 1975 to 2000.[98] The dependent variable in this study is the length of time until a currency peg collapses, an event that I will refer to as an "exit".

Until now, the modeling of exchange rate regime duration has received comparatively little attention in the economic literature. The voluminous literature on exchange rate regimes has been more concerned with exchange rate regime choice. However, I would argue that it is important to account for time dependence. The motivation to analyze the *duration* of fixed exchange rate regimes springs from two points. First, previous studies (both logit and duration data analysis) on the sustainability of currency pegs have shown that duration is important to account for (Klein and Marion 1997; Bodea 2003; Tudela 2004; Wälti 2005). Neglecting this insight leads to a loss of information in the data and causes inconsistent parameter estimates and incorrect standard errors (Beck et al. 1997: 10). Second, even if time dependence were not important, it would be useful to parametrize time as a proxy variable for the omission of other variables. Since one can hardly control for all variables that affect the exchange rate

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[97] I use the terms duration models and survival analysis methods interchangeably.

[98] The countries included in the sample are: Algeria, Argentina, Belarus, Bolivia, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Cote d` Ivoire, Croatia, Cyprus, Czech Republic, Dominican Republic, Ecuador, El Salvador, Estonia, Guatemala, Guyana, Haiti, Honduras, Jamaica, Latvia, Lebanon, Lithuania, Malaysia, Mexico, Moldova, Morocco, Nicaragua, Nigeria, Panama, Paraguay, Peru, Philippines, Poland, Republic of Korea, Romania, Russia, South Africa, Slovakia, Slovenia, Santa Lucia, Suriname, Thailand, Turkey, Ukraine, Uruguay, and Venezuela. As in chapter 3, for the postcommunist CEECs, no observations before 1992 are included in the study.

regime decision, it seems theoretically more desirable to use observable political economy factors and model the probability of exchange rate regime *change* rather than *choice*. By calculating instantaneous rates of failure (hazard rates), one can easily conclude whether certain political events increase or decrease the duration of a fixed exchange rate regime.

The literature review in chapter 4 highlighted that until now only *Bodea* (2003) and Blomberg et al. (2004) have analyzed political and institutional factors in the context of exchange rate regime duration. The present study differs from these two studies in a number of ways. First, both previous studies on this subject are based on smaller samples for single regions. Bodea (2003) analyzes CEECs and Blomberg et al. (2004) consider exclusively Latin American countries. The present study uses a global sample consisting of 49 countries from four different continents. A second limitation of previous research on the political economy of exchange rate regime duration is that these studies consider only a relatively small number of institutional and political factors. Expanding the political and institutional variables should help to provide a more comprehensive picture of a government's incentives and a country's institutional restrictions. Thus, the objective is to test for a wide number of political-economic indicators. A third area of possible improvement from previous studies is in the specification of the empirical model. Both Bodea (2003) and Blomberg et al. (2004) use the Weibull model. The use of this parametric approach has two drawbacks: First, one should be cautious in terms of drawing conclusions about duration dependence from Weibull parametrization because it only allows for a monotonic shape of the underlying or baseline hazard function (Jenkins 1997: 7).[99] In fact, the hazard of exiting from a peg could increase (or decrease) nonmonotonically with duration as well.[100] In this case, the Weibull would fit the data poorly and the coefficient estimates would be biased. To allow for both nonmonotonic and monotonic hazards, semiparametric approaches, such as the Cox proportional hazards model, are more appropriate because they allow for more flexibility in the shape of the baseline hazard function. A second drawback of the Weibull specification is that it is ill-equipped to handle ties. In the context of exchange rate regime duration, ties exist if there are equal exit times from a currency peg for different countries. Since observations on exchange rate regimes are made in discrete time, the existence of ties is a relevant case and should

[99] The hazard function is a theoretical measure for the risk of occurrence of an event. See section 6.3 for further information on this term.

[100] Wälti (2005), e.g., presents clear evidence of a nonmonotonicity in the shape of the hazard rate.

not be ignored. Again, specific applications of the Cox model may be preferred because they are able to approximate for this problem.

This chapter is divided into eight sections. Following the introductory remarks, section 6.2 presents the relevant dataset. Emphasis is put on the construction of the dependent variable, as well as on the coding of the political-economic explanatory variables. Section 6.3 introduces the concept of survival analysis in the context of currency peg durability. The following empirical section of this chapter is divided into two parts: In the first part (sections 6.4, 6.5, and 6.6) I will verify the previously discussed hypotheses and empirically test the predicted impact of political, institutional, and interest group factors on spells of exchange rate stability. In this effort I rely on the Levy Yeyati and Sturzenegger (2002) exchange rate regime classification as the basis for the construction of the dependent variable. In the second part of the empirical analysis (section 6.7) I investigate how the same set of variables affects the occurrence of a speculative attack. The dependent variable in this study is an unweighted speculative attack index based on changes in the nominal exchange rate and the level of foreign reserves. The robustness of the results in both empirical parts is checked by employing two different estimation strategies. In a first step, I resort to semiparametric modeling of the data using discrete Cox regression. Use of the Cox regression model is justified by its flexible nature, which makes it theoretically appropriate to model the duration of spells when it is impossible to determine a shape for the underlying hazard rate ex ante. As a complement, I re-examine the predicted influence of political-economic variables on exchange rate policymaking in both empirical parts using a complementary log-log *(cloglog)* hazard function. The theoretical case for this model lays in its characterization as the discrete analog of the Cox model.

6.2 The variables definition

6.2.1 Measuring exchange rate regime longevity

This chapter analyses the duration of currency pegs or, in other words, the number of years between the beginning and the end of a fixed exchange rate regime. In the first part of this chapter, an exchange rate regime transition is defined simply as a move down or up in the exchange rate regime classification. This means that I analyze together all currency pegs, regardless of the underlying reason for the peg's abandonment. The incentive for the inclusion of all exits in the analysis is given by the fact that in developing countries, where the prime rationale for fixing is to stabilize the eco-

nomy, every abandonment of a currency peg signals the move from a stabilization-oriented policy toward a more discretionary policy orientation with presumably higher inflation rates. Thus, as argued by Edwards (1996, 1996a) and Collins (1996), every exit of a pegged regimes entails some political costs.

The duration of pegs is measured in years. From a theoretical point of view, it would be more appropriate to use a higher frequency measure of duration, such as months or quarters, but some of the political and institutional explanatory variables are not available in these frequencies. Nevertheless, the use of more aggregated data should not affect the estimation results. Ter Hofstede and Wedel (1999) show that the effects of the time aggregation bias on the baseline parameters are small and are therefore not a concern for most applications. Moreover, the large number of countries in my sample should help to limit the problem of low frequency data.

In order to determine the duration of a fix, it is important to choose an appropriate exchange rate classification. The IMF de jure exchange rate regime classification is inappropriate because it fails to capture macroeconomic policies that are inconsistent with a peg. For instance, if the institutional setting prevents a country from maintaining exchange rate stability, but the country still claims to have its exchange rate fixed, the failure to sustain to the currency peg would not be reflected in the regression results. The natural classification by Reinhart and Rogoff (2002) has severe drawbacks for the purpose of my analysis as well. In this classification, actual exchange rate flexibility is measured on a five-year moving average time period. While this procedure is useful to distinguish long-term regimes from short-term periods of exchange rate stability, it also results in very few regime transitions and makes it difficult to pinpoint changes in exchange rate policy due to political shocks. This problem is addressed by Levy Yeyati and Sturzenegger (2002), whose classification is chosen because it best captures the actual behavior of policymakers. Exchange rate policy is measured on a yearly basis and deviations from exchange rate stability in a given year immediately reflect in a lower regime category. Thus, the censoring indicator, named *exit*, takes on values of *1* or *0* depending upon whether a country has abandoned a fixed exchange rate regime or not. However, the LYS classification is not completely satisfactory either. Since it is only based on the observed behavior of exchange rates, it fails to capture a country's commitment to a currency peg. Thus, in order to get a clearer picture of the impact of politics on currency pegs, a second estimation routine asks a more specific question. Following the classic currency crisis literature, I analyze whether the same set of political and institutional variables affects the likelihood of a speculative attack. A detailed description of the resulting dependent variable (*attack*) is given below.

6.2.2 Measuring political, institutional, and interest group characteristics

The theoretical considerations in chapter 5 have identified various potential political, institutional, and interest group determinants of the duration of currency pegs. The following paragraphs present a discussion of the coding of these explanatory variables.

Elections: As presumed by hypothesis 1, the timing of shifts in exchange rate policy may depend on the electoral calendar. In order to test whether the period surrounding the election increases or decreases regime duration, a dummy variable, *elect,* is introduced and coded *1* for years in which an election takes place and *0* otherwise. As the incentive for the monetary authorities to manipulate the exchange rate system might differ depending on the political system, in countries with presidential systems only presidential elections are considered, while in countries with parliamentarian systems only parliamentarian elections are coded. Two additional dummy variables, *preelect* and *postelect*, account for pre- and post-election years, respectively. I include all elections in the sample irrespective of whether elections were fair or whether they were characterized by irregularities, fraud, or riots. The reason for this is that any election increases the risk of losing office for the political leaders even when implementing measures that increase chances of re-election.[101]

Partisanship: The solution to the data problem with respect to the ideological position of a government is to use information from the Database of Political Institutions (DPI), a project conducted by the World Bank (Beck et al. 2001). Although one must be cautious with traditional measures of partisanship,[102] particularly in less-democratic countries, the advantage of the World Bank data is that they provide a consistent measure of whether the executive is dominated by a party from the right, the center, or the left. Based on this classification, I construct three dummy variables (*right, center,* and *left*). The dummy variables are coded *1* for a right/center/left government, and *0* otherwise.[103] Interaction effects are pre-

[101] Even if this were not the case, the inclusion of fraudulent elections should make it more difficult (not easier) to detect a significant relationship between elections and exchange rate regime duration.

[102] The main problem is that in developing countries, the ideological objectives of the parties depend much more on the personal preferences of its political leaders. This indicates that the same party may change its socio-economic background over time.

[103] Since the dependent variable is in nominal terms, this coding is consistent with both traditional and rational partisan theory. Traditional partisan models provide rationale for multiyear cycles in both real and nominal variables. In ra-

dicted to be important as well. In order to capture varying pre-election effects predicted by hypothesis 2b, three interaction variables of *preelect* and *left, center, and right*, respectively are constructed. The variables are named *preleft, precenter*, and *preright.*

Veto players: The variable for the number of veto players is based on data from Keefer and Stasavage (2003). In any given year, the variable *checks* records the number of veto players in a polity. The variable takes a value of *1* if there is a multi-party system and the largest party received less than 75 percent of the votes. The value of *checks* is then incremented depending on the competitiveness of the election, the influence of the opposition, the number and composition of chambers in the legislature (in presidential systems), the parties in the government coalition (in parliamentary systems), and the number of parties in the government coalition that have a position on economic issues closer to the largest opposition party than to the party of the executive. A higher value of *checks* thus reflects a higher number of veto players. Since hypothesis 3 predicts a U-shaped relationship between the probability of exit and the number of veto players, the empirical analysis uses a transformed variable, *veto*, which measures the deviation from the average value of *checks*. The coding of veto players is complemented by the Herfindahl index. This is a widely used index in political sciences that measures the fractionalization of the government. It is calculated by the sum of the squared seat shares of all parties in the government. Again, I recode the variable and summarize the deviation from an "average government fractionalization" with the variable *herfindahl.*

Central bank independence: Measuring central bank independence is not a straightforward task. In principle, indices of central bank independence can be classified by two groups depending on whether their focus is on actual or formal independence. The majority of the studies analyzing actual independence in industrial countries base their empirical findings on either the Grilli et al. (1991) or the Cukierman (1992) index.[104]

Given the large discrepancy between the (often relatively high) legal independence of central banks in developing countries and their actual inde-

tional partisan models, economic agents adjust prices and wages to new conditions after the election, and real output returns to its pre-election equilibrium level. Thus, in these models, real effects caused by partisan differences disappear in the medium run. However, changes in nominal variables tend to persist, i.e. inflation and the rate of devaluation remain at a higher level throughout the term of a left-wing government (Alesina et al. 1997: 51; Boix 2000: 41).

[104] Other indices of central bank independence include Caesar (1981); Alesina and Summers (1993); Eijffinger and Schaling (1993).

pendence, it seems more reasonable to use an indicator to serve as a proxy for actual independence (Cukierman 1992: chapter 19). Previous studies determined the turnover rate of central bank presidents, a continuous variable that ranges from 0 to 1. The basic idea behind this ratio is that, at least over some threshold, a higher turnover ratio indicates a higher influence of the executive branch on monetary policy (Eijffinger and de Haan 1996: 3; Siermann 1998: 77). In developing countries a new political leadership is often followed by a replacement of the central bank governor. A limitation of this type of measure, however, is that it treats *every* change of the central bank governor as an indication of political dependence without inquiring the reasons for the replacement. Still, this study relies on the turnover ratio as today's most widely used index for research on central bank independence in developing countries. Data for the turnover of central bank presidents are collected from de Haan and Kooi (1998), the IMF International Financial Statistics and national central banks (webpages and personal enquiries). The number of central bank governor shifts is then divided by the number of years the country (respectively currency) has existed during the observation 1975-2000 period. The ratio is summarized in the variable *cbi*.

Democracy: To measure a country's degree of democracy I use the same measure as in chapter 3 when analyzing the impact of democracy on the probability of a country to display fear of floating/pegging. The variable *polity* ranges from -10 for highly autocratic countries to +10 for highly democratic countries.

Political instability: The indicator for political instability likewise follows the specification outlined in chapter 3. In any given year, this indicator, called *govinst*, takes on values reflecting the number of government turnovers within the last five years. It is expected that the higher the number of government changes, the higher the political instability. An alternative variable, *partyinst*, is smoothed into a five-year backward average of the ruling party turnover ratio. This variable includes only those instances where a transfer of power from the largest government party to another party that was formerly in the opposition took place. In the following regressions either this or the government turnover ratio is used, but not both at the same time due to high correlation.

Interest groups: The operationalization of the impact of different interest groups is based on data from World Bank (2003). For each country and year the manufacturing and service sector value added to GDP is calculated.[105] The number for the industrial sector, *manufact*, is intended to

[105] Value added is the net output of an industry after adding up all outputs and subtracting intermediate inputs.

measure interest group pressure from the tradable sector, while the number for the service sector, *service*, is intended to measure the nontradable sector's political influence. In addition, I construct a variable *finance* to measure the ratio of liquid liabilities to GDP.[106] This ratio is a general indicator of the size ("depth") of the financial intermediaries relative to the size of the economy. It is frequently used as an overall measure of financial sector development (see Levine et al. 2000). All three variables are admittedly very crude measures for a sector's influence on political decisionmaking. However, other measures were simply not attainable for such a large panel.[107]

6.2.3 Macroeconomic, structural, and financial variables

Political and institutional factors alone cannot account for changes in exchange rate policy. Due to the selective nature of duration data, the ignorance of all other observable and unobservable characteristics that might affect the longevity of currency pegs may lead to spurious regression results. For instance, if a fixed regime in a country with an authoritarian political regime has a relatively short duration, it can be for two reasons: Either there is indeed a positive relationship between these two variables or this country has a set of other characteristics that would have caused it to leave the currency peg relatively quickly anyway. The second relation is called spurious because the regression output delivers significant results only due to the limited observability of other explanatory variables.

The economic variables that are included as controls in the following estimations are broadly representative of the existing literature. They include structural variables suggested by the OCA and fear of floating literature (see Juhn and Mauro (2002) for an overview), and measures for the country's vulnerability to a speculative attack as claimed to be relevant by the currency crisis literature (Kaminsky et al. 1997). However, one must also be aware that the inclusion of too many explanatory variables may lead to multicollinearity problems. The reason for the assumed occurrence of multicollinearity is the possibility that political variables may affect the exchange rate regime via the government's choice of macroeconomic policies (Simmons 1997: 15). For instance, if a left-wing government engages

[106] Liquid liabilities are broad money (M3). They are defined as the sum of currency plus demand and interest-bearing liabilities and other financial intermediaries.

[107] I ignore the role of the agricultural industry in exchange rate policymaking since concentrated manufacturing interests typically prevail over dispersed agricultural interests in developing countries (Willett 2004: 17).

in expansionary monetary policy, increasing inflation and thereby causing the exchange rate to devalue, estimation results could possibly attribute the abandonment of the peg to higher inflation rates although the underlying reason is the left-wing government's lower concern for economic stability. Hence, even purely economic variables may be related to political factors. Accordingly, an empirical specification that combines political variables with economic variables that can be influenced by the government might wash out the political effects, which are clearly more exogenous.[108]

My solution to this dilemma is as follows: First, I collect a number of structural variables that are clearly exogenous to the political variables. These variables include external debt (*debt*), size of the economy (*gdp*), trade openness (*open*), standard deviation of export growth (*sdexport*), and two variables that account for a possible time trend (*share*, *contag*). Then, I form a second group of economic variables that are under control of policymakers, or that could at least be related to domestic political factors. These are capital openness (*capop*), inflation (*inflation*), fiscal balance (*fiscal*), and participation in an IMF credit program (*credimf*). I will be more cautious when controlling for this second group of variables and only include them in some selected specifications.

Some of the variables have already been included in the empirical analysis of chapter 3. The motivation to include them in an empirical analysis on exchange rate regimes will not be repeated here. Rather, the aim of the following paragraphs is to explain the coding of only those economic variables that have not been discussed in chapter 3. Data sources and definitions for all variables are given in the appendix to this chapter (table A6.1).

Inflation: Pegging the exchange rate requires prudent macroeconomic policy. Quite intuitively, overexpansionary monetary policy will lead to a real overvaluation that makes a currency peg unsustainable. Similarly, a country that relies on the inflation tax and sale of government bonds to the central bank will not be able to keep its exchange rate fixed for long. Many developing countries that have used the exchange rate as a nominal anchor initially experienced a sharp decline in inflation. However, in later periods the country's willingness to pursue appropriate macroeconomic policy often declined (Diehl and Schweickert 1997: 29-112). The deterioration in policy discipline was accompanied by higher inflation rates. Under fixed exchange rates, a persistent inflation differential with respect to the anchor currency leads to real appreciation and, accordingly, to a deterioration in

[108] Still, political effects may continue to exist even after controlling for economic variables because, as suggested by second-generation models, several equilibrium exchange rate values may be consistent with the same set of macroeconomic fundamentals (Obstfeld 1994).

the economy's international price competitiveness. The implication for the duration of a fixed exchange rate regime is that macroeconomic policy that keeps inflation running at high rates clearly increases the probability of the abandonment of a currency peg. It is therefore expected that high inflation rates reduce the sustainability of pegged regimes. By contrast, countries with low inflation are better able to maintain a fixed exchange rate regime. In the empirical section, the logarithm of consumer price inflation is used, as effects are not expected to be linear (*inflation*).

Current account: High inflation rates do not necessarily lead to misalignments. The Balassa-Samuelson effect shows that inflation differentials between the pegging country and the anchor currency country are compatible when there are differences in productivity gains between both countries (de Grauwe and Schnabl 2005). To assess the risk of devaluation, the current account balance has been used in some previous studies on currency crises. A widened current account balance may point to increasing difficulties with the sustainability of the peg.[109] The current account is expressed as a ratio to GDP (*curracc*). I expect deterioration in the current account balance to increase the likelihood of a crisis.

Fiscal policy: To the extent that unsustainable growth of the money supply reflects the need to finance large fiscal deficits, fiscal imbalances could complicate the sustainability of currency pegs. Controlling for the fiscal stance may also provide interesting insights into whether partisan effects on the exchange rate are due to different exchange rate preferences across parties or simply a consequence of different fiscal stances between left and right parties. A country's fiscal position is measured in terms of overall fiscal surplus in percent of GDP (*fiscal*).

Foreign reserves: First-generation currency crisis models argued that the sustainability of pegged regimes decreases if: a) the stock of foreign reserves runs low or if b) the money supply grows in a way that is incompatible with the proclaimed level of the fixed exchange rate. Since the money supply is given exogenously in a fixed exchange rate regime, excessive money creation leads to an inconsistency between monetary and exchange rate policy. The central bank must intervene on the foreign exchange market and sell foreign reserves to purchase the excess supply of domestic currency. Eventually, the central bank will run out of reserves and will no longer be able to defend the peg. A lower ratio of reserves should therefore lead to the lower sustainability of pegged regimes. To assess this mechanism, a variable, *reserves*, is constructed to measure the ratio of reserves over money supply (M2).

[109] However, many studies did not find the current account to be a significant determinant of currency crises (see, e.g., Kaminsky et al. 1997; Mei 1999).

IMF credit program: Some authors found that pressure from the IMF has important consequences on economic policy (Przeworski and Vreeland 2000; Dreher and Vaubel 2004). In terms of exchange rate policy, the IMF often recommends more flexible exchange rates to avoid cumbersome crises (see, e.g., Fischer 2001: 5). The effectiveness of this recommendation should be particularly relevant if a country has outstanding obligations to the IMF. The reason is that the use of IMF credit is often bound to the implementation of the recommended IMF policy. To evaluate the IMF's impact on exchange rate policy, a dummy variable for the use of an IMF credit is implemented (*credimf*). Collins (1996: 126) argues that such a dummy could also be interpreted as a measure for real exchange rate misalignment in the previous year. Accordingly, I expect this variable to be positively associated with a more rapid exit from a peg.

Time trend and contagion: Another highly relevant aspect for the adoption of exchange rate policies is the international environment. The literature on currency crises and contagion has found that the feasibility of currency pegs significantly decreases when other countries devalue. Two variables are constructed to account for a possible time trend and contagion. The variable *share* measures the relative number of fixed exchange rate regimes for each year. The inclusion of this variable controls for the effect that there is a steady decline in the number of fixed exchange rate regime within the time period under consideration. The variable *contag* counts the number of speculative attacks in a given year. This variable is intended to account for a common feature of recent currency crises episodes; that is, the fast transmission of shocks across many countries. If contagion from financial crises in other parts of the world is a feature, then this implies that in spite of sound domestic policies, the maintenance of currency peg could be complicated by developments in other countries, which have spill-over effects in the domestic economy. Both variables are not included at the same time. The variable *share* is used in sections 6.5 and 6.6 when the duration of fixed exchange rate regimes is analyzed. The variable *contag* is only included in the analysis of speculative attacks in section 6.7.

Note that in the empirical analysis, all variables are lagged one period to minimize reverse causality problems.[110] Some descriptive statistics on the variables is presented in table A6.2. Quite importantly, the correlation ma-

[110] Simmons (1997: 16) writes that "[w]here political variables can compete effectively with lagged economic variables in a multivariate regression and where political variables are only weakly correlated with prior economic conditions, a convincing case can be made that politics have an important independent causal effect on economic outcomes."

trix in table A6.3 reveals no further problems of multicollinearity. The high pairwise correlations between *polity* and *democracy* (0.98), and *party-inst* and *govinst* (0.78) are no matter of concern, since these variables are not simultaneously included in the regressions. From an economic point of view, it is interesting to see that *cbi* (as a measure for the political dependence of central bankers) and *inflation* are positively related (0.18).[111]

6.3 Modeling exchange rate regime duration

6.3.1 The concept of survival analysis

As was briefly discussed in the introduction to this chapter, the statistical analysis relies on survival analysis. The nature of survival analysis is to measure the time to the occurrence of an event, referred to as "exit" or "failure". Modeling the duration between transitions to different states has been a common objective in many different areas of applied sciences, such as medical sciences or engineering. Within economics, the techniques of survival or duration data analysis have been primarily used in empirical studies of labor markets. For example, survival analysis is a common tool to analyze the duration between spells of employment or the time until an unemployed person gets a job.

Essentially, the methods of survival analysis address the same questions as many other procedures.[112] However, the flexibility of the survival analysis approach has three main advantages for this analysis that will be elucidated by comparing survival analysis with standard empirical methods. An alternative way to focus on the duration of currency pegs would be to apply logit (or probit) analysis and denote the dependent variable with *1* whenever there is an exit from a fixed regime (and *0* otherwise). As such, these techniques only observe whether there is an exit from a currency peg or not. The failure of this procedure is the assumption of a hazard function that is constant over all periods. In other words, logit analysis does not account for the time the currency peg already lasts. However, there are good reasons to believe that time plays an important role in the persistence of exchange rate regimes. For instance, one might hypothesize that short time after introducing a currency peg the probability of exit is high. Over time,

[111] Note that higher values for *cbi* indicate a lower degree of central bank independence.

[112] For a detailed understanding of duration data modeling see Kalbfleisch and Prentice (1980); Kiefer (1988); or Box-Steffensmeier and Jones (2004). The following discussion draws largely from these three sources.

the likelihood of leaving the peg could decrease (for example, because the political authorities' skills to maintain the peg increase with time). The survival analysis approach accounts for this time dependence and tests the underlying hazard of an exchange rate regime shift. It determines the probability that a given currency peg fails at time t, conditional on having lasted up to t. Thus, survival analysis is concerned with the conditional probability of an event taking place.

A second factor that motivates the application of survival analysis is that all methods in survival analysis are able to handle the problem of multiple events. The problem of multiple events arises because each country can experience multiple regime shifts. In fact, most countries in the sample changed their exchange rate regime more than once during the survey period. In these cases, a country should not leave the sample after the first regime shift, but rather re-enter with its new regime. In principle, logit or probit models can also incorporate multiple failures. However, the assumption made in these models is that subsequent failures can be treated like first events. As such, these models do not account for the fact that failures for each country may be interrelated. If one is simply interested in the duration of currency pegs then it may be appropriate to restart each currency peg after an exit. However, if one hypothesizes that a history of past exits from currency pegs makes future exits more likely, the potential for bias emerges. Survival analysis does not assume independence in modeling subsequent exits for the same country. To estimate the model with multiple failures, it is assumed that once a regime shift occured the hazard function has restarted since last failure.

A third major challenge when modeling duration data is to account for censoring in the analysis. The problem of censoring is a distinguishing feature of duration data and cannot be easily handled by other empirical models. Censoring occurs whenever a spell's full event history is unobserved. Specifically, my dataset includes no information on exchange rate regimes for the years prior to 1975 or following the end of the observation period (post 2000). This means that I am uncertain about the beginning (left-censoring) and/or ending (right-censoring) date for some currency pegs. For right-censored data, a bias may be introduced because an exit from a currency peg in 2001 is not taken into account at all in the regression even if the instability that led to it was presumably present in the time frame under study. Left-censored observations refer to countries that have a fixed exchange rate regime at the beginning of the observation period in 1975. The fixed exchange rate regime may have begun in 1974 or it may have begun in some prior year. Based on the data I cannot be sure how long that spell ultimately lasted. A third form of censoring, random-censoring, is also relevant to this study. Random censoring is due to the fact that not all

countries in the sample are under observation for the whole time. For example, given the poor data quality before 1990, transition economies were not included in the dataset for the entire period of time. Other countries simply did not exist for the whole sample period.

Previous work on exchange rate regime duration, such as Duttagupta and Ötker-Robe (2003: 10), has often simply omitted censored observations from the dataset. However, this may induce a form of case selection bias in the results. Box-Steffensmeier and Jones (2004: 19) write: "If censored data are systematically different from uncensored cases, then simply deleting the latter cases will produce a nonrepresentative 'sample' and render coefficient estimates biased due to case selection process." The implication is that simply disregarding censored observations should be avoided, especially in the present study, because censored observations have, on average, a longer regime persistence than uncensored spells and would thus be underrepresented in the sample.

Before looking at these points more deeply, the goal of the following section is to illustrate the general methodology of the concepts that have been developed to analyze duration data.

6.3.2 Mathematical components of survival analysis

In principle, four functions can be used to characterize the distribution of the survival time: the cumulative failure distribution function, the density function, the survivor function, and the hazard function.[113]

The cumulative failure distribution is characterized by

$$F(t) = \Pr(T < t), \tag{6.1}$$

where T is a continuous non-negative random variable that takes values t that measure the time spent in a particular state. The corresponding density function can be obtained by differentiating the failure distribution:

$$f(t) = dF(t)/dt. \tag{6.2}$$

f(t) describes the likelihood that an event takes place exactly at time t. Complement to the cumulative distribution function, the survivor function is defined as the probability that the event of interest has not occurred by duration t, i.e. the random variable T exceeds (or at least equals) the specified time t.

[113] The following discussion on duration data models relies on Kalbfleisch and Prentice (1980); Kiefer (1988) and Box-Steffensmeier and Jones (2004).

$$S(t) = 1 - F(t) = \Pr(T \geq t). \tag{6.3}$$

S(t) is a nonincreasing function with a value *1* at the time origin and a value *0* as *t* goes to infinity. The relationship between the failure (or exit) rate and the time already spent in that state is determined by the hazard function. The hazard function emphasizes conditional probabilities: It describes the probability of a spell ending at some time point, given that the spell has lasted to that time point.[114] It is defined as

$$\lambda(t) = \lim_{dt->0} \frac{\Pr\{t < T < t + dt \mid T > t\}}{dt}. \tag{6.4}$$

The numerator is the conditional probability that the event will occur in the time interval (*t*, *t+dt*), given that it has not occurred before. The denominator is the width of the interval.

After some simple transformations, $\lambda(t)$ can be expressed as the ratio of the duration density to the complement of the survivor function at time *t*:

$$\lambda(t) = f(t) / S(t). \tag{6.5}$$

The hazard rate varies depending on the potential pattern of duration dependence. As time passes, the hazard rate can increase (positive duration dependence), decrease (negative duration dependence), remain constant, or take on nonmonotonic shapes. Possible values for the hazard function range from zero (if the risk of exit is zero) to infinity (if exit is certain at that instant).

The above considerations are designed for continuous variables. In the present study, data is collected in discrete time intervals and, as such, the random variable *T* denotes a discrete random variable. In a discrete-time approach,[115] the density function converts to

$$f(t) = \Pr(T = t_i). \tag{6.6}$$

It denotes the probability of an event occurring at the discretely defined time point t_i. (i=1,2,...). As is evident from equation (6.6), there can be multiple failures occurring at the same time ("ties"). The survivor function for the discrete case is given by

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[114] In the present study, it expresses, e.g., the probability of a currency peg to change in the sixth year, given that it has existed for five years. By contrast, specifications in terms of a density function emphasize unconditional probabilities (e.g., the probability of a currency peg to persist exactly 6 years).

[115] The discrete-time formulation was introduced by Prentice and Gloeckler (1978).

$$S(t) = \Pr(T \geq t_i) = \sum_{j \geq i} f(t_j), \tag{6.7}$$

where j denotes a failure time. The discrete-time hazard rate may be written as:

$$\lambda(t) = f(t_i) / S(t_i). \tag{6.8}$$

It depicts the conditional probability a regime ends at t_i, given that it lasts until t_i.

Translating the more general situation into the language of the present study's survival framework, regime persistence (i.e., the time from the beginning of a pegged exchange rate regime until its abandonment) is interpreted as the survival time for this regime. Consequently, the phenomenon that a currency peg is abandoned is an event or exit in this model.

6.3.3 Estimating survivor and hazard functions

There are three approaches to fitting survival models: parametric, semiparametric, and nonparametric. The three strategies differ in the form of the survivor function and in the way the survival rate is affected by covariates. The characteristic feature of the nonparametric approach is that no assumptions about the course of the hazard rate are made. The most common nonparametric approach is the Kaplan-Meier estimate of the survivor function. This estimator employs conditional probabilities and can be graphically illustrated by a step function that steps down at each time interval.

The estimator at any point in time is obtained by multiplying out the survival probabilities across the time interval (Kalbfleisch and Prentice 1980: 12):

$$\hat{S}(t) = \prod_{i=1}^{n} \left(\frac{n_i - z_i}{n_i}\right), \tag{6.9}$$

where n_i is the number of countries "at risk" of failing at t_i (in the present study, this is the number of countries with a currency peg in the respective period) and z_i is the number of failures at t_i (exits from currency pegs in this study). Each conditional probability estimator is obtained from the observed number at risk and the observed number of exits and is equal to "n-z/n". The Kaplan-Meier estimator is robust to censoring and uses information from both censored and uncensored periods.

In contrast to nonparametric estimates, parametric approaches require a very detailed idea about the course of the hazard rate. The Weibull model,

e.g., allows only for hazard rates that monotonically increase or decrease with duration. However, in this study I prefer to estimate the probability of leaving a currency peg in a semiparametric framework with flexible baseline hazard rates. The reason for this choice is twofold: First, parametric approaches are rejected as too restrictive. Parametric approaches make strong assumptions about the shape of the risk function and the functional form one chooses in these specifications has important consequences on the estimated effects. Since there is no strong theoretical reason to expect a restricted shape of the hazard function, a basic requirement of parametric approaches is not fulfilled. Semiparametric approaches yield more robust results than those obtained from parametric approaches. As will be shown, they do not require certain specification of the baseline hazard rate and focus exclusively on the estimation of the parameter coefficients. Second, the use of a semiparametric approach is also motivated by the fact that in the present study time dependency is thought of as a nuisance. Interest is *not* in predicting the underlying risk of exit from a currency peg. Rather, I am primarily interested in the effects of political and institutional variables on currency peg duration. Accordingly, the exact shape of the hazard function is not central to my analysis and it seems unnecessary to risk making erroneous assumptions about it.

6.3.4 The Cox model

Semiparametric approaches have much weaker assumptions about the nature and shape of the baseline hazard rate and are therefore widely used in political sciences. Most importantly for the present study, they can be adapted to handle coterminous event occurrences ("ties") (Box-Steffensmeier and Jones 2004: 53).[116] The characteristic feature of the semiparametric models is that the baseline hazard $\lambda_0(t)$ is left completely unspecified. The hazards are made dependent on a vector of explanatory variables x with coefficients β that are to be estimated and the baseline hazard λ_0. The setting is then as follows:

$$\lambda(t, x, \beta, \lambda_0) = \lambda_0(t)\phi(x, \beta), \tag{6.10}$$

where φ is a positive function of x and β, and $\lambda_0(t)$ characterizes how the hazard function changes as a function of time. The baseline hazard depends on t, but not on x, meaning that it captures individual heterogeneity

[116] By contrast, standard parametric regression models are not able to handle tied data.

that is unexplained by the covariates. Alternatively, the baseline hazard can be interpreted as the probability of an exchange rate regime to change conditional on all the covariates of zero. The most commonly used semiparametric procedure was developed by Cox (1972). He proposed to specify the relative hazard function $\phi(x,\beta)$ in the following way:

$$\phi(x,\beta) = \exp(x'\beta). \tag{6.11}$$

The advantage of this model is that nonnegativity of φ does not impose restrictions on β.[117] The Cox model is one of proportional hazards, meaning that the explanatory variables have the same proportional effect on the hazards over time. In other words, the ratio of the hazard functions for two countries *a* and *b* with different values on one or more covariates is independent of *t*. Formally, this implies that

$$\frac{\lambda_a(t)}{\lambda_b(t)} = \frac{\exp(x_a\beta)}{\exp(x_b\beta)}, \tag{6.12}$$

which is constant over time. The proportional hazard assumption is useful because the unspecified baseline hazard drops out of the partial likelihood. To estimate the hazard function, observed spells are ordered by length from smallest to largest, $t_1<\ldots<t_n$. The conditional probability that the first observation abandons a spell at time t_1, given that any of the *n* observations could have been failed at t_1, is

$$\frac{\exp(x_1,\beta)}{\sum_{i=1}^{n}\exp(x_i,\beta)}. \tag{6.13}$$

This quantity is the contribution of the shortest observation to the partial likelihood. Generally, the contribution of the *j*-th shortest observation *j* to the partial likelihood is given by

$$\frac{\exp(x_j,\beta)}{\sum_{i=j}^{n}\exp(x_i,\beta)}. \tag{6.14}$$

Translating this technique into that of exchange rate regimes, the numerator is the hazard for the country whose currency peg completes at time t_1, while the denominator is the sum of the hazards for countries

[117] The variable must take on non-negative values as there is no negative risk of failure.

whose spells were still maintained just prior to time t_j (i.e. those whose spells formed the risk set and could have ended at time t_j). The likelihood is formed as the product of these contributions and may be written as

$$L(\beta) = \prod_{i=1}^{n} \frac{\exp(x_j, \beta)}{\sum_{i=j}^{n} \exp(x_i, \beta)}. \tag{6.15}$$

The likelihood function depends only on the unknown coefficient vector β and can then be maximized using standard methods.[118] The functional form of the hazard rate does not need to be specified. The Cox log likelihood function is then as follows:

$$ln\, L(\beta) = \sum_{i=1}^{n} \left\{ \ln \phi(x_i, \beta) - \ln \left[\sum_{j=i}^{n} \phi(x_j, \beta) \right] \right\} \tag{6.16}$$

where $\phi(x_i, \beta) = \exp(x_1, \beta)$.

One of the advantages of the survival analysis is that the partial likelihood framework accommodates for censored data. This is done by including censored observations in the summation of the denominator of the partial likelihood function terms corresponding to observations that fail before their censoring point. Censored observations do not enter in the denominator of observations that fail after their censoring point and they are never included in the numerator of a contribution to likelihood.

6.4 Estimation results

6.4.1 Nonparametric analysis with the Kaplan-Meier estimator

This chapter starts with a nonparametric analysis of the 49 countries in the dataset. Estimation results for the Cox model are given in the second part of this section.

Figure 6.1 plots the proportion of all countries in each exchange rate regime in each year of the sample. As is evident from the figure, the popularity of different exchange rate regimes has varied since the breakdown of the Bretton Woods fixed exchange rate system in 1973. Many of the countries have been moving toward more flexible arrangements. The number of

[118] It is referred to as a partial likelihood because it makes no assumption about the baseline hazard rate at times when failures do not occur.

de facto floaters increased from 1974 to 2000 from 15 percent to 39 percent, while at the same time the proportion of countries under de facto fixed regimes decreased from 70 percent to 39 percent. In 1974, 15 percent of the countries had an intermediate regime; that share increased to 48 percent in 1994. However, this trend has reversed since then. In 2000, the number of de facto intermediate regimes had decreased to 22 percent.

The main focus of this chapter is less on the overall share of different exchange rate regimes at a specific point of time and more on the persistence of different regimes. Thus, an interesting question to ask is whether differences exist in regime persistence across different exchange rate arrangements. Following the recommendation by Kalbfleisch and Prentice (1980: 17), the Wilcoxon test is performed to test for the equality of survivor functions across different de facto exchange rate regimes.[119]

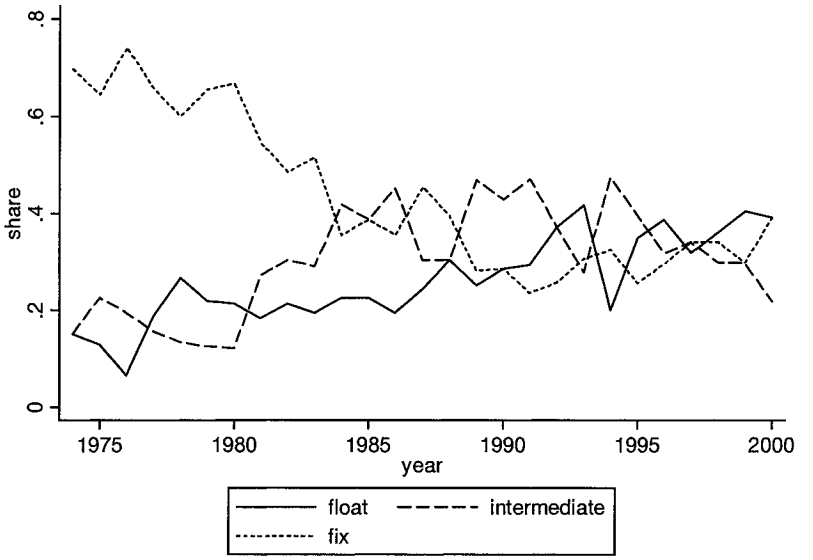


Figure 6.1. De facto exchange rate regimes, 1974-2000

[119] There are a variety of appropriate tests for testing the equality of survivor functions across different groups. The Wilcoxon test is the optimum rank test if one wishes to put additional weights to early failure times when the number of subjects at risk is higher and if there are no reasons to assume that the censoring pattern differs over the test groups (Kalbfleisch and Prentice 1980: 17). Nevertheless, a Log-rank test and a Tarone-Ware test were also conducted and achieved identical results.

Table 6.1. Wilcoxon test for equality of survivor functions

Exchange rate regime	Observed exits	Expected exits	Sum of ranks
Float	93	90.64	16
Intermediate	144	106.38	1414
Fix	89	128.98	-1430
Total	326	326.00	0
$Chi^2(2)$	43.84		
$Pr>chi^2$	0.000		

As displayed in table 6.1, the test statistics strongly rejects the null hypothesis of no differences in persistence across exchange rate regimes. Therefore, one can conclude that different exchange rate regimes exhibit different patterns of duration dependence.

Which exchange rate regime is the most persistent? Nonparametric estimates are presented In the following to derive meaningful statements about regime persistence. Figure 6.2 shows the Kaplan-Meier survival estimate for the full sample and the complete period under observation conditional on the type of de facto exchange rate regime.

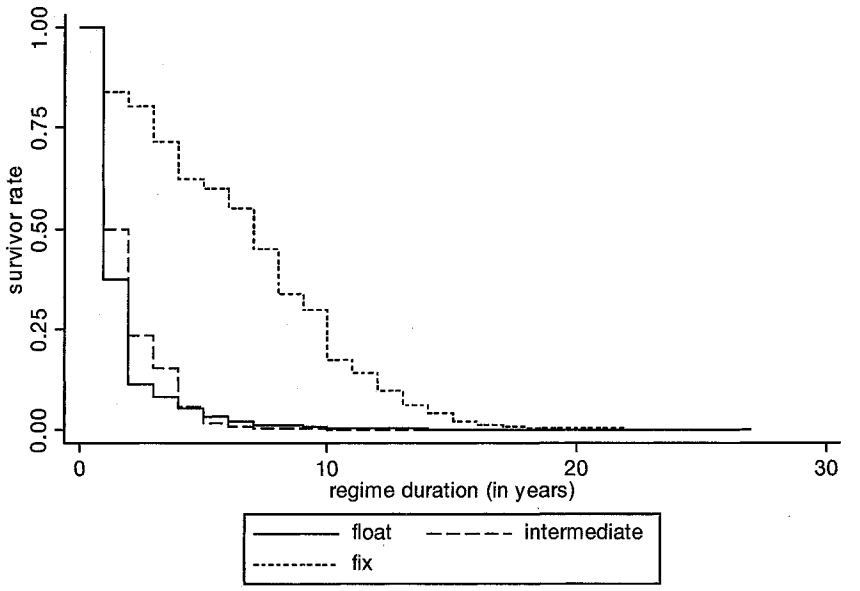


Figure 6.2. Kaplan-Meier survival estimates, 1974-2000

As expressed by the figure, there is clear evidence of a longer duration of fixed exchange rate regimes in comparison to intermediate and flexible arrangements. The hazard for intermediate regimes decreases much more quickly, indicating a shorter persistence of these arrangements. Only half of the intermediate arrangements "survive" the first year; after four years only 6 percent continue to exist. Surprisingly enough, flexible exchange rates have an even shorter lifespan. Less than two-fifths of the arrangements exist for more than one year; roughly one in twenty flexible regimes lasts longer than four years. Figure 6.2 is thus only partially supportive for the two-corner hypothesis. According to this view, we would have expected both polar regimes to have a higher persistence. Although it is evident that intermediate regimes, such as crawling pegs and bands, are not sustainable, the short persistence of flexible exchange rates contradicts the bipolar hypothesis.

One might argue that the short persistence of flexible regimes contradicts the increasing popularity of flexible arrangements presented in figure 6.1. However, this apparent puzzle is explained if we consider that although developing countries are reluctant to let their currency float over a long period of time, in calm periods the "fear of floating" is not as strong and the country may thereby benefit from some flexibility in its exchange rate.

It is also of interest to compare different time spans. In a second step the analysis is therefore limited to the 1990s. Given the recent process of financial liberalization, the 1990s are expected to be the most relevant time period for the validity of the two-corner hypothesis.

As can be observed from figure 6.3, the divergence between different regimes decreases when reducing the sample to the 1990s. The pattern of results changes insofar as flexible exchange rates now have a higher survivor rate (i.e., regime persistence) than before. While over the whole sample period, only 11 percent of flexible regimes exist for more than two years, this number increases to 30 percent in the 1990s. However, fixed regimes still have the longest persistence, with nearly a quarter of the regimes surviving four years or longer. Again, the figure confirms the vulnerability of intermediate regimes, which have the lowest survivor rate at every point in time.

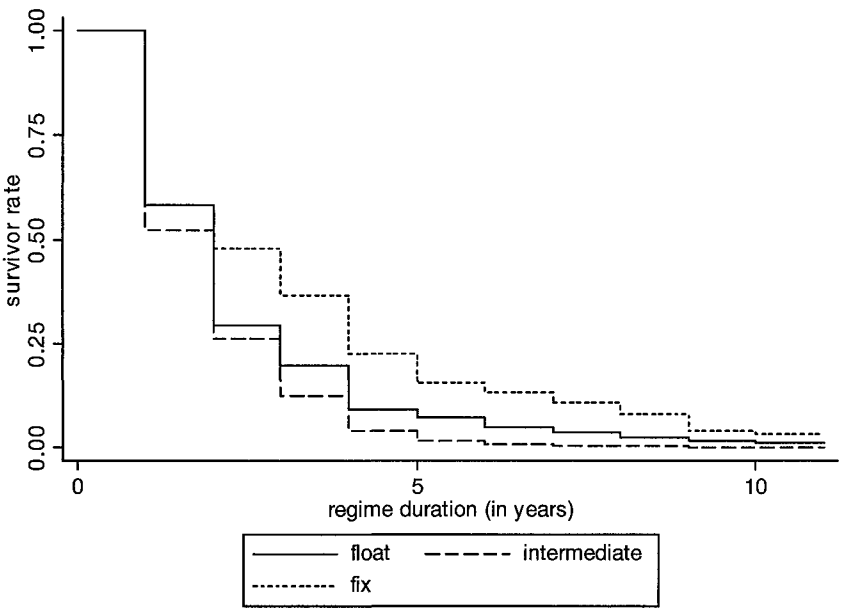


Figure 6.3. Kaplan-Meier survival estimates, 1991-2000

One possible explanation for the short persistence of intermediate regimes is the insufficient discipline that these regimes impose on the conduct of economic policy. Fixed regimes place strains on policymakers by ruling out the possibility to conduct an independent monetary policy. Even flexible exchange rates set some restrictions on the availability of opportunistic policy behavior. The usefulness of monetary policy is limited by the usually high exchange rate pass-through in developing countries. Fiscal policy is constrained as well because an overexpansionary fiscal policy leads to a depreciating currency, which serves as an immediate and observable signal of the government's incompetence (Tornell and Velasco 1995). Alternatively, intermediate regimes rarely impose any of these constraints and are thus more prone to crisis.

It is important to note that one should not draw far-reaching conclusion from the previous nonparametric analysis. The results presented may reveal a downward bias due to censored data. This is particularly true for figure 6.3, in which more than one-third of the spells re either left- or right-censored. Despite this limitation, I feel safe to conclude that the nonparametric analysis documents some heterogeneity between different exchange rate regimes. This does not mean, however, that the Kaplan-Meier estima-

tor can provide support for the two-corner hypothesis. Though a Wilcoxon test clearly rejects the null hypothesis of equality in regime persistence between different exchange rate arrangements, the graphical analysis shows that differences between various regimes are too small to unambiguously confirm the thesis from the "vanishing middle" (Frankel 1999: 11). Rather, a characterizing feature is the low regime persistence across all regimes. The short durability of exchange rate regimes is consistent with findings by Klein and Marion (1997), Eichengreen and Masson (1998), and Duttagupta and Ötker-Robe (2003). Only studies calculating exchange rate regime persistence based on the natural classification by Reinhart and Rogoff (2002) demonstrate much longer exchange rate regime duration (Rogoff et al. 2004; Wälti 2005).

6.4.2 Descriptive statistics on fixed exchange rate regime periods

The main focus of the analysis is on the duration of currency pegs. Thus, some closer inspection of periods of fixed exchange rate regimes is in order. The variable *duration* characterizes the "life" of a fixed exchange rate regime or the consecutive number of years that a currency peg has persisted until it is abandoned. By definition, the minimum number of years that a pegged exchange rate regime lasts is one year and the maximum is 26 years. As illustrated in the graphical analysis, regime persistence is very low. The average currency peg duration is 3.97 years. Once again, it is important to note that this number has a downward bias because the operational design restricts the maximum length of a currency peg to be 26 years (the number of years covered by my 1975-2000 sample) and since some of the pegs are either left- or right-censored.

Figure 6.4 further illustrates this point. It plots an estimate of the smoothed hazard function. The graph agrees with former analysis on currency peg duration (see, e.g., Wälti 2005), showing an increasing hazard first and a decreasing hazard afterward. In other words, the conditional probability of abandonment depends upon the amount of time that the peg has existed. The clearly nonmonotonic pattern of duration dependence may be explained by a time lag between the introduction of a peg and gains in credibility. Achieving credibility is a long-lasting process and thus, only if the peg has persisted for a long time, the conditional probability of exit decreases. In any case, the nonmonotonic pattern provides a strong case for the use of duration models such as the Cox that allow nonmonotonity in the hazard rate.

Figure 6.4. Estimated hazard function for currency pegs, Kaplan-Meier estimator

6.4.3 Results of the Cox estimates

The main drawback of the nonparametric analysis is that it cannot reveal great insight in terms of an explorative analysis on the influence of certain variables on the duration of currency pegs. It makes no assumption about the fundamental form of the survivor function and the effects of covariates are not modeled either. In the following, the semiparametric approach by Cox (1972) is employed to derive conclusions about the impact of the political economy variables on currency peg duration. The objective is to test the hypotheses derived in chapter 5. The statistical calculations were performed using Stata 8.0's "stcox" procedure.

The application of the Cox method requires that time spans of exchange rate regimes can be measured exactly, meaning that no tied failures occur. In the present context, however, tied failures exist since only the yearly time interval in which the abandonment of a currency peg occurs is given. Thus, some currency pegs will share its observed duration time with other pegs. To handle this problem, all estimates use the exact partial likelihood method as an approximation. This method treats the data as discrete and is

especially attractive if the number of failures in a specific time interval is large (Cleves et al. 2004: 142; Box-Steffensmeier and Jones 2004: 56).[120]

When using a Cox model, it is also important to check the proportional hazard assumption. The Schoenfeld residual test is conducted after each estimate to verify this basic assumption of the Cox model.[121] A violation of the proportional hazards assumption occurs when regression coefficients are dependent on time, i.e. when time interacts with one or more covariates. In this case, the re-scaled Schoenfeld residuals no longer have an expected value of zero. Under the null hypothesis of proportional hazards, a rejection of the null hypothesis indicates a violation of the proportional hazard assumption. Additionally, the model fit of each specification is judged by Pregibon's (1980) link test. The link test verifies that the predicted squared values of a first round model are insignificant in a second round model. A rejection of the null hypothesis indicates the presence of omitted variables bias.

In order to avoid the above-mentioned multicollinearity problems, eight Cox models were measured. Some explanatory variables are alternately dropped from the regression equations. As suggested by second-generation currency crisis models, political variables may affect exchange rates regardless of the inclusion of economic variables. That is, political variables may directly affect market expectations regarding how governments will react to exchange market pressure.[122] Therefore, as a starting point, the first set of regressions (models [1] through [4] displayed in table 6.2) estimates currency peg duration including political, institutional, and interest group variables only. I will refer to these specifications as "political models". The second set of regressions (models [5] through [8] in table 6.2) enriches these models with alternative economic specifications. I term the latter "political-economic models".

[120] Box-Steffensmeier and Jones (2004: 56) call this the "exact discrete method" of handling ties.

[121] Since Schoenfeld residuals cannot be calculated with the exact partial likelihood method, they are calculated based on Efron's method of approximating tied failure (Box-Steffensmeier and Jones 2004: 55).

[122] I thank *Adi Schnytzer* for clarifying this point.

Table 6.2. Duration of currency pegs, Cox model, partial-likelihood estimates

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
elect	0.77** (0.38)	0.43 (0.42)	0.60 (0.46)	0.89** (0.43)			0.65 (0.69)	0.53 (0.73)
left	0.77* (0.47)	0.85* (0.47)	1.42** (0.57)	0.78 (0.55)		1.12* (0.62)	1.63*** (0.60)	1.34 (1.38)
right	0.79* (0.41)	0.89** (0.41)	1.17** (0.54)	0.78 (0.50)		1.04** (0.47)	1.03* (0.53)	0.79 (1.12)
veto	0.63** (0.25)	0.55** (0.26)	0.61** (0.30)	0.61* (0.32)	0.49** (0.25)	0.65** (0.28)		0.49 (0.45)
cbi	-1.70** (0.86)	-2.31*** (0.89)	-1.89* (1.07)	-2.28** (1.15)	-2.12** (0.98)	-2.37** (1.01)	-3.27** (1.49)	-4.27* (2.57)
polity	0.07** (0.03)	0.06** (0.03)	0.07* (0.04)	0.08* (0.03)	0.11*** (0.03)	0.09** (0.04)	0.04 (0.04)	0.02 (0.08)
govinst	-0.47* (0.25)	-0.09 (0.14)	-0.12 (0.26)		-0.52** (0.26)	-0.44* (0.27)	-0.19 (0.20)	-0.16 (0.41)
prelect		-0.46 (0.44)			-0.90** (0.44)		-0.73 (0.54)	
postelect		-0.55 (0.53)			-0.69 (0.51)			
preleft			-2.13* (1.20)	-1.33 (1.19)	-2.10* (1.25)			
preright			-0.63 (0.68)		-0.56 (0.64)			
herfindahl			-0.97 (0.78)					
manufact				0.09** (0.04)			0.04 (0.04)	0.07 (0.07)
finance				0.02** (0.01)			0.04*** (0.01)	0.03 (0.03)
service				-0.05** (0.02)			-0.11*** (0.03)	-0.13** (0.06)
share				0.30 (1.92)	1.58 (1.70)	2.43 (1.91)		
debt (log)					0.35** (0.17)	0.35* (0.18)	0.06 (0.19)	
sdexport (log)					-0.28 (0.48)	-0.29 (0.59)		
open					0.00 (0.01)	0.00 (0.01)	-0.02** (0.01)	0.01 (0.01)
gdp (log)					0.29** (0.12)	0.37*** (0.14)	0.34** (0.16)	0.51* (0.29)
credinf							0.77 (0.60)	
inflation (log)								0.63 (0.45)
fiscal								-0.20** (0.10)
capop							-1.12* (0.59)	-0.90 (0.86)
Wald chi^2	32.01	29.68	29.06	50.65	38.44	42.40	58.36	66.23
Prob>chi^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AIC	202.23	202.92	148.31	152.91	204.91	188.11	157.63	84.00
BIC	227.72	235.21	182.06	191.20	244.86	234.35	210.27	131.98
Link test	0.44	0.55	0.58	0.12	0.67	0.33	0.32	0.79
Schoenfeld test	0.13	0.12	0.14	0.96	0.00	0.01	0.06	0.01
N	282	267	216	240	279	259	247	181

Note: *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. Standard deviations are reported in brackets. Dependent variable is length of time until a fixed exchange rate regime is abandoned. N is number of observations. Exact partial likelihood method has been used to handle tied failures. The computed values for the link and Schoenfeld test are p-values.

Table 6.2 presents the results for the political model. Let us begin with the interpretation of the results for the partial-likelihood estimate of the first political model presented in column (1). The null hypothesis of $H_0 : \beta_x = 0$ can be tested against the alternative by means of a Wald test. This is basically a joint test of the restriction that the coefficients on the explanatory variables are all zero. Under the null hypothesis this test statistic is distributed chi-squared with eight degrees of freedom. Since the test statistic of 32.01 is clearly above the critical 1 percent level, the null hypothesis can be rejected. Hence, variables implied by the literature on the political economy of exchange rate regimes are helpful in explaining de facto currency peg duration.

As expressed by the table, all variables are significant at least at the 10 percent level. Coefficients for any β_i parameter significantly above zero indicate that an increase in the corresponding variable leads to a faster exit, and conversely for a negative coefficient parameter. Thus, we see that election years are significant and positively related to the risk of abandoning a peg. This is support for the notion that short time horizons raise the probability of abandonment. Statements about the magnitude of the impact can be drawn by calculating hazard ratios, which are exponentiated coefficients (i.e., e^{β_i}). For dummy variables, the exponentiated coefficients are easily interpreted as time-ratios. This implies that in election years the probability of exiting a currency peg is 116 percent higher than in non-election years.

In line with hypothesis 2a, *left* has a higher probability of abandoning a currency peg than *center*. More exactly, the hazard at the same time for left parties is 117 percent higher than for parties from the ideological center. Surprisingly, the results also report that right parties have a 121 percent higher probability of exiting from a fixed regime than center parties. The exponentiated time ratios can be directly set against each other, giving relative time ratios. Thus, the relative time ratio for a regime shift of left parties with respect to right parties is equal to $e^{\beta_L} / e^{\beta_R}$, i.e., 0.98.

The statistically significant positive parameter estimate of 0.63 for *veto* in model (1) means that every additional veto player above the mean (or, analogously, the loss of one veto player below the mean) increases the time-to-exit for a fixed exchange rate regime by 89 percent, a result that is consistent with the predicted U-shaped relationship between veto players and currency peg duration (hypothesis 3).

The hazard ratio for *cbi*, as a proxy for the actual degree of central bank independence, is also significant at the 5 percent level. The negative coefficient indicates that independent central banks have a higher probability of abandoning a peg. This is in line with the idea of a substitutive relation-

ship between independent central banks and fixed regimes (hypothesis 4). A one standard deviation increase in central bank independence would be predicted to increase the probability of exit by 16 percent.

With respect to *polity*, the positive parameter estimate combined with the low p-value (0.06) implies that the level of democracy does matter for explaining the duration of pegs. However, contrary to what has been suggested in hypothesis 5, more democratic countries display a faster exit from currency pegs. A one-point increase in the 21-point polity index increases the probability of exit by 7 percent. This result broadly survived when I experimented with the 11-point index of *democracy* as an alternative measure for the level of democracy.

Even more puzzling, the degree of political instability also influences currency peg durability in a counterintuitive way. Surprisingly, a higher level of political instability leads, ceteris paribus, to a lower persistence of currency pegs. Again, the result is significant at the 5 percent level and the magnitude of the effect is quite large. A one standard deviation increase in political instability leads to a 27 percent lower probability of abandoning the currency peg. This result is an apparent puzzle and will be discussed below.

Quite importantly, as displayed in the bottom part of column (1), the Schoenfeld residual test cannot reject the null hypothesis of proportional hazards. The nonsignificance of the link test also indicates that the specification seems to fit the data quite well.

Columns (2) through (4) display alternative specifications of the political model. With respect to the basic variables just discussed, the results remain very much the same. All variables keep its sign from the first estimation model. Thus, I will only discuss the most important changes to these variables in the following. To the model in column (2), I add the two dummy variables *preelect* and *postelect*. The parameter estimates indicate a lower probability of exit in both pre-election and post-election periods. The former is consistent with hypothesis 1a; however, the coefficient is not significant. The negative sign for *postelect* contradicts the expectation of a higher risk of exit after the election. Thus, I obtain weak support for hypothesis 1a and no support for hypothesis 1b. The most important change in terms of the remaining variables is that the coefficient of *elect* now loses significance. Additionally, if pre-election periods are controlled for, the impact of right parties gains in significance and increases in magnitude. Model (3) asks whether there are any differences in the pre-electoral period between left- and right-wing parties. Both interaction variables *preleft* and *preright* have a negative sign. As expected, the parameter estimate for *preleft* is much larger and the coefficient is statistically significant. If pre-election periods are controlled for, the coefficient of *left* becomes signifi-

cant at the 5 percent level. Moreover, the absolute magnitude of the impact of both left- and right-wing parties increases considerably in this specification. Thus, data in column (3) reveal that in non-election periods, leftist parties have a higher probability to abandon a currency peg (the relative hazard for leftist parties compared to rightist parties is 1.29), while in pre-election periods right-wing parties are more likely to exit (in these periods the relative hazard for *left* is 0.22). This result is perfectly consistent with the view that despite its overall preference for flexible exchange rates, left-wing parties are unwilling to abandon a currency peg in pre-election periods to signal their concern for price stability (hypotheses 2a and 2b). Right-wing parties, by contrast, have a greater reputation for being tough on inflation and thereby have fewer electoral consequences to fear if they abandon a peg in election periods. The inclusion of the Herfindahl index produced clearly nonsignificant results and thus, the variable *herfindahl* and the remaining nonsignificant variables are kept away from model (4).

Interest group variables, as introduced in model (4), do appear to play a direct important role in the determination of the duration of a fixed regime. Their inclusion results in a loss of significance for the coefficients of the partisan variables. By contrast, the coefficients and standard deviations of the institutional variables remain quite stable. Data support hypothesis 7a that an important manufacturing sector shortens the duration of a fix (all else equal). The results also suggest that a strong service sector tends to lower the probability of exit. Hypothesis 7b suggested, however, a reversed pattern. One reason for this apparent puzzle may be the limited capacity of the crude *service* variable to measure the political influence of the nontradable sector. Another possible reason is that exchange rate preferences of the nontradable sector are well diversified. To the extent that a fixed exchange rate increases real income and fosters price stability, there are also good reasons to explain nontradable sector' s interest in exchange rate stability. Finally, the introduction of the variable *share* provides no additional explanatory power to the model.

As more conservative specifications, columns (5) through (8) in table 6.2 display estimation results including both political and economic covariates ("political-economic models"). Specification (5) adds structural variables to the model as suggested by the OCA and the fear of floating literature. The application of a Wald test for this model yields a statistics of 38.44. Comparing the statistic with the 1 percent critical value of a chi-squared distribution with eleven degrees of freedom indicates that the null hypothesis that no variable has any influence on fixed rate regime duration is strongly rejected by the data. The coefficient of the variable *debt* is significant at the 10 percent level. Note that predictions on the effect of this variable are inconclusive. Fear of floating literature and currency crisis lit-

erature come to different conclusions regarding this variable. The former predicts that in countries where outstanding public and private debts are large, policymakers favor policies that keep a stable value of the domestic currency. The latter argues that countries with large external debt position are more vulnerable to speculative attacks, which should result in a shorter duration of currency pegs. In the present study, the positive parameter estimate for *debt* provides more support for the currency crisis than for the fear of floating hypothesis. With the exception of *size*, which is negatively correlated with currency peg durability, none of the OCA variables is significant. However, this is absolutely consistent with the literature on the OCA theory, which has generally found only poor empirical regularities for these variables with a country's size being the only exception (Juhn and Mauro 2002: 7).[123]

In terms of the institutional variables, the pattern of results shows many similarities with the results obtained in the purely political models. The coefficients of all four institutional variables are significant at least at the 5 percent level. However, the impact of political instability drastically increases in magnitude and significance after the inclusion of the structural variables. The coefficient of *preelect* also increases in magnitude, reaching statistical significance at the 5 percent level. Specification (6) appends partisan variables to the model. Again, these variables are largely unaffected by the inclusion of structural variables. Both the left-wing and the right-wing dummy variables keep their sign and enter with statistical significance. The variable *preleft* is also significant, providing further support for the notion that leftist parties are particularly interested in maintaining exchange rate stability in the pre-election period.

Models (7) and (8) add interest group variables and further economic variables, which are not necessarily exogenous to the political variables. Consistent with expectations, the sign for *capop* is negative, suggesting that countries with capital controls are better able to defend a currency peg. The coefficient reaches statistical significance at the 5 percent level. The

[123] The negative coefficient for *sdexport* contradicts expectations. However, it has also been found in previous studies (see Frieden et al. 2001: 38). One explanation for this outcome is that the standard deviation of export growth may be a poor proxy for the actual vulnerability to asymmetric shocks, since changes in export growth can also be caused by domestic factors, such as increased technological competitiveness. Moreover, there are some concerns about the measurement of the variable itself. Since no monthly data for export growth were available for all countries, the measure is not conformed every year, but takes on the same value for the whole period. Thus, this specification ignores the fact that in some countries the vulnerability to asymmetric shocks might have changed significantly over the 1975-2000 period.

coefficient of *credimf* is not significant at conventional levels of significance. Still, the positive sign suggests that countries that receive an IMF credit are more likely to abandon a currency peg. Inflation rates, as introduced in model (8), are positively associated with the probability of abandonment, but are not significant. In contrast, the coefficient of *fiscal* enters statistically significant and displays the expected sign, indicating that countries with fiscal imbalances have difficulties in maintaining a fixed exchange rate system. With the introduction of the economic variables most of the political and institutional variables lose their significant explanatory power. This suggests, e.g., that differences in the duration of pegs between authoritarian and democratic regimes or between countries with a different degree of political stability may be explained by differences in monetary and fiscal policy. In the same manner, the loss of significance for the coefficient of *left* indicates that the higher probability of exit under left-wing governments can be partly attributed to their looser fiscal policy. Again, test statistics for the Schoenfeld residuals are displayed, indicating some departure from proportional hazards. The link test implies a reasonable model fit.

Given the different specifications, a reasonable question to ask is which specifications fits the model best. The Akaike Information Criterion (AIC) can be used to compare models with different constructs. The model with the smaller AIC is considered the better-fitting model (all else being equal). A small AIC occurs when large likelihood values are obtained with fewer covariates. AIC values are reported in the bottom part of each column in tables 6.2. One may suggest that the tables identify model (8) as the preferred model. However, one problem with the AIC is that if several models have similar AIC values and if the number of observations varies across different specifications, as presently is the case, the difference is probably not of any consequence. I therefore use an additional method to assess the model fit by calculating Cox and Snell (1968) residuals. If the fitted model is correct, the Cox-Snell residuals should have a standard censored exponential distribution with hazard ratio equal to one for all *t*. Therefore, a plot of the cumulative hazard function (based on the Kaplan - Meier estimator) for these data should lie on a straight line from the origin with slope equal to one. Figure A6.4 plots the Cox-Snell residuals for the different specifications of the political model. The graphic analysis indicates that the different models are reasonably specified. The plots satisfy the exponential requirement most of the time: models (4), (6) and (8) in particular fit the data rather well. Note that some deviation of the 45° line is expected due to the reduced effective sample caused by censoring (Cleves et al. 2004: 193). The deviation is higher in the right-hand tail of the plot where the sparseness of data reduce the adequacy of the model, while

the large number of smaller residuals in the left-hand tail of the figure cluster more closely around the straight line with slope equal to one.

Finally, it is interesting to see that the semiparametric analysis confirms the basic pattern of nonmonotonic duration dependence. Although the Cox model does not directly estimate the baseline hazard, it can be obtained from the partial likelihood estimation. Figure 6.5 displays the estimated hazard function based on the specification in column (8) of table 6.2. The function is produced at the means of the explanatory variables. The figure shows that even if a number of variables is controlled for, the hazard rate still indicates positive duration dependence at first, followed by negative duration dependence after a certain point in time. Thus, there is some evidence that the dynamics of duration dependence are not caused by the omission of explicative variables, but rather, that it is really time that matters for the conditional probability of exit.

Figure 6.5. Estimated hazard function for currency pegs, semiparametric estimator

6.5 Testing for misspecification

6.5.1 Motivation for employing an alternative specification

Some econometricians worry about the use of the Cox model when data are considered on a yearly basis (Prentice and Gloeckler 1978: 58). Strictly speaking, the application of the Cox method requires that time spans of exchange rate regimes can be measured exactly, i.e. no tied failures occur. In the present study, the unit of measurement is discrete. Duration is measured in years, meaning that the existence of speculative attacks can only be measured in yearly intervals.[124] Accordingly, a larger number of tied failures exist, i.e. spells of exchange rate stability end at the same observed time. The problem that tied failures pose for the partial likelihood function is that it is not possible to discern exactly the composition of the risk set at each failure time. Estimation results may then be less efficient. In Cox's estimates, the exact discrete method of handling ties was used. This is the recommended specification when having larger number of tied failures. Box-Steffensmeier and Jones (2004) write, "the exact approximation of the Cox model [...] can be applied to discrete duration data—data that by definition have many tied outcomes. Hence, even in the face of discrete time data, the Cox model can be applied. Further, it is our view that the Cox approach in such a setting will be preferable to the logit-based approach" (Box-Steffensmeier and Jones 2004: 194).[125]

Nevertheless, the exact partial likelihood method is still an approximation. To increase the robustness of the results, a second estimation routine resorts to complementary log-log (cloglog). The dependent variable in the cloglog approach is a censoring indicator, which takes on values of *1* when there is an exit from a currency peg and *0* otherwise. If one denotes the probability of exit by $Pr(y_{it} = 1) = \lambda_i$, the model has the following form:

$$\log[-\log(1-\lambda_i)] = \beta_o + \beta_1 x_{1i} + \beta_2 x_{2i} + \ldots + \beta_k x_{ki}. \qquad (6.17)$$

The predicted probability of an event occurrence, that is $\hat{\lambda}_i$, can be retrieved from the cloglog model by reexpressing equation (6.17) as

[124] Data availability for political variables restricts me to using data at low frequency.

[125] Elsewhere, Box-Steffensmeier and Jones (2004: 83) argue that the "Cox model [...] can be used to estimate parameters of interest, even in the face of highly discretized data."

$$\hat{\lambda}_i = 1 - \exp[-\exp(\beta' x)]. \tag{6.18}$$

The advantage of cloglog over alternative estimation strategies to handle discrete duration data, such as logit or probit, is that the response curve is asymmetric (skewed) about λ_i=0.5. The response curve has a fat tail as it departs from *0*, whereas it approaches *1* more rapidly than both the logit and the probit function.[126] This suggests that the cloglog function is particularly appropriate in datasets where there are relatively few failures (Box-Steffensmeier and Jones 2004: 74).

Another positive feature of the cloglog is that some aspects of time dependence can be modeled as well. A number of routines have been developed in this context. A simple approach would be to include temporal dummy variables that specify how many years have passed since the beginning of a currency peg. The inclusion of these variables in the model would show whether duration dependence were an issue and, if this were the case, would correct for temporally dependent observations. However, temporal dummies are costly in terms of degrees of freedom. In the present study, 25 dummy variables would have to be estimated. If time dependence is thought of only as a nuisance parameter, i.e. if no inferences about duration dependence are made, the cubic spline approach is the theoretically more appropriate solution (Beck et al. 1997: 10). The basic idea behind this approach is to fit cubic polynomials to several predetermined subsets of the data. As for the smoothness of the hazard function, the separate cubic functions are joined smoothly at knot points. The number of knots is determined by the researcher. The advantage of this procedure is that it requires few assumptions regarding duration dependence and thus saves degrees of freedom (each knot only uses one degree of freedom) (Beck et al. 1997: 11-12). In the present study, I estimate a cubic spline

[126] Another procedure, which accounts for the discrete nature of the data and for duration dependence, is to use a discrete time (grouped duration data) proportional hazards model by Prentice and Gloeckler (1978). In this specification, two versions of the Prentice-Gloeckler model are estimated by maximum likelihood (Jenkins 1997: 22). First, each hazard function is estimated without accounting for unobserved individual heterogeneity (or "frailty"). In a second step, these results are compared to a complementary specification that allows for a gamma distributed unobserved heterogeneity term, as recommended by Meyer (1990). Unfortunately, however, this procedure is not applicable in the present study since current statistical packages do not allow the estimation of the Prentice-Gloeckler model in the case of multiple failure. The reason is that with each additional failure, the number of matrices to be calculated rises in an exponential way (Ondrich and Rhody 1999: 140).

function on the basis of three knots. Accordingly, the estimated model will, in addition to the independent variables described above, include three splines, which produce an estimate of the form of duration dependence.[127]

Even after controlling for duration dependence, substantial complication may still exist due to multiple failures and censoring (see Beck et al. 1997: 12-14 for a discussion). For all estimation below, I therefore use Huber-White standard errors which are robust to misspecification of the correlation within countries.

6.5.2 Results for specification tests

Table 6.3 presents the results for the re-estimation of the above specifications using the cloglog model. Overall, results are in line with the Cox models and thus I will only emphasize those aspects that bring additional interesting results. Again, I begin with some specifications where exchange rate sustainability is explained solely by values of political variables (columns [1] through [4] in table 6.3). Unlike previous specifications, the variable *elect* is now significant at the 1 percent level in all specifications. There is also a stronger support of the view that left parties are more likely to abandon a peg. By contrast, the results suggest a weaker impact for the institutional and interest group variables. Quite importantly in terms of robustness, all but one variable keep its sign. The exception is *preright*, which now turns positive suggesting that right-wing parties have a higher probability of exit in pre-election periods. The sign of *preleft* remains negative, which is consistent with the view that leftist parties fear the credibility loss associated with the abandonment of a peg and will therefore not devalue in the period prior to an election. As suggested by the highly significant time variables, the hazard function varies with time. It increases initially, then decreases, and finally increases again.[128]

[127] The cubic splines are estimated by Stata's "spbase" program.

[128] This shape of the hazard rate is very similar to the one found by *Wälti* (2005).

Table 6.3. Duration of currency pegs, Cloglog model

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
elect	1.11*** (0.26)	0.91*** (0.30)	0.94*** (0.30)	1.02*** (0.29)		0.89** (0.35)	0.93*** (0.32)	0.52 (0.48)
left	0.68** (0.32)	0.65* (0.33)	1.05** (0.44)	0.86** (0.37)		1.25** (0.52)	1.41*** (0.41)	1.19** (0.59)
right	0.53 (0.35)	0.56 (0.37)	0.76* (0.46)	0.78* (0.45)		0.84* (0.47)	0.91* (0.51)	0.46 (0.57)
veto	0.21 (0.16)	0.19 (0.16)	0.05 (0.18)	0.26 (0.18)	0.17 (0.18)	-0.07 (0.24)		
cbi	-0.87 (0.64)	-0.76 (0.75)	-0.35 (0.75)	-1.24** (0.61)	-1.46* (0.76)	-1.30* (0.79)	-3.24*** (1.08)	-5.28*** (1.68)
polity				0.00 (0.39)	0.05** (0.02)	0.01 (0.04)	0.03 (0.03)	-0.00 (0.04)
govinst	-0.20 (0.18)	-0.26 (0.21)	-0.13 (0.23)		-0.11 (0.13)	-0.04 (0.22)	-0.27 (0.23)	-0.26 (0.19)
preelect		-0.00 (0.32)			-0.56* (0.33)		-0.32 (0.43)	-0.14 (0.46)
posteelct		-0.16 (0.45)			-0.59 (0.42)			
preleft			-1.23 (0.96)			-1.23 (0.93)		
preright			0.10 (0.36)			0.09 (0.45)		
herfindahl			-0.32 (0.39)			-0.55 (1.04)		
manufact				0.03 (0.02)			-0.00 (0.03)	
finance				0.00 (0.00)			0.03*** (0.01)	0.05*** (0.01)
service				-0.04** (0.02)			-0.09*** (0.02)	-0.13*** (0.04)
share		-2.08** (0.97)	-2.16** (1.07)	-2.42* (1.24)		-3.08** (1.50)	-3.70*** (1.21)	-6.89*** (1.79)
T1	0.43*** (0.14)	0.36*** (0.13)	0.40** (0.17)	0.32** (0.14)	0.41*** (0.13)	0.38** (0.15)	0.31** (0.15)	0.28 (0.18)
T2	-0.28*** (0.09)	-0.23*** (0.09)	-0.26** (0.11)	-0.21** (0.10)	-0.27*** (0.09)	-0.25** (0.10)	-0.21** (0.10)	-0.20* (0.12)
T3	0.02** (0.01)	0.02** (0.01)	0.02* (0.01)	0.02** (0.01)	0.02*** (0.01)	0.02** (0.01)	0.02* (0.01)	0.03** (0.01)
debt (log)					0.33* (0.19)	0.42* (0.23)	0.07 (0.12)	
sdexport (log)					-0.16 (0.38)	-0.65 (0.49)		
open					-0.00 (0.00)	-0.01 (0.00)	-0.02*** (0.00)	-0.03*** (0.01)
gdp (log)					0.14 (0.08)	-0.06 (0.14)		
credimf							0.87* (0.47)	0.71** (0.30)
inflation (log)								0.00 (0.27)
fiscal								-0.10 (0.09)
capop							-0.47 (0.44)	-0.47 (0.42)
cons	-0.97** (0.38)	0.01 (0.55)	-0.02 (0.62)	0.87 (0.98)	-2.97 (2.19)	1.56 (3.63)	6.08*** (1.34)	9.87*** (3.33)
Wald chi^2	44.96	46.54	58.73	57.55	53.69	58.07	169.29	305.13
Prob>chi^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AIC	285.60	277.46	228.14	256.76	290.49	227.46	235.95	154.21
BIC	322.02	324.15	275.46	306.22	341.32	291.50	302.63	214.77
N	282	268	217	253	279	215	247	179

Note: *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. Standard deviations are reported in brackets. Dependent variable is length of time until a fixed exchange rate regime is abandoned. N is number of observations. Huber-White standard errors with clustering on countries are used.

Columns (5) through (8) in table 6.3 document that economic covariates, including the country's openness and debt position help to explain currency peg durability. The dummy for the IMF credit also ends up being significant, suggesting that countries that implement an IMF program will be more likely to abandon a currency peg (either because the IMF recommends that they do so or because they are in a crisis situation that aggravates the maintenance of a pegged regime). Again, the impact of the institutional variables is much weaker than in the Cox specifications. Yet, the results further confirm the important role of electoral, partisan, and interest group motives. Again, duration dependence is nonmonotonic and statistically significant in all models. Note also that the share of countries with fixed regimes is a non-negligible determinant of the duration of currency pegs as well.

6.6 Hypotheses verification

This section will summarize the findings and relate them to the eleven hypotheses delineated in chapter 5. Concerning the impact of political variables, results are broadly in line with theory. With regard to elections, I found strong and statistically significant evidence of a higher probability of exit from currency pegs in election years. In contrast, both pre- and post-election years are characterized by a lower likelihood of abandonment throughout all specifications. Since the former is at least partly significant, hypothesis 1a (which proposes a lower likelihood of exchange rate adjustments in pre-election periods) is confirmed. By contrast, hypothesis 1b is clearly rejected. An explanation for the inconclusive impact of elections may be that all variables are grouped in annual data, thus discerning any possible short-term political exchange rate regime cycles.

The coefficient for the left-wing government dummy always displays the expected positive sign and is statistically significant in twelve of the fourteen models included. Thus, there is strong evidence for the notion that the risk of exit from a peg is higher for left-wing governments than for governments from the ideological center. However, the dummy for right-wing governments is also positive in all tests. Yet, particularly in the cloglog specifications, the overall significance of this variable is lower than for *left*. Thus, I tentatively confirm hypothesis 2a, which claims that countries with a left-wing government have a higher probability of abandoning a currency peg than countries with a center or right-wing government.

As expected, the interaction variable *preleft*, which measures the pre-election effects under left-wing governments is negative in all tests. It is, however, only significant in the Cox regressions. The sign for the interaction variable of *preelect* and *right*, *preright*, is negative in the Cox model and positive in the *cloglog* regressions. This is consistent with the view that on the one hand, right-wing governments should have an interest to signal competence and delay currency devaluations until after the election; but on the other hand, they may still prefer abandoning a fixed regime in the pre-election period in order to make use of their comparative advantage in monetary discipline. Thus, hypothesis 2b, which suggests that countries with a left-wing government have a lower probability of exiting from a currency peg in pre-election periods than countries with governments from right-wing or center parties, can be weakly confirmed.

Political institutions seem to be a weaker predictor of exchange rate instability than any electoral and partisan impacts. Still, the results suggest that as the variable *veto* increases (that is, as the deviation from the mean of veto players increases), the likelihood of abandoning a fixed exchange rate regime rises. Thus, the third hypothesis, which claims that the probability of exiting from a currency peg in relation to the number of veto players is U-shaped, is also weakly confirmed.

The variable that captures the degree of central bank independence was negative in all and significant in most tests of the Cox and cloglog model. Therefore, the fourth hypothesis, which holds that the probability of exiting from a currency peg increases with the independence of the central bank can be plainly confirmed.

The type of political regime affected currency peg duration in a way that had not been predicted. With one exception, the index variable to measure a country's degree of democracy was positive in all specifications. Hence, contrary to the prediction of hypothesis 5, there is evidence that more autocratic governments are more (rather than less) likely to maintain a stable exchange rate.

Hypothesis 6, which states that political instability increases the probability of exiting from a currency peg, is also rejected. Quite surprisingly, the negative sign for *govinst* suggests that government instability is associated with a lower probability of exit. The variable is even significant in some specifications of the Cox regressions, which is at odds with previous research that found that political turmoil complicates the sustainability of currency pegs. Why did I found a reversed relationship between political instability and currency peg durability? One possible explanation is that previous studies, such as those by Edwards (1996) and Berger et al. (2000), that found a positive relationship between political instability and the choice of a fixed regime, have omitted to control for the type of politi-

cal regime. Since the present study suggests that democratic countries are assumed to have a higher government turnover rate[129] and a lower currency peg duration, a correlation between political instability and the duration of a fix that does not control for these effects is spurious. However, models (1) to (3) in table 6.3 reveal that even when omitting the democracy variable from the regressions, the puzzling coefficient for *govinst* remains. This result does also hold if I exclude the countries with the highest political turnover ratio (Bolivia and Haiti) or when I use the government party turnover ratio as a measure for political instability. Thus, the result is robust to various specifications which allows me to suggest that the greater political costs instable governments incur when they abandon the peg explain the difference (Edwards 1996a: 159). The reason that other researchers found a reversed pattern of results may be that they based their analysis on the official IMF exchange rate regime classification rather than on a de facto scheme as the present study does. Interestingly, the only study that analyzed the impact of political instability on exchange rate policymaking using a behavioral measure of exchange rate flexibility, found results consistent with the present study (Poirson 2001).[130] Frieden et al. (2001) found also results in line with the finding in this study.

Due to the heterogeneity of interests, I expected only weak impacts for the interest group variables. Surprisingly, the variable intended to measure interest group pressure by the nontradable sector, *service*, was negative and significant throughout all regressions. The negative sign contradicts the prediction of hypothesis 7b that a stronger nontradable sector decreases the duration of pegs. Thus, hypothesis 7b is not confirmed. The remaining two interest group variables displayed a weaker impact. The proxies for the tradable sector, *manufact*, and for the banking sector, *finance*, were positive in all tests. These results confirm hypothesis 7a, which predicts a shorter duration of currency pegs when the political influence of the manufacturing sector is large. However, the positive sign of *finance* contradicts the priors of hypothesis 7c.

Thus, six of eleven hypotheses can be confirmed by the data. The ideological orientation of the governing party, the degree of central bank independence, and the number of veto players have a significant impact on a country's probability to maintain an exchange rate fix. Four other variables also appear to have an important influence on the duration of currency pegs. Highly democratic regimes, government stability, small nontradable

[129] See the positive pairwise correlation (0.35) between these two variables in the correlation matrix (table A6.3).

[130] As argued in chapter 4, Poirson (2001) unfortunately does not further discuss this result.

sectors, and a developed banking sector tend to be negatively associated with a country's willingness to sustain exchange rate stability. These results are, however, not too surprising. As discussed above and in chapter 5, there are good arguments to explain such a reversed pattern of results in all four cases. At first glance, the rejection of the remaining hypothesis 1b, dealing with post-election effects, remains puzzling. A possible explanation for the insignificance of this variable in most tests may be the crude measure of this variable. Chapter 7 will shed further light on this issue.

6.7 The politics of speculative attacks

6.7.1 Identifying speculative attacks

The previous statistical analysis has not discriminated between different types of abandoning a period of exchange rate stability. As argued in chapter 4, the exit from a fixed exchange rate regime is often triggered by strong pressure for devaluation. In developing countries in particular, the transition from fixing to floating is likely to be caused by a speculative attack. Thus, it is not only of interest to examine the determinants that increase or decrease the probability of abandoning a currency peg, but also to explicitly investigate the likelihood of a speculative attack. Accordingly, the objective of this section is to analyze whether the same set of political, institutional, and interest group variables helps to explain the existence of speculative attacks.

Again, duration data analysis is a useful strategy and complements the existing literature on speculative attacks that has employed logit or probit specifications. Contrary to logit or probit, the duration data approach can account for both the occurrence of a speculative attack as well as the length of time until a speculative attack occurs. Thus, the specific question that is asked in the following empirical analysis is: What is the probability that a country experiences a speculative attack at time t, conditional on there having a period of tranquility (defined as a period in a pegged regime without a speculative attack) up to t? One view is that the likelihood of a speculative attack decreases with longer periods of tranquility in a fixed exchange rate regime. With time spent in the peg, policymakers should acquire skills and reputation that refrain markets from speculating against the currency. The alternative view qualifies duration dependence as positive: the longer the fixed regime lasts, the more likely the occurrence of a speculative attack. The latter view may hold when the pegged regime's disciplinary effect on policymakers weakens with time and markets react to arising economic incompatibilities with sudden capital outflows.

The event in this specification is a speculative attack. The definition of speculative attacks closely follows the existing literature on currency crisis (see Eichengreen et al. 1995: 278; Kaminsky et al. 1997: 15; Block 2002: 14; Leblang 2002: 76, and others). First, since speculative attacks are only meaningful if the exchange rate has been relatively fixed, I construct a measure of exchange rate stability. Following Kraay (2000: 7-9), the exchange rate is defined as pegged whenever the average monthly change in the nominal exchange rate is lower than 2.5 percent on a yearly basis.[131] "Relative" instead of "absolute" exchange rate stability is imposed because this enables me to detect speculative attacks out of the (often described as vulnerable) middle ground of the exchange rate regime spectrum (such as crawling pegs or target zones). Another advantage is that by allowing for some movements in the bilateral exchange rate between the US dollar and the domestic currency, I also capture speculative attacks in countries where the exchange rate is pegged to a currency other than the US dollar (*Kraay* 2000: 7).

In a second step, a speculative attack index is constructed. The basic idea behind this indicator is that a currency experiences "exchange market pressure" (EMP) if there is a sharp depreciation, a large drop in foreign reserves, or a combination of the two:

$$EMP_{it} = \frac{\Delta e_{it}}{\sigma_i^e} + \left[-\frac{\Delta r_{it}}{\sigma_i^R} \right] \tag{6.19}$$

where e_{it} is the nominal exchange rate (defined as units of domestic currency per US dollar) of country i with the anchor currency in month t, and r_{it} are the nongold foreign reserves for country i in month t. Each component of the index is weighted by its respective standard deviation to prevent the index from being driven by one variable.[132]

Crises are then said to occur when the exchange market pressure reaches extreme values. Following *Leblang* (2002: 15), I define speculative attacks

[131] Since the construction of the speculative attack index uses monthly data, I could not rely on alternative exchange rate regime classifications, such as Levy Yeyati and Sturzenegger (2002); Reinhart and Rogoff (2002), or the IMF scheme. Data for monthly exchange rates are taken from IMF (2003).

[132] In principle, it would be desirable to include interest rates in the speculative attack index as well. However, given the large number of missing values, this would lead to a drastically reduced sample. Thus, following Kraay (1998); Kaminsky and Reinhart (1999); Goldfajn and Valdés (2000) and Levy Yeyati and Sturzenegger (2002), I dispensed with the idea to include interest rates in the index.

as a period in which EMP_{it}^{*} is greater than or equal to two standard deviations from the country mean. The dummy variable *attack* is thus defined as

$$attack_{it} = 1 \text{ if } EMP_{it}^{*} > \mu_i^{EMP} + 2\sigma_i^{EMP} \qquad (6.20)$$

$$= 0 \text{ if otherwise.}$$

Here μ_i^{EMP} and σ_i^{EMP} are the country-specific mean and standard deviation of *EMP*, respectively. The variable is then recoded on an annual frequency such that *attack* equals *1* in country-years in which the country has had a pegged exchange rate regime and a large nominal devaluation and/or a substantial loss in foreign reserves occurs. As in Leblang (2002: 15), I further eliminate speculative attacks that were preceded by attacks in any of the prior six months.[133]

One might argue that fluctuations in a country's foreign reserve position are not always a sign of central bank intervention on the foreign exchange market. Specifically, changes in the real value of foreign reserves may simply be attributed to exchange rate movements. Moreover, it is well known that the amount of foreign reserves needed to stabilize the exchange rate varies among countries. Neely (2000) argues, however, that despite these shortcomings there is still a positive correlation between changes in official reserves and foreign exchange intervention, with sharp increases in official foreign currency holdings indicating strong intervention. Furthermore, in developing countries there are simply no alternatives to this measure and therefore reserve fluctuations are a common indicator to measure the degree of central bank intervention (Levy Yeyati and Sturzenegger 2002: 6).

It is important to note that this second specification of the dependent variable differs from the first in an important point. The speculative attack indicator measures the probability of a currency crisis and is not necessarily connected with an abandonment of the fixed exchange rate regime. If the country uses its reserves to defend the currency, the fixed regime may be maintained. However, since the decision to attack depends on the markets' expectations about the politicians' commitment to the peg, one might expect that political-economic factors are important determinants of a market's perception as well.

[133] "Double-counting" of prolonged crises is avoided in this way.

Table 6.4. Number of speculative attacks by country

Country	Speculative attacks	Country	Speculative attacks
Algeria	1	Lithuania	2
Argentina	3	Malaysia	3
Belarus	1	Mexico	4
Bolivia	5	Moldova	1
Brazil	2	Morocco	2
Bulgaria	1	Nicaragua	2
Chile	2	Nigeria	4
Colombia	4	Paraguay	5
Costa Rica	1	Peru	1
Croatia	1	Philippines	4
Cyprus	1	Poland	2
Czech Republic	1	Romania	2
Dominican Republic	4	Russia	2
Ecuador	2	Slovakia	1
El Salvador	2	Slovenia	0
Estonia	1	South Africa	4
Guatemala	2	Suriname	2
Guyana	4	Thailand	2
Haiti	4	Turkey	5
Honduras	4	Ukraine	1
Hungary	1	Uruguay	1
Jamaica	1	Venezuela	5
Korea Republic	2		
Latvia	1	Total	108
Lebanon	3	Mean	2.30

Note also that Panama and the Cote d' Ivoire are excluded from the sample in the following analysis. Panama is officially dollarized, using the US dollar as legal tender, while the Cote d' Ivoire is member of the CFA currency union. While in both cases devaluations are still a possibility (see, e.g., the dissolution of the currency union between the Czech Republic and Slovakia in 1993) and an analysis of exchange rate regime longevity as in the previous section is meaningful even for countries with tightly fixed exchange rate regimes, the construction of a speculative attack index is useless, given that conclusions drawn from foreign reserve fluctuations are hardly meaningful in these cases.

As a useful starting point for the empirical analysis, some descriptive statistics on the characteristics of the speculative attack variable are provided. The previous definition of *attack* yields that a speculative attack took place in 13 percent of the country-years with pegged exchange rate regimes. In total 108 speculative attacks are included in the sample. The number of speculative attacks by country is documented in table 6.4.

With the exception of Slovenia, every country in the sample exhibits at least one period of extreme exchange market pressure. Yet, there is some heterogeneity in the frequency of speculative attacks across countries. Several countries, including many CEECs, have experienced only one speculative attack. By contrast, the exchange rate market pressure lists 5 speculative attacks for Bolivia, Paraguay, Turkey, and Venezuela.[134] Figure 6.6 reports the number of speculative attacks by year. The number of speculative attacks has increased compared to the 1970s. However, speculative attacks are not new phenomena of the 1990s. Contrary to what is often assumed, the frequency of speculative attacks remains roughly constant throughout the 1980s and 1990s.

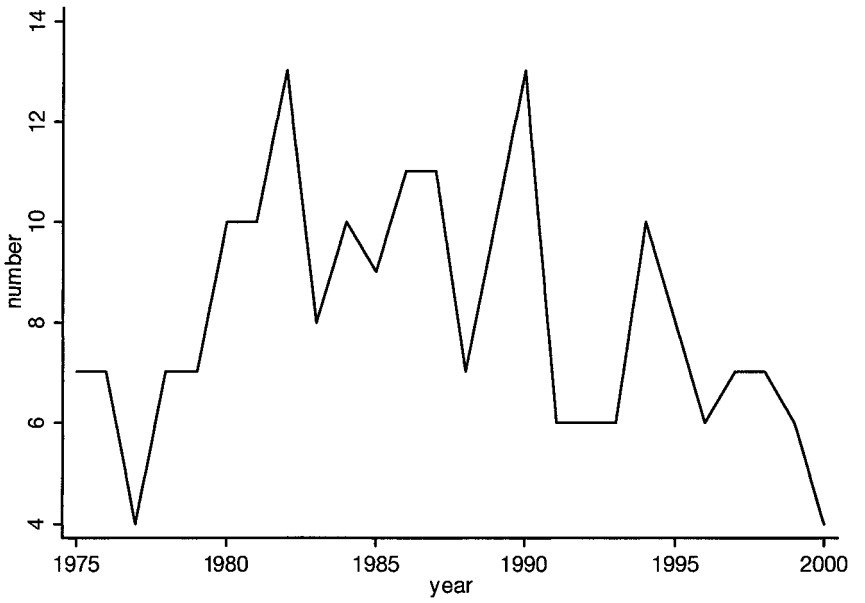


Figure 6.6. Number of speculative attacks by year

[134] Note that differences in the number of speculative attacks may also occur because not all countries are included in the sample for the entire period of time.

6.7.2 Results of the speculative attack specification

This section presents the results for the estimation procedure with the speculative attack index as a censoring indicator. Again, both Cox and cloglog regressions are employed. The specification of the variables follows the procedure of the analysis on currency peg longevity. As before, I begin with a Cox model that explains speculative attacks by political, institutional, and interest group factors alone. It is evident from columns (1) through (4) in table 6.5 that the use of the alternative dependent variable essentially confirms the importance of political and institutional factors. Most of the variables in the model perform as expected.

The results for *elect* reflect the view that increased political uncertainty could lead to a higher likelihood of speculative attacks in election years. Throughout the regressions, there is a statistically significant lower probability of a speculative attack in pre-election periods (for all political parties), while the risk of an attack increases after the election. Apparently, markets tend to delay speculative attacks until after the election, presumably because they realize that countries are more willing to defend a currency peg in the pre-election period. Currency traders are also aware that after the election the newly introduced government has a good excuse for currency devaluation — it can simply blame its predecessor. The partisan dummies also appear to be correctly specified. As anticipated, *right* always shows the expected negative sign indicating that there is a lower probability of speculative attacks under right-wing governments. This is consistent with the view of a higher credibility for rightist parties. In the political models of column (1) to (4), *left* has a positive sign. The coefficient is, however, not significant.

As before, the number of veto players is positive and exhibits significant effects in some specifications. According to the coefficient in model (1), any deviation from an average number of veto players increases the probability of a speculative attack by 26 percent. The two institutional variables *partyinst* and *polity* change sign compared to the previous analysis on fixed exchange rate regime durability. Political instability, defined by the 5-year moving average of ruling party turnover, now contributes to speculative attacks as expected. The magnitude of the effect is also quite great. According to the significant coefficient for *partyinst* in column (4), a one standard deviation increase in political instability raises the probability of a speculative attack by 34 percent. There is also weak support to the view that more democratic countries have a reduced likelihood to experience periods of exchange market pressure. The results of the point estimate for *polity* in model (4) suggest that a one standard deviation increase in the level of democracy leads, ceteris paribus, to a 30 percent reduced probability of

speculative attacks. In contrast to the estimations in section 6.4 and 6.5, the proxy for central bank independence (introduced in column [3]) is no longer significant; however, it keeps a negative sign. Seen on the whole, the significance and point estimates of the institutional variables are relatively robust in different specifications of the regression. This also holds true if the Herfindahl index of government fractionalization is introduced. The positive and statistically significant coefficient for this variable in model (4) suggests that a one standard deviation increase in the fractionalization of the government above its mean leads to a 46 percent increased vulnerability to speculative attacks (all else equal).

Given the diversified exchange rate preferences of interest groups, it is not surprising to see that the proxies for the impact of the tradable and the nontradable sector have no significant coefficients (model [4]). An exception is the somewhat larger role that the financial sector plays. Countries with a higher ratio of liquid liabilities to GDP are positively associated with the probability of a currency crisis. Note also that, as suggested by the significant outcome for *contagion*, developments in other parts of the world have important spill-over effects on the domestic economy and complicate the maintenance of a fixed exchange rate regime.

The inclusion of economic variables does not change the basic results. Columns (5) through (8) in table 6.5 report the results from these regressions. In column (5), the more structural variables (including the current account balance) are introduced. The electoral and partisan variables are all correctly signed and statistically significant at least at the 10 percent level. Regarding the institutional variables, the results are also very similar to those presented in the pure political model. With the exception of *partyinst* (p-value is 0.14), all institutional variables remain significant.[135] Results for the economic variables themselves are also quite informative. Again, there is clear evidence for contagion effects. Moreover, a large current account deficit should be interpreted as a significant "warning signal" for a speculative attack. *Size* is also significant, suggesting that larger countries are more likely to suffer from speculative attacks. One variable that does not perform as expected is *debt*. A high level of outstanding foreign liabilities attends to increase the probability of a currency crisis and this impact is even significant in some of the specifications. My preferred explanation for this outcome is that, as suggested by Radelet and Sachs (1989: 5), currency crises are crises of liquidity, rather than of fundamental solvency.

[135] The effects of political instability on speculative attacks are not significant when I used the government turnover ratio (p-value is also 0.14) either.

Table 6.5. Vulnerability to speculative attacks, Cox proportional hazards model, partial-likelihood estimates

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
elect	0.26 (0.29)	0.33 (0.33)	0.44 (0.35)	0.45 (0.37)				
left	0.21 (0.31)	0.20 (0.32)	0.04 (0.36)			-0.37 (0.39)	-0.44 (0.41)	-0.61 (0.44)
right	-0.19 (0.30)	-0.18 (0.31)	-0.37 (0.36)	-0.72** (0.31)	-0.54* (0.29)	-0.71** (0.36)	-0.67* (0.37)	-0.66* (0.39)
veto	0.23* (0.14)	0.26* (0.14)	0.24* (0.15)	0.22 (0.17)	0.27*(0.15)	0.24 (0.15)	0.23 (0.16)	0.26 (0.16)
cbi			-0.03 (0.75)					
polity	-0.02 (0.02)	-0.02 (0.02)	-0.03 (0.03)	-0.05 (0.03)		-0.02 (0.03)	-0.02 (0.03)	-0.02 (0.03)
govinst	0.21** (0.10)	0.19* (0.11)	0.26** (0.11)	0.29** (0.14)	0.16 (0.11)	0.20* (0.12)	0.18 (0.12)	
preelect		-0.71* (0.40)		-0.89* (0.49)	-0.80**(0.41)	-0.79* (0.41)	-0.75* (0.42)	-0.95** (0.48)
postelct		0.72** (0.32)	0.89*** (0.33)	0.84** (0.37)	0.71**(0.32)	0.81** (0.33)	0.71** (0.34)	0.65* (0.36)
preleft			-1.24 (1.07)					
preright			-0.51 (0.59)					
herfindahl			0.83 (0.52)	0.96 (0.55)	0.59 (0.50)	0.80 (0.45)	0.55 (0.58)	0.69 (0.60)
manufact				-0.00 (0.03)				
finance				-0.01** (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.01 (0.01)	-0.01* (0.01)
service				-0.00 (0.02)				
contag	0.26*** (0.09)	0.29*** (0.10)	0.26** (0.11)	0.07 (0.15)	0.22** (0.10)	0.22* (0.12)	0.20* (0.12)	0.18 (0.13)
debt (log)					-0.24* (0.13)	-0.22 (0.13)	-0.24* (0.13)	
sdexport (log)								
open								
gdp (log)					0.21** (0.11)	0.23** (0.11)	0.24** (0.11)	0.31** (0.13)
credtmf								
inflation (log)								
currace							0.32** (0.14)	0.30* (0.16)
reserves					-0.09*** (0.03)	-0.08*** (0.03)	-0.07** (0.03)	-0.07* (0.03)
capop								-0.28* (0.17)
								-0.19 (0.39)
Wald chi^2	22.16	33.51	35.40	39.13	43.34	43.35	46.22	47.05
Prob>chi^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AIC	427.89	404.45	343.38	291.06	307.56	304.10	287.85	255.11
BIC	459.46	444.55	394.88	341.46	353.77	358.55	345.96	312.39
Link test	0.13	0.45	0.74	0.96	0.85	0.98	0.82	0.43
Schoenfeld test	0.39	0.53	0.62	0.69	0.58	0.58	0.59	0.06
N	672	636	540	493	493	487	469	442

Note: *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. Standard deviations are reported in brackets. Dependent variable is length of time in a pegged exchange rate regime until speculative attack occurs. N is number of observations. Exact partial likelihood method has been used to handle tied failures. The computed values for the link and Schoenfeld test are p-values.

Further extensions of the model involve the lagged logarithms of inflation and foreign reserves, as well as a lagged dummy variable for capital controls (columns [7] and [8]). Not surprisingly, higher inflation rates, a lower level of foreign reserves, and unrestricted capital flows increase a country's vulnerability to speculative attacks.[136] As with the structural variables, the basic model is relatively robust with regard to the additional variables. It is interesting to see that there are still clear differences. This implies that the impact of contagion is lower than in the political models suggesting that contagious effects are also fundamentally driven, or that part of the transmission of shocks across countries takes place through trade or financial links (Eichengreen et al. 1996: 2; Kaminsky and Reinhart 1999: 474).[137] Yet the coefficient of *contagion* is still significant in model (7) and only marginally misses statistical significance at the 10 percent level in model (8). This corroborates the view that the magnitude of the transmission of currency crises to multiple countries is beyond what is warranted by fundamentals. As such, contagion cannot be explained by real or financial fundamental linkages alone. This is not surprising in view of the relatively low trade linkages among developing countries, which would hardly justify such a scenario. Thus, following the naming of *Masson* (1998), the point estimates for *contagion* in model (8) can be interpreted as "pure" or "true" contagion, "where a crisis in one country may conceivably provoke a crisis elsewhere for reasons unexplained by macroeconomic fundamentals" (Masson 1998: 2). The coefficient for *partyinst* also loses statistical significance when the level of inflation is introduced (column [7]).[138] This suggests that some of the higher vulnerability to speculative attacks for politically unstable countries is due to higher inflation rates in these countries.

As noted previously, the Schoenfeld residual test was used to test the null hypothesis of proportional hazards against the alternative hypothesis of nonproportional hazards. The fact that the null hypothesis was not rejected in all but one specification confirms the lack of evidence against the assumption of proportional hazards. The link test also shows that the models are reasonably specified.

In order to evaluate the goodness of fit of the different models, I plot the Cox-Snell residuals against their cumulative hazard rate for all eight different specifications (see figure A6.5). Recall that a deviation from the 45° line indicates misspecification. In many cases, I find strong deviations in

[136] The impact of capital controls, however, is not statistically significant.

[137] In order to separate fundamentals-based contagion from pure or true contagion, Masson (1998) refers to this phenomenon as "spillover".

[138] The p-value for partyinst in model (7) is 0.14.

the right-hand tails of the plots. Due to censoring and a reduced effective sample size at longer durations, the jagged line departs clearly from the 45° benchmark line in this area. However, there is considerably smaller deviance from the line in the left-hand tail of the plots where a larger number of residuals is available. Specifically, models (2) and (6) provide a reasonable model fit.

As in the analysis on exchange rate regime longevity, the robustness of the results in terms of the empirical procedure is tested with a *cloglog* specification. Again, the inclusion of cubic splines does contribute to the quality of estimations. Accordingly, time variables are included in the regression estimation. Columns (1) through (4) in table 6.6 display the results for the political models. The estimated parameter coefficients are very much in line with the Cox model. All variables keep their sign and the significance of the coefficients is also consistent with previous specifications. The most important changes to the Cox regressions are that the impact of veto players gains in significance, while the opposite is true for the Herfindahl index of government fractionalization.

The final estimation routine reinforces the basic results. The economic variables are added to the specification in columns (5) to (8) of table 6.6. The results are even stronger than for the Cox regressions. In particular, the finance sector index variable and the Herfindahl index increase in both magnitude and significance. It is also interesting to see that contagion is highly significant even after all economic variables are introduced (column [8]). This confirms the view that the transmission of crises cannot be explained by economic fundamentals alone. With the exception of *debt*, all economic control variables are consistent with current findings by the currency crisis literature. The only notable changes compared to the Cox model are that the *inflation* ends up being insignificant, while the impact of foreign reserves and the capital account increases.

Table 6.6. Vulnerability to speculative attacks, Cloglog model

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
elect	0.30 (0.29)	0.48 (0.36)	0.61 (0.37)	0.64 (0.39)				
left	0.25 (0.28)	0.21 (0.31)	-0.18 (0.35)			-0.28 (0.29)	-0.36 (0.33)	-0.43 (0.43)
right	-0.04 (0.27)	-0.08 (0.29)	-0.46* (0.26)	-0.60** (0.25)	-0.49** (0.24)	-0.57** (0.26)	-0.63** (0.27)	-0.59* (0.34)
veto	0.20* (0.12)	0.22** (0.11)	0.25*** (0.09)	0.22** (0.11)	0.27*** (0.10)	0.25** (0.10)	0.25** (0.10)	0.22* (0.12)
cbi			0.13 (0.49)					
polity	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.03)	-0.05* (0.03)		-0.03 (0.02)	-0.03 (0.02)	-0.00 (0.03)
govinst	0.18*** (0.06)	0.14** (0.06)	0.15** (0.08)	0.13 (0.09)	0.07 (0.09)	0.10 (0.09)	0.08 (0.09)	
precelect		-0.45 (0.40)	-0.35 (0.43)	-0.47* (0.41)	-0.64* (0.36)	-0.62 (0.39)	-0.58 (0.39)	-0.74* (0.42)
postelect		0.82*** (0.28)	0.93*** (0.26)	0.85*** (0.28)	0.59** (0.23)	0.66*** (0.24)	0.55** (0.23)	0.46* (0.26)
contag	0.25*** (0.04)	0.26*** (0.04)	0.24*** (0.05)	0.22*** (0.05)	0.26*** (0.05)	0.27*** (0.05)	0.28*** (0.05)	0.27*** (0.06)
T1	0.13*** (0.05)	0.13** (0.05)	0.14** (0.05)	0.13** (0.06)	0.14** (0.06)	0.15*** (0.06)	0.15** (0.07)	0.10 (0.08)
T2	-0.08** (0.03)	-0.08** (0.04)	-0.08** (0.04)	-0.08** (0.04)	-0.08** (0.04)	-0.09** (0.04)	-0.09** (0.04)	-0.06 (0.05)
T3	0.02* (0.01)	0.02 (0.01)	0.01 (0.01)	0.02 (0.01)	0.02* (0.01)	0.02** (0.01)	0.02* (0.01)	0.01 (0.01)
herfindahl			-1.97** (0.87)	-1.95** (0.83)	-1.73** (0.77)	-1.97** (0.77)	-1.70** (0.82)	-1.89** (0.95)
manufact				-0.00 (0.02)				
finance				-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.03** (0.01)
service				-0.00 (0.02)				
debt (log)					-0.08 (0.07)	-0.08 (0.06)	-0.09 (0.07)	
gdp (log)					0.10 (0.07)	0.12* (0.07)	0.12 (0.08)	0.17 (0.10)
currace					-0.06*** (0.02)	-0.06*** (0.02)	-0.06*** (0.02)	-0.06** (0.03)
inflation (log)							0.15 (0.11)	0.20 (0.12)
reserves								-0.32** (0.16)
capop								0.21 (0.25)
cons	-3.32*** (0.28)	-3.38*** (0.31)	-2.67*** (0.48)	-1.55* (0.88)	-4.75*** (1.75)	-4.96*** (1.78)	-5.54*** (1.83)	-6.46** (2.64)
Wald chi^2	85.76	96.40	90.73	110.52	93.22	109.21	144.42	161.61
Prob>chi^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AIC	596.32	478.74	411.83	360.76	386.84	377.67	361.11	329.04
BIC	555.93	536.66	476.21	472.99	446.85	448.87	435.82	402.69
N	672	636	540	493	493	487	469	442

Note: *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. Standard deviations are reported in brackets. Dependent variable is length of time in a pegged exchange rate regime until a speculative attack occurs. N is number of observations. Huber-White standard errors with clustering on countries are used.

6.7.3 Findings for an alternative speculative attack indicator

A drawback of the exchange market pressure approach as defined above is that both the weights attached to the two components and to the threshold value are arbitrary. To see whether results are sensitive to the specification of the dependent variable, this section proposes an alternative indicator of exchange market pressure. In this setting, a speculative attack is defined as an episode in which i) the nominal exchange rate depreciates by more than 10 percent in a given month, and/or ii) the loss in international reserves exceeds 20 percent. Thus, the censoring variable *attack2* equals *1* in country-years in which the country has had a pegged exchange rate regime and a large nominal devaluation and/or a substantial loss in foreign reserves occurs (and *0* otherwise). I further eliminate speculative attacks that were preceded by attacks in any of the prior six months. The results for the alternative indicator are presented in tables 6.7 and 6.8 and strongly confirm the basic pattern of results. For many variables, results are even stronger compared to the effects discussed in the previous section.

The proxy for central bank independence now has a positive sign and is statistically significant. Any increase in the turnover of central bank governors strongly raises the probability of a speculative attack. Hence, politically independent central banks decrease the vulnerability to a speculative attack. There is also stronger support to the view that more democratic countries have a lower probability of suffering from speculative attacks. The positive coefficient for *capop* indicates that countries with capital controls have a higher likelihood of speculative attacks. This result is consistent with previous empirical work on the relationship between exchange rate regime policymaking and capital controls (Leblang 2003: 550; Blomberg et al. 2004: 23).[139] Moreover, it also confirms the result of chapter 3 that the introduction of capital controls may send a negative signal to currency and financial markets, and thus increases the likelihood of speculative attacks.[140] In sum, however, there is no evidence that the use of an alternative indicator of exchange market pressure change the results substantially.

[139] See Drazen (1997) for a theoretical justification of this result.

[140] This outcome suggests that the reverse causality problem is not entirely solved even though lagged values of the capital openness indicator are used.

Table 6.7. Vulnerability to speculative attacks (alternative indicator), Cox proportional hazards model, partial-likelihood estimates

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
elect	0.24 (0.25)	-0.01 (0.28)	-0.01 (0.26)	-0.11 (0.28)				
left	0.04 (0.26)	0.03 (0.27)	0.29 (0.27)	-0.03 (0.30)		0.45* (0.25)		
right	-0.43 * (0.24)	-0.38 (0.25)	-0.14 (0.26)	-0.47 (0.29)	-0.44* (0.23)		-0.49* (0.26)	-0.53* (0.29)
veto	0.20* (0.12)	0.22* (0.12)	0.22* (0.12)	0.33** (0.13)	0.21 (0.13)	0.13 (0.13)	0.17 (0.15)	0.38** (0.16)
cbi	1.43*** (0.49)	1.26** (0.51)	1.18** (0.51)	1.95* (0.61)	0.73 (0.60)	-0.08 (0.66)	-0.03 (0.73)	1.93** (0.83)
polity	-0.05 *** (0.02)	-0.04** (0.02)	-0.05*** (0.02)	-0.02 (0.02)	-0.05** (0.02)	-0.05** (0.02)	-0.01 (0.02)	-0.03 (0.02)
govinst		0.07 (0.07)	0.07 (0.07)	-0.04 (0.10)	0.08 (0.07)	0.07 (0.07)	-0.03 (0.11)	0.01 (0.12)
precelect		-1.32*** (0.36)		-1.63*** (0.40)	-1.17*** (0.35)		-1.42*** (0.40)	-1.20*** (0.44)
postelect		0.12 (0.28)			0.19 (0.28)			
preleft			-2.53** (1.05)			-2.48** (1.06)		
preright			-1.82*** (0.63)			-1.63*** (0.62)		
manufact				-0.07***(0.02)			-0.08*** (0.03)	
finance				0.004 (0.00)			0.01* (0.01)	
service				0.03** (0.01)			0.03* (0.02)	
contag2					0.30*** (0.11)	0.30*** (0.11)	0.28** (0.11)	0.32 (0.14)
debt (log)					0.03 (0.10)	0.10 (0.11)		
open						-0.65** (0.26)	-0.78** (0.34)	-0.62* (0.32)
gdp (log)					-0.16** (0.07)	-0.27*** (0.09)	-0.20 (0.11)	
credinf					0.43* (0.24)	0.50** (0.24)	0.62** (0.29)	-0.20 (0.32)
inflation (log)								-0.03 (0.12)
fiscal								-0.22*** (0.04)
capop								0.61* (0.37)
Wald chi^2	52.98	64.26	68.77	64.76	68.75	78.31	76.30	102.02
Prob>chi^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AIC	580.84	552.35	548.30	476.23	517.37	510.20	439.49	320.35
BIC	612.42	596.90	592.87	528.55	565.82	563.08	499.80	370.28
Link test	0.55	0.96	0.77	0.69	0.90	0.99	0.70	0.00
Schoenfeld test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
N	672	636	637	578	605	606	549	474

Note: *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. Standard deviations are reported in brackets. Dependent variable is length of time in a pegged exchange rate regime until speculative attack occurs. N is number of observations. Exact partial likelihood method has been used to handle tied failures. The computed values for the link and Schoenfeld test are p-values.

Table 6.8. Vulnerability to speculative attacks (alternative indicator), Cloglog model

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
elect	0.32 (0.22)	0.21 (0.23)	0.03 (0.26)	0.04 (0.23)				
left	0.07 (0.20)	0.06 (0.21)	0.27 (0.24)	0.03 (0.24)		0.29 (0.20)		
right	-0.29 (0.20)	-0.24 (0.21)	-0.20 (0.25)	-0.20 (0.24)	-0.31* (0.18)		-0.26 (0.25)	-0.29 (0.24)
veto	0.10 (0.11)	0.11 (0.11)	0.09 (0.12)	0.22* (0.12)		0.05 (0.11)	0.16 (0.13)	0.30 ** (0.12)
cbi	0.87** (0.43)	0.78* (0.43)	1.18** (0.49)	0.51 (0.49)	0.42 (0.48)	-0.06 (0.54)	0.29 (0.63)	1.13* (0.64)
polity	-0.04*** (0.01)	-0.04*** (0.01)	-0.05*** (0.01)	-0.02 (0.01)	-0.04*** (0.01)	-0.04*** (0.01)	-0.03 (0.02)	-0.03 (0.02)
govinst		0.05 (0.05)	-0.01 (0.03)	-0.01 (0.09)	0.08 (0.05)	0.06 (0.05)	-0.05 (0.11)	-0.02 (0.09)
preelect		-0.97*** (0.32)		-1.32*** (0.36)	-0.93*** (0.31)		-1.36*** (0.42)	-0.99*** (0.38)
postelect		0.35 (0.22)			0.31 (0.21)		0.29 (0.25)	
preleft			-2.09** (1.02)			-2.13** (1.02)		
preright			-1.46** (0.61)			-1.45** (0.59)		
contag2	0.21*** (0.04)	0.21*** (0.04)	0.21*** (0.04)	0.23*** (0.04)		-0.17*** (0.04)	0.19*** (0.05)	0.19*** (0.05)
T1	0.001 (0.01)	0.001 (0.01)	0.001 (0.01)	0.001 (0.01)	0.001 (0.01)	0.001 (0.01)	0.000 (0.01)	0.000 (0.01)
T2	0.05*** (0.01)	0.05*** (0.01)	0.05*** (0.01)	0.04** (0.02)	0.05*** (0.01)	0.04*** (0.01)	0.04* (0.02)	0.03** (0.01)
T3	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.02* (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.02 (0.02)	-0.02* (0.01)
herfindahl			0.34 (0.68)				-0.21 (0.75)	
manufact				-0.05*** (0.02)			-0.05 (0.03)	
finance				0.01*** (0.00)			0.01 (0.01)	
service				0.02** (0.01)			0.03 (0.02)	
open						-0.52*** (0.20)	-0.59** (0.28)	-0.58** (0.25)
debt (log)					0.13 (0.09)	0.12 (0.10)		
gdp (log)					-0.11* (0.06)	-0.19*** (0.07)	-0.19** (0.09)	
fiscal								-0.16*** (0.02)
inflation (log)								-0.14* (0.08)
credimf					0.37* (0.20)	0.40* (0.22)	0.68** (0.30)	0.004 (0.26)
capop								0.35 (0.31)
Wald chi^2	114.45	109.79	97.40	110.55	82.29	106.74	102.75	103.13
Prob>chi^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AIC	648.35	622.49	499.56	544.13	653.91	586.82	434.24	405.65
BIC	697.96	684.87	563.94	613.88	711.83	657.32	517.71	472.23
N	672	636	540	578	636	606	480	474

Note: *, **, *** indicate significance at the 10%, 5%, 1% level respectively. Standard deviations are reported in brackets. Dependent variable is length of time in a pegged exchange rate regime until a speculative attack occurs. N is number of observations. Huber-White standard errors with clustering on countries are used.

6.8 Summary of results

This chapter has examined political-economic determinants of fixed exchange rate regime duration in the framework of duration data analysis. I have argued that standard statistical methods such as logit or probit do not adequately capture the duration of currency pegs for three reasons: First, they ignore time dependence and do not account for the fact that the exit of a currency peg is more likely to happen at some time. Second, they are not suitable to handle multiple-failure data. Third, they treat censored and uncensored observations as the same. I then described the coding of the explanatory variables that are supposed to explain the probability of ending a currency peg and discussed the duration model that best suits the data. I also dealt with those aspects related to regime persistence of different de facto exchange rate regimes and found that fixed exchange rates entail lower hazard than floating or intermediate regimes. Nonetheless, I found the average duration of fixed exchange rate regimes to be very short, on an average four years.

In the semiparametric analysis I suggested and implemented discrete Cox regression models, in which the time dependent structure of the data is implicitly implemented and more simple complementary log-log models. Evidence was presented that political, institutional, and interest group factors have an important impact on the duration of pegged exchange rate regimes. In general, the results hold regardless of whether the Cox model or the complementary log-log specification was employed. The analyses further revealed that political-economic variables not only influence the duration of currency pegs but also help to explain downward speculative pressure on the exchange rate. The greatest statistical support was found for the impact of elections, partisan actors, and the financial sector.

This chapter also provided insights in the overall sustainability of currency pegs. An important similarity across the various specifications employed is that there is important information contained in exchange rate regime duration. The nonparametric Kaplan-Meier estimator, the semiparametric Cox analysis, and the cloglog approach all uncovered a nonmonotonic pattern of duration dependence with hazards first increasing and then decreasing. This implies that duration models, like Cox's, which allow for some flexibility in the shape of the hazard rate, are appropriate tools to model currency peg duration.

6.A Appendix to chapter 6

Table A6.1. Data description and sources of main variables used in chapter 6

Variable	Description	Source
	Spell length and censoring variables	
duration	spell length of fixed exchange rate regime (definition of Levy Yeyati/Sturzenegger 2002)	Levy Yeyati and Sturzenegger (2002)
exit	dummy variable, value equals 1 when de facto currency peg is abandoned, 0 otherwise	Levy Yeyati and Sturzenegger (2002)
peg	spell length of pegged regime (definition of Kraay 2000)	own calculation
attack	dummy variable, value equals 1 when exchange market pressure EMP is greater than or equal to two standard deviations from the country mean	own calculation
attack2	dummy variable, value equals 1 when nominal exchange rate depreciates by more than 10 percent in a given month, and/or ii) any monthly loss in international reserves exceeds 20 percent, 0 otherwise	own calculation
	Policy variables	
elect	dummy variable for election periods, value equals 1 if election takes place in the respective period, 0 otherwise.	Lijphart (2004); Popescu and Hannavy (2001); CDP (2004)
preelect	dummy variable for pre-election periods, value equals 1 if election takes place in the following year, 0 otherwise.	Lijphart (2004); Popescu and Hannavy (2001); CDP (2004)
postelect	dummy variable for post-election periods, value equals 1 if election has taken place in the year before, 0 otherwise.	Lijphart (2004); Popescu and Hannavy (2001); CDP (2004)

Table A6.1. (continued)

left	dummy variable for partisanship, value equals 1 if government party is from ideological left, 0 otherwise.	Beck et al. (2001)
center	dummy variable for partisanship, value equals 1 if government party is from ideological center, 0 otherwise.	Beck et al. (2001)
right	dummy variable for partisanship, value equals 1 if government party is from ideological right, 0 otherwise.	Beck et al. (2001)
preleft	interaction variable, value equals 1 if both left and preelect equal 1, 0 otherwise	see sources for partisan and election variables
precenter	interaction variable, value equals one if both center and preelect equal 1, 0 otherwise	see sources for partisan and election variables
preright	interaction variable, value equals one if both right and preelect equal 1, 0 otherwise	see sources for partisan and election variables
veto	deviation of average number of veto players	Keefer and Stasavage (2003)
herfindahl	Herfindahl index of government, which is the sum of squared seat shares of all parties in government (deviation from average)	Beck et al. (2001)
cbi	number of turnovers in central bank governors divided by years in sample	Jakob de Haan, national central banks
polity	index variable that captures essential democratic elements, from -10 (highly autocratic) to +10 (highly democratic)	Marshall and Jaggers (2002)
democracy	index variable for democracy, from 0 (low democracy) to +10 (high democracy)	Marshall and Jaggers (2002)
govinst	5-year moving average government turnover rate	Zárate (2004)
partyinst	5-year moving average ruling party turnover rate	

Table A6.1. (continued)

service	share of manufacturing value added to GDP	World Bank (2003)
manufact	share of service sector value added to GDP	World Bank (2003)
finance	share of liquid liabilities (M3)/GDP	IMF (2003)
	Structural variables	
debt	outstanding amount of debt owed to nonresidents by residents of an economy as percent of GDP	World Bank (2003)
gdp	gross domestic product (in billion US dollar)	World Bank (2003)
open	share of exports and imports over GDP	World Bank (2003)
sdexport	standard deviation of real export growth	World Bank (2003)
	Macroeconomic and financial variables	
capop	dummy variable, value equals 1 when capital flows are restricted	IMF (2003), Carmen Reinhart
inflation	change in consumer prices	IMF (2003)
curracc	current account surplus as percent of GDP	World Bank (2003)
fiscal	overall fiscal surplus as percent of GDP	World Bank (2003)
reserves	foreign reserves as ratio of M2	IMF (2003)
credimf	dummy variable, value equals 1 when IMF credit program is implemented	World Bank (2003)
	Time trend variables	
share	proportion of countries in sample with de facto fixed exchange rate regime	own calculation
contagion	number of countries in sample that experienced a speculative attack (defined by attack=1) during the year in question	own calculation

Table A6.1. (continued)

contagion2	number of countries in sample that experienced a speculative attack (defined by attack2=1) during the year in question	own calculation

Note: All variables are collected on a yearly basis. In the empirical analysis, lagged versions of structural, macroeconomic, and time trend variables are used.

Table A6.2. Summary statistics for estimation sample used in chapter 6

Variable	Mean	Std. Dev.	Min.	Median	Max.	Observations
duration	3.98	5.30	1	2	27	99
exit	0.34	0.47	0	0	1	964
peg	0.83	0.37	0	1	1	948
attack	0.11	0.31	0	0	1	1222
attack2	0.16	0.38	0	0	1	1206
elect	0.15	0.35	0	0	1	1248
preeelct	0.15	0.36	0	0	1	1200
postelect	0.14	0.35	0	0	1	1247
left	0.31	0.46	0	0	1	1051
center	0.30	0.46	0	0	1	1051
right	0.40	0.49	0	0	1	1051
preleft	0.04	0.20	0	0	1	1004
precenter	0.05	0.20	0	0	1	1004
preright	0.08	0.27	0	0	1	1004
veto	1.41	0.85	0	1	8	1013
herfindahl	0.49	0.29	0.002	0.41	1	951
cbi	0.34	0.19	0	0.33	0.78	1011
polity	2.40	6.88	-10	6	10	1039
democracy	4.91	3.86	0	6	10	1054
govinst	1.24	1.45	0	1	12	1225
partyinst	0.74	1.21	0	0	8	1225
manufact	20.27	6.94	4.00	19.14	45.97	908
service	49.80	10.18	4.55	50.48	76.74	995
finance	43.25	27.20	10.62	34.43	198.08	994
debt	0.65	0.85	0.001	0.458	10.644	982

Table A6.2. (continued)

gdp	52.21	99.73	0.10	14.71	808.109	1011
open	67.78	36.84	9	60	282	1035
sdexport	0.19	0.08	0.07	0.17	0.57	1043
capop	0.75	0.432	0	1	1	1028
inflation	123.43	758.639	-11.45	12.82	14315.80	997
curracc	-4.28	7.08	-42.89	-3.51	18.22	923
fiscal	-3.32	5.286	-45.03	-2.25	9.91	788
reserves	0.73	0.67	0.01	0.59	5.32	936
credimf	0.55	0.497	0	1	1	1248
share	0.43	0.151	0.235	0.371	0.742	1196
contagion	4.15	2.35	1	3	10	1196
contagion2	7.35	2.27	4	7	12	1196

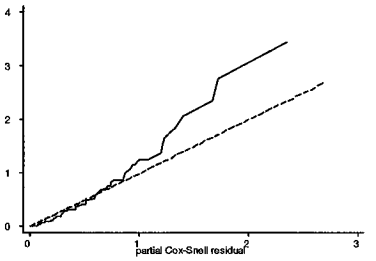
Table A6.3. Correlation matrix for variables used in chapter 6

	(01)	(02)	(03)	(04)	(05)	(06)	(07)	(08)	(09)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(01) veto	1.00																					
(02) cbi	-0.03	1.00																				
(03) polity	-0.20	0.25	1.00																			
(04)democracy	-0.21	0.24	0.98	1.00																		
(05) govinst	0.08	0.08	0.35	0.36	1.00																	
(06) partyinst	0.25	0.12	0.36	0.38	0.78	1.00																
(07)herfgov	-0.01	-0.08	-0.00	0.03	0.05	0.14	1.00															
(08)manufact	0.04	0.07	0.00	-0.01	0.10	0.06	-0.04	1.00														
(09) service	-0.16	0.06	0.25	0.25	0.03	0.06	0.07	-0.43	1.00													
(10) finance	-0.07	-0.21	0.04	0.04	-0.05	-0.02	0.25	0.07	-0.06	1.00												
(11) debt	0.00	0.10	-0.14	-0.12	-0.21	-0.12	-0.05	-0.22	-0.03	0.08	1.00											
(12) gdp	0.03	0.03	0.09	0.04	0.14	0.10	0.09	0.38	0.04	0.10	-0.37	1.00										
(13) open	-0.22	-0.29	0.12	0.11	0.02	-0.07	0.12	-0.02	-0.00	0.44	0.05	-0.33	1.00									
(14) sdexport	0.10	-0.12	-0.19	-0.19	-0.05	-0.15	-0.18	-0.27	0.15	-0.37	0.12	-0.15	-0.06	1.00								
(15) inflation	0.05	0.18	0.11	0.11	0.16	0.15	-0.13	0.31	-0.19	-0.37	0.05	0.05	-0.26	0.15	1.00							
(16) fiscal	0.11	0.01	0.07	0.06	-0.01	0.00	0.04	-0.02	0.09	-0.14	-0.14	0.04	0.06	-0.05	-0.22	1.00						
(17) curracc	-0.05	-0.05	0.07	0.07	-0.01	-0.05	0.06	0.13	-0.00	0.04	-0.32	0.33	-0.13	-0.10	-0.09	0.19	1.00					
(18) credimf	0.06	0.19	0.02	0.03	-0.02	0.08	-0.01	0.04	0.18	-0.14	0.16	-0.08	0.00	-0.06	0.09	-0.16	-0.04	1.00				
(19) share	0.08	-0.06	-0.31	-0.29	-0.05	0.00	-0.18	-0.02	-0.36	-0.12	-0.20	-0.18	-0.21	-0.03	-0.04	-0.19	-0.05	-0.13	1.00			
(20) contag	-0.03	0.04	0.12	0.10	-0.01	-0.03	0.06	0.01	0.16	0.06	0.17	0.08	0.05	0.01	-0.00	0.03	0.04	0.08	-0.48	1.00		
(21) contag2	0.05	0.03	-0.16	-0.16	-0.05	-0.03	-0.06	0.12	-0.18	-0.04	0.10	-0.02	-0.14	-0.03	0.15	-0.14	-0.03	0.05	0.08	0.29	1.00	
(22) reserve	-0.14	-0.01	0.25	0.24	0.12	0.08	0.13	-0.06	0.08	0.20	-0.00	0.10	0.17	0.02	-0.12	0.28	0.11	-0.21	-0.25	0.11	-0.23	1.00

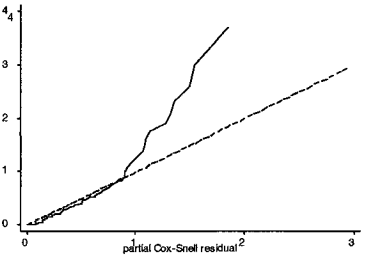
Note: Dummy variables are not included.

Figure A6.4. Cox-Snell residuals (based on currency peg duration model)

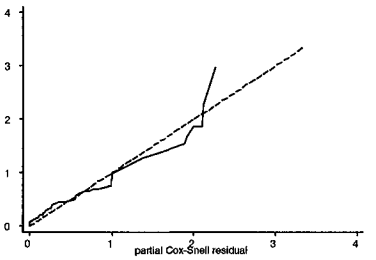
a) Model (1)



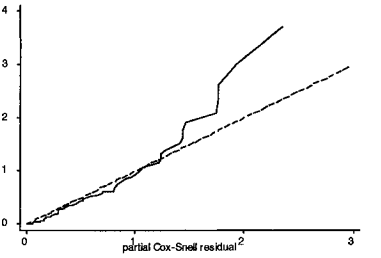
b) Model (2)



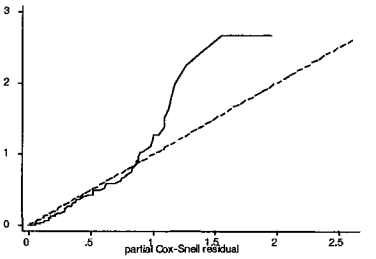
c) Model (3)



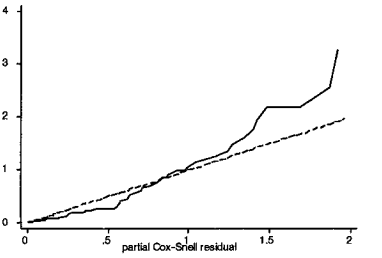
d) Model (4)



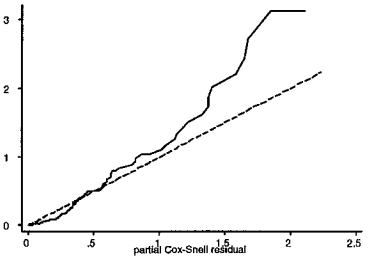
e) Model (5)



f) Model (6)



g) Model (7)



h) Model (8)

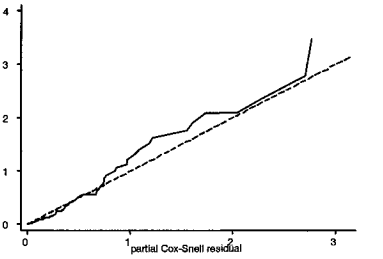
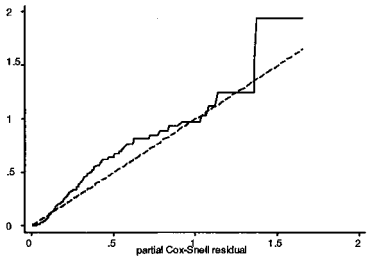
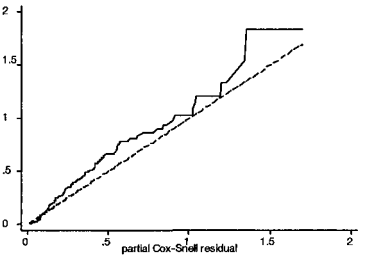


Figure A6.5. Cox-Snell residuals (based on Cox speculative attack model)

a) Model (1)

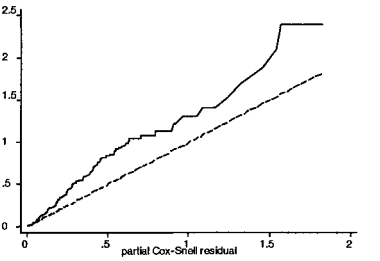


b) Model (2)

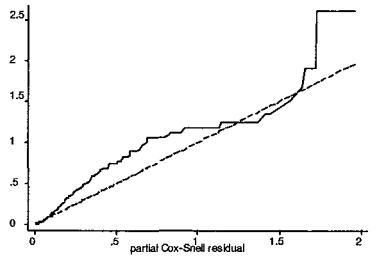


c) Model (3)

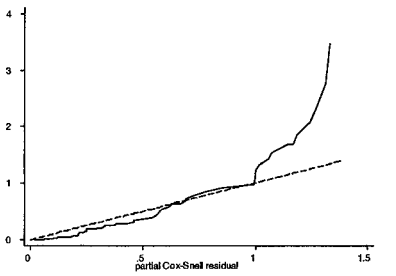
d) Model (4)



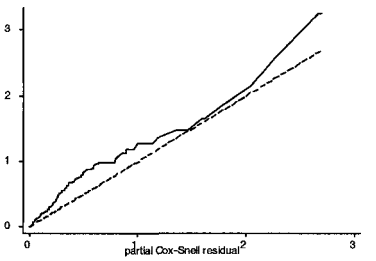
c) Model (5)



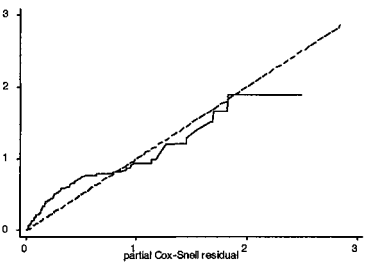
d) Model (6)



e) Model (7)



f) Model (8)



7 Political cycles and the real exchange rate

7.1 Introduction to chapter 7

The important insight of the PBC theory is that cycles in economic variables may be a consequence of opportunistic incumbents that are driven by the motive to maximize their chances of re-election (Nordhaus 1975). The incentive to distort the economy is due to the fact that the probability of re-election is higher when the economy prospers than when economic conditions are bad. Voters are taken to express a general dissatisfaction when the economy is in recession and hold the government responsible. Indeed, a number of studies have shown that electoral outcomes are strongly influenced by economic conditions (Remmer 1991; Lewis-Beck and Stegmaier 2000).

Traditionally, most empirical and theoretical research on PBC has referred to fiscal or monetary policy. For a long time, literature has ignored exchange rate policy as an additional instrument that may help to increase the chances of the incumbent to get re-elected. It has been widely neglected that insomuch as exchange rates influence the economic key indicators price level, employment, and real income, the exchange rate may be of strategic value for the incumbent to maximize his re-election prospects. The objective of this chapter is to expand the recently developed literature on political exchange rate cycles. The primary goal is to identify and characterize the pattern of real exchange rates around elections for 17 Latin American countries. The particular question that is asked is whether policymakers in developing countries manipulate the exchange rate *level* in election periods in order to increase their re-election prospects. The key findings in this chapter can be summarized as follows: First, I present evidence that real exchange rates are significantly influenced by elections. Consistent with previous research, I find that devaluations tend to be postponed until after the election. Second, I find evidence that the magnitude of this effect strongly depends on a number of further political, economic, and external factors.

This chapter is organized in the following way. Section 7.2 answers questions on the ability and willingness of policymakers to pursue an elec-

tion cycle in the real exchange rate and gives an overview of the small, but growing empirical literature on political exchange rate cycles. The objective of sections 7.3 to 7.6 is empirical. Based on a balanced panel of 17 Latin American countries, it will be tested whether one can observe a characterizing pattern in the real exchange rate around elections. Section 7.3 begins with the presentation of the dataset and applies a simple graphical methodology to illustrate the relationship between elections and the exchange rate. Section 7.4 comments on some methodological issues in time-series cross-section analysis. Section 7.5 presents the regression results. As an innovation to the literature on political exchange rate cycles, Section 7.6 provides some robustness checks. The intention of this section is to show why certain elections matter and others do not. Finally, section 7.7 provides conclusions based on the findings.

7.2 Elections and currency markets

7.2.1 Politics and currency markets

Chapter 6 provided some evidence in favor of the hypothesis that elections influence the likelihood of exchange rate adjustments. However, hypotheses 1b, which predicted a negative impact of post-election periods on the duration of currency pegs, was rejected. There are two plausible explanations for this finding. The first has to do with the level of measurement. Data were provided on yearly basis; however, rational opportunistic models predict much shorter cycles.[141] If one observes electoral effects on exchange rates, they are probably present on a much shorter time period around election time. Thus, the fact that the crude yearly election dummy variables in chapter 6 delivered in many cases the predicted sign deserves further investigation. Second, a weak impact of elections on the sustainability of currency pegs does not imply that there is no characterizing exchange rate pattern around election. Possibly, a stronger link is observed in the exchange rate *level*. Hence, this chapter's focus is on depreciations in general and not on discrete devaluations as in the preceding chapters.

Nonetheless, many economists would probably be skeptical concerning the existence of political exchange rate cycles. Two common caveats against political exchange rate cycles are that the increasing independence of central banks and the growing international financial integration prevents governments from distorting the domestic economy through mone-

[141] By contrast, the traditional Nordhaus (1975) cycles allows for multi-year political cycles.

tary or exchange rate policy. However, there are some qualifications to such a conclusion. In terms of central bank independence, even in countries with a high degree of central bank independence, governments have retained control of exchange rate policy.[142] This means that the finance minister is the sole responsible for interventions in the market for foreign exchange, while the central bank acts only as an agent (Vitale 2003: 860). As a result, adjusting an exchange rate peg, widening an exchange rate band, or simply increasing the rate of devaluation in a crawling peg might be pursued even against countervailing pressure from the central bank. It is certainly true that exchange rate policymaking can only be effective if it is consistent with monetary policy decisions; however, the assumption that central banks operate independently from elected officials is unrealistic, at least for most developing countries.[143] In some developing countries, the central bank president is even part of the executive branch. In other countries, there arises a strong discrepancy between the statutory independence of a central bank and the actual practice. A formally independent central bank does not preclude the success of attempts by the executive branch to influence monetary policy decisions — either directly by sheer political pressure or indirectly by appointing subservient board members. As Beblavy (2002: 15) writes, "[d]ue to political sensitiveness of foreign exchange decisions, there might be an unwritten convention that requires at least the approval of the government. Even if no such convention exists, it can be preferable for central banks to occasionally seek political cover for such decisions even if they have the authority to do so." Hence, it is justified to assume that central banks in developing countries can be overruled by the government.

The second argument against political exchange rate cycles is that in the context of growing international financial integration, political exchange rate cycles are unlikely to hold because large capital flows prevent governments from manipulating the exchange rate (Hefeker 1996: 362; Leertouwer and Maier 2002: 211). However, while market determination of exchange rates undoubtedly plays a role, it is not so strong that it renders a political-economic analysis of exchange rate policymaking meaningless. The optimism concerning the possibility of political short-term exchange

[142] A rare exception is Slovakia and, until recently, also the Czech Republic (Beblavy 2002: 5).

[143] Empirical research by Freeman et al. (1999: 27) confirms this view even for major industrial countries. The authors find that differences in central bank independence do not help to explain the effect of elections on currency markets. For the United States, Hibbs (1986: 68) argues that "the administration's macroeconomic goals are what drive Federal Reserve policy behaviour."

rate manipulation is based on recent research on purchasing power parity (PPP). The so called "purchasing power parity puzzle" (Rogoff 1996) refers to the difficulty to reconcile persistent international price differences between tradable goods and the high short-term volatility of real exchange rates. From a political-economic perspective, it is interesting to see that changes in relative inflation rates are unlikely to have an immediate impact on exchange rates. The speed of convergence is usually summarized by the time necessary for half the effect of a given shock to dampen down. Most studies report an average half time of deviation of PPP of 3 to 5 years (Rogoff 1996: 648). In emerging markets, short-run deviations from the PPP are also quite sustainable (Goldfajn and Valdés 1999). The results of these studies have important policy implications as they indicate that foreign exchange markets are not strongly efficient, even when capital flows are liberalized. This, in turn, suggests that political-economic factors can affect short-term exchange rate movements.

This view is corroborated by research on foreign exchange market intervention that shows that policy measures initiated by the government to influence the exchange rate can have small, but nonnegligible effects on the exchange rate (Fatum and Hutchison 2003; Hutchison 2003; Tapia and Tokman 2004). Admittedly, these effects are likely to be of temporary nature only. Over a longer period of time, changes in the value of a currency are primarily driven by economic factors. However, a major result from PBC theory is that a politician's time horizon decreases with approaching elections. Thus, in pre-election periods, a policymaker's time horizon is particularly short term, increasing the incentive for the government to take short-term actions to influence the exchange rate.

The growing influence of financial investors does not necessarily offset such active exchange rate management. In fact, the impact of exchange rate movements on the economy is even larger in more open economies. Stronger external linkages mean that exchange rate changes have greater effects on economic target variables. In this context, the interaction of the behavior of the government and the expectations of market participants plays an important role. Elections present a major source of uncertainty to participants in the foreign exchange market. As argued in chapter 5, currency traders may change their behavior during these periods. For example, expectations about the outcome of an election may cause international investors to withdraw money from (or to invest it in) a country, thereby augmenting a political cycle (or possibly creating their own cycle). Second-generation currency crisis models have illustrated this idea, emphasizing the existence of multiple equilibria. According to this view, exchange rate swings can occur even in the absence of changes in economic fundamentals, simply because private agents expect them (Obstfeld 1994). In

such a situation, a government's efforts to change the exchange rate may be particularly promising since it can shift market expectations toward the desired exchange rate level without changing economic fundamentals.

Thus, the assumption made below is that there is a role for active exchange rate management in the short run. Consequently, the existence of a political exchange rate cycle is a possibility. Even though views on the subject differ, this is supported by recent empirical evidence.

7.2.2 Theoretical models on political exchange rate cycles

If one assumes that the existence of a political exchange rate cycle is a possibility, the next question is whether the generation of such a cycle makes economic sense for policymakers. Why should governments have an incentive to generate certain exchange rate path around elections? To understand this incentive, the effects of real exchange rate movements on economic and social outcome have to be taken into account. Since the real exchange rate measures the relative price of domestic and foreign goods and services in the same currency, it influences the consumption and investment decision of economic agents between domestic and international goods. Chapter 5 has already developed different arguments that provide a direct link between elections and the exchange rate. Chapter 6 has provided some empirical evidence for the hypothesis that speculative attacks are less likely to happen before than after an election. Carrying these considerations to the exchange rate level, it is argued in this chapter that currencies are likely to appreciate before the election and be devalued after the election.

This view contradicts early opportunistic models on political exchange rate cycles that emphasized the costs of real appreciations, such as the worsening of the terms of trade with a possible erosion of export competitiveness and a deterioration of the current account (both are variables often found to negatively affect employment or economic growth). Gärtner and Ursprung (1989) developed an open economy model based on adaptive expectation, assuming naïve, myopic voters and opportunistic behavior by politicians. Under the assumption of an exploitable Phillips curve trade off between inflation and unemployment, governments have an incentive to manipulate the economy by an expansionary monetary policy immediately prior to the election. In the framework of the overshooting model by Dornbusch (1976), in which prices are sticky, the expansionary monetary policy causes a sharp depreciation in the short run, which leads to increased international competitiveness and creates the appearance of a strong economy. Voters are expected to reward this policy by reelecting the incumbent gov-

ernment without realizing that such a policy drives the economy into a recession once the election is over and the price level responds to the increase in money supply.

The Gärtner and Ursprung (1989) model provides a valuable first contribution to model the incentives of policymakers for manipulating the exchange rate around elections. If fiscal policy is constrained because rising government debt or higher taxes are politically unpopular, opting for devaluation might be the most convenient way to boost aggregate demand. Thus, the merit of the Gärtner and Ursprung (1989) model is that it extends the Nordhaus (1975) model to an open economy and incorporates the exchange rate as a macroeconomic variable controlled by the government. However, the model is seriously flawed because it neglects the important fact that devaluations are politically costly and have short-run contractionary effects, in developing countries in particular. Hence, generating devaluations, although welcomed by exporters and the import-competing industry, is not a good idea in terms of increasing prospects for re-election.

A better description of a government's incentives to manipulate the exchange rate is that vote-maximizing incumbents try to conduct a "hard" rather than a "weak" currency policy in the pre-election period. As modeled by van der Ploeg (1989), the time asymmetries of appreciations are the opposite of devaluations: The benefits of an appreciation including an improvement in the current account[144] and an increase in real income are immediate, while the undesirable effects on price competitiveness, output and employment are felt only with some delay, meaning, if the timing is right, not before the election. The consequence is that "immediately upon entering office a government depreciates the exchange rate, which can be viewed as an 'investment' in improving competitiveness and subsequently, it gradually appreciates the exchange rate" (van der Ploeg 1989: 854).

Both the Gärtner and Ursprung (1989) and the van der Ploeg (1989) model are based on naïve voters with adaptive expectations. However, if agents possess rational expectations, it is unrealistic to assume that voters can be fooled systematically, in particular in conjunction with an upcoming election. Recently, Ghezzi et al. (2000) and Bonomo and Terra (2001) have rationalized another channel through which the exchange rate can be used as an effective way to signal competence. In these models, the political exchange rate cycle is explained by rational expectations and imperfect information on a policymaker's competence (Ghezzi et al. 2000) and preferences (Bonomo and Terra 2001). In both models, it is expected that all

[144] The improvement in the current account takes place since in the short run the expenditure-enhancing effect of appreciations exceeds the expenditure-switching effect (see section 3.2.1).

governments face the same incentive to manipulate the exchange rate and, as such, the exchange rate path will be the same, independently of the party in power. Following Edwards's (1994: 28) prominent rule to "devalue immediately and blame it on your predecessors", governments reduce devaluations as polling day approaches. After the election, a higher rate of devaluation results. Another common characteristic of both models is that they introduce uncertainty about the outcome of the election. This possibility is not irrelevant since, as will become clear later, an appreciation (or a smaller devaluation) in the run up to elections and a larger devaluation afterward do not necessarily mean that the politicians act in an opportunistic fashion.

The basic ideas of both models are presented in the following: In Ghezzi et al. (2000) electoral cycles are produced as a result of informational asymmetries between the government and voters.[145] The authors follow the signaling game approach by Rogoff and Sibert (1988) and Rogoff (1990), assuming that governments differ with respect to their competency (i.e. in their ability to provide a given level of government services at low costs) and that voters rationally infer the incumbent's true competency from the observed action. While in Rogoff and Sibert (1988) and Rogoff (1990) "tax cycles" are generated, in Ghezzi et al. (2000) incumbents use the exchange rate to signal competence during election periods. The point of departure is that the private sector bears the alternative between holding its assets in interest-bearing government bonds or noninteresting-bearing cash, with the latter being necessary for domestic transactions. The interest earnings that consumers lose by holding on to cash accrues to the central bank as seigniorage revenue, which transfers revenues to the government. Major devaluations imply higher interest rates that lead to higher seigniorage revenues for the government. The higher revenues are a transfer from private agents to the government that would correspond to the costs the government faces when it takes on debts by issuing government bonds. However, it does not make debts because through devaluations consumers accept an asset that does not carry interests. Thus, devaluations have (through their effect on the nominal interest rate) the same effects as an inflation tax, but they are politically costly because they signal low competence to the voters.[146] For this reason, incompetent but opportunistic gov-

[145] Another version of the model is Stein and Streb (2004), which uses the same political model, but differs in terms of the economic model. Only Ghezzi et al. (2000) allow for effects on the real exchange rate.

[146] The private sector knows that incompetent governments need to raise more seigniorage in order to provide the same level of public goods as competent governments.

ernments try to signal competence in the run up to elections and reduce the rate of devaluation under its sustainable level (e.g., by implementing an exchange rate based stabilization program). If voters can be cheated and the incumbent government wins the election, it will resort to a higher rate of devaluation (e.g. by abandoning the stabilization program) in the post-election period to pay all debts that have been accumulated in the pre-election period. As a result, the low rate of devaluation in the pre- election period is followed by a higher rate of devaluation after the polling day.

However, it is not only the opportunistic behavior of politicians that generates an election cycle. For example, if the election outcome is uncertain, and a competent politician is replaced by an incompetent one, an identical exchange rate path results even without such efforts to cheat the voter. The competent incumbent will need a lower devaluation before the elections to provide the desired amount of public goods. After the election, the rate of devaluation increases because the new incompetent incumbent needs a higher devaluation rate to provide the same amount of public goods.

In the model by Bonomo and Terra (2001), it is assumed that politicians are either agents of the tradable or the nontradable sector and that voters in the nontradable sector are more numerous than voters in the tradable sector. Both types of voters differ with respect to their preferred exchange rate policy. Voters belonging to the nontradable sector favor an appreciated real exchange rate, while voters of the tradable sector prefer a depreciated rate.[147] The information about the type of policymaker is private, meaning that the public is unaware of each politician's preferences. As in Ghezzi et al. (2000), this induces voters to extract information about the type of politicians from the observed real exchange rate path. Since the median voter belongs to the nontradable sector, politicians of the tradable sector know that they can only win elections if they signal to represent the interests of the nontradable sector.[148] In the period prior to an election, opportunistic politicians from the tradable sector then keep a devaluation path that is lower than they would deem optimal. In this way they temporarily favor the interests of the nontradable sector and try to persuade voters that they represent the interests of the nontradable sector. If this strategy is successful and the representative of the tradable sector wins the election, he will increase devaluation in the post-election period.

[147] See section 5.4 for a justification of this claim.

[148] Bonomo and Terra (2001) have developed their model for the relatively closed Brazilian economy. In small and open economies the median voter does not necessarily favor the interests of the nontradable sector.

The same political cycle in the exchange rate can be generated if an incumbent, representing the interest of the nontradable sector (and therefore favoring a lower rate of devaluation), is substituted by a representative of the tradable sector (who favors a higher rate of devaluation). Again, the resulting exchange rate path from this partisan cycle is characterized by a lower rate of devaluation before and a higher devaluation after the election. Thus, if one observes an exchange rate path that follows the above mentioned pattern, one can argue that it is a political cycle. However, it is undetermined whether it is opportunistic or partisan. Policy changes around elections may simply occur because political power changes hands and the new government has different economic preferences than its predecessor.[149]

7.2.3 The empirical literature on political exchange rate cycles

This section deals with the question of whether the idea of a political exchange rate cycle has been empirically confirmed. The corresponding literature is quite small and has only developed recently. An early contribution by Bachman (1992) presents a simple peso problem model, which investigates the effect of elections on the forward exchange rate bias. In the empirical part of his paper, event study methodology is used to estimate equations for four industrial countries. Bachman (1992) finds that the forward bias changed significantly around elections in six of the thirteen events under review. When a party that favors capital owners wins the election, the forward bias will be lower. By contrast, elections resulting in a labor-friendly party's victory are associated with a higher forward bias after the election. Garfinkel et al. (1999) follow Bachman's approach and compare forecast errors for pre-election and post-election spot rates in six industrialized countries. Overall, they find only weak evidence for their proposition that surprising election outcomes are associated with larger forecast errors than unsurprising election outcomes.

The more relevant papers for my purpose have directly analyzed the relationship between the timing of elections and nominal or real exchange rates. Stephan's (1994) findings come close to the present study. For a sample of nine industrialized countries, he models the change in the nominal exchange rate index as an autoregressive process. Various election cycle variables are added to the autoregressive variables in least square re-

[149] Lobo and Tufte (1998) and Leblang (2002) point out that even if the present government is confirmed, the policy may change (e. g. due to political constraints).

gressions. The idea is that these variables capture possible patterns for political exchange rate cycles. For three of his nine countries he finds a statistically significant effect that indicates political influence on exchange rates in these countries. On average, the political dummies contribute about 5 percent to the explanation of the exchange rate. In a similar study, Blomberg and Hess (1997) present evidence for Germany, England, and the United States that an upcoming election tends to stimulate the domestic currency. Their results further suggest that a political model that includes post- and pre-electoral dummy variables as well as lagged government approval ratings beats the random walk model in terms of exchange rate out-of-sample prediction for these three countries.

More recently, a growing number of studies have addressed the issue of political exchange rate cycles in developing economies, and in Latin American countries in particular. Clearly, this reflects the sensitivity of exchange rate management in that region. Interestingly, results of both cross-country studies and single-country tests of opportunistic cycles in developing countries confirm the thesis of delayed devaluations in the period before elections. In many of these studies, the size of the effect is not only statistically significant, but also quite large which indicates greater economic relevance of political exchange rate cycles in developing countries than in industrialized economies.

Frieden et al. (2001) present evidence for both real and nominal exchange rates on a cross-country basis. They use a very simple methodology to study the pattern of exchange rates around elections in 26 Latin American countries for the 1960-1994 period. They take a 19-month window centered on the election month (9 months before and 9 months after elections with month 0 corresponding to the month of election) and calculate for each month the geometric average of the rate of nominal depreciation. Their findings suggest that depreciations are delayed until after the election. For presidential elections, they find that the domestic currency gradually appreciates in the three months preceding an election, while the post-election months 2 to 4 are characterized by a 2 percent higher average rate of real depreciation than other months. An even stronger pattern is observed around constitutional changes. In this case, the real devaluation culminates in post-election month 1 with an average rate of 10 percent (Frieden et al. 2001: 54).

Covering five Latin American countries from 1970 to 1989, Lucinda and Arvate (2002) use the dynamic panel procedure by Arellano and Bond (1991) to find that election years lead to increased currency devaluation. However, since the authors use annual data, the interpretation of their results remains vague. Whether their result is consistent with the empirical findings that currency devaluations should only be observed *after* elec-

tions, or whether the observed devaluations took place before the election, cannot be said without further disaggregation of the data.

Several authors have analyzed political exchange rate cycles for individual countries. Assael and Larraín (1994, 1997) analyze exchange rate movements around election periods in Chile during the 1939-1993 period. The authors determine an opportunistic cycle in the exchange rate if one of the three following events occurs: 1) in the election year, the country loses more than 30 percent of its foreign reserves or increases its external debt by more than 10 percent, 2) there is a 10 percent devaluation shortly after the election, 3) in the case of a fixed exchange rate system, there is a readjustment of the exchange rate toward an appreciated rate in the period before the election. Based on these ad-hoc criteria they find a political cycle in the exchange rate in five out of nine electoral periods. Jaramillo et al. (1999) use linear regression analysis to determine whether a political cycle in the nominal exchange rate in Colombia existed between 1960 and 1997. In order to control for the fact that elections in Colombia always take place between April and June, the opportunistic variable takes on values of *1* in the second quarter of an presidential election year, *-1* in the third quarter, and *0* in all other cases. The partisan dummy variable takes on values of *1* if there is a conservative government in power and *0* otherwise. The opportunistic variable is not statistically significant, while the partisan is. The coefficient for the partisan variable is positive in all regressions, indicating larger devaluations when a conservative government is in power. This result, which contradicts other findings in the literature (see, e.g., Block 2002: 21), can be explained by the close connection in Colombia between conservative governments and the coffee industry, the latter having a higher interest in a depreciated exchange rate.

Aboal et al. (2003) analyze political-economic cycles in Uruguay using annual data from 1920 to 1996. They construct eight different electoral variables to try to capture post- and pre-electoral effects. Estimating an ARIMA model, they find that the rate of devaluation is highest in the year after an election. It is further evident that in those election years when the government could not avoid larger devaluations, it was punished by being voted out. The authors conclude that avoiding devaluations in election years seems to be a necessary (though not sufficient) condition for the incumbent to win the election. Bonomo and Terra (2001a) determine exchange rate policy in Brazil. The authors present evidence for an opportunistic cycle in Brazil finding that the probability of an appreciated real exchange rate is much higher in the pre-election period than in the post-election period. Pascó-Font and Ghezzi (2001) and Grier and Hernández-Trillo (2004) provide similar evidence for Peru and Mexico, respectively.

In sum, this literature provides a consistent picture. Devaluations tend to be postponed until after elections. However, with the exception of the study by Frieden et al. (2001), most empirical work has been concentrated on industrial countries or on single Latin American country tests. Furthermore, hardly any efforts have been made to determine why political exchange rate cycles exist at some elections, but not at others. The following sections will try to shed light on these two issues.

7.3 The data

The primary aim in the following sections is to empirically analyze political exchange rate cycles. Based on a balanced panel of 17 Latin American countries, it will be tested whether exchange rate movements in the 1985-2003 period can be (partly) explained by election dates.[150] The working hypothesis derived from the theoretical part of this chapter is that the currency appreciates with an upcoming election, which is followed by a depreciation in the post-election period. The literature review in the last section has shown that such political cycles exist for single countries. However analysts have failed to provide systematic empirical evidence for a larger set of developing countries. The advantage of a cross-country sample is that it accounts for the argument by Treisman and Gimpelson (2001: 229) that single country tests of political cycles may miscalculate the effect of political manipulation since policymakers change the instruments depending upon the political environment. The difficulty in estimating time series cross sections (TSCS) data is that the error process is typically more complicated than in either time-series or cross-sectional models.[151]

[150] The 17 countries included in the sample are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Paraguay, Peru, Uruguay, and Venezuela.

[151] Many econometricians differentiate between panel data and TSCS data. The cutting point is usually whether the time dimension T is larger (TSCS data) or smaller (panel data) than the number of cross-sections N. Other analysts define the cutoff level when T is at least two digits. Again, other authors have questioned the distinction between both terms at all (see Beck and Katz 2004: 3). Since the distinction between both terms is not of primary relevance in the present study, I follow the latter and do not differentiate between them.

7.3.1 Rationalizing the choice of the dependent variable

The data used in this study include monthly observations on real exchange rates between the domestic currency and the US dollar for the time period 1985:01 to 2003:12. The choice of the observation period is motivated by the fact that during the 1980s, Latin American countries experienced a far-reaching process of political transformation that resulted in the building of relatively stable democracies and the call for competitive elections (Remmer 1991: 778). At the same time, the liberalization of capital flows increased the power of the exchange rate as a tool to influence the domestic economy.

Data on exchange rates and prices are taken from the IMF's International Financial Statistics. The use of monthly TSCS data allows identifying even short cycles as is predicted by rational PBC theory. Regressions are conducted for real exchange rates because they more directly impact purchasing power and the international price competitiveness of the economy. Market participants desire predictability of real values, or relative prices, and should be more interested in a stable real value of the domestic currency than in a fixed nominal value.[152]

Real exchange rates are calculated using nominal exchange rates and national consumer price indices. The real exchange rate index Q is defined as:

$$Q_{it} = E_{it} \cdot P_{it} / P_{it}^{*}, \tag{7.1}$$

where the exchange rate, E, is the foreign currency price of the domestic currency (e.g. US dollar per peso), P is a measure of the domestic consumer price index, and P^{*} is a measure of the foreign consumer price index. The subindices i and t denote the value of the respective variable for country i at time t. The base month for the real exchange rate index is June 1995 (1995:6). Real appreciations (depreciations) are denoted by increases (decreases) in Q. Thus, higher values of the real exchange rate index imply a higher real value of the currency under study.

Variables are transformed to logs to avoid the domination of the results by extreme values.[153] Letting lowercase letters denote logarithms gives

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[152] Moreover, given the finding by Mussa (1986) that in the short-term real exchange rates are driven by nominal exchange rate changes, the question whether to use nominal or real exchange rates is of no primary importance when using monthly data.

[153] Sarno and Taylor (2002: 36-38) highly recommend the use of logarithmic transformations with exchange rates.

$$q_{it} = e_{it} + p_{it} - p_{it}^{*}. \tag{7.2}$$

In order to gain a preliminary idea of the data, figure A7.1 illustrates the evolution of the log of real exchange rates during the research period for all countries in the sample. As is evident, real exchange rates are conditional heteroskedastic, i.e. they display periods of turbulence and quiescence that cluster together, a feature commonly found in financial time series and most likely driven by volatile nominal exchange rates (*de Vries* 1994).

7.3.2 Graphical data analysis

Before starting with a systematic empirical analysis, this section develops a graphic illustration of the impact of elections on the exchange rate. The methodology to present the data follows Frieden et al. (2001: 54).[154] As briefly described previously, the focus is on a 19-month window centered on elections for every election in the sample (that is 9 months prior and 9 months after the election with month 0 corresponding to the month of election).

Data on elections come from the CDP (2004) and have been checked for consistency by a number of further sources such as the World Bank DPI (Beck et al. 2001); CIA (2004); Lijphart (2004), and Popescu/Hannavy (2001). All countries in the sample are characterized by a presidential political system, meaning that the president is directly elected into office and has significant independent authority dominating the other branches of government. Therefore, only presidential elections (and no parliamentary or local elections) are included in the dataset. In the case of multiple electoral rounds, the date or the dates of the run-off election are taken. Overall, 80 elections are included, with an average of 4.7 elections for each country (roughly one every 4.5 years).[155]

Exchange rate changes across all elections are averaged for each of the 19 months in the window. Following Frieden et al. (2001: 54), geometric (instead of arithmetic) averages are used to reduce the impact of outliers. Figure 7.1 presents the pattern of real exchange rate changes around all elections in the sample.

[154] Goldfajn and Valdés (1999) present a similar illustration.

[155] See table A7.1 for an overview of all elections included in the sample.

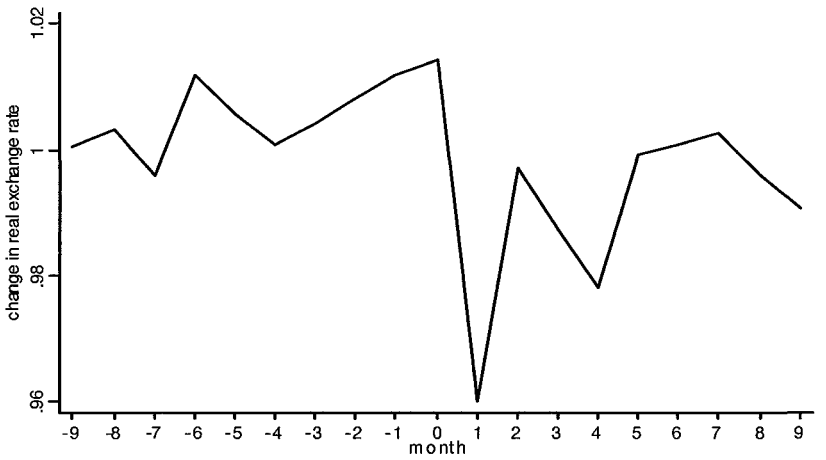

Figure 7.1. Real exchange rates and election (1985:1-2003:12)

Note: Month 0 is election month. Months –9 to –1 denote pre-election period; months 1 to 9 denote post-election period. Values above (below) 1 indicate real appreciation (depreciation).

A rise (fall) in the curve corresponds to an appreciation (depreciation) of the national currency. The figure depicts that elections mark important events for the course of the real exchange rate. While the average monthly exchange rate change for the whole time period under consideration is a 0.5 percent depreciation of the national currency, in 8 of the 9 months preceding an election, the domestic currency appreciates. The accumulated real appreciation of the domestic currency within the 9 months prior to the election reaches 6.5 percent. After the election, the domestic currency sharply decreases in value. In 7 of the 9 post-election months, the average monthly rate of depreciation exceeds the average rate of depreciation for all periods. The effects are particularly strong in the first and the fourth month following the election. In these periods, the domestic currency depreciates on average by 4 and 2.2 percent, respectively. The latter possibly reflects the fact that new administrations do not typically take office until some months after the election date.

Real exchange rate changes can either be driven by price changes or nominal exchange rate changes. In order to get an idea of which of the two channels dominates, figure 7.2 presents the same graphical procedure based on changes in the nominal exchange rate.

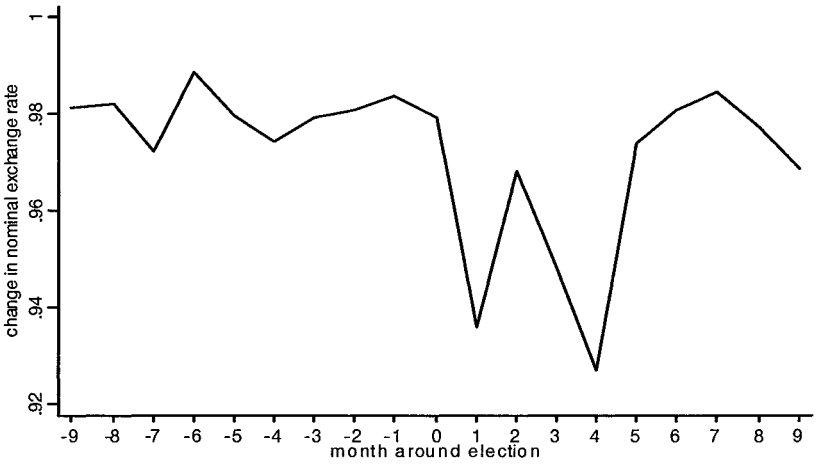

Figure 7.2. Nominal exchange rates and elections (1985:1-2003:12)

Note: Month 0 is election month. Months –9 to –1 denote pre-election period; months 1 to 9 denote post-election period. Values above (below) 1 indicate nominal appreciation (depreciation).

Again, the monthly exchange rate changes in election periods have to be compared with the average depreciation rate, which is 2.3 percent across all months in the sample. The figure reveals that in pre-election periods, monthly nominal depreciations are not significantly reduced. However in the post-election period, the nominal value of the domestic currency decreases sharply. The accumulated rate of nominal depreciations for the first four post-election months reaches 19 percent — more than 10 percent higher than the average nominal depreciation rate for a typical four-month non-election period.

In sum, the graphical illustration suggests that currencies tend to appreciate (or depreciate less) with an upcoming election, while the rate of depreciation tends to accelerate after the election. This result confirms the research by Frieden et al. (2001). In their study of Latin American elections between 1960 and 1994 results are also stronger for the post-election period compared to the pre-election period. The magnitude of their results is also very similar to this study. In Frieden et al. (2001), depreciations peaked in the second month after the election, exceeding the average rate of depreciations for all periods by 3 percent for real exchange rates and even 4.5 percent for nominal exchange rates.

7.3.3 Explanatory variables

In order to investigate the validity of the hypothesis of a political exchange rate cycle more deeply, I will conduct a fully specified regression in the following sections. The empirical results that will be obtained will also shed light on the statistical significance of the impact of elections. First, however, efforts will be taken to ensure accuracy of the empirical model.

The empirical investigation follows the specification by McCallum (1978) and later applied by a large number of further analyses on political business cycles (see Grier 1987; Beck 1987; Stephan 1994, among others). The idea is to construct several variables that capture possible exchange rate cycles around election periods. Evidence for a political exchange rate cycle is provided if these main explanatory variables result to be significant in the regression. A straightforward procedure for the coding is to use variables that equal *-1* in the *T* months preceding an election, *1* in the *T* months following an election, and *0* otherwise, where *T* may equal 3, 6, or 9 (see, e.g., Alesina et al. 1997: 84). As this specification fits closely to the empirical implications derived by the signaling models (Ghezzi et al. 2000; Bonomo and Terra 2001), a first category of dummy variables, labeled *EC1* to *EC3*, is coded following this standard specification.

One point of criticism against the simple *-1–0–1* specification is its discontinuous nature. There is no reason to assume a discrete rise and drop of the electoral cycle from one time period to another. Rather, electoral manipulation should develop continuously. Hence, a more detailed specification fits the data better. Following McCallum (1978), I therefore include a second category of electoral variables (*EC4-EC6*), which traces a more elaborate pattern. The coefficient of all variables is expected to have a negative sign. The exact pattern of all electoral variables is shown in table 7.1.[156]

[156] In some countries, early elections were called. In these cases, the election variables were coded regularly up to the month when the decision for early elections was announced. From then on, election variables took the value depending on the time to the prematurely elections. Data on early elections are from the Political Handbook of the World (various issues).

Table 7.1. Coding of electoral variables

Month	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	all other
EC1	0	0	0	0	0	0	-1	-1	-1	0	1	1	1	0	0	0	0	0	0	0
EC2	0	0	0	-1	-1	-1	-1	-1	-1	0	1	1	1	1	1	1	0	0	0	0
EC3	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	1	1	1	1	1	1	1	1	1	0
EC4	0	0	0	0	0	0	-1	-2	-3	0	3	2	1	0	0	0	0	0	0	0
EC5	0	0	0	-1	-1	-2	-2	-3	-3	0	3	3	2	2	1	1	0	0	0	0
EC6	-1	-1	-1	-2	-2	-2	-3	-3	-3	0	3	3	3	2	2	2	1	1	1	0

Note: Month *0* is month of election. Months –9 to –1 denote pre-election period; months 1 to 9 denote post-election period.

The literature has identified a number of other, primarily economic, variables that should influence exchange rates. It is however questionable whether one should control for these factors. As argued in chapters 3 and 6, economic variables may be endogenous to political variables. For instance, the channel through which elections exert an impact on the exchange rate may have to do with macroeconomic policies. This implies that explanatory economic variables are jointly codetermined with the endogenous exchange rate variable, both depending on the electoral process. Therefore, including both macroeconomic and election cycle variables into the regression may dilute the political effects (Simmons 1997: 15; Alesina and Wagner 2003: 15). Nevertheless, I include the domestic real interest rate as a control variable in order to demonstrate that the empirical findings are robust to the inclusion of this variable. The choice of interest rates is warranted by the fact that this variable has received the most attention as a predictor of exchange rate movements. The expectation is that a rise in interest rates causes a currency appreciation, as suggested by the short-term fixed price model by Dornbusch (1976).

Real interest rates are constructed by deflating nominal interest rates with the lagged rate of inflation. The lagged (not the current) inflation rate is chosen because this accounts for the fact that real interest rates are defined by inflation expectations, with lagged actual inflation rates as a good indicator for inflation expectations (Leblang 2003: 559). In order to account for problems with reverse causality, real interest rates were then lagged one period. Reliable data on central bank's discount rates (as the best measure for nominal interest rates) were, however, not available for all

countries and for all time periods. Thus, I used the interest rate series that had the least number of missing observations. Following Leblang (2003: 559), the order of preferences for the construction of the interest rate variable was the central bank's discount rate, the money market interest rate, the Treasury bill rate, and the interest rate on deposits and savings.[157] As will be specified in the next section, further explanatory variables include lags of the dependent real exchange rate variable.

7.3.4 The logic of lagged dependent variables

It is quite common for researchers to include lagged dependent variables on the right-hand side of the model specification. The present study follows this recommendation for two reasons: First, the inclusion of lagged dependent variables in the equation system is motivated by economic considerations. In the study of exchange rates, the lagged dependent variable model is often used as a reference specification for the quality of other, more sophisticated exchange rate models. We can conceive of theories in which the exchange rate at time t is a function of the exchange rate at time t-1 as modified by new information rather than viewing the exchange rate at time t as a linear function of independent variables. For instance, de Grauwe and Grimaldi (2002) and Taylor and Taylor (2004) emphasize features such as transaction costs, trade barriers, contagion effects, or bubbles, which lead to a "band of inaction" and provoke a time dependence property in exchange rate adjustments after a shock affecting the macroeconomic fundamentals in both developing *and* developed countries.

A second argument for structuring the econometric model in a dynamic form is that the lagged dependent variable procedure is a valuable mean of mitigating the omitted variable bias since it allows for the control, to a large extent, of many omitted variables by observing changes in the dependent variable over time. As a result, accurate forecasts can be derived though the underlying structural model is not fully specified.

However, estimating lagged dependent variable models with OLS does not give unbiased estimators. The following explanations clarify these problems and build an effective TSCS model alternative.

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[157] This procedure resulted in the following choices of interest rates: Discount rates were available for Colombia, Costa Rica, Ecuador, El Salvador, Paraguay, Peru, Uruguay, and Venezuela. The money market rate was chosen for Argentina and Brazil. The Treasury bill rate was used for Mexico. For Bolivia, Chile, the Dominican Republic, El Salvador, Guatemala, and Haiti I fell back on deposit rates. For Honduras, the saving rate was taken.

7.4 Methodological issues in TSCS analysis

TSCS data typically consist of country data over a long period of time. In other words, they are pooled time-series data. This offers a number of advantages to the researcher because TSCS allow the study of dynamic adjustment processes and thereby control for unit heterogeneity. They also make more efficient use of the data and provide more degrees of freedom, allowing richer specification of models. However, TSCS data have numerous problems that violate the standard OLS assumptions about the error process. In particular, TSCS errors often exhibit unit roots, groupwise heteroskedasticity, contemporaneous correlation, and autocorrelation (Beck and Katz 1995: 634).

Therefore, one of the most important issues of the TSCS methodological research is to account for these characteristics and to carefully choose the appropriate statistical model. Hence, what follows is a justification for having chosen the present methodology and an account on its benefits in comparison with the alternatives frequently used. I will address first the most important problems that relate to nonstationary behavior of the data (7.4.1). In the two subsequent subsections I will discuss the main issues that relate to the selection of the estimation method. Section 7.4.2 deals with the pooling dilemma and dynamic panel issues. Section 7.4.3 describes a way to mitigate problems caused by complexities in the error process.

7.4.1 Testing for stationarity

A natural starting point for TSCS analysis is to test the variables for stationarity. A series is called to be weakly stationary when its mean value and all autocovariances are independent of time. The issue of stationarity is of major importance since running regressions on nonstationary series will lead to unreliable hypothesis testing and forecasts. For example, if two variables follow a linear trend, a regression of one on the other could have a high R-squared even though they are totally unrelated. This leads to what Granger and Newbold (1974) call "spurious regression", i.e. regression results that have no real meaning. Although the stationarity issue is not problematic for the election variable that is coded with constant mean and variance, the real exchange rate and interest rate variables could be subject to nonstationarity.

For real exchange rates to be stationary, nominal exchange rate changes must equal the difference between changes in national price levels of countries, i.e. the relative PPP must be fulfilled. Under this condition, the real

exchange rate (and its log) is constant. As such, any change of the log of the real exchange rate from its constant equilibrium value can be interpreted as a deviation from PPP and should dissipate so that the real exchange rate can return to its mean.[158] Researchers have spent much time of examining the mean-reversing properties of real exchange rates. A number of early studies showed that significant deviations from PPP arise. This corroborates the view that in the short term, real exchange rates are driven by nominal exchange rates due to a combination of nominal exchange rates that react immediately to a shock and rigid prices that adjust sluggishly to changing nominal exchange rates. More recently, however, with the application of more sophisticated tests and the use of either longer time spans or panel data, results are more favorable for PPP (Taylor and Sarno 1998).[159] Analyses specific to developing countries are also mostly supportive of PPP (Boyd and Smith 1999; Grier and Hernández-Trillo 2004). Yet, as argued above, the consensus from the empirical literature appears to be that, although real exchange rates tend to converge to parity level in the long run, the rate at which this happens is very slow (Rogoff 1996).[160]

Testing for the stationarity property of real interest rates is equally important before setting the empirical model. The Fisher effect, which implies a one-to-one relationship between the nominal interest rate and the expected inflation rate, provides the basis for the notion that real interest rates are stationary. A necessary condition for the Fisher hypothesis to hold is that real interest rates are mean reverting. However, empirical research has predominantly shown that this is not the case. Yet, things are far from clear cut and thus the empirical tests will verify whether the stationarity property holds or not in the present dataset.

While a large literature on testing for unit roots in time series data exists, it is only recently that unit root tests for panel estimators have been developed. The advantage of panel unit root tests is that they combine time-series information with the information from cross-sectional units and therefore lead to an increased power in comparison to conventional single time series tests (Taylor and Sarno 1998: 304; Hadri 2000: 149). Among

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[158] An important implication of nonstationarity in the real exchange rate is that this characteristic is at odds with most theories of international finance since these theories are based on PPP theory. For example, the monetary approach to exchange rate determination by Frenkel (1976) assumes PPP continuously. In the Dornbusch (1976) sticky price model, PPP is assumed to hold in the long term.

[159] Most of the studies that test support for long run PPP use data from the post-Bretton Woods period.

[160] It is interesting to see that PPP convergence is faster for high-inflation than for low-inflation countries.

the most popular panel unit root tests are the Levin-Lin test (Levin and Lin 1992), Taylor and Sarno's (1998) Multivariate Augmented Dickey-Fuller (MADF) test, and the Hadri (2000) test. One limitation of the Levin/Lin (1992) procedure is that it does not allow for cross-sectional correlation.[161] In the present study, the assumption that exchange rate swings in one country are uncorrelated to all other countries in the sample seems extremely unrealistic. Exchange rates in developing countries are often affected simultaneously by exogenous factors such as changes in US interest rates or oil price movements and thus cross-sectional correlation should not be ignored.[162]

In contrast, the MADF test accounts for serial dependence. The test is the panel version of the Augmented Dickey-Fuller (ADF) test for a unit root to a set of time series. Taylor and Sarno (1998: 287) regress the variable under consideration on a constant, and lagged levels of the dependent variable. The *i*-th equation of the panel system can be written as follows:

$$q_{it} = \mu_i + \sum_{j=1}^{m_i} \rho_{ij} q_{it-j} + u_{it}\,, \tag{7.3}$$

where $i=1,\ldots,N$ and $t=1,\ldots,T$ denote the cross section and the time series dimension of the panel respectively, m_i denotes the number of lags, μ_i denotes a deterministic regressor, and u_{it} is the error term of the regression which has conditional mean zero.

The MADF test estimates the system in equation (7.3) jointly on all N equations by the seemingly unrelated regression (SUR) method.[163] A Wald test is then conducted to test the null hypothesis that all time series in the panel exhibit a nonstationary behavior.

$$H_0 : \sum_{j=1}^{m_i} \rho_{ij} - 1 = 0, \quad i = 1,\ldots,N \tag{7.4}$$

The statistical model in equation (7.3) allows for the effects of the economic variables on the real exchange rate to occur with a lag. Choosing the optimal lag length m is important for two reasons. From an econometric perspective, using too few lags causes serial correlation in the residuals,

[161] For the extent of size distortions in panel unit root tests due to the failure to allow for contemporaneous correlations of the residuals see Bornhorst (2003) and O'Conell (1998).

[162] Cross-sectional correlation in real exchange rates should also exist because of the use of the US dollar as numeraire.

[163] Since T must exceed N in standard SUR, the MADF test is only applicable to small-N and large-T panels.

thereby invalidating standard significance tests. Implementing more lags means using more information. However, this comes at the cost of lower efficiency since many and possibly redundant coefficients have to be estimated. From an economic perspective, choosing the optimal lag length is important because the presence of serial correlation conflicts with the interpretation of the residuals as exogenous shocks. As there is no theoretical relationship and in order to be sure that the criterion for choosing lag length does not affect the results, three different statistical methods are used to select the appropriate lag in the specification. A first solution suggests starting with a specification having many lagged differences and then decreases their numbers one by one until the t-statistic corresponding to the highest-order lag becomes statistically significant at the 5 percent level (Ng and Perron 1995). Other possibilities are to choose the specification with the smallest Akaike (AIC) or Bayesian (BIC) information criterion. Regardless of the procedure, a lag length of 9 was found to be the best fit.[164]

Table 7.2. Statistics for MADF panel unit root test

Variable	Lags	Test statistics	Approximated 5% CV
Real exchange rate (log)	1	125.142	14.013
	3	109.275	14.036
	9	102.931	14.109
Real interest rate	1	450.608	14.321
	3	272.673	14.349
	6	180.030	14.438

Note: The null hypothesis for both the exchange rate and the interest rate variable is that all 17 series in the panel are realizations of unit root processes. The alternative hypothesis is that at least one of them is a realization from a stationary process. The tests on the interest rate variable were performed on a restricted sample in order to meet the requirement of a balanced panel.

Test statistics and critical values (CVs) of the MADF test are presented in table 7.2. In the case of nine lags, I find the test statistics to be 102.931 for the lagged log levels of real exchange rates and its critical value, at the 5 percent level, to be 14.06, so that the joint null hypothesis of a unit root is rejected. As displayed by the table, the results are not sensitive to the number of lags. The null hypothesis is also rejected for the interest rate

[164] The longest possible lag for both the recursive t-statistic procedure and the information criteria was set to 17 (which approximately denote the square root of sample size).

variable.[165] Hence, not all series of the panel contain a unit root. The alternative hypothesis is problematic for two reasons (Enders 1995: 212). First, it is difficult to distinguish the null hypothesis from stationarity alternatives, especially when the unit root is close to unity. The second problem is based on the fact that given the test statistic it is not clear how many time series of the panel exhibit stationary behavior. It is possible that the null hypothesis of a unit root is violated even though there is only one (or a few) stationary series in an otherwise nonstationary environment. In the present study, this vagueness may be important as each country in the sample followed a different exchange rate regime path that could lead to varying conclusions about stationarity for each country.

In view of the obscure null hypothesis of the MADF test, the Hadri test is utilized as a complement to check for stationarity in the real exchange rate. This test is a stationarity test with the corresponding null hypothesis that all series in the sample are stationary. Since the null includes a time trend in the estimation, this allows to test whether the nonstationary series are difference or trend stationary (i.e., *I[0]* after removing a deterministic trend component). The application is preferred to panels with large T and moderate N (Hadri 2000: 149), making it well suited to the present panel of T=228 and N=17.

Table 7.3. Statistics for Hadri stationarity test

Variable	Test statistics	p-value
Real exchange rate (log)	24.156	0.000
Interest rate	2.209	0.014

Note: The null hypothesis is that at least one of the real exchange rate series is a realization of a unit root process. The alternative hypothesis is that all of them are realizations of stationary processes.

When applying the test to the data, serial dependence in the disturbances is controlled for by using a Newey-West estimator of the long-run variance. Table 7.3 shows that the null hypothesis can be clearly rejected both for real exchange rates and real interest rates, implying that not all series in the panel are stationary.[166]

Based on these test statistics with a unit root null (MADF test) and one with a stationarity null (Hadri test), there is reasonable evidence of a mixture of stationary and nonstationary processes in the panel. Some (though

[165] When applying the test to the real interest rate variable, some countries were removed from the sample in order to get a balanced panel.

[166] The Hadri test is a residual-based test and includes no lags of the dependent variable.

not all) exchange rate and interest rate series are integrated of order 1, i.e. realizations of *I(1)*. Thus, on the basis of both the MADF and the Hadri test, it is not obvious whether the panel should be treated as *I(0)* or *I(1)*. In order to be sure to achieve stationarity in the panel, I decided to difference data once and proceed with both variables being modeled as *I(1)*. I feel confident with this solution since the drawback of differencing data (the loss of information with respect to the level of the series) should not affect the results in the present study.[167] Although differencing data precludes the investigation of a long-run relationship, the theoretical considerations outlined above depend solely on short-term changes in the exchange rate and interest rate.

7.4.2 Basic model selection

Previous studies on political cycles often used pooled regression analysis (see, e.g., Stephan 1994: 41). One problem with this type of analysis is that the estimates of coefficients derived from ordinary multiple regression techniques may be subject to omitted variable bias—a bias in the regression estimation that arises when there is some unconsidered ("omitted") variable that is correlated with the dependent variable (Greene 2000: 334). In terms of exchange rates, the literature has found a large number of factors that would be expected to have an impact on the real exchange rate. If all relevant factors could be included in the specification, the problem of missing variables would be solved. However, some of these variables are difficult to observe, let alone quantified. For others, the impact is not clear. Pooled regression analyses assume these omitted variables to be randomly distributed within and across countries. This assumption is, however, extremely unrealistic in the present study since it assumes, e.g., that the effects of elections on the exchange rate are independent of any institutional differences across countries.

The TSCS data approach is able to control for some of these omitted variables. For instance, institutional differences are sometimes controlled for by assuming that they are fixed over time, allowing them to be captured by a different intercept for each country. The existence of unobserved heterogeneity in the dataset can be tested with the Breusch-Pagan test

[167] Another concern is that the detection of nonstationarity in the present sample is attributed to the effects of structural breaks. For example, the statistical properties of a country's real exchange rate series could vary when it decides to change its exchange rate arrangement. However, using two centuries of data, Lothian and Taylor (1996) show that reliable inferences can be drawn by extending data across exchange rate regimes.

(Wooldridge 2002: 264). A rejection of the null hypothesis of homogeneity suggests that the sample is too heterogeneous to be pooled. As the test statistic in table 7.4 displays, the null hypothesis can be clearly rejected. Hence, there are unobserved country-specific effects in the data.

Table 7.4. Breusch-Pagan test for random effects

Dependent variable	Test statistics	Empirical Realization
First difference logged real exchange rate	$Chi^2(1)$	4.22
	p-value	0.039

Note: Null hypothesis is that no unobserved heterogeneity exists.

The next step is to ask whether the country-specific intercepts α_i should be treated as fixed parameter to be estimated or as random variable. Models of fixed and random effects differ in terms of their assumptions of the error term. The fixed effects approach assumes country-specific, time-constant effects, while random effects models assume the country-specific effects as random variables.

The random effects model provides more efficient estimators. The crucial assumption of this model is, however, that the unobserved effects are uncorrelated with the explanatory variables in the model.[168] The choice between random effects and fixed effects regression essentially hinges on this basic assumption. A formal method to check the assumption is provided by the Hausman test. This statistic contrasts the estimators of both the random effects and the fixed effects model. The null hypothesis of the Hausman test is that the composite error term and the explanatory variables are not correlated. If this hypothesis cannot be rejected because differences between the coefficients of both models are not systematically different from zero, either a model with fixed and a model with random effects is statistically justifiable. In this case, it would be advisable to choose a random effects estimator since it is more efficient.[169] If the null is re-

[168] Only in this case, the random effects model generates consistent and efficient estimates, whereas in such a situation the fixed effects model ends up consistent, but not efficient. Otherwise, if the time invariant components α_i are correlated with the explanatory variables, the estimator of fixed effects is both consistent and efficient, whereas the estimator of random effects is inconsistent due to omitted variables (Hsiao 2002: 102).

[169] The reason is that the random effects estimator uses information from both the variation within a single unit and the variation between units. In contrast, fixed effects estimators ignore variation between units.

jected, the (unbiased) fixed effects should be used. Thus, a random effects model should only be used when there is enough confidence that its composite error is uncorrelated with the explanatory variables.

Table 7.5. Hausman test for fixed versus random effects

Dependent variable	Test statistics	Empirical Realization
First difference logged real exchange rate	$Chi^2(2)$	34.22
	p-value	0.001

Note: Null hypothesis is that the difference in coefficients between the fixed effects model and the random effects model are not systematic.

Results of the Hausman test are reported in table 7.5 and reveal evidence in favor of fixed effects. There are, however, two caveats to the application of the Hausman test in the present study (Wooldridge 2002: 289). First, the Hausman test assumes strict exogeneity of the explanatory variables under the null and the alternative hypothesis. A second caveat is that it assumes that the idiosyncratic errors u_{it} have a constant unconditional variance and are serially uncorrelated. Moreover, the conditional variance of unobserved effect must be homoskedastic.

Nonetheless, the rejection of the null hypothesis is consistent with theoretical considerations. In political-economic analysis, the assumption of random effects is hard to satisfy since omitted variables should cause a correlation of explanatory variables and the composite error term. The fact that the fixed effects model is capable of accounting for many of these unobservable factors makes it particularly suitable for this kind of analyses. By controlling explicitly for country-specific fixed factors that do not change over time, this approach may mitigate the bias due to poorly measurable features, such as institutional differences. The parameter estimators are unbiased even when the fixed effects are correlated with the explanatory variables.[170]

Another economic reason why in the present study fixed effects should be preferred to random effects is that the fixed effects model is generally considered an appropriate specification for comparative TSCS analysis. The focus of the present study is on a specific set of countries and the in-

[170] The potential drawback of the fixed effects model that variables that do not change over time cannot be estimated because they cannot be separated from the fixed effects is of no significance in the present study.

ference it derives is restricted to the behavior of these observed countries (Judson and Owen 1999).[171]

The following dynamic panel form can then describe the empirical model:

$$q_{it} = \alpha_i + \sum_{j=1}^{m} \beta_j q_{t-j} + \delta\, x_{it} + u_{it}, \tag{7.5}$$

with q_{it} as the dependent (real exchange rate) variable, α_i the country specific intercept, β_j as m parameters to be estimated, δ as $k \times 1$ parameters to be estimated, x_{it} as $1 \times k$ vector of nonconstant regressors (e.g. the interest rate variables), and u_{it} the idiosyncratic error term, which represents the effects of the omitted variables that are peculiar to both countries and time. The transformed model in case of a first-differenced dependent variable looks as follows:

$$\Delta q_{it} = \sum_{j=1}^{m} \beta_j \Delta q_{t-j} + \delta\, \Delta x_{it} + \Delta u_{it}, \tag{7.6}$$

with $\Delta q_{it} = q_{it} - q_{it-1}$, $\Delta x_{it} = x_{it} - x_{it-1}$, and $\Delta u_{it} = u_{it} - u_{it-1}$. Note that the country-specific effects α_i are differenced away.

One econometric problem remains, however. The models in equation (7.5) and (7.6) include a lagged dependent variable. In this case, the usual approach to estimating a fixed effects model, the least squares dummy variable estimator (LSDV), generates a biased estimate of the coefficients. The bias arises from the correlation of the lagged dependent variable with the country-specific effects and the error term. Since q_{it} is a function of α_i and u_{it}, $q_{i,t-1}$ will also be a function of α_i and u_{it} (Wooldridge 2002: 256). Hence, the estimator has a sampling distribution with a mean unequal to the parameter to be estimated. This problem of the correlation between the lagged dependent variable and the country-specific effect (respectively error term) is known as the Nickell bias.

To deal with this problem, one could argue that an instrumental variable procedure such as those suggested by Anderson and Hsiao (1981) or Arellano and Bond (1991) better suits the data. The advantage of these me-

[171] The random effects approach would be appropriate for the opposite goal. Here, one typically draws a certain number of countries randomly of a much larger population while the observed country is not of any interest per se. Instead, one is generally interested to generalize the inferences observed to all other units of the population from which this sample was randomly drawn.

thods is that the Nickell bias is accounted for. Anderson and Hsiao (1981) overcome the bias by using the first differencing transformation so as to remove the country-specific fixed effects. However, the problem of the correlation between the explanatory variables and the errors still exist (i.e. Δq_{t-1} is still correlated with Δu_{t-1}). The standard approach for dealing with variables that are correlated with the error term is to instrument them. Legitimate instruments are those variables that are correlated with the first differenced lagged value of the dependent variable, Δq_{t-1}, but are uncorrelated with the first differenced error Δu_{it}. Anderson and Hsiao (1981) recommend taking the second lag q_{t-2} or Δq_{t-2} as instrumental variables for Δq_{t-1}. Both of these instruments are correlated with Δq_{t-1}, but are uncorrelated with u_{it} (as long as the u_{it} themselves are not correlated). However, since this instrumental variable (IV) estimation does not make use of all the available moment conditions, the Anderson and Hsiao (1981) estimator yields consistent, but inefficient estimates.

Arellano and Bond (1991) show that an estimator that uses the levels as instruments is more efficient than the choice of differences as instruments as it has no singularities and displays much smaller variances. As in Anderson and Hsiao (1981), the authors first-difference the equation to eliminate the country-specific effect α_i. The resulting correlation between the differenced lagged dependent variable and the differenced error term is then handled by using all lagged levels of the endogenous variable as instruments for the first differences, beginning with the lag two and potentially going back to the beginning of the sample. The parameters are then estimated by a generalized method of moments (GMM) estimator, which provides consistent estimators under the assumption of no second order autocorrelation in the differenced error term.

However, some econometricians worry about the applicability of the estimator when T becomes large. Since all lags beyond the second lag are valid instruments, the Arellano and Bond technique gives a potentially large instrument set. When having a long time series with many different time observations, this procedure is difficult to implement because there can be overfitting in the instrument equation (Hsiao 2002: 86). It has also been shown that alternative sets of instruments can give very different results. Even more important, for panels where T is very large, the Nickell bias is very small, approaching 0 as T approaches infinity (see Nickell 1981: 1423 for a proof of this claim).[172] As a rule of thumb, if T is greater than 30, the bias created by using the LSDV is slight and should be more

[172] Furthermore, when T is large, the Arellano and Bond procedure specifies many instruments, which may exceed the maximum number of variables that can be included in popular software packages.

than compensated by its greater precision in comparison to IV or GMM estimators (Judson and Owen 1999).[173] Since the number of observations for each country is 228 in the present sample, the bias of the LSDV estimator may be negligible under weak dependence. Hence, it seems advisable to dispense with dynamic panel procedures and rely on a simple fixed effects estimation technique that should perform well in a long and relatively narrow panel.

7.4.3 Error specification

A convenient way to estimate time series cross-section equations would be to use ordinary OLS. However, it is likely that the assumptions on the error structure of OLS regressions are violated. It is inappropriate if the errors show heteroskedasticity, serial or spatial correlation (Beck and Katz 1995: 636). The aim of the following section is to test for these complexities in the error term.

For ordinary OLS to be optimal, all the errors must have the same variance, i.e. they must be homoskedastic. However, nonconstancy of the error variance is a characteristic widely observed in TSCS data. This can be thought of as clustering of the variance of the error term over time. Even if the variance is constant within a panel, it is almost certainly different across panels. In the present study, countries with a flexible exchange rate regime are likely to have a higher variability in the real exchange rate than countries with a fixed exchange rate, a phenomenon that should be particularly relevant for emerging market economies (Calvo and Reinhart 2000: 3). What this means for the linear model is that as the size of the variation in the dependent variable increases, larger absolute values in the error term are possible and, therefore, the proportion of variation in the dependent variable attributable to the error term becomes larger.

In order to determine the degree of heteroskedasticity, the likelihood ratio test involves comparing the model with heteroskedasticity to the model without heteroskedasticity. As expected, the test statistic indicates significant panel-level heteroskedasticity (see table 7.6). Thus, any estimation procedure must account for heteroskedasticity.

[173] The lower precision of dynamic panel model is due to the fact that instrumental variables are only imperfectly correlated with the actual variables.

Table 7.6. Likelihood ratio test for panel level heteroskedasticity

Dependent variable	Test statistics	Empirical Realization
First-differenced logged real exchange rate	$Chi^2(16)$	2773.70
	p-value	0.000

Note: Null hypothesis is of no heteroskedasticity.

Another property that is likely to occur in TSCS data is correlation at the same time point across cross-sectional units (contemporaneous or spatial autocorrelation). In the present study contemporaneous correlation across cross-sectional units is reasonable to assume given that emerging markets are often affected by the same shocks. For example, it is a well-known fact that capital flows in developing countries are cyclical (Kaminsky et al. 2004). In periods of rising US interest rates capital flows to developing markets tend to dry up, causing a depreciation of the countries' real exchange rate. Correlations across countries might also become relevant in the case of currency crises that can have severe spill-over effects to other countries, a phenomenon extensively observed in many developing countries during several financial crises in the last decade. Hence, we would not expect errors in the statistical model for Argentina to lack some resemblance to those for Brazil or errors for Mexico and Guatemala to be altogether independent.

Errors tend not only to be contemporaneously correlated. Another likely deviation from independent errors in the context of panel data is serial correlation. This term describes the property of many TSCS data that errors for a particular unit at one time are not independent to errors for that unit at all other times, such that, e.g., errors in country i at time t are correlated with errors in country i at time $t+1$. This is due to the fact that observations and traits that characterize them tend to be interdependent across time. A new test for serial correlation in panel data models has been derived by Wooldridge (2002: 282-283). This test involves running the original regression and obtaining the residuals. The idea is then to regress the residuals on the independent variables and the lagged residuals. After this, a t test on the significance of the lagged residual coefficient is performed. If the coefficient is significant, the null hypothesis of independent errors can be rejected.[174] The null hypothesis is rejected, meaning that significant dependence of the residuals is present (see table 7.7). Clearly, this result

[174] The Wooldridge test is also robust to conditional heteroskedasticity.

strengthens the argument for the inclusion of lagged dependent variables as additional explanatory variables.

Table 7.7. Wooldridge test for serial correlation

Dependent variable	Test statistics	Empirical Realization
First-differenced logged real exchange rate	F (1, 16)	4.820
	p-value	0.043

Note: The null hypothesis is of no autocorrelation.

Together all of these factors suggest that ordinary OLS estimation is not an appropriate estimation procedure for the present dataset. Based on previous economic considerations and the results of the Hausman test that suggest the existence of fixed effects, fixed effects regression with a first-order autoregressive error term to account for serially correlated errors were run using the *xtregar, fe* command in Stata version 8.0 (which estimates the relevant parameters by the LSDV estimator) (Stata 2003: 211-225). Fixed-effects models can be used to estimate coefficients on the basis of standard errors that are robust to autocorrelation as well as heteroskedasticity. Moreover, they are widely applied and easy to interpret. Following Beck and Katz (1995: 638) and Greene (2000: 605), who strongly recommend estimating an AR coefficient that is the same for all countries, I prefer to impose the restriction of a common AR(1) across countries in all cases.[175]

7.5 Empirical results

The dependent variable in the following regression outputs is the first differenced log-transformed real exchange rate. The election cycle variables designed to capture possible political cycles in the real exchange rate are added one at a time to the basic model and tested for statistical significance. Additionally, all specifications include a constant, the lagged real interest rate variable, and lags of the dependent variable. Since Ng/Perron (1995) show that their stepwise regression method has better size and

[175] Beck and Katz (1995: 638) show by using Monte Carlo estimations that using panel-specific coefficients of the AR(1) process largely increases the uncertainty of the estimates. They conclude that even if the coefficients of the AR(1) process are not the same across all countries, they do not do much harm.

power properties to determine optimal lag length than alternative procedures such as AIC and BIC methods, I rely on a specification of the Ng/Perron (1995) procedure, which does not necessarily include all lower-order lags.[176] The best specification uses first-, third-, fourth-, fifth-, and sixth-order lags. The model is estimated over the entire sample period, from 1985:01 to 2003:12.

The performance of the variables when included in the fixed effects estimation is presented in table 7.8. To keep the number of reported results, standard deviations are not reported. Columns (1) to (6) report the regression results corresponding to the six electoral variables. All electoral variables are statistically significant at the 1 percent level.[177] As expected, the coefficients are negative, indicating that currencies appreciate in the pre-election period and depreciate in the post-election period. The results are qualitatively similar for all electoral variables. However, variables EC1 and EC4, which imply effects only in the quarters around elections, perform slightly better than the variables EC2/EC5 and EC3/EC6, which imply 2 and 3 quarter political cycles, respectively. To get a sense of the magnitude of the effects predicted by the model, consider the coefficient for EC1 in column (1) of table 7.8 (which also provides the best model fit according to AIC and BIC). The estimate of -0.013 suggests that, all else equal, in each month of the pre-election quarter the exchange rate appreciates by 1.3 percent, while the currency depreciates in the first post-election quarter by the same rate. Thus, ceteris paribus, currencies appreciate (depreciate) by roughly 4 percent in the pre-election (post-election) quarter—a figure that is consistent with the finding of the data's graphical inspection. Results for the control variables are also as theoretically expected. The lagged dependent variables are mostly significant, reflecting the fact that the real exchange rate adjusts gradually to asymmetric shocks. The interest rate variable is statistically significant and shows the expected positive sign. However, the magnitude of the effect is economically negligible.

[176] One reason for the preference of the Ng and Perron (1995) technique compared to both the AIC and the BIC is that the information criteria are based on the log likelihood of the observations. Thus, they can only be used to compare models from the same sample. With lagged dependent variables, one must adjust the sample size to compare the AIC and BIC values.

[177] It is important to note that the significance of the electoral variables is not due to the predominant influence of any single country. If one drops any of the 17 countries and retains the other 16, the coefficients on the electoral variables remain significant.

Table 7.8. Fixed effects estimation (all elections included)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
EC1	-0.013***					
EC2		-0.012***				
EC3			-0.009***			
EC4				-0.007***		
EC5					-0.006***	
EC6						-0.005***
drexr (-1)	-0.179***	-0.176***	-0.176***	-0.177***	-0.176***	-0.176***
drexr (-3)	-0.058***	-0.061***	-0.061***	-0.058***	-0.060***	-0.060***
drexr (-4)	-0.032*	-0.034**	-0.035**	-0.033*	-0.033*	-0.034**
drexr (-5)	-0.081***	-0.079***	-0.082***	-0.081***	-0.080***	-0.081***
drexr (-6)	-0.047**	-0.045**	-0.047**	-0.046**	-0.045**	-0.046**
int. rate (-1)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
R^2 within	0.044	0.044	0.043	0.045	0.046	0.044
R^2 between	0.739	0.729	0.737	0.736	0.720	0.693
R^2 overall	0.015	0.017	0.015	0.016	0.017	0.017
AIC	-8578.01	-8586.65	-8580.93	-8584.59	-8587.98	-8586.08
BIC	-8528.96	-8537.60	-8531.87	-8535.54	-8538.92	-8537.02
N	3402	3402	3402	3402	3402	3402

Notes: Table reports fixed effects model with AR(1) disturbance term. Dependent variable (drexr) is first differenced log-transformed real exchange rate. Number of lags is in brackets. The standard errors are robust to heteroskedasticity, and serial correlation. *, **, *** indicate significance at the 10%, 5%, 1% level, respectively. N is number of observations.

The parameter estimates are highly significant, but the coefficients of determination are fairly low. The R-squareds are all very close and indicate that the model explains no more than 1.7 percent of the variation of the dependent variable. However, this does not necessarily imply a poor fit of the empirical model. First, the low R-squared merely reflects the fact that most of the original variance is removed by first differencing the real exchange rate. Variables expressed in levels typically display a much higher R-squared, but the estimate would be less reliable given the nonstationarity of the exchange rate series.[178] Second, the low R-squared is also plausible against the prediction of the efficient market theory, which suggests that underlying fundamentals and past values of the exchange rate provide no explanatory power for the future course of the exchange rate. Finally, a third reason why only a small share of the variance in the dependent variable is explained by the explanatory variables is due to the fact

[178] For the sake of comparison, a fixed effects regression using the same independent variables, but using real exchanges rate in levels instead of first differences was performed. In this case, the R-squared exceeds 0.95 in many specifications.

that the electoral variables capture only possible exchange rate movements in election periods. Exchange rate movements in non-election periods cannot be explained by these variables. In view of these considerations, the low R-squared appears quite acceptable.

I interpret these facts as support for the model specification. Independent of the estimation procedure, the results suggest the existence of a political exchange rate cycle.[179] If this were pure spurious regression, one would have little reason to expect the pattern of estimated coefficients to be consistent with the signaling approach to political exchange rate cycles (Ghezzi et al. 2000; Bonomo and Terra 2001).

7.6 Robustness checks

To gain some additional perspective on the sensitivity of the relationship between elections and exchange rates, the following section compares the benchmark regression with a number of alternative specifications. The objective is to disentangle those factors that drive the result. To my knowledge, this form of analysis has not been employed in previous research on political exchange rate cycles.

7.6.1 Exchange rate regime

An often-neglected characteristic in many empirical tests on political business cycles is the type of exchange rate regime. Based on the insights of the open economy trilemma between capital openness, monetary autonomy, and exchange rate stability, Clark and Hallerberg (2000) argue that the exchange rate regime affects the instruments politicians use to influence the economy in election periods. Using data from 19 OECD countries and assuming that capital is mobile, they find evidence of pre-electoral monetary expansions only when the exchange rate is flexible. By contrast, only if the country has fixed exchange rates, do they detect pronounced fiscal cycles. Carrying these considerations to exchange rate policymaking, the expectation is that political exchange rate cycles are stronger for countries and periods with a floating regime. Clearly, if a country has a fixed exchange rate regime it is more difficult to manipulate the exchange rate. By contrast, the increased monetary policy autonomy under floating regimes is supposed to increase the likelihood of manipulation.

[179] Additional specifications with more alternative lag structures yield no changing results.

One problem to be faced here (again) is the classification of exchange rate regimes. Common exchange rate regime classification schemes, such as those provided by the IMF, Levy Yeyati and Sturzenegger (2002) or Reinhart and Rogoff (2002), do not provide a monthly classification of exchange rate regimes. I therefore follow the behavioral measure applied by Kraay (2000: 7-9) to classify a country's exchange rate regime. For each observation I construct an average over the previous 12 months of the absolute value of percentage changes in the nominal exchange rate. I then classify countries as having a pegged exchange rate regime if the 12-month moving average of nominal exchange rates vis-à-vis the anchor currency remains within a 2.5 percent band. As a result, 2659 observations fall in the pegged category and the remaining 743 observations are classified as floats.

Results are presented in table 7.9 and provide unambiguous support for the hypothesis that floating exchange rate regimes facilitate political exchange rate cycles. The magnitude of the estimated electoral variable coefficients is much larger than under the benchmark specification. In terms of overall fit, the specifications improve as well. Interestingly, most of the lagged dependent variables are significant. Apparently, even if the currency floats, past changes in the exchange rate help to explain future movements of the exchange rate.

Table 7.9. Fixed effects estimation (country-years with floating regimes included)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
EC1	-0.062***					
EC2		-0.051***				
EC3			-0.041***			
EC4				-0.040***		
EC5					-0.029***	
EC6						-0.021***
drexr (-1)	-0.316***	-0.315***	-0.318***	-0.311***	-0.314***	-0.316***
drexr (-3)	-0.093***	-0.108***	-0.114***	-0.094***	-0.107***	-0.108***
drexr (-4)	-0.080**	-0.090***	-0.095***	-0.082**	-0.085**	-0.091***
drexr (-5)	-0.046	-0.047	-0.054	-0.048	-0.047	-0.051
drexr (-6)	-0.027	-0.023	-0.028	-0.028	-0.025	-0.026
int. rate (-1)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
R^2 within	0.136	0.136	0.136	0.148	0.144	0.139
R^2 between	0.557	0.443	0.457	0.473	0.355	0.386
R^2 overall	0.030	0.035	0.473	0.043	0.437	0.038
AIC	-945.16	-951.47	-948.96	-959.90	-960.54	-954.21
BIC	-908.46	-914.77	-912.26	-923.20	-923.84	-917.51
N	743	743	743	743	743	743

Notes: See Table 7.8.

Table 7.10. Fixed effects estimation (only country-years with fixed exchange rate regime included)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
EC1	0.000					
EC2		0.001				
EC3			0.001			
EC4				0.001		
EC5					0.000	
EC6						0.000
drexr (-1)	-0.299***	-0.299***	-0.299***	-0.299***	-0.299***	-0.299***
drexr (-3)	0.046**	0.046**	0.046**	0.046**	0.046**	0.046**
drexr (-4)	0.061***	0.061***	0.061***	0.061***	0.061***	0.061***
drexr (-5)	0.0061***	0.0061***	0.0061***	0.0061***	0.0061***	0.0061***
drexr (-6)	0.024	0.024	0.024	0.024	0.024	0.024
int. rate (-1)	0.000***	0.000***	0.001***	0.000***	0.001***	0.000***
R^2 within	0.101	0.101	0.101	0.101	0.102	0.101
R^2 between	0.513	0.526	0.541	0.518	0.524	0.516
R^2 overall	0.015	0.015	0.015	0.015	0.015	0.015
AIC	-12484.12	-12484.29	-12484.80	-12484.74	-12484.78	-12484.35
BIC	-12437.03	-12437.20	-12437.71	-12437.66	-12437.70	-12437.27
N	2659	2659	2659	2659	2659	2659

Notes: See Table 7.8.

Consistent with the expectations, I find no evidence of a political exchange rate cycle when the exchange rate is pegged (see table 7.10). The electoral variables even change sign and are now slightly positive, suggesting that in the period prior to elections the real exchange rate depreciates and a real appreciation occurs in the post-election period. However, high p-values throughout all six specifications indicate that this effect is not statistically significant. Not surprisingly, the lagged dependent variables are highly significant.

7.6.2 Degree of central bank independence

Previous chapters have already highlighted the important role of a country's monetary policy framework. The degree of central bank independence could determine the room for the incumbent administration to influence the macroeconomic environment. One view is that central bankers who are not under direct control of the government have no interest in generating political exchange rate cycles. According to this argument, only in countries where central banks are dependent on elected officials should

elections affect the exchange rate (Grier and Grier 2003: 1). The alternative view is that foreign exchange rate intervention falls typically under the realm of fiscal authorities and, thus, the central bank's degree of independence should not influence the effect of elections on the real exchange rate.

As a further robustness check, I therefore test whether political cycles in the exchange rate are more likely to be observed when the central bank is politically dependent. The central bank turnover ratio is used as an index for central bank independence. A low turnover indicates high central bank independence, while frequent central bank governors' changes indicate a high influence of the government on monetary policy (see chapter 6). In order to restrict the analysis on those countries with low central bank independence, I remove all observations in which central bank independence is below the mean and rerun the regression with the restricted sample of 1485 observations. The results, displayed in table 7.11, are consistent with the ambiguous theoretical considerations. The estimated coefficients remain highly significant and the magnitude of the coefficients increases slightly compared to the benchmark regression. As indicated by higher R-squared values, the model fit improves a bit. Hence, there is some evidence that political exchange rate cycles are somewhat more likely in countries with more dependent central banks.

Table 7.11. Fixed effects estimation (countries with politically dependent central bank included)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
EC1	-0.021***					
EC2		-0.015***				
EC3			-0.012***			
EC4				-0.014***		
EC5					-0.009***	
EC6						-0.006***
drexr (-1)	-0.245***	-0.242***	-0.242***	-0.239***	-0.240***	-0.242***
drexr (-3)	-0.109***	-0.114***	-0.144***	-0.108***	-0.113***	-0.113***
drexr (-4)	-0.067**	-0.070***	-0.068***	-0.067***	-0.067***	-0.068***
drexr (-5)	-0.114***	-0.112***	-0.112***	-0.116***	-0.112***	-0.112***
drexr (-6)	-0.065*	-0.061*	-0.061*	-0.064*	-0.062*	-0.061*
int rate (-1)	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**
R^2 within	0.080	0.079	0.079	0.085	0.081	0.080
R^2 between	0.729	0.742	0.746	0.715	0.730	0.738
R^2 overall	0.035	0.035	0.034	0.042	0.038	0.035
AIC	-3167.95	-3168.89	-3167.82	-3181.18	-3175.72	-3170.12
BIC	-3125.53	-3126.46	-3125.40	-3138.76	-3132.60	-3127.69
N	1485	1485	1485	1485	1485	1485

Notes: See Table 7.8.

7.6.3 US elections

A further robustness check tests whether there are any distortions from the occurrence of a possible US election cycle in the real exchange rate. If an election in a Latin American country takes place at a time close to US elections, policymakers in both countries should aim to appreciate the domestic currency at the same time. As a result, effects on the real exchange rate initiated by domestic policies are neutralized. Alternatively, US policymakers' efforts to manipulate the exchange rate could outweigh any efforts of Latin American policymakers. Hence, it is possible that the inclusion of US election dummy variables decreases the significance of the estimated election variable coefficients. Two different specifications result from these considerations. First, I rerun the regression, coding the election variables based on the timing of the US election (thereby creating variables US1 to US6 and ignoring all impacts of Latin American elections).[180] As expected, the sign of the electoral variables now changes (see table 7.12). With an upcoming US election, Latin American currencies tend to depreciate against the US dollar and appreciate after the election.

Table 7.12. Fixed effects estimation (US elections)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
US1	0.007*					
US2		0.001				
US3			-0.000			
US4				0.004**		
US5					0.001	
US6						0.001
drexr (-1)	-0.177***	-0.177***	-0.177***	-0.176***	-0.176***	-0.176***
drexr (-3)	-0.059***	-0.059***	-0.059***	-0.058***	-0.059***	-0.059***
drexr (-4)	-0.032*	-0.033*	-0.033*	-0.032*	-0.033*	-0.033*
drexr (-5)	-0.080***	-0.081***	-0.081***	-0.081***	-0.081***	-0.081***
drexr (-6)	-0.047**	-0.048**	-0.048**	-0.047**	-0.047**	-0.048**
int. rate (-1)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
R^2 within	0.040	0.040	0.040	0.040	0.040	0.040
R^2 between	0.776	0.774	0.774	0.775	0.775	0.774
R^2 overall	0.013	0.012	0.012	0.013	0.012	0.012
AIC	-8569.34	-8566.11	-8565.97	-8570.53	-8567.34	-8566.45
BIC	-8520.28	-8517.06	-8516.91	-8521.47	-8518.28	-8517.39
N	3402	3402	3402	3402	3402	3402

Notes: See Table 7.8.

[180] Presidential elections in the United States during the observation period took place in the years 1984, 1989, 1994, and 1999 (each in November).

It is also interesting to simultaneously consider the effects of US and domestic elections. Following Stephan (1994: 47) and Blomberg and Hess (1997: 203), I estimate a more restricted version of the benchmark model in which explanatory variables are included as differentials between the electoral and interest rate variables of the US and the domestic country (variables NET1 to NET6). As displayed in table 7.14, the magnitude of the estimated coefficients for the electoral variables is smaller throughout all specifications. Still, the net electoral variables are highly significant, suggesting that there is a political exchange rate cycle for the panel of Latin American countries even when controlling for the effects of US elections.

Table 7.13. Fixed effects estimation (election variables coded according to difference between domestic and US elections)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
NET1	-0.010***					
NET2		-0.006***				
NET3			-0.005***			
NET4				-0.005***		
NET5					-0.003***	
NET6						-0.002***
drexr (-1)	-0.178***	-0.175***	-0.176***	-0.176***	-0.175***	-0.174***
drexr (-3)	-0.057***	-0.059***	-0.060***	-0.056***	-0.058***	-0.059***
drexr (-4)	-0.031*	-0.033*	-0.034**	-0.032*	-0.032*	-0.033*
drexr (-5)	-0.079***	-0.080***	-0.081***	-0.081***	-0.079***	-0.080***
drexr (-6)	-0.047**	-0.046**	-0.047**	-0.046**	-0.045**	-0.046**
intdiff (-1)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
R^2 within	0.043	0.042	0.041	0.044	0.043	0.042
R^2 between	0.751	0.752	0.752	0.746	0.742	0.746
R^2 overall	0.015	0.014	0.014	0.017	0.016	0.015
AIC	-8547.70	-8545.73	-8543.98	-8554.77	-8550.77	-8547.11
BIC	-8498.67	-8496.70	-8494.95	-8505.74	-8501.73	-8498.07
N	3393	3393	3393	3393	3393	3393

Notes: The variable *intdiff* denotes differential in real interest rates between Latin American country and United States. See also Table 7.8.

7.6.4 Competitiveness of elections

The previous analysis has not attributed any special significance to the nature of the election itself. Following Frey and Schneider (1978), one might argue that whether the economy will be manipulated or not crucially depends on the expected probability of re-election. When re-election is in danger, there should be a higher probability of opportunistic behavior than

in a situation when the government faces a high probability of re-election. To account for the pre-election popularity of the incumbent, analysts typically use approval ratings, e.g. from Gallup surveys (see, e.g., Alesina et al. 1997: 116; Blomberg and Hess 1997: 191). Unfortunately, lack of such data for most developing countries makes this procedure impossible for the present study. As a proxy for missing data, a further specification restricts the episodes to those elections that were followed by a constitutional change. The underlying assumption is that in those elections leading to a change of government, the pre-election government should have had a high interest in manipulating the economy because its re-election had obviously not been certain. Applying this procedure, 22 of the 75 elections were removed from the sample.

As an additional attempt to assess the impact of electoral closeness on the real exchange rate, I took a look at the competitiveness of election results. The idea is as follows: If election results are close, re-election has been a concern for the incumbent and thus there is a high electoral incentive to manipulate the exchange rate in the short-run. The defined margin for a close election is 10 percent. According to this specification, 37 of the 75 elections remained in the sample.

Results for both analyses are displayed in tables 7.14 and 7.15, respectively. Consistent with the expectation, the magnitude of the estimated coefficients increases both when the election leads to a constitutional change and when the election outcome is close. In the case of close elections, the results now seem to suggest a longer political cycle. However, the difference to the benchmark regression is not large. One explanation for the similarity of the results is that even when re-election is certain, the incumbent may have an incentive to generate a wide margin of victory. Another explanation is that when a government is politically unstable and likely to lose the election, it is incapable of distorting the economy. In this case, the currency will not appreciate before the election.

7.6.5 Endogenous election timing

Another possible critique concerns the exogeneity of election dates. Although the assumption of exogenously determined elections is widely adopted in the literature to simplify the empirical analysis (in particular because there are no good instrumental variables for elections), in some countries the election date is not fixed, but may be determined by the incumbent administration. In developing countries in particular, the scheduling of elections does usually not follow a strict, constitutionally established pattern. The possibility to strategically change election dates poses a meth-

odological challenge for empirical tests on PBCs. The difficulty is that in countries with endogenous election dates, the incumbent administration may pursue "political surfing" (Belke 1996: 137), meaning that the election will be timed so that it occurs when the economy is doing well. The rationale for choosing the most advantageous timing for an election rather than attempting to alter the macroeconomy is that it is possibly much easier to manipulate the election day than economic outcomes. In this case, the election date does not determine movements in economic variables, but economic variables affect the election date.

In the present study concern for endogenous election timing is mitigated by two factors: First, a necessary ingredient to the endogenous election timing theory is that political decisionmakers have the power to change the election schedule. In most countries of this sample, however, election dates are fixed and therefore the government has no scope to change the election date. Second, the crucial assumption for the existence of endogenous election timing is not that the timing of elections is endogenous, but that it is predetermined relative to exchange rate movements (Shi and Svensson 2002: 6). Hence, if elections are called earlier than expected due to reasons unrelated to the exchange rate, the identifying assumption is valid.

Therefore, assuming election dates as exogenous is less restrictive than it seems at first glance. Despite the unlikely appearance of endogenous election timing, I address the issue empirically by looking at the constitutionally scheduled election interval (which is four or five years for most presidential elections) and by disregarding all those elections that were called prior to the fixed year. I consider all those elections to be endogenously determined, where elections were called at least one year in advance.[181] Five out of 75 elections are endogenously determined.[182] The results are displayed in table 7.16. Given the low number of endogenously determined elections, it is not surprising to see that the main conclusions remain unchanged. Interestingly, the magnitude of the electoral coefficients increases slightly, providing evidence against the notion that the detection of a political exchange rate cycle is due to endogenous election timing.

[181] Data were collected from the Political Handbook of the World (various issues).

[182] Elections identified as irregularly scheduled are: Dominican Republic 1996:6, Ecuador 1998:6, Paraguay 1989:5, Peru 2001:4, and Venezuela 2000:7.

Table 7.14. Fixed effects estimation (elections with constitutional change included)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
EC1	-0.015***					
EC2		-0.013***				
EC3			-0.010***			
EC4				-0.010***		
EC5					-0.007***	
EC6						-0.005***
drexr (-1)	-0.178***	-0.175***	-0.175***	-0.174***	-0.174***	-0.175***
drexr (-3)	-0.058***	-0.060***	-0.061***	-0.057***	-0.060***	-0.060***
drexr (-4)	-0.032*	-0.034**	-0.034**	-0.032*	-0.033*	-0.034**
drexr (-5)	-0.081***	-0.080***	-0.081***	-0.081***	-0.080***	-0.080***
drexr (-6)	-0.047**	-0.045**	-0.046**	-0.047**	-0.046**	-0.046**
int. rate (-1)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
R^2 within	0.043	0.043	0.042	0.045	0.044	0.043
R^2 between	0.728	0.714	0.723	0.715	0.700	0.674
R^2 overall	0.015	0.016	0.016	0.018	0.017	0.016
AIC	-8577.92	-8584.52	-8582.13	-8590.11	-8589.45	-8585.85
BIC	-8528.87	-8535.47	-8533.07	-8541.05	-8540.39	-8536.79
N	3402	3402	3402	3402	3402	3402

Notes: See Table 7.8.

Table 7.15. Fixed effects estimation (close elections included)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
EC1	-0.014***					
EC2		-0.017***				
EC3			-0.012***			
EC4				-0.009***		
EC5					-0.008***	
EC6						-0.006***
drexr (-1)	-0.179***	-0.176***	-0.177***	-0.176***	-0.176***	-0.177***
drexr (-3)	-0.058***	-0.060***	-0.061***	-0.058***	-0.059***	-0.060***
drexr (-4)	-0.032*	-0.033*	-0.035**	-0.032*	-0.032*	-0.033**
drexr (-5)	-0.080***	-0.078***	-0.080***	-0.080***	-0.078***	-0.079***
drexr (-6)	-0.046**	-0.044**	-0.045**	-0.046**	-0.045**	-0.045**
real int. rate (-1)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
R^2 within	0.042	0.044	0.043	0.043	0.044	0.044
R^2 between	0.743	0.729	0.742	0.729	0.717	0.729
R^2 overall	0.014	0.017	0.015	0.015	0.017	0.016
AIC	-8573.11	-8586.14	-8580.20	-8579.87	-8586.79	-8583.40
BIC	-8524.05	-8537.08	-8531.15	-8530.81	-8537.73	-8534.34
N	3402	3402	3402	3402	3402	3402

Notes: See Table 7.8.

Table 7.16. Fixed effects estimation (exogenously determined elections included)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
EC1	-0.014***					
EC2		-0.013***				
EC3			-0.009***			
EC4				-0.008***		
EC5					-0.006***	
EC6						-0.005***
drexr (-1)	-0.179***	-0.175***	-0.176***	-0.177***	-0.176***	-0.176***
drexr (-3)	-0.058***	-0.061***	-0.061***	-0.058***	-0.060***	-0.060***
drexr (-4)	-0.032*	-0.034**	-0.035**	-0.033*	-0.033*	-0.034*
drexr (-5)	-0.081***	-0.079***	-0.081***	-0.081***	-0.079***	-0.080***
drexr (-6)	-0.047**	-0.045**	-0.047**	-0.046**	-0.045**	-0.046**
int. rate (-1)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
R^2 within	0.044	0.044	0.043	0.045	0.045	0.044
R^2 between	0.737	0.668	0.700	0.733	0.710	0.695
R^2 overall	0.015	0.017	0.015	0.017	0.017	0.017
AIC	-8578.88	-8587.39	-8580.41	-8585.83	-8589.08	-8586.16
BIC	-8529.82	-8538.37	-8531.35	-8536.77	-8540.02	-8537.10
N	3402	3402	3402	3402	3402	3402

Notes: See Table 7.8.

7.7 Summary of chapter 7

Since democracy was established in Latin America in the 1980s, a relevant question in political terms is whether governments use policy instruments to increase their chance of re-election in the same way as is evidenced for developed countries. Since monetary stability has been at the top of the agenda in many election campaigns throughout Latin America, the expectation was to find political cycles in the real exchange rate. In fact, the findings support the hypothesis recently put forward by Ghezzi et al. (2000) and Bonomo and Terra (2001) that real exchange rates systematically appreciate prior to elections and depreciate in the post-election period. Such a political cycle reflects the interests of policymakers to signal anti-inflationary competence during pre-election periods.

My findings also shed some light on determinants of political exchange rate cycles. More specifically, I explored whether the type of exchange rate regime and the degree of central bank independence influenced the strength of the political exchange rate cycle. I looked at whether close elections or elections resulting in a constitutional change displayed a different exchange rate pattern and I controlled for the effects of endogenous elections and the possible distortions of US elections. The two most impor-

tant results from these checks for robustness are that political exchange rate cycles in Latin American countries exist (1) only when the currency floats, and (2) even when one controls for the effects of US elections.

Finally, a few words on the limits of political exchange rate cycles are in order. First of all, it is questionable whether the magnitude of the result is strong enough to considerably increase an incumbent's chance for re-election. Stronger political cycles are probably impeded by both the willingness and the ability of politicians. Concerning the latter, the relatively low R-squared statistics, which I obtained in all specifications, are consistent with predictions by the efficient market hypothesis that information available to the market prior to month t should not help to predict currency movements during the month t. Moreover, other electoral factors (both economic and non-economic) are important determinants of an incumbent's electoral success as well. Thus, it is impossible to derive deterministic predictions to the extent that all elections lead to political cycles in the exchange rate. Accordingly, one should not expect that every election will create the same predictable pattern of policy choices. Under some circumstances, generating a political exchange rate cycle may be more favorable to policymakers than producing a political budget or monetary cycle. In other situations, the exchange rate is not the appropriate tool.

7.A Appendix to chapter 7

Figure A7.1. Log-transformed real exchange rate series of 17 Latin American countries (1995:6=log 100)

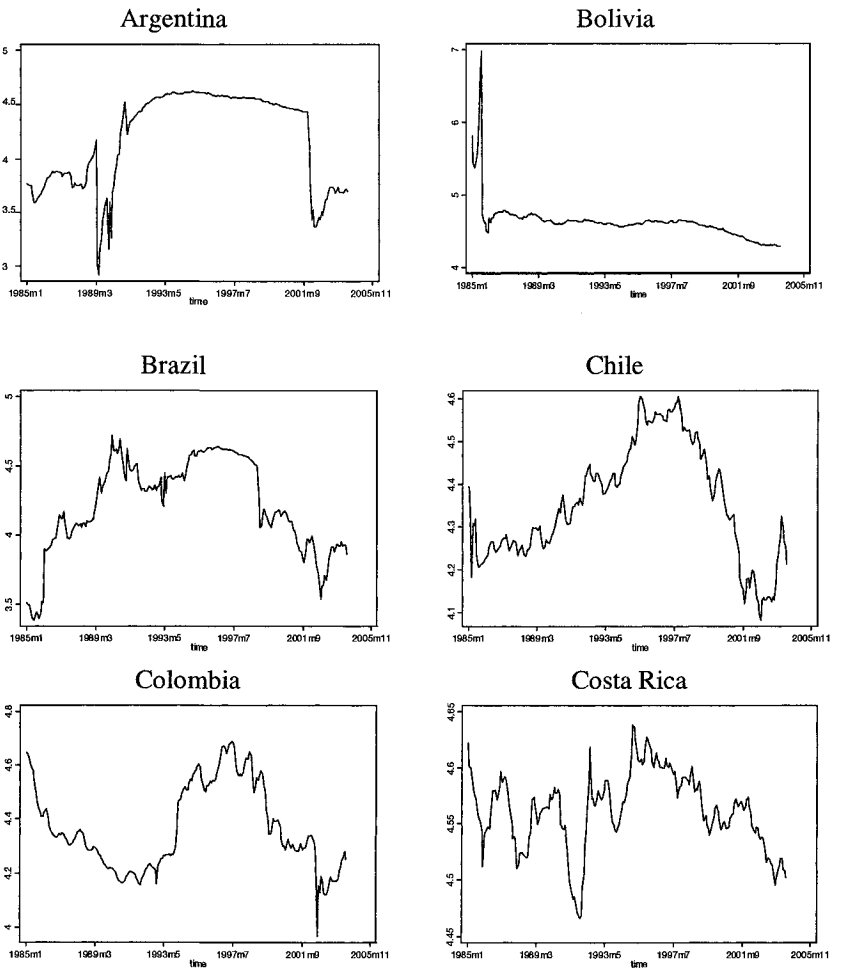

Figure A7.1. (continued)

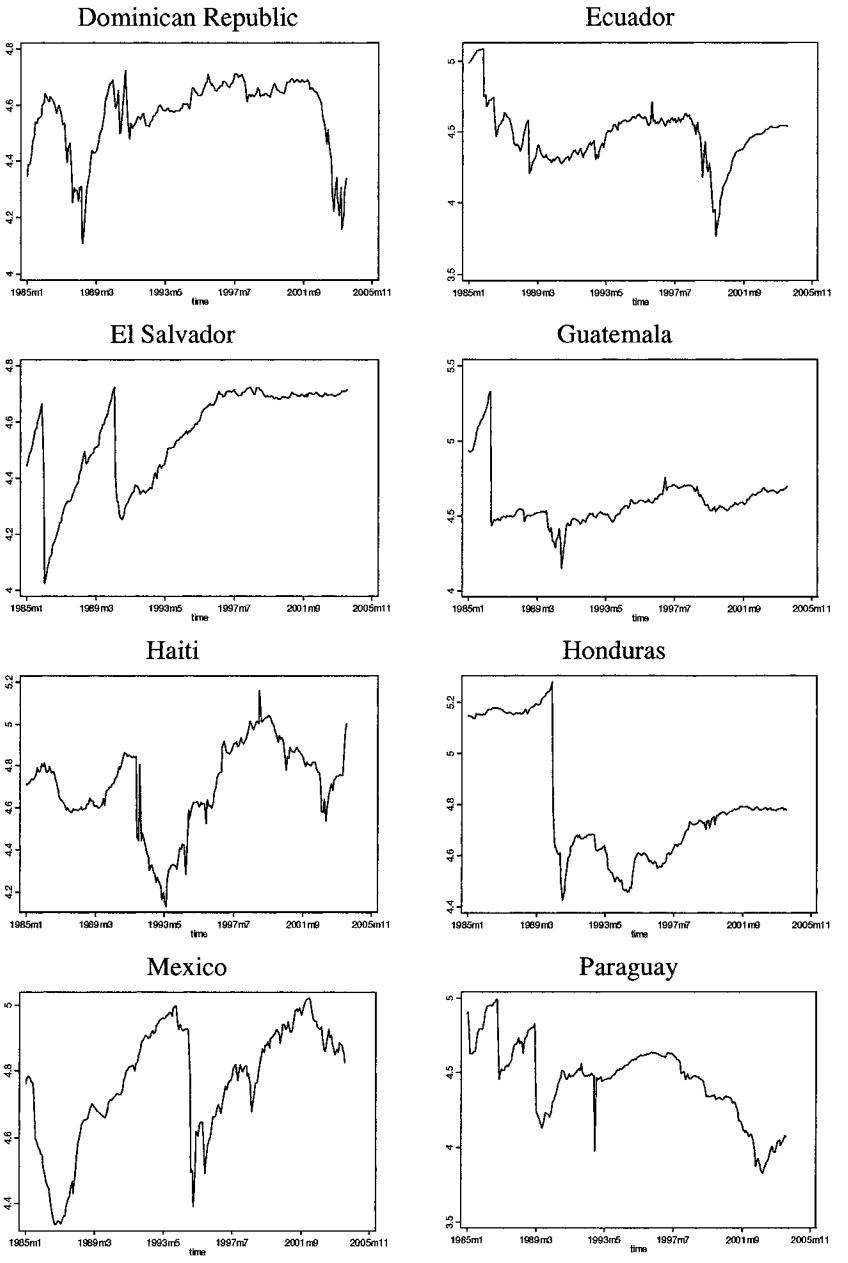

Figure A7.1. (continued)

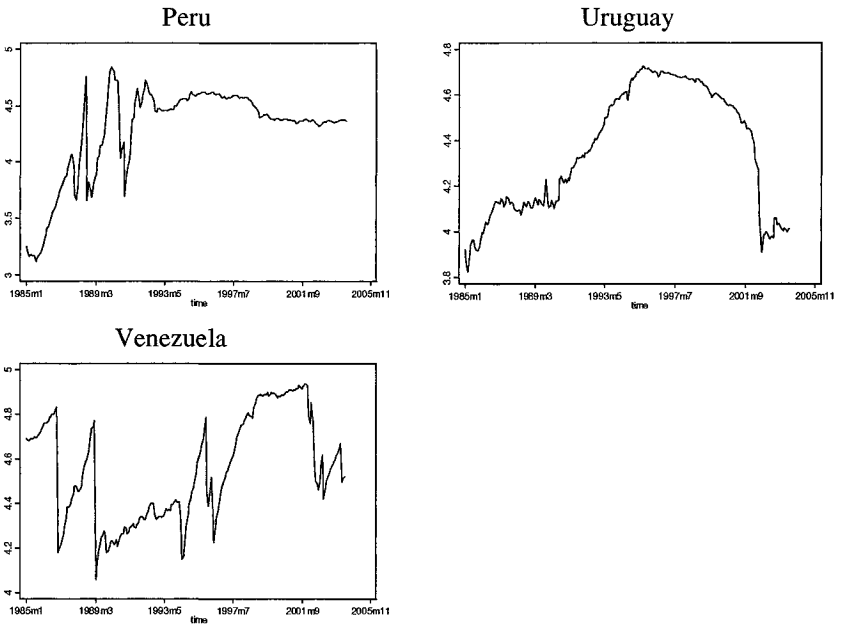

Table A7.1. Election dates (1984-2004)

Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Argentina						3						7				10				4	
Bolivia		8				8				8				6					6		
Brazil		1				12					10				10				10		
Chile						12				12						12					
Colombia			5				5				6				6				5		
Costa Rica			2				2				2				2				2		
Dom. Rep.			5				5				5		6				5				5
Ecuador	1				5				7				7		6				10		
El Salvador	3					3					4					3					3
Guatemala		11					11					11				11				11	
Haiti							12					12					11				11
Honduras		11				11				11				11				11			
Mexico					7						7						7				
Paraguay					2	5				5					5					4	
Peru		4					4					4					4	4			
Uruguay	11					11					11					11					10
Venezuela					12					12					11		7				

Note: The numbers 1 to 12 denote the months from January (1) to December (12) when a presidential election was held. In the case of multiple elections during a year, only the election immediately prior to the installment of a candidate in office is recorded. Elections in 1984 and 2004 are only in the sample to the extent that the resulting coding of electoral variables affects the observation period 1985:1 to 2003:12. Data are from the CDP (2004), the World Bank DPI (Beck et al. 2001).

8 Conclusion and discussion

8.1 Main contributions to the literature

This thesis has considered the issue of exchange rate policymaking from a political economy perspective. By modeling policymakers' preferences as endogenous, it has been shown that different types of actors involved in the policymaking process each have their own exchange rate preferences. Under the assumption that the international price of a currency has major impacts on the domestic economy, it has been argued that exchange rate policy is often made on the basis of largely political goals.

Several contributions to the literature have been made in this thesis: The first contribution is the empirical examination of the question of why governments deviate from an officially announced flexible exchange rate regime and display fear of floating. Many analysts have documented the economic rationale for exchange rate stabilization in developing countries, arguing that the observed excessive exchange rate volatility under freely floating exchange rate regimes is a major concern for countries whose debt is denominated in foreign currency and where there are substantial pass-through effects from exchange rate swings to the inflation rate. However, why governments stabilize the exchange rate via a disguised peg and not by officially introducing a fixed exchange rate regime has remained an open issue. I have argued that political factors may provide an explanation for this inconsistency. The theoretical model provided here is based on the idea that devaluations under fixed exchange rate regimes entail significantly higher costs for policymakers than the same depreciations would in a flexible exchange rate regime. However, the proposition that democratic countries in particular fear the electoral costs associated with exchange rate adjustments has found only weak support. There was much stronger evidence to show that political instability had a significant negative impact on the fear of floating. This indicates that frequent government changes complicate exchange rate stabilization at a reasonable level. This basic result was confirmed when analyzing a government's likelihood to display a fear of pegging.

A second contribution of this study is to provide a comprehensive survey of the empirical literature linking political cycles and institutional aspects to exchange rate policy. The review revealed that much of the literature has emphasized political instability, political uncertainty surrounding election periods in particular. In terms of the empirical methodology, most of this research has been conducted with probit and logit estimations. A severe drawback of these methodologies is that they do not account for an exchange rate regimes' duration dependence property.

Consequently, a third contribution of this dissertation is that it is the first study to analyze the duration of a currency peg by means of a Cox model. The analysis revealed that there are considerable time effects in the duration of currency pegs. However, it is also important to note that it is extremely difficult to judge whether it is really time that matters or whether the ups and downs in the hazard rate are the result of unobserved heterogeneity in the sample due to the omission of unobservable variables. I further found that there are significant differences in the observed behavior of political and institutional variables in periods leading up to floating regimes and periods of high exchange market pressure. In terms of the main explanatory variables, the most important results are as follows:

Applying the PBC perspective, it was hypothesized that the existence of election years should significantly influence the survival of a currency peg. It was found that the risk of abandoning an exchange rate commitment is higher in pre-election as well as, somewhat surprisingly, post-election years than in non-election years. Yet, the vulnerability to speculative attacks is highest in post-election periods. There exists some weaker evidence that political parties compete over exchange rate policy, with left-wing governments bearing a higher probability of abandoning a fixed exchange rate regime and of currency crisis occurrence, especially when compared to parties from the ideological center. Interaction effects are also relevant. Despite their overall preference for more flexible exchange rate arrangements, there are leftist governments that seek to maintain a fixed exchange rate in the period before elections. My preferred explanation is that in election periods left-wing governments seek a binding exchange rate commitment to neutralize their comparative disadvantage in monetary discipline. More structural factors, such as the number of veto players or the degree of central bank independence, are also found to be relevant in both explaining currency peg survival and vulnerability to speculative attacks.

Not all of the eleven hypotheses I set out to test were confirmed by the data. The most striking result is that political instability did not affect the duration of currency pegs as expected. Political instability appears to decrease the probability of exit from a currency peg. This finding, robust to different specifications and definitions, contradicts not only results pre-

sented by other scholars, but also with the fear-of-pegging analysis in chapter 3. Apparently, as suggested by Edwards (1996), political instability contributes to an even greater shortened time horizon for politicians, propelling them to heavily discount long-term benefits of exchange rate adjustments. Another possible explanation is that frequent government changes (my primary measure for political instability) prevent interest groups from having a sustainable impact on policymakers. Interestingly enough, the results were more intuitive when I disregarded orderly exits from pegged exchange rates and concentrated on episodes of high exchange market pressure. In these cases, political instability caused economic instability. As such, frequent government changes were associated with higher vulnerability to currency crises, as was expected.

In general, institutional and interest group variables displayed a less systematic impact on the probability of a speculative attack. One exception is the degree of central bank independence. This should not come as a surprise given the close interaction between monetary and exchange rate policy. The findings suggest that even though politically independent central banks have an interest in flexible exchange rates, they are less vulnerable to sudden capital outflows. From a political-economic point of view, this result is compelling. Under a fixed exchange rate, monetary policy tools are powerless to affect the economy's money supply or its output. Thus, independent central banks should have their own interest to abandon a currency peg in order to increase their discretionary leeway. However, the higher transparency and accountability under independent central banks increases the probability that the authorities may undertake this shift without being forced to by the market.

In sum, these political and institutional differences may help to explain why some countries have maintained fixed exchange rates and others have not. In particular, the analysis might provide an explanation to why economically comparable countries choose different exchange rate regimes.

A final contribution of this study is a detailed analysis of how policymakers' exchange rate preferences change during election periods. To the extent that depreciations impose political costs, elections affect the authorities' incentives regarding the timing of exchange rate adjustments. Devaluations in the pre-election period are unpopular for policymakers because the associated short-run costs endanger re-election. By contrast, in the post-election period the long-run benefits of devaluations are more heavily weighted. Accordingly, devaluations are postponed from pre-election to post-election periods. I also found that opportunism intensifies if there is a flexible exchange rate system (that is, if adjustments of the real exchange rate can take place by nominal exchange rate changes). The political exchange rate cycle is also somewhat stronger for countries with politically

dependent central banks. In my view, this accentuates the higher predictability and transparency of the political decisionmaking process in countries with independent central banks.

8.2 Discussion of findings and open issues

In sum, all of these findings imply that political and institutional factors add to economic variables to explain exchange rate policies. The causes of exchange rate regime discrepancies, the duration of currency pegs, the vulnerability to speculative attacks, and the explanation of exchange rate movements in election years are not purely theoretical issues, but depend on electoral, partisan, institutional, and interest group incentives. Political uncertainty provides the most important impetus for such changes in exchange rate policy. In fact, if I had to single out one political-economic variable that most affects exchange rate policies, it would be the date of the election. Thus, one can conclude that the concentration on the occurrence of elections as the sole measurement for political risk is largely supported by the data. Nonetheless, political institutions can mediate these effects, although my results suggest a less systematic impact of these variables.

It is important to note that the statements derived from the empirical analyses are by no means normative. It has not been claimed here that the sustainability of a currency peg is economically reasonable per se, nor do the statements about veto players imply that an average number of veto players is always preferable to a system with more checks and balances. I have not made any predictions regarding broader macroeconomic implications of partisan differences either. An interesting question resulting from the empirical findings is whether the asserted lower vulnerability of right-wing governments to speculative attacks leads to improved economic performance. A related question is whether the political manipulation of exchange rates in election periods has any consequences in terms of macroeconomic results and electoral gain.

Thus, it is necessary to integrate the political influence on exchange rates in broader macroeconomic policy. This issue is important because the interplay between macroeconomic policy and exchange rates is reciprocal. Exchange rates affect macroeconomic policy, but macroeconomic policy also affects exchange rates. Monetary factors are linked to the exchange rate through interest rates. Fiscal policy influences the savings-investment balance and thus the demand for foreign capital. Hence, some of the arguments presented in chapter 5 could refer to fiscal policy in the first place. For example, a straightforward way of arguing this would be that the fiscal

stance is decisive for explaining the duration of a currency peg and that political and institutional factors explain the sustainability of expansive fiscal policies. In the empirical analysis, this effect has been attenuated by the inclusion of controls; yet, further research is certainly necessary in this field.

Two other questions are also left for future research: First, the analysis could be extended to provide more valuable results if additional data information could be employed. For several potential determinants, only relatively crude measures were available. The need for better measures is particularly important for the interest group variables, but would make sense for other political variables (such as the role of partisanship) as well. The fact that these variables nevertheless turned out to be significant in many specifications is particularly interesting and requires further investigation.

Last but not least, another extension to the current analysis would be to distinguish between different types of fixed exchange rate regimes. The taxonomy of exchange rates includes irrevocably fixed regimes such as currency unions, dollarization/euroization, and currency boards, but also comprises adjustable pegs in which the exchange rate is set by the authority but is allowed to change in the event of fundamental misalignments. The justification for including all fixed regimes in a single category rests on the premise that regardless of the hardness of the fix, fixed regimes in developing countries always reflect some concern for macroeconomic stability. Moreover, even hard pegs are not as "irrevocably fixed" as often claimed. The exit from dollarization in Liberia in 1982, the dissolution of the currency union between the Czech Republic and Slovakia in 1993, and the abandonment of the Argentinean currency board in 2002 show that even these regimes may be subject to exchange rate adjustments. Still, interesting conclusions could be drawn from a more subtle classification of exchange rate regimes.

These considerations show that further empirical and theoretical work is necessary to explain why some of the observed effects are present. Yet, I hope to have provided a useful extension of the literature on the political economy of exchange rates with this thesis.

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