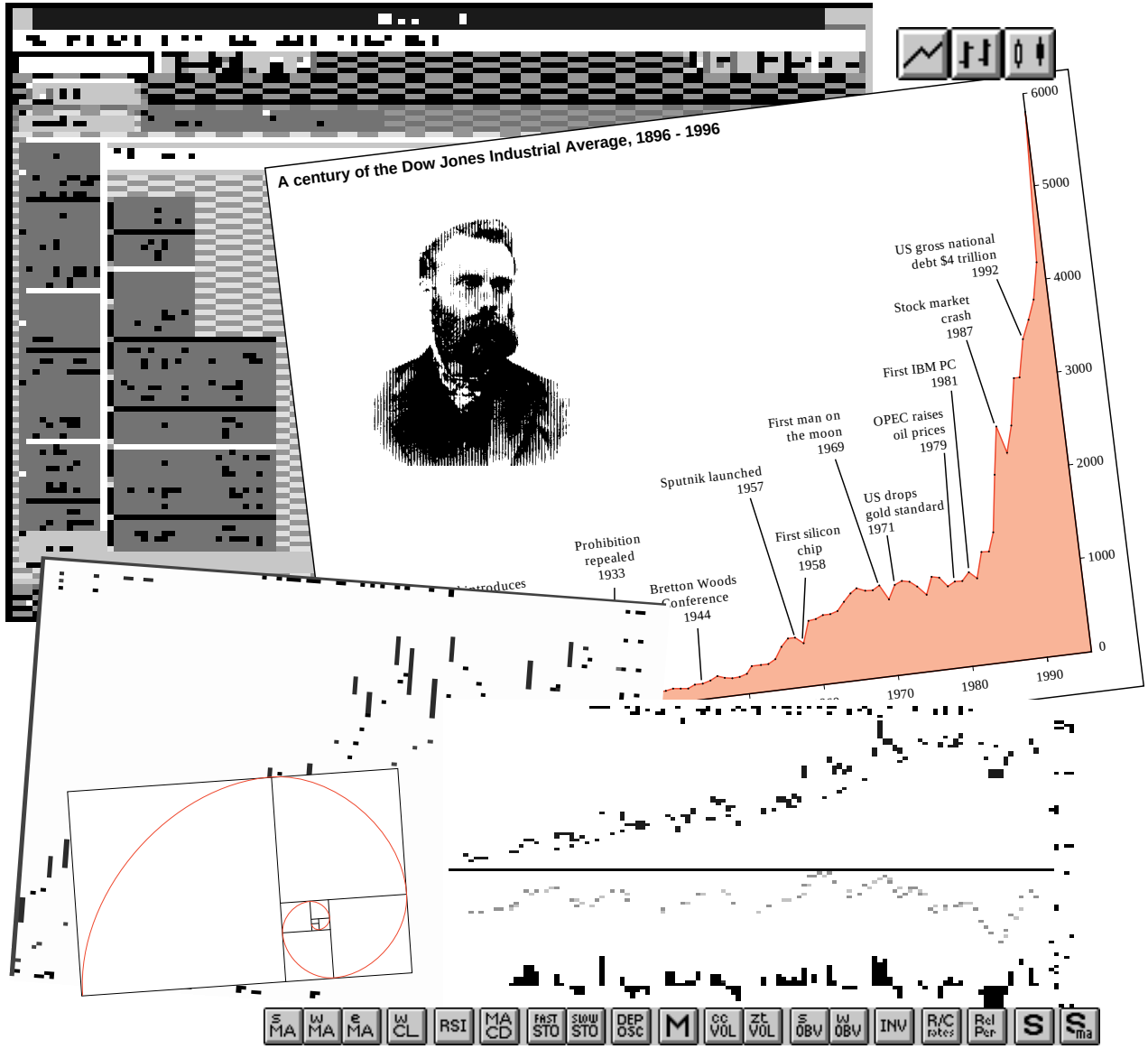

Technical Analysis

An introduction

Workbook

UKI Training

OPEN LEARNING

Technical Analysis

An introduction

Workbook

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Project sponsored by Amanda Rogers, *Reuters European*

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Annette James, *Reuters UKI Training*
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Richard Lyons, *Reuters European*
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Andrea Tinker, *Reuters International*

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Thanks are also due to *Dow-Jones Telerate*, *Wall Street Journal Europe* for supplying and giving permission to use the photograph of Charles Dow

Version 1.0
December 1996

OPEN LEARNING

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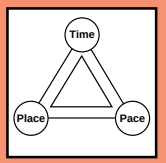


What is this package and who is it for?

In order to provide an effective quality service you need to understand the markets in which your customers operate. This workbook is an open learning package designed to give you a basic understanding of technical analysis. The workbook has also been designed to cater for the needs of a number of different groups.

Technical analysis has become one of the key techniques available to Reuters customers with the introduction of the 3000 series of products and the access they provide to historical price data. Whether you are in sales, customer support, or client training, if you are involved in selling or supporting 3000 products, this workbook is for you.

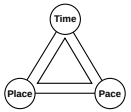
It will take you through technical analysis from first principles, from creating your first chart with pencil and paper, to using sophisticated analysis tools and techniques. By the time you have completed this workbook you will be able to use most of the main market techniques and understand when they should be applied.

You may find it useful to have access to the 3000 products and Reuters Graphics to do the exercises in the workbook. Going through the exercises will help you to become familiar with the software, as well as learning the analysis techniques.

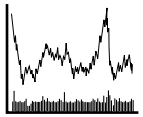
You may also find the workbook useful as Technical Analysis is one of the subjects which forms part of the examination syllabus leading to either Fellowship or Associateship of the ACI Institute.

What does this workbook contain?

This workbook contains the following sections each of which are indicated by the following icons:



Before you start
This section!



Introduction
This summarises the development of technical analysis and the Dow Theory.

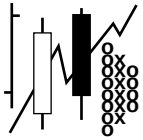
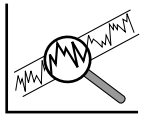
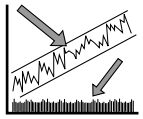


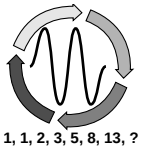
Chart types
This section deals with the main ways in which prices and financial data can be plotted on a chart together with the uses for each chart type.



Patterns
Should I buy or sell? Charting techniques often give rise to patterns which can be used to help you decide.

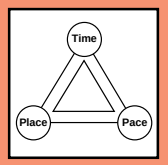


Indicators
Can you predict future market trends? This section describes the various types of indicators available.



Waves, numbers and cycles
Markets follow cycles and patterns of buying and selling move in waves... or do they? Perhaps the markets are governed by mathematical laws or are they ruled by chaos?

A day in the life of a technical analyst
This is what it is really like!



Before you start

Throughout the workbook you will find that important terms or concepts are shown in bold, for example, **Dow Theory**. You will also find that at certain points activities are included which are designed to enhance your learning. The various activities use the following icons:

This means stop and think about the point being made. You may want to jot a few words in the box provided – it doesn't matter if you don't.

This indicates an activity for you to do. It is usually something written – for example, a definition, notes, a calculation.

This is the answer or response to an activity and it usually follows the activity or is close to it.

This indicates that you should use **Reuters 3000** and follow the instructions. A screen dump of what you should see is included as well. **It is important to understand that the activities here assume you have a basic understanding of the product functionality.**

This indicates that you should use **Reuters Graphics** and follow the instructions. A screen dump of what you should see is included as well. **It is important to understand that the activities here assume you have a basic understanding of the product functionality.**

At the end of most sections there is a **Quick question quiz**, with answers, so you can test yourself on your knowledge and understanding. All sections have an **Overview** which is a graphical revision aid for the learning materials covered. There may be other resources you will need access to which are not supplied in the package. These materials are listed in the **Further resources** section. It is worth checking the availability of these resources before you start your study.

How to use the package

Before you start using the package you should discuss with your line manager how he/she will help by giving time for study and giving you feedback and support. Although your learning style is unique to you, you will find that your learning is much more effective if you allocate reasonable sized periods of time for study. The most effective learning period is about 30 minutes – so use this as a basis. If you try to fit your learning into odd moments in a busy schedule you will not get the best from the materials or yourself. You might like to schedule learning periods into your day just as you would business meetings.

Being a successful open learner means more than just reading. Open learning is interactive – it is designed to enhance your learning by getting you to be active. There is an old Chinese saying which may help:

I hear and I forget
I see and I remember
I do and I understand

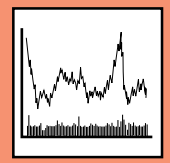
The various types of activities and their icons have already been mentioned – even thinking is an activity.

Try to make sure your study is uninterrupted. This probably means that your workplace is not a good environment! You will need to find both the time and place where you can study – you may have access to a quiet room at work, you may have a room at home, you may need to use a library.

It's important to remember that learning is not a race – everyone learns at their own rate. Some people find things easy, some not quite so easy. So don't rush your learning – make sure you get the most from the package.

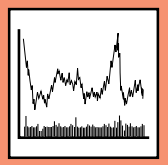
Remember it's your learning – so it's over to you...

Introduction



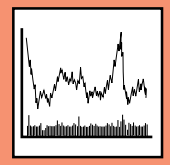
Contents

This section of the module should take no more than 60 minutes of study time. You may not take as long as this or it may take a little longer – remember your learning is individual to you.



‘He was an experienced newspaper reporter, with an early training under Samuel Bowles, the great editor of the Springfield Republican. Dow was a New Englander, intelligent, self-repressed, ultra-conservative, and he knew his business... Knowing and liking Dow, with whom I worked in the last years of his life, I was often, with many of his friends, exasperated by his conservatism... In the language of the prize ring, he pulled his punches.’

How Good is the Dow Theory? Part 1 by Bill Dunbar
Technical Analysis of Stocks and Commodities , Vol. 3:2 (59-63), 1985



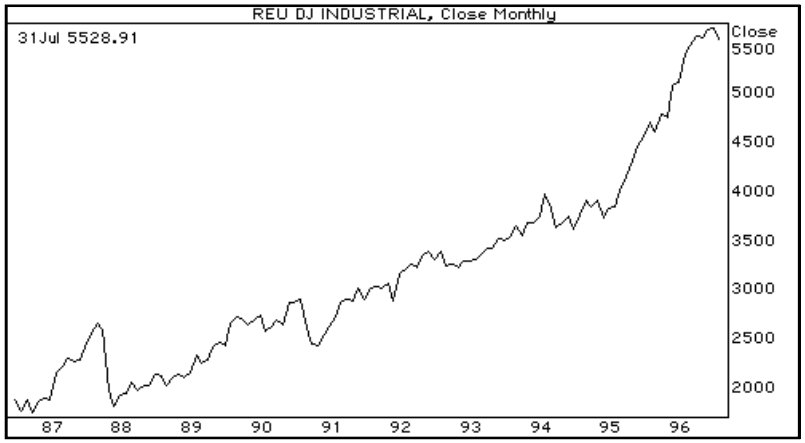
Introduction

From the early days of shares being bought and sold and trading in commodities such as rice, traders and investors have noted trends and patterns in prices over time. Modern markets abound in sayings such as:

The trend is your friend

Go with the trend

But what do these mean? Charts such as the one shown below of the Dow Jones Industrial Index over the last ten years can be seen in financial publications such as the *Financial Times* and *The Wall Street Journal* and on electronic data systems such as the RT.



You may have asked yourself questions such as:

- Where did these sayings originate?
- Are these sayings true and what use are they?
- Who uses these charts?
- What do these charts indicate?

Most investors, individual and institutional, traders, brokers, dealers etc are seeking the best return on their investments or best profit on their deals. It is therefore obvious that any methods these market players can use to reduce the risk of losing their money and improve their chances of rewards will be welcomed. But is it possible to forecast when it is a good time to buy or sell shares, trade futures contracts etc?

Charts and analytical techniques are used to forecast prices and influence trading strategies in all financial markets. Some of the more familiar chart uses involve the following:

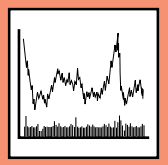
- Whole stock markets
- Stock market sectors
- Individual shares
- Currencies
- Interest rates
- Commodities – agriculturals, metals, energy and softs
- Futures

There are two basic types of market analysis available to guide market players, each having its own experts:

- **Fundamental analysis**

- **Technical analysis or charting**

In practice investors and traders will probably practice and/or use tools and techniques from both types of analysis.



Fundamental analysis

Fundamental analysis may be defined as follows:

> A method of forecasting based on basic economic, political and environmental factors.

In essence the fundamental analyst forecasts prices concerned with supply and demand, based on factors such as historical price data, weather conditions and government policy. If there is a decrease in supply but the level of demand remains the same, then there will be an increase in market prices. An increase in supply produces the opposite effect.

Fundamental analysts study company prospects, commodities and financial instruments in order to forecast where the market prices **ought** to be. One of the important tools used in fundamental analysis is statistics.

Technical analysis

Technical analysis may be defined as follows:

> A method of predicting price movements and future market trends by studying charts of past market action which take into account price of instruments, volumes of trading and, where applicable, open interest in the instruments.

Technical analysis, or Chartism, is concerned with what has **actually** happened in the market, rather than what should happen. Technical analysis uses charts as its primary focus which are derived from the actions of people – the market players. The charts are not derived from the results of economical, political and environmental analysis.

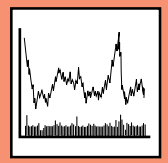
Technical analysis is therefore very much a subjective 'art' or skill and even experienced chartists can disagree on the interpretation of a chart. So why is Technical analysis so important in the market places?

The underlying principles of Technical analysis

Technical analysis is based on three underlying principles:

1. Market action discounts everything	This means that the actual price is a reflection of everything that is known to the market that could affect it, for example, supply and demand, political factors and market sentiment. The pure chartist is only concerned with price movements not with the reasons for any changes.
2. Patterns exist	Chartism is used to identify patterns of market behaviour which have long been recognised as significant. For many given patterns there is a high probability that they will produce the expected results. Also there are recognised patterns which repeat themselves on a consistent basis.
3. History repeats itself	Chart patterns have been recognised and categorised for over 100 years and the manner in which many patterns are repeated leads to the conclusion that human psychology changes little with time.

If all the above principles were valid, then Technical analysis would be closer to a science than an art. The reality is that history does not always repeat itself exactly and patterns do not always occur exactly as before. The result is that Technical analysis is a subjective skill with the interpretation of charts and market behaviour forecasting dependent on the skills of individual chartists. The future cannot be predicted necessarily, with certainty, from past events. Technical analysts consider the probability that a given situation will produce a given result – in some cases this probability is very high.



Technical v Fundamental analyses

The following chart broadly summarises the differences between the two types of analysis:

Fundamental analysis	Technical analysis
❑ Focuses on what **ought** to happen in a market ❑ Factors involved in price analysis include: • Supply and demand • Seasonal cycles • Weather • Government policy	❑ Focuses on what **actually** happens in a market ❑ Charts are based on market action involving: • Price • Volume – all markets • Open interest – futures only ❑ Seasonality in commodities

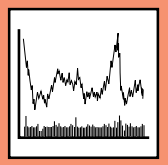
In practice many market players use Technical analysis in conjunction with Fundamental analysis to determine their trading strategy. One major advantage of Technical analysis is that experienced chartists can follow many markets and market instruments whereas the fundamental analyst needs to know a particular market intimately.

Technical analysis for different markets

The first known recording of prices and their subsequent analysis is attributed to **Munehisa Honma**, the inventor of Japanese candlesticks, in the early 1700s. However, most analysts consider the charting principles pioneered by **Charles H. Dow** in the 1880s as the birth of modern Technical analysis. Dow was a member of the New York Stock Exchange and applied his techniques to the US stock market. He was the same man who subsequently established the Dow Jones news service and *The Wall Street Journal*.

Charting techniques are now applied to a wide range of shares, stock indices, interest rates, foreign exchange and derivatives contracts for commodities. Although the basic techniques are the same in all markets there are some important differences between two of the more important markets dealing with shares and commodity futures. These differences are summarised in the table below:

Factor	Shares	Commodity futures
Instrument life span	Share prices have unlimited time spans - provided the company stays in business! If investors miss buy or sell signals then there may well be other trading opportunities in the long term.	Most commodities futures contracts are short term with 3 month expiry dates. This means any charting can only be for a short term. Some charts are produced for hourly price changes. However, using continuation charts, produced by joining/splicing data for consecutive periods, means that the contracts can be charted over a longer period than each individual contract's life.
Pricing structure	Within the same stock exchange share prices are quoted in the same units.	The variation for commodity futures contracts units and amounts is considerable.
Margin payments	Buying or selling shares is usually transacted at the full price. There is no system of margin payments. However, shareholders are usually entitled to any dividends which may be paid on their shares.	Futures contracts are usually traded on margin – typically 10% of the contract value is paid as initial margin. Subsequently contracts are marked to market at the end of each day's trading and variation margin is credited to/debited from the trader's account. Small price movements in either direction can make or lose large sums very quickly.



The strengths and weaknesses of technical analysis

The following chart broadly summarises the strengths and weaknesses of technical analysis.

Strengths	Weaknesses
❑ Chartism can be used to follow a wide range of instruments in almost any market place	❑ Because charting is subjective to a degree and charts are open to individual interpretation, there is a danger that makers of charting predictions can become emotionally attached to the advice they offer
❑ Charts can be used to analyse data for time periods ranging from hours to a century – the Dow Jones Industrial Index has been in constant use since May 26th 1896	❑ It is not necessarily a valid assumption that the past can always be used to predict future events
❑ There are many charting tools and techniques available which have been developed to cater for the needs of different market sectors	❑ Charting is concerned with the degree of probability that an event will happen – not the certainty of the event
❑ The basic principles of charting are easy to understand and have been developed from the way markets operate – charting is concerned with what is actually happening in markets	❑ Some modern charting techniques require complex mathematical calculations and are not easy to understand or use – this weakness is being overcome with the increasing availability and use of sophisticated computer applications
	❑ It is vital for the success of charting that the information used is both accurate and timely

Whatever the weaknesses, charting is now firmly established as an investment tool and is practised and used by a growing number of market players for many reasons including:

- ❑ An increased market awareness of the success of Technical analysis techniques
- ❑ The ever increasing power, falling costs and availability of personal computers and sophisticated charting software

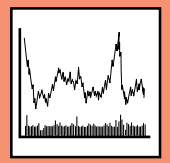
Trading theories, market players and analysis

There is a vast amount of data and a wide range of analytical techniques now available to help market players choose what instruments to invest in and when to do so. How individuals select their trading theory or strategy depends much on the market in which individual market players operate. A few years ago a futures trader, Grant D. Noble, suggested that there were three theories of trading which highlighted different market players and their use of technical and fundamental analysis. Although some of the terms used for each theory may be unfamiliar now, by the time you finish this workbook you will have covered most of them. If you compare the contents of the workbook with this practitioners view you will see there is little difference – just the way the techniques are combined.

Theory A – Market equilibrium

- ❑ **Indicators** – Oscillators, eg, Relative Strength Index (RSI)
- ❑ **Number theory** – Fibonacci numbers, Gann numbers
- ❑ **Waves** – Elliott Wave Theory
- ❑ **Gaps** – High / Low, Open / Closing

Favoured by experts



Theory B – Classical charting

- ❑ **Trends** – following Moving averages etc
- ❑ **Chart formations** – Triangles, Head & Shoulders etc
- ❑ **Trend lines** – Channels
- ❑ **Cycles**

Favoured by public advisors

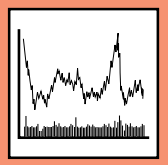
Theory C – Supply and demand fundamentals

- ❑ **Spreads** – Months, Exchanges, Cash / futures
- ❑ **Flow of funds** – Volume and open interest
- ❑ **Seasonals** – Weather, economy
- ❑ **Reports** – Expectations versus reality

Favoured by floor traders

Whichever type of market player you are interested in will influence the way you use this workbook. However, all the factors involved in the above theories have either been mentioned already or are discussed later.

Having had a look at the various theories in the previous section, before moving on, it may be useful to note here if there are any charting techniques and their application to a market sector that particularly interest you. For example, if you are interested in buying and selling shares which techniques would you like to know more about?



Producing a chart

This workbook has been designed to give you the basic knowledge and understanding of the principles and techniques used in charting and the Reuters products associated with charting. This knowledge and understanding will help you identify, meet and support the needs of your customers.

However, before moving on to learn about the more detailed aspects of charting try the following activity ...

Producing a chart: Exercise 1

The data opposite shows the closing prices for Reuters shares over a 50 day period in early 1996.

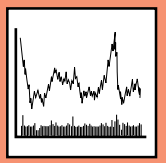
All you need to do on the graph paper on the opposite page is mark the closing price on the vertical axis for each day. Use a pencil to mark each price with a cross or dot – any mistakes can easily be erased. Then join your marks to produce your chart – you may find using a colour helps.

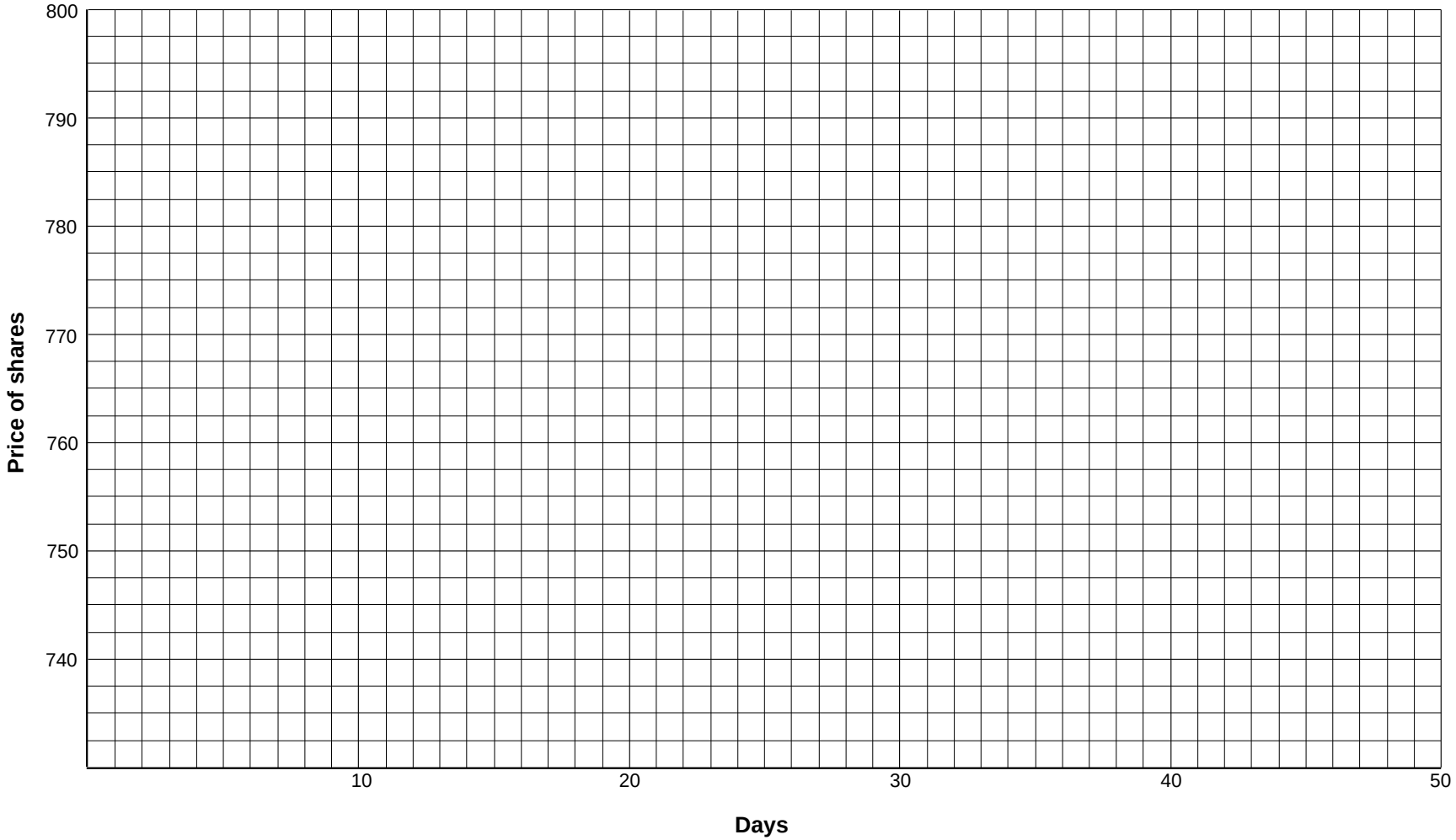
Although many computer graphing or charting programmes will produce the same results, by carrying out this exercise you will see how straightforward charting can be at a basic level. You will produce the simplest form of chart which connects consecutive closing prices for an instrument – it is called a line chart.

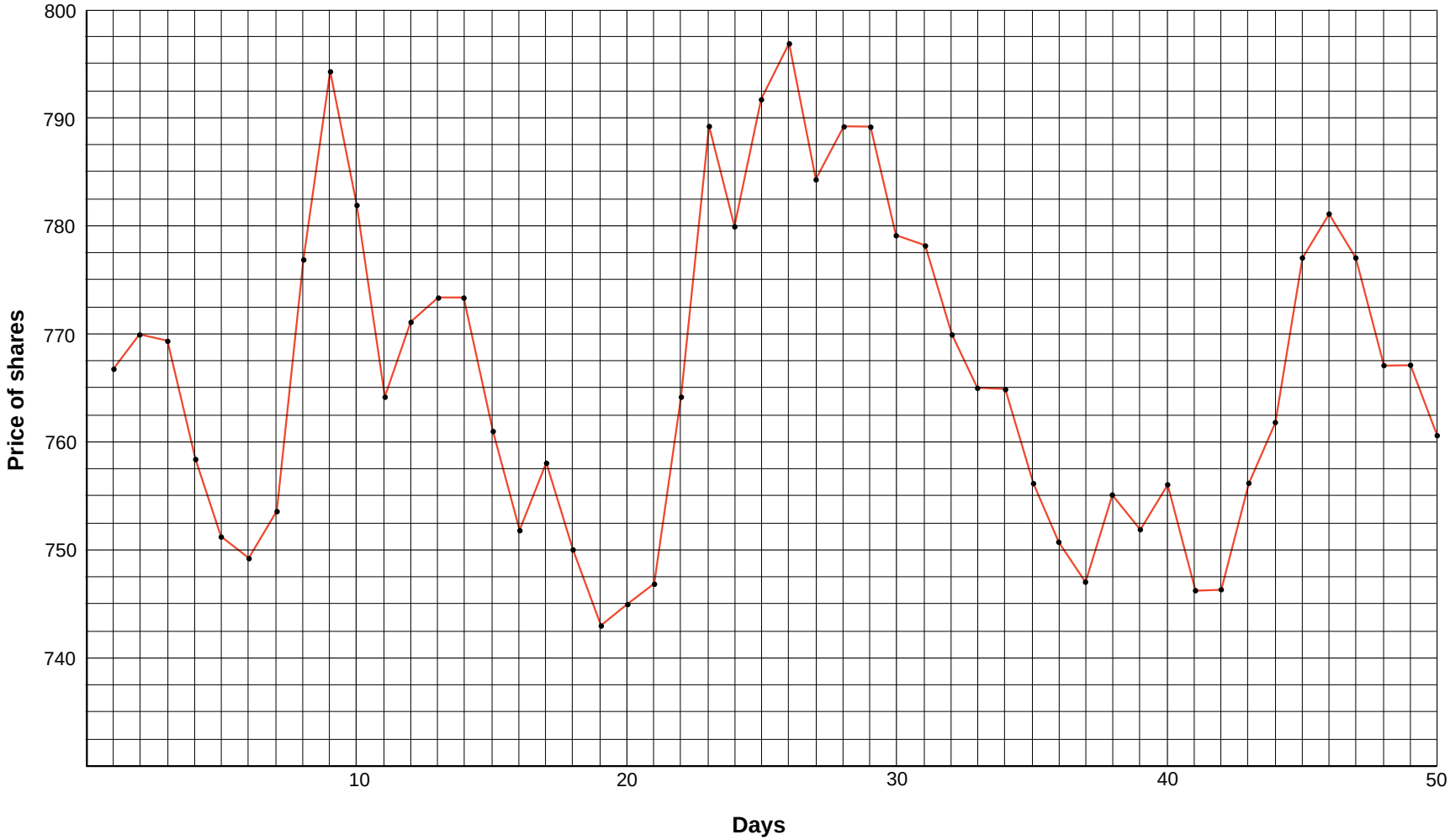
Once you have drawn your chart have a close look and see if you can see any 'patterns'. If there are, then indicate them on your chart.

The chart of what you should see is shown on page 14.

Day	Price	Day	Price
1	766.5	26	797
2	770	27	784
3	769	28	789
4	758	29	789
5	751	30	779
6	749	31	778
7	753.5	32	770
8	777	33	765
9	794	34	765
10	782	35	756
11	764	36	750.5
12	771	37	747
13	773	38	755
14	773	39	751.5
15	761	40	756
16	752	41	746
17	758	42	746
18	750	43	756
19	743	44	762
20	745	45	777
21	747	46	781
22	764	47	777
23	789	48	767
24	780	49	767
25	792	50	760.5




800
790
780
770
760
750
740
Price of shares
10
20
30
40
50
Days


800
790
780
770
760
750
740
Price of shares
10
20
30
40
50
Days

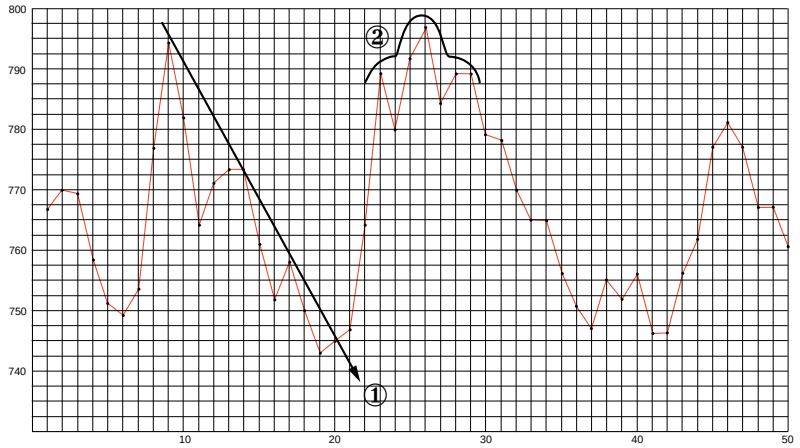
Producing a chart: Exercise 1
You should have produced a chart similar to that shown on the previous page.

Having drawn the chart, which should not have been all that difficult, you may have seen the patterns indicated here:

① A pattern showing a downward trend in the prices from day 10 to 19

② The pattern between day 22 and 30 resembles a head and shoulders of a person

Looking at this chart if an investor had bought shares about day 21 at 747 and sold them about day 31 at 770 then his or her profit, excluding any brokerage, would have been 23p per share.



You have now produced your first chart! The exercise should not have been that demanding and from your results you can probably appreciate the practical use charting can be put to in a very simple way. However, market players will be basing their trading strategies on a little more than a line chart over 50 days for any particular share!

The development of technical analysis

Charles Henry Dow

The origins of modern technical analysis or charting can be traced back to the work and theories of Charles Henry Dow (1851 – 1902). As a young man Dow arrived in New York, in 1879, to be a reporter for a financial news service. By 1882 he and Edward D. Jones had founded *Dow Jones and Company* and were delivering their own news items to Wall Street financial houses.

By studying the closing prices of shares Dow concluded that it was possible to produce a market 'barometer' or **stock index** which could be used by investors to measure the **overall** performance of the stock market. In July 1884 Dow produced his first market measure calculated from the average of eleven stocks. This was called the **Railroad Index** because nine of the stocks were railroad companies. This first stock index was published, intermittently, in his company's *Customer's Afternoon Letter* which was the forerunner of *The Wall Street Journal* first published in 1889.

Along with his financial publishing interests Dow was also a member of the New York Stock Exchange between 1885 and 1891. Dow continued to study the market data and by 1896 he had decided that his original index presented only a partial picture of the economy. Dow had concluded that two separate measures of the economy would provide confirmation of any broad market trend. So he introduced the **Industrial Index** which was the average closing price of 12 stocks of, what were then considered to be highly speculative, industrial companies.

The Dow Jones Industrial Average was first published on May 26th 1896 in *The Wall Street Journal*. Along with the Railroad index, now known as the Transportation Average, these indices have been published in every issue of *The Wall Street Journal* ever since.

The original 12 companies in the Industrial Index were expanded to 30 in 1928 and remain at this number today. Only one company remains in the average under its original name – the General Electric Company. The composition of the companies used to calculate the average changes from time-to-time in order to reflect changes in the economy and maintain its broad market representation.

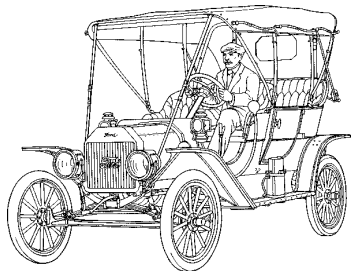
The first day average close was 40.94 which was almost repeated again in 1932 during the depths of the US Depression. It took until 1972 for the index to reach 1000 but only a few years to rise from 4000 to over 5500 – its current level in 1996. The present day value is some 140 times its original value but the Dow Jones Industrial Average is still seen as a popular barometer of the US stock market.

The chart opposite shows the fortunes of the Dow Jones Industrial Average over the past 100 years together with some important historical events.

The original Dow 12

American Cotton Oil
American Sugar Refining Co.
American Tobacco
Chicago Gas
Distilling & Cattle Feeding Co.
General Electric Co.
Laclede Gas Light Co.
National Lead
North American Co.
Tennessee Coal, Iron & Railroad Co.
US Leather
US Rubber Co.

A century of the Dow Jones Industrial Average, 1896 - 1996



Klondyke gold rush 1896

Ford introduces the Model T 1908

The 'Great Crash' 1929

Prohibition repealed 1933

Bretton Woods Conference 1944

Sputnik launched 1957

First silicon chip 1958

First man on the moon 1969

US drops gold standard 1971

OPEC raises oil prices 1979

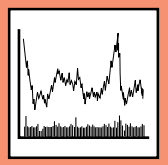
First IBM PC 1981

Stock market crash 1987

US gross national debt $4 trillion 1992

6000
5000
4000
3000
2000
1000
0

1896 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990



Introduction

As has already been mentioned Dow was a member of the New York Stock Exchange and in his continuing studies of the markets he formulated what is now known as **Dow Theory**.

Dow never wrote a book about his theories but he published them as a series of *The Wall Street Journal* editorials around the turn of the century. These editorials were collected together and reprinted in 1903, a short time after Dow's death in December 1902.

Dow had noted that a simple line plot of index price against time gave rise to zig-zag patterns which had certain characteristics depending on market **trends**. It is these basic patterns which chartists still use today, albeit with many refinements.

Dow formulated six basic principles from his study of the markets which are summarised as follows:

1. **Average prices discount everything**

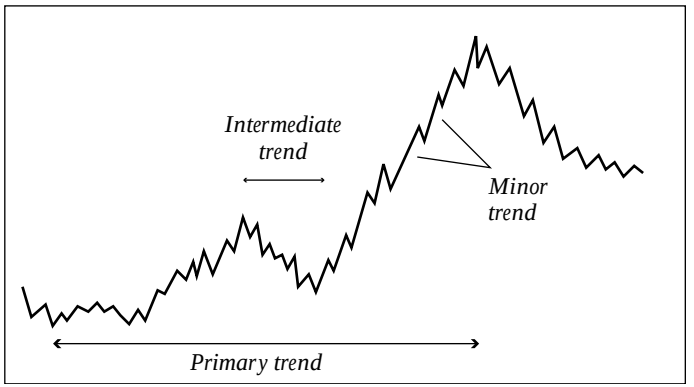
   Dow used **closing prices** exclusively to calculate his averages. He also assumed that the prices discounted everything – still an underlying assumption of Technical analysis.

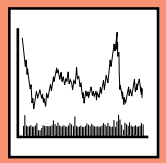
2. **The market moves in trends**

   Uptrends have a pattern of rising peaks and troughs – the opposite for downtrends.

Dow identified three distinct types of trend:

- **Primary** or **major**. These lasted a year or more and could be considered to be like a **tide**.
- **Secondary** or **intermediate**. These were like **waves** and lasted 3 weeks to 3 months.
- **Minor**. These were like **ripples** and lasted for less than 3 weeks.





3. Major trends have three phases

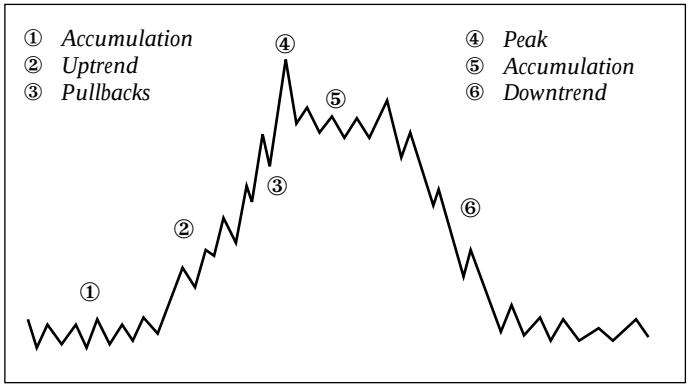
Phase 1
This is an **accumulation** phase which moves sideways and where astute investors are buying on an informed analytical basis.

Phase 2
This is an **uptrend** period where more investors begin to participate based on analysis and business news. Although the trend is up, the market prices zig-zag during **corrections** or **pullbacks**.

Phase 3
After a market price **peak** there is another accumulation period during which there is increased investor activity as the market news becomes more widely available.

The end of Phase 3 is marked by a downtrend and a return to a period of accumulation.

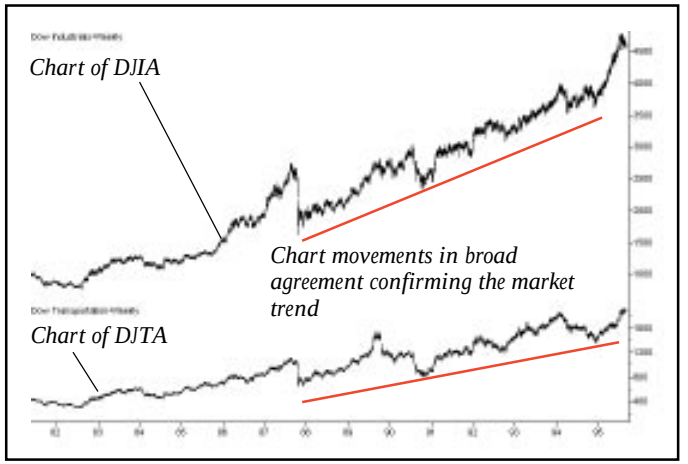
*Ralph Nelson Elliott developed the Dow Theory further in the 1920s to provide an overall perspective of market movement expounded as **Elliott Wave Theory** – this is described later in Section 5.*

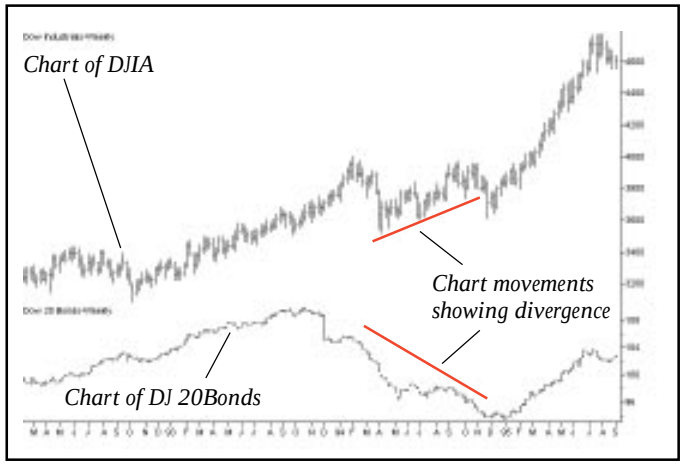


4. Averages must confirm each other

Dow was convinced that both the Industrial and the Railroad indices had to be moving in the same direction to confirm a market trend.

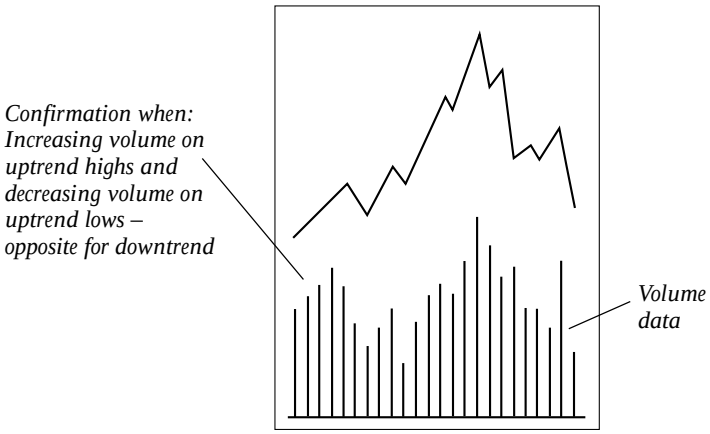
These charts show modern Dow Jones average indicies – the upper charts show confirmation whereas in the lower charts the markets are moving apart.





5. **Volume must confirm the trend**

Volume represents the total trading activity for a financial instrument in a particular time period. Dow considered that volume was important additional information in confirming market signals. The volume should expand in the direction of the major trend.



6. **A trend is assumed to be in effect until it gives definite signals that it has reversed**

This is the basis of trend analysis but it is not always easy to identify a trend reversal. For example, is a change just a correction or the start of a down-trend?

Modern chartists have a number of tools and techniques available to help which are described later:

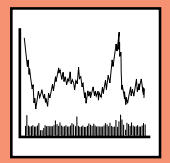
- Support and resistance levels
- Trend lines
- Moving averages

Criticisms of the Dow Theory

Dow's theories were never intended to indicate specific stocks which should be bought or sold but were intended to identify the stock market's major trend based on closing price information. Because this type of charting is based on **trend-following** it cannot predict exact beginnings and reversals of trends. Nor can the charting predict the exact duration and extent of trends. However, despite these limitations the Dow Theory has been used to give 40 correct signals in the period 1897 – 1991. During this period only 5 incorrect signals were forecast.

Dow intended his indices to be market barometers which meant that the selection of individual stocks to buy or sell was entirely in the hands of investors. Originally it was not possible to buy or sell a stock index. However, since the early 1980s trading in stock index futures contracts has been possible – the Chicago Mercantile Exchange launched Standard & Poor 500 Stock Index futures in 1982 and LIFFE offered FT-SE 100 Stock Index futures and options in 1984.

Although the Dow Theory has its limitations, it has provided the basis of many of the charting techniques which are described later in this workbook.



Summary

You have now finished the first section of the workbook and you should have a clear understanding of:

- ☞ The differences between technical and fundamental analysis
- ☞ The underlying principles and uses of technical analysis
- ☞ The production of a basic chart
- ☞ The development of technical analysis and the Dow Theory

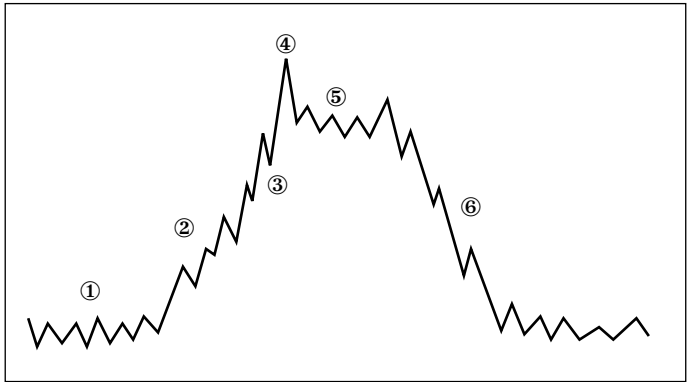
As a check on your understanding of this section you should try the Quick quiz questions. You may also find the section Overview a useful revision aid.

Quick quiz questions

1. Which of the following statements are true concerning the underlying principles of technical analysis?

	True	False
a) The main focus is on what ought to happen in the market		
b) Patterns exist in market behaviour		
c) History repeats itself		
d) Market action discounts nothing		

2. According to Dow Theory, briefly describe what is happening in the various phases of a major trend numbered 1 to 6 in this diagram.



①

②

③

④

⑤

⑥

You can check your answers on page 24.

Overview

Technical v Fundamental analysis

❑ Fundamental analysis

A method of forecasting based on basic economic, political and environmental factors.

❑ Technical analysis

A method of predicting price movements and future market trends by studying charts of past market action which take into account price of instruments, volumes of trading and, where applicable, open interest in the instruments.

❑ Summary of differences

Fundamental analysis	Technical analysis
❑ Focuses on what **ought** to happen in a market	❑ Focuses on what **actually** happens in a market
❑ Factors involved in price analysis include: • Supply and demand • Seasonal cycles • Weather • Government policy	❑ Charts are based on market action involving: • Price • Volume – all markets • Open interest – futures only ❑ Seasonality in commodities

❑ Underlying principles of technical analysis

1. Market action discounts everything	This means that the actual price is a reflection of everything that is known to the market that could affect it, for example, supply and demand, political factors and market sentiment. The pure chartist is only concerned with price movements not with the reasons for any changes.
2. Patterns exist	Chartism is used to identify patterns of market behaviour which have long been recognised as significant. For many given patterns there is a high probability that they will produce the expected results. Also there are recognised patterns which repeat themselves on a consistent basis.
3. History repeats itself	Chart patterns have been recognised and categorised for over 100 years and the manner in which many patterns are repeated leads to the conclusion that human psychology changes little with time.

❑ Trading theories

Theory A – Market equilibrium

- ❑ **Indicators** – Oscillators, eg, Relative Strength Index (RSI)
- ❑ **Number theory** – Fibonacci numbers, Gann numbers
- ❑ **Waves** – Elliott Wave Theory
- ❑ **Gaps** – High / Low, Open / Closing

Favoured by experts

Theory B – Classical charting

- ❑ **Trends** – following Moving averages etc
- ❑ **Chart formations** – Triangles, Head & Shoulders etc
- ❑ **Trend lines** – Channels
- ❑ **Cycles**

Favoured by public advisors

Theory C – Supply and demand fundamentals

- ❑ **Spreads** – Months, Exchanges, Cash / futures
- ❑ **Flow of funds** – Volume and open interest
- ❑ **Seasonals** – Weather, economy
- ❑ **Reports** – Expectations versus reality

Favoured by floor traders

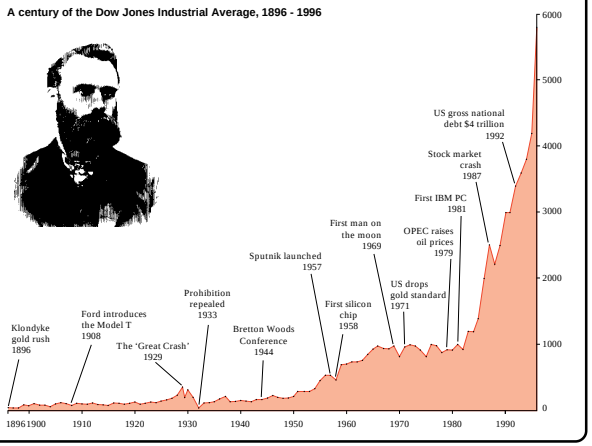
Introduction

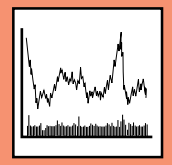
The development of technical analysis

❑ Charles Henry **Dow** first published the **Dow Jones Industrial Average** in *The Wall Street Journal* in 1896

❑ Dow's **six basic principles**:

1. Average prices discount everything
2. The market moves in trends
3. Major trends have three phases
4. Averages must confirm each other
5. Volume must confirm the trend
6. A trend is assumed to be in effect until it gives definite signals that it has reversed





Further resources

Books

Technical Analysis of the Futures Markets
John J. Murphy, New York Institute of Finance, 1986
ISBN 0 13 898008 X

Technical Analysis Explained
Martin Pring, McGraw-Hill, 1991
ISBN 0 0705 1042 3

The New Commodity Trading Systems and Methods
Perry Kaufman, J. Wiley & Sons, 1987
ISBN 0 4718 7879 0

Technical Analysis from A – X
Steven Achelis, Probus Publishing Co., 1995
ISBN 1 55738 816 4

Timing the Market – How to profit in Bull and Bear Markets with Technical Analysis
Curtis M. Arnold, Probus Publishing Co., Revised Edition 1993
ISBN 1 55738 496 7

Charters on Charting – How to improve your stockmarket decision making
David Charters, Rushmere Wynne, 1995
ISBN 0 948035 21 8

Technical Analysis of Stocks and Commodities

Taking Stock of Commodity Trading Methods by B. Venitis
Vol. 1:6 (129-132), 1982/3

A 'map' for the trading jungle by G.D. Noble
Vol. 4:2 (81-82), 1986

Real world technical analysis by K. Calhoun
Vol. 9:3 (103-103), 1991

Dow Theory by M.F. Bowman and T. Hartle
Vol. 8:9 (359-363), 1990

Financial Times

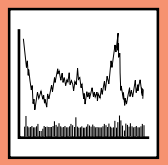
A series of articles by Gillian O'Connor in Weekend Money

Picking the pops from the charts	19.8.95
How the trend can become your friend	2.9.95
How candlesticks can shed light on trends	9.9.95
Indicators confirm your first thoughts	16.9.95
Waves that boom and crash	30.9.95
Simple approaches to a complex jigsaw	14.10.95
In search of the stars	21.10.95

Investors Chronicle

A series of articles by Robin Grffiths

Making a science of an art form	8.9.95
The pencil is mightier than the PC	15.9.95
What are the charts telling us now	22.9.95

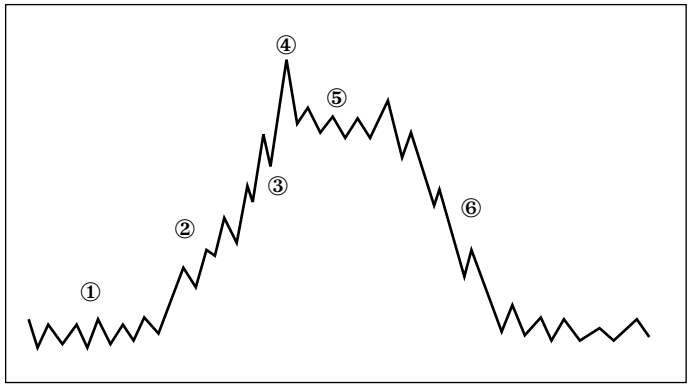


Quick quiz answers

1. *Which of the following statements are true concerning the underlying principles of technical analysis?*

	True	False
a) The main focus is on what ought to happen in the market		✔
b) Patterns exist in market behaviour	✔	
c) History repeats itself	✔	
d) Market action discounts nothing		✔

2. *According to Dow Theory, briefly describe what is happening in the various phases of a major trend numbered 1 to 6 in this diagram.*



① Phase 1: **Accumulation** where price action is moving sideways

② Phase 2: **Uptrend** where investors begin to participate

③ Phase 2: **Corrections** or **pullbacks** to market prices

④ Market **peak**

⑤ Phase 3: **Accumulation** period after peak

⑥ Phase 3: End marked by a **downtrend**

Your notes

Chart types

Contents

This section of the module should take about 90 minutes to 2 hours of study time. You may not take as long as this or it may take a little longer – remember your learning is individual to you.

The Will Rogers theory has only two rules.
Rule 1: If it don't go up, don't buy it.
Rule 2: If it don't go down, don't sell it.

The Will Rogers Theory of Point and Figure Trading by J. Adam Hewison
Technical Analysis of Stocks and Commodities , Vol. 9:8 (320-322), 1991

Introduction

The chartist has a wide variety of technical analysis tools and techniques to choose from. All of them require some type of chart plotting. Charts can be plotted by hand as you have already carried out, or more likely today charts are produced with computer applications such as Reuters Graphics and Reuters 3000 products. Although this wide choice exists most chartists tend to have favoured chart types and analytical methods which they prefer using.

This section covers the basic types of charts available, how they are created and, to some extent, how they are used. Chart types range from simple line plots and bar charts, point and figure charts to complex candlestick plots which originated in Japan. Line charts are the simplest form of chart connecting consecutive closing prices and show the **result** of market movements. Candlesticks chart Open / High / Low / Close prices and provide **edited highlights** of what is happening.

The chart types covered include:

- ❑ Line
- ❑ Bar
- ❑ Candlestick
- ❑ Point and figure
- ❑ Volume
- ❑ Open interest

For some of these chart types there are activities for you to carry out to illustrate particular points – you will benefit if you take the time to perform the activities but if you do not have time then the answers are always illustrated. You may find it useful to use a pencil for these activities – it's a lot easier to erase any mistakes! You may also find it useful to photocopy the original blank charts as a backup.

Each chart type is discussed using the following process:

What is it?

How is it used?

Important information

Useful diagrams

Examples

Line charts

The **line chart** is the simplest form of chart joining a series of points for instrument data on the vertical axis (Y-axis) and a timescale on the horizontal axis (X-axis).

Line charts are not frequently used today. Typically Bid, Ask, High, Low or Close prices are used for the vertical axis and timescales used can vary from tick (every price plotted consecutively) to hourly, daily and weekly.

There are a number of ways in which line chart data can be plotted – two involve the vertical axis and one the timescale.

Arithmetic vertical scale

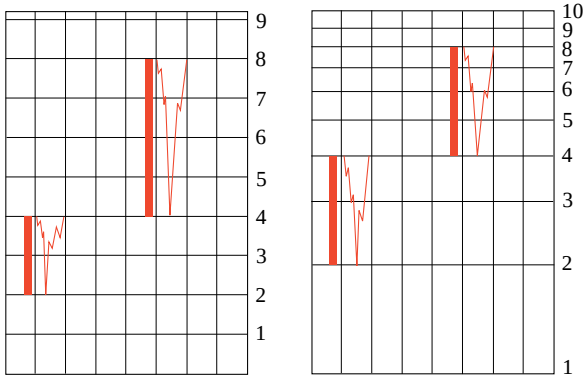
The most common method is to use an arithmetic scale where each division represents the same price difference.

Logarithmic vertical scale

This method uses a price scale where the Y-axis is constructed using a logarithmic scale. The chart still uses an arithmetic timescale so the chart is often termed **semi-logarithmic**. The main purpose for using a logarithmic scale is to keep price movements involving very large rises and falls in perspective. In the Equity market many players believe that it is better to chart stocks which have seen very large rises/falls in prices using a logarithmic Y-axis rather than use an arithmetic scale.

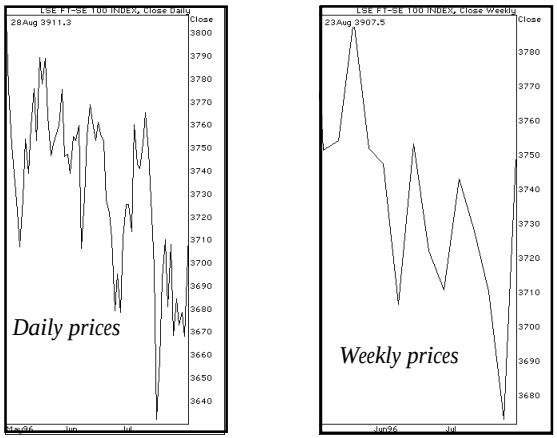
Timescale

Depending on the timescale used for each arithmetic division on the horizontal scale, the appearance of a line chart can vary dramatically. For example, the appearance of a chart using 1 division per week for a closing price line chart will look very compressed compared with one using one division per day. Chartists select the most appropriate timescale divisions depending on the type of analysis and trading needs they have.



In both cases a movement from 2 – 4 and 4 – 8 is 100%. In the arithmetic chart the movement looks twice as big as it really is. In the semi-logarithmic chart the movements look the same. Why not measure the line lengths to check?

Arithmetic charts



The same prices have been plotted using daily and weekly timescales. You can see how much more compressed the daily chart looks.

Line charts

Arithmetic chart

Semi-logarithmic chart

These charts show the weekly bar charts for the Hang Seng Index. The top chart shows the share prices plotted on an arithmetic scale; the bottom chart shows the same prices using a semi-logarithmic scale. The channels which are indicated by the red lines give an indication of the difference in appearance of the price movements.

Exercise 2a
Using the blank Arithmetic and Semi-logarithmic charts and closing prices for Iomega Corporation, plot the data and compare the charts.

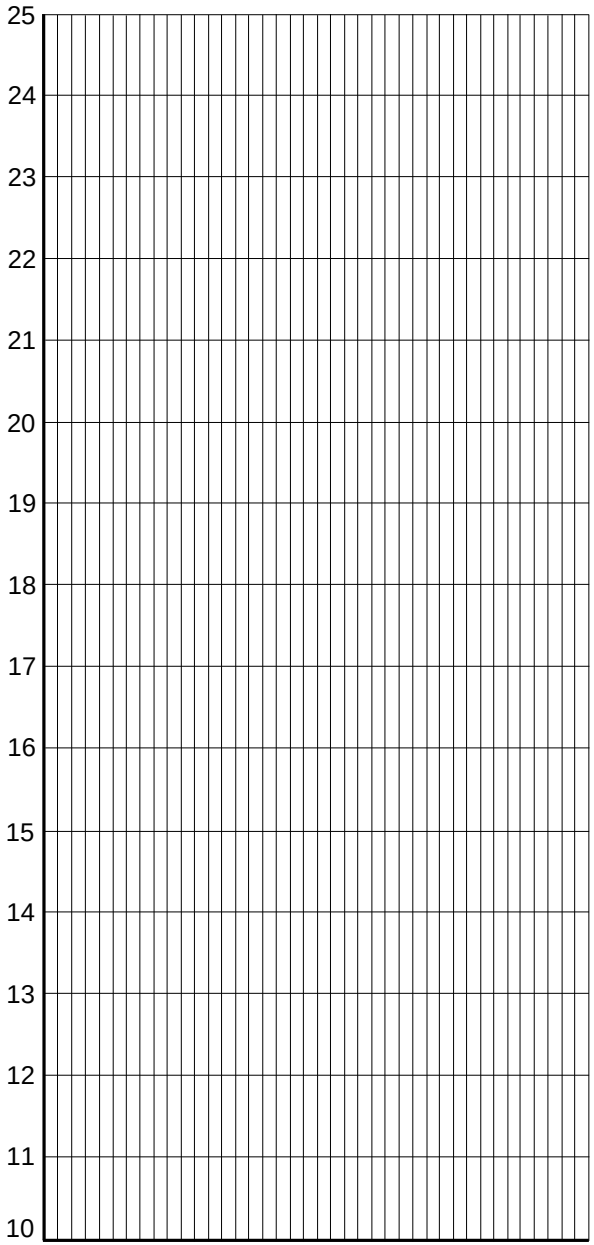
Exercise 2b
Using the blank charts, daily and weekly closing prices for the FT-SE 100 Index, plot the data and compare the charts.

Chart types

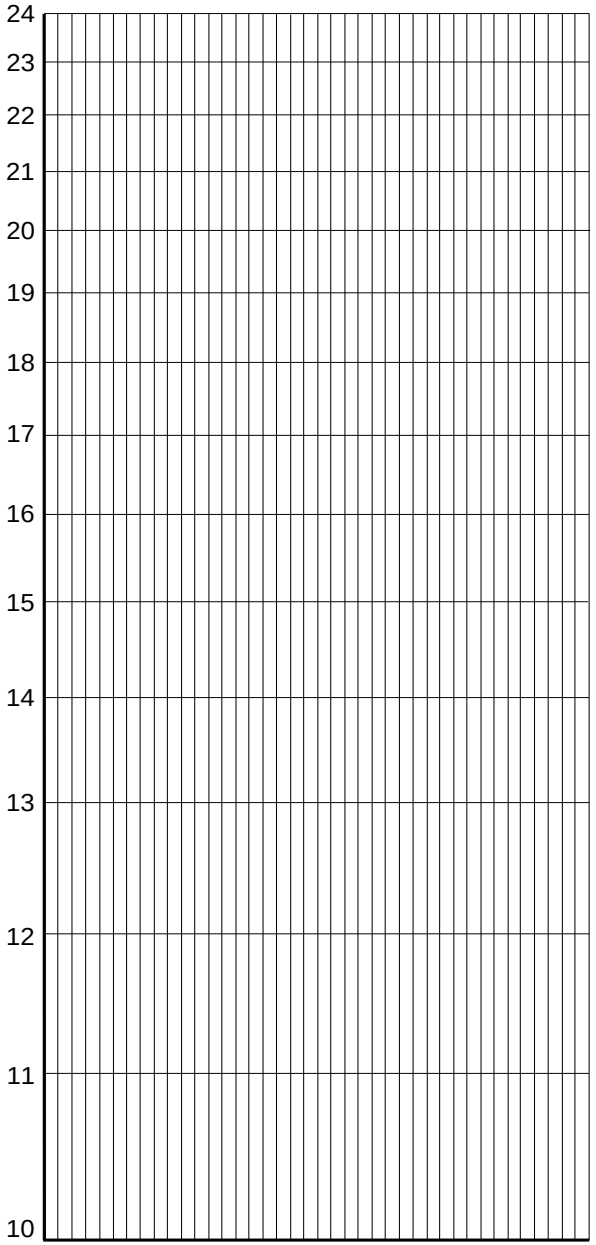
Iomega Corp daily closing prices

Day	Price
1	10.00
2	10.63
3	10.50
4	10.44
5	10.25
6	10.25
7	10.50
8	10.00
9	10.38
10	10.00
11	10.38
12	11.00
13	13.25
14	13.75
15	14.50
16	15.00
17	15.00
18	14.13
19	14.75
20	14.50
21	14.50
22	14.13
23	13.88
24	14.50
25	15.25
26	14.75
27	14.63
28	14.25
29	14.13
30	14.63
31	15.31
32	16.50
33	18.00
34	22.00
35	23.25
36	20.00
37	21.00
38	21.50
39	20.25
40	21.00

Arithmetic chart



Semi-logarithmic chart



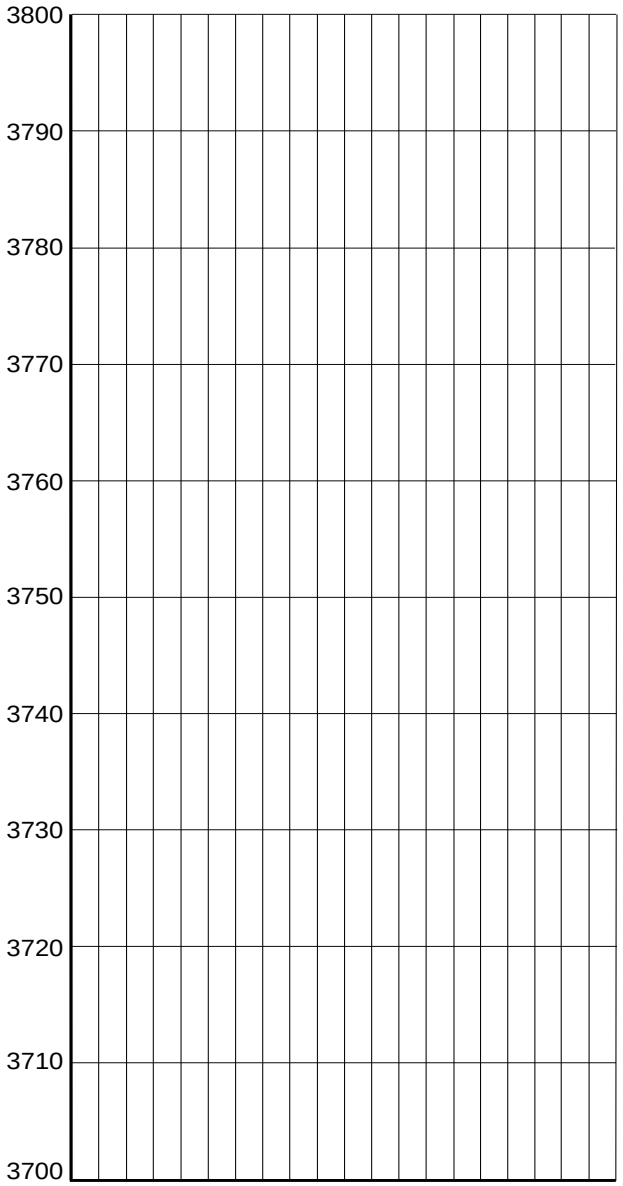
FT-SE 100 Index daily closing prices

Day	Price
1	3776
2	3752
3	3723
4	3707
5	3728
6	3754
7	3759
8	3776
9	3754
10	3790
11	3778
12	3789
13	3764
14	3747
15	3752
16	3760
17	3775
18	3747
19	3748
20	3739

FT-SE 100 Index weekly closing prices

Week (= day above)	Price
2	3752
6	3754
10	3790
15	3752
19	3748

Daily chart



Weekly chart

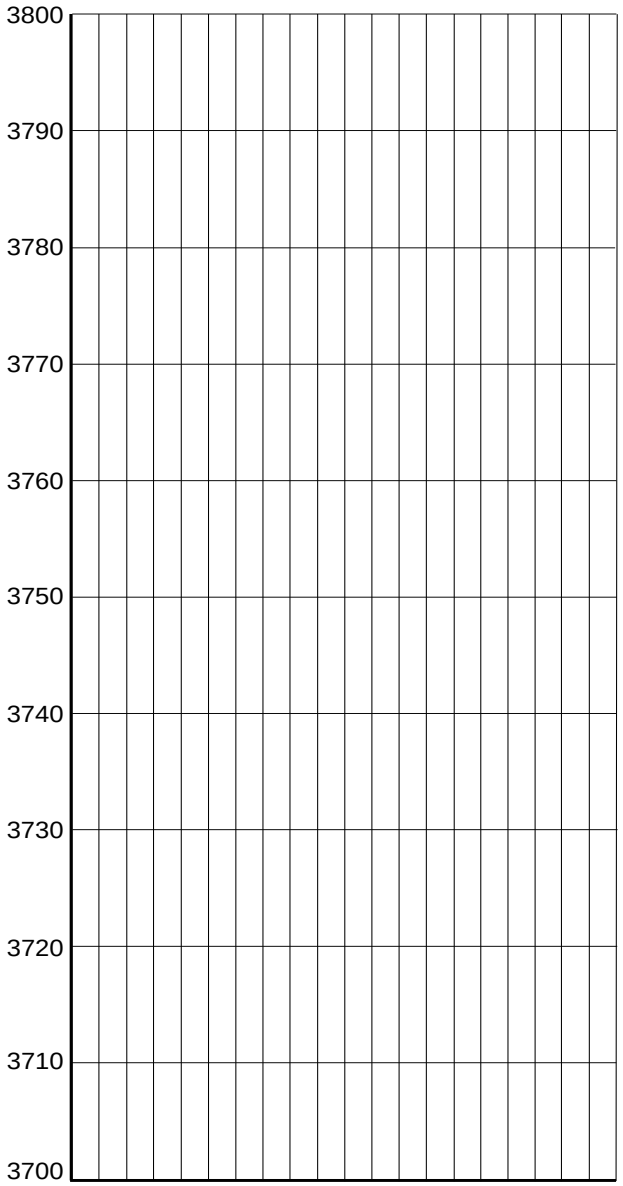
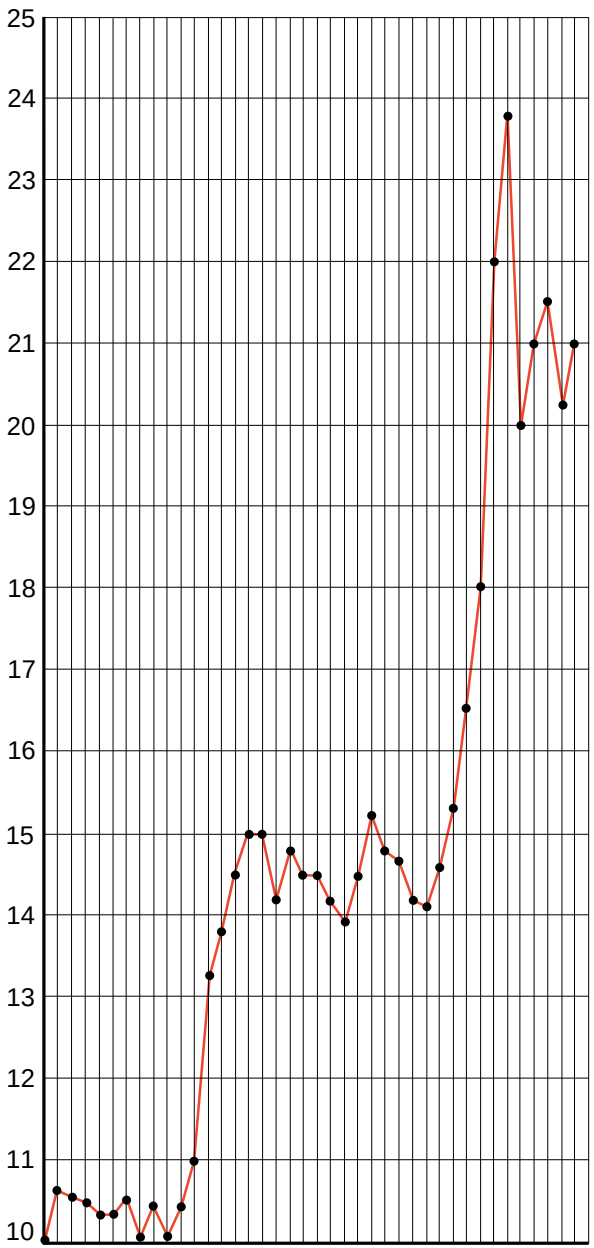


Chart types

Exercise 2a
Your charts should have looked something like these.

Arithmetic chart



Semi-logarithmic chart

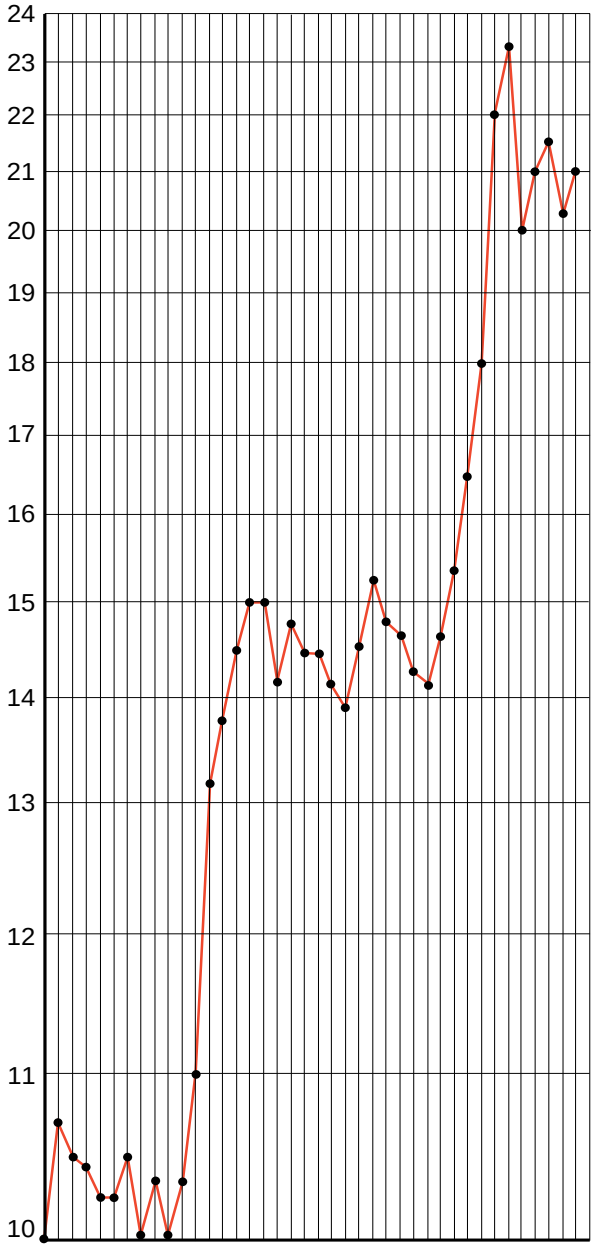
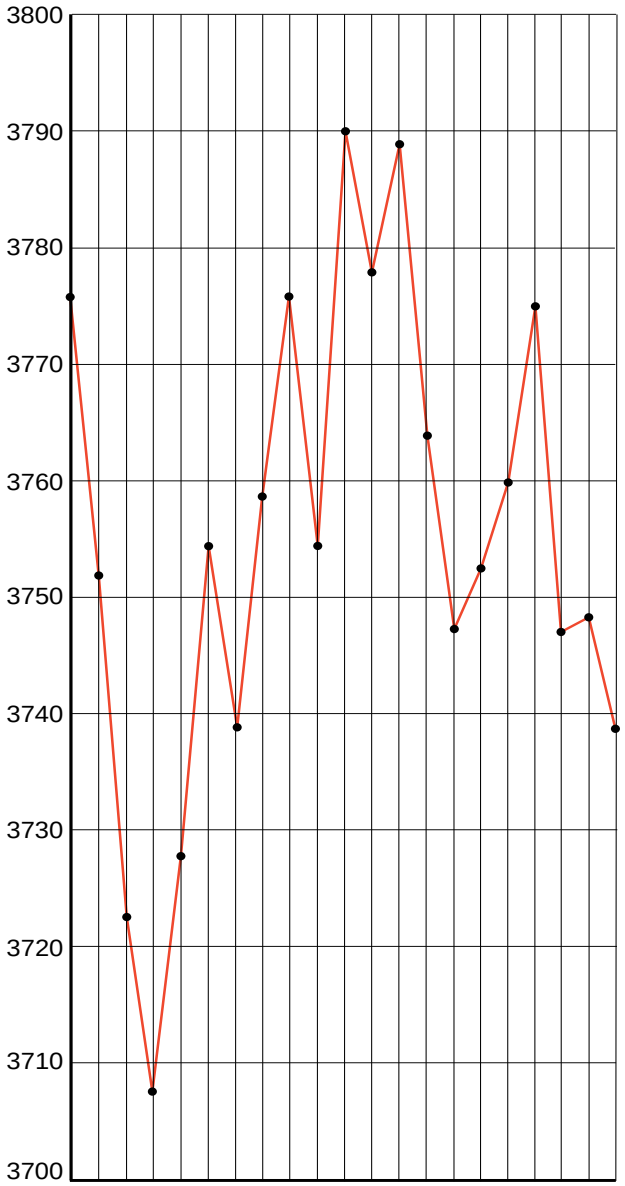


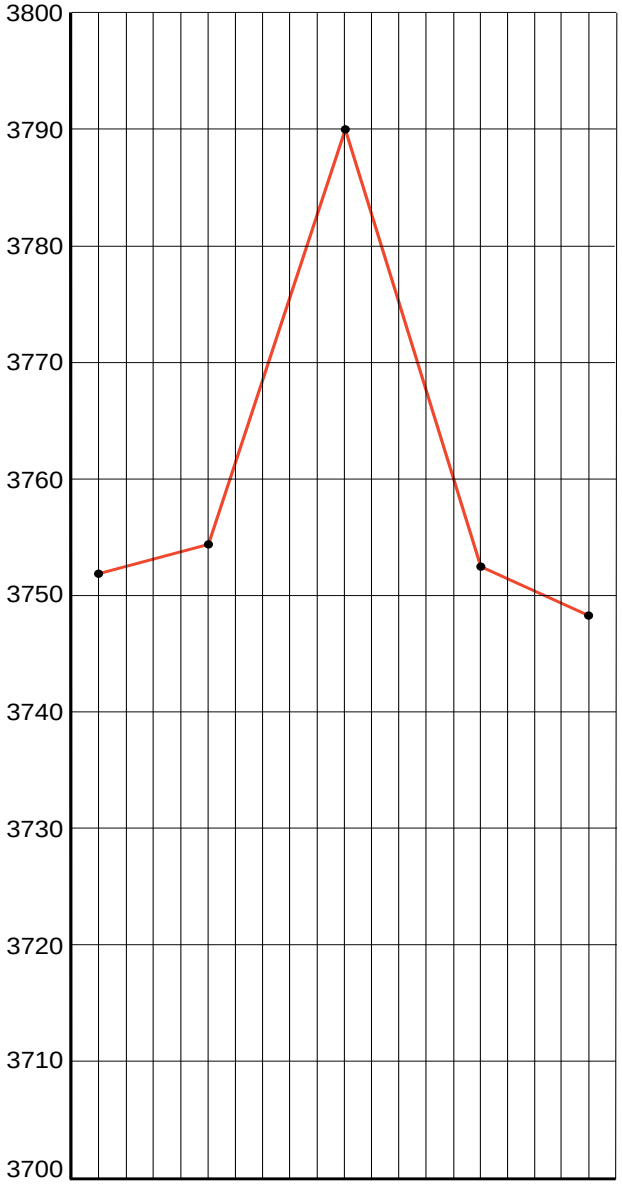
Chart types

Exercise 2b
Your charts should have looked something like these.

Daily chart



Weekly chart



Bar charts

The **bar chart** is the most common way of indicating price data used by Western chartists. A bar chart plots instrument data activity as a series of **vertical** bars each of which covers a specific period.

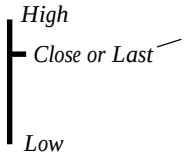
In most cases the period bar indicates **High, Low** and **Close** prices for historical data and **High, Low** and **Last** for real-time prices. Some bars indicate **Open/High/Low/Close** prices – especially for exchange traded instruments – but Open prices are not always available for historical data. Just as for line charts, bar charts can use an arithmetic or a logarithmic scale for the vertical axis – an arithmetic scale is most commonly used.

Drawing a bar

Bars are drawn as follows:

1. Draw a **vertical** line between the **High** and **Low** prices.

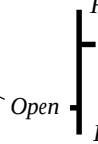
2. Add a short bar to the **right** of the vertical bar as the **Close** or **Last** price. The close price is, as its name implies, the price at the close of the market. When the market next opens and the financial instrument is traded once again the close price becomes the last price.



The Last price moves up and down the bar as its price changes. At the end of the period the final Last price becomes the Close price.

3. Add a short bar to the **left** of the vertical bar representing the **Open** price.

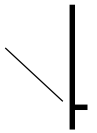
When used in charting futures the Open bar is often drawn shorter in length than that used for the Close.



Bar charts are useful as they provide highlights of what is happening in the market but as you will see, in compact charts it is not always easy to read the bars!

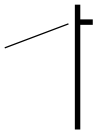
During a strong **uptrend** the closing price will usually be near the price **High**.

If you see this pattern during a strong uptrend it is usually taken as a warning signal.



During a strong **downtrend** the closing price will usually be near the price **Low**.

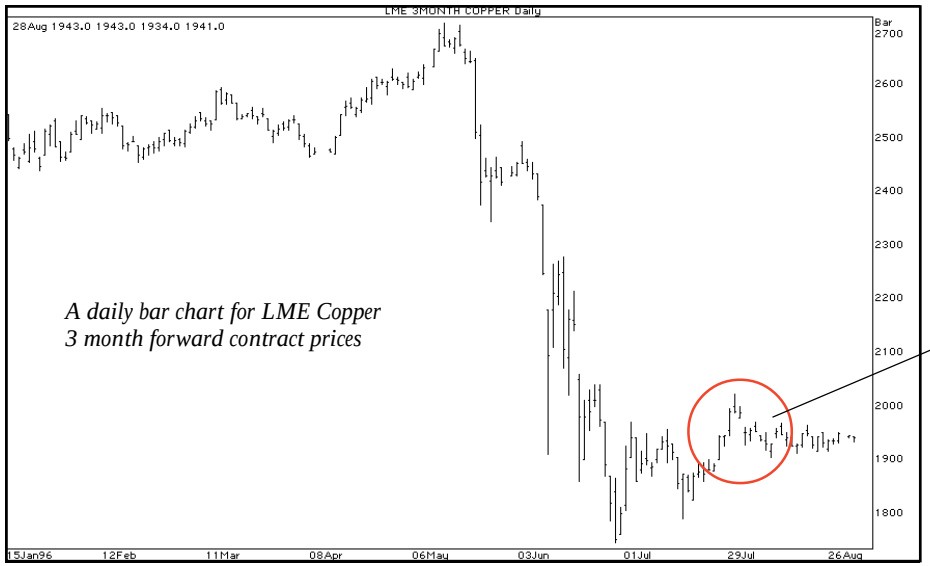
If you see this pattern during a strong downtrend it is usually taken as a warning signal.



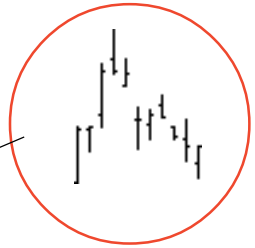
Prices on RG/RTA are displayed according to the following order. For example:

750	760	740	745
Open	**High**	**Low**	**Close**
			Market closed at 745

Bar charts

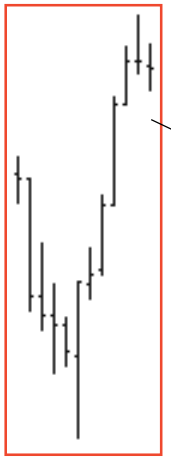


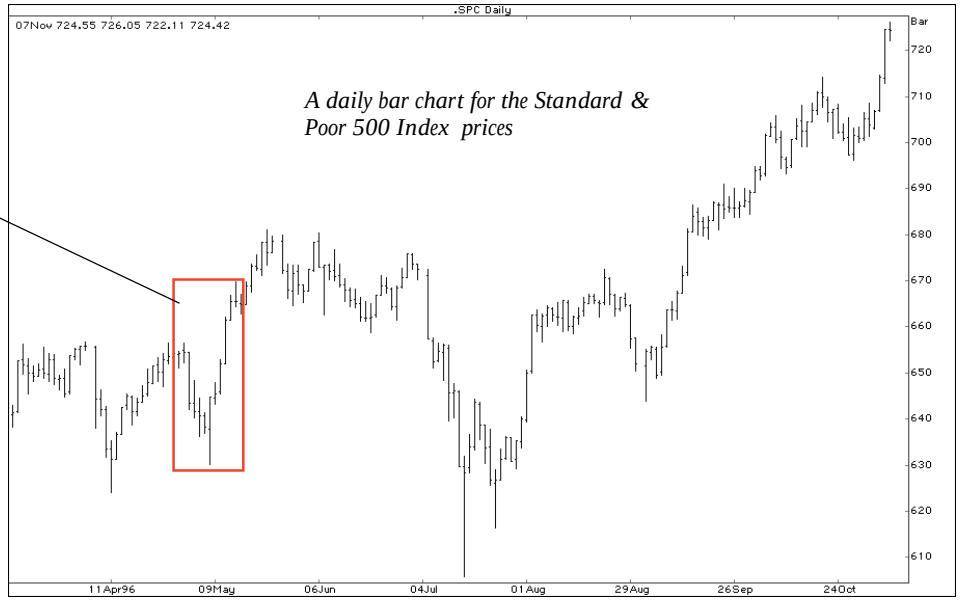
A daily bar chart for LME Copper 3 month forward contract prices



This shows a magnified view of the area in the chart – you can see the bars more clearly

This shows a magnified view of the area in the chart – you can see the bars more clearly





A daily bar chart for the Standard & Poor 500 Index prices

Candlestick charts

A **candlestick chart** plots instrument data activity as a series of two dimensional **candles** and their **wicks**, each of which covers a specific period. The **candle body** indicates the **Open/Close** or **Last** prices and the **wick** is used to indicate the **High/Low** prices – similar to the vertical bar used in bar charts.

In addition a candlestick provides a visual indication of the relative price movement of the instrument for the period.

- If the Close or Last is **lower** than the Open price then the candle body is coloured **black**
- If the Close or Last is higher than the Open price then the candle body is coloured **white** or **red** as used originally

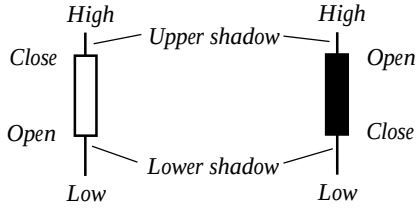
Although candlestick charts are a relatively recent introduction into western technical analysis, Japanese rice traders used these charts centuries ago. Many exponents of candlestick charts believe that patterns produced even by 2 – 3 days trading can give important signals for short-term trading markets such as futures.

Drawing a candlestick

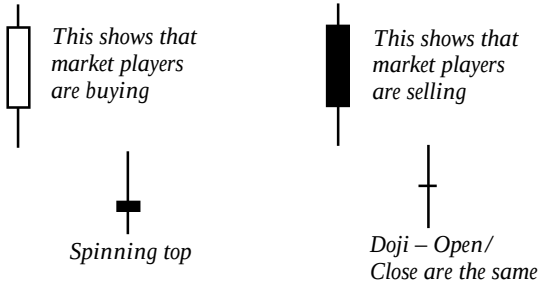
Candlesticks are drawn as follows:

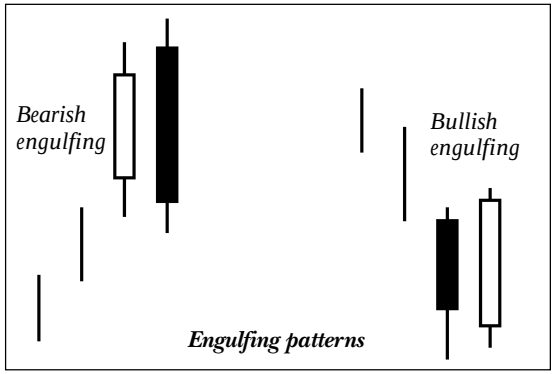
1. Draw a **vertical** line between the **High** and **Low** prices which is known as the **wick** or **shadow**.

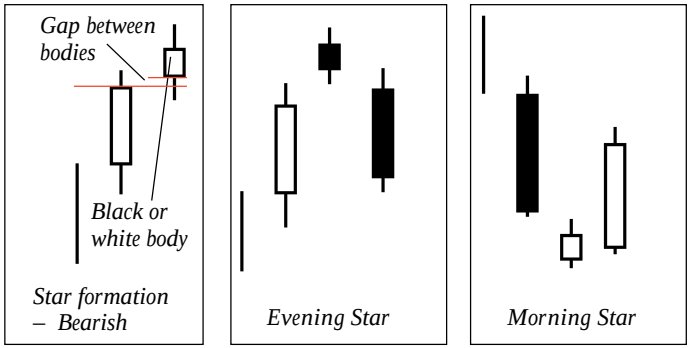
2. Overlay on this wick a **candle** or **body** for which its top and bottom limits are given by its **Open** and **Close/Last** prices. If the Close is **lower** than the Open price, then colour the candle **black**. If the Close is **higher** than the Open, then leave the candle **hollow** or **white**.



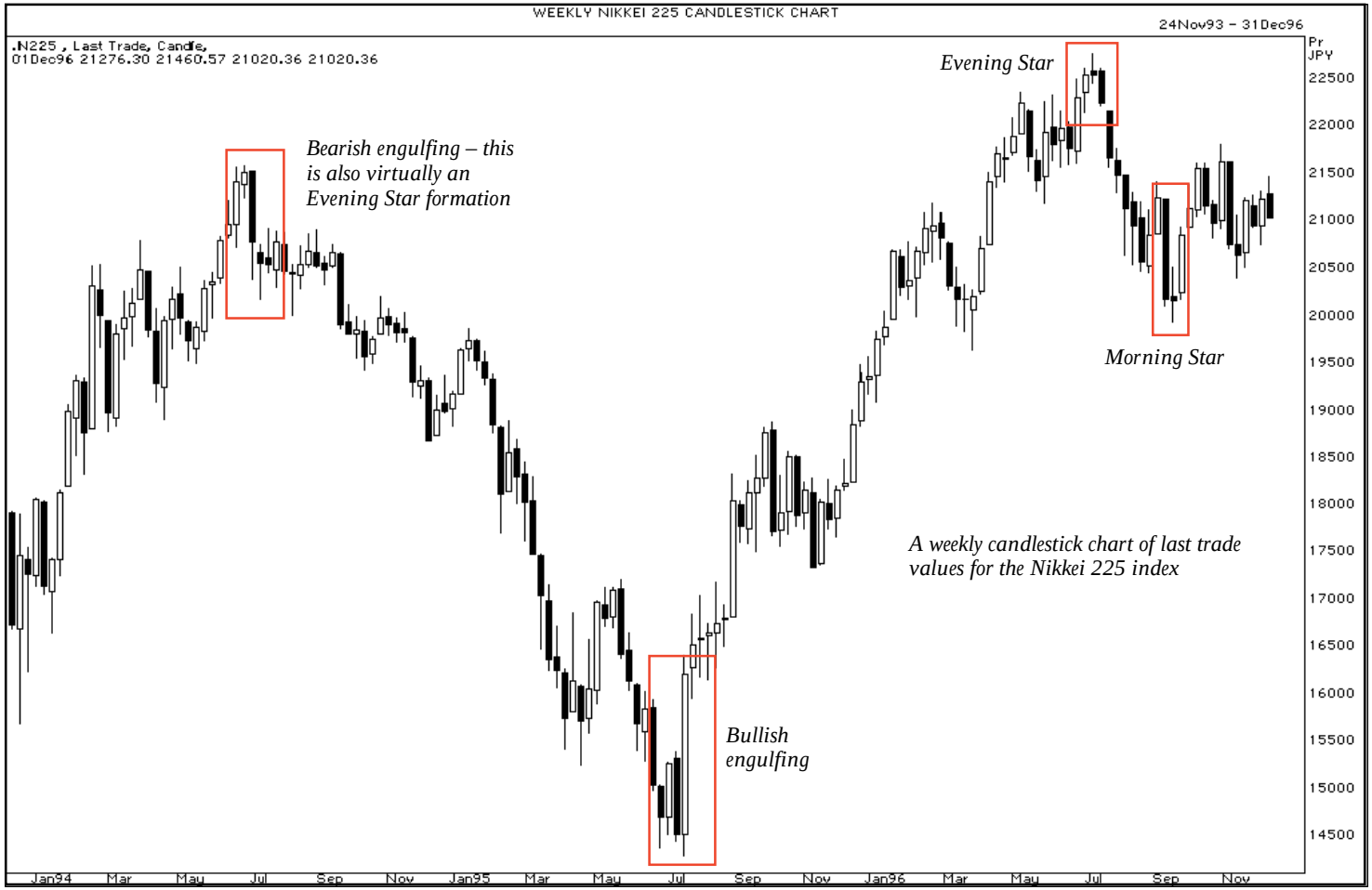
Candlestick charts use what may seem a bewildering number of names for candles and their patterns. Below are just a few explanations of candles and patterns:







Candlestick charts



Point and figure charts

Point and figure charting is a simple technique for plotting stock and commodity prices which only charts significant changes in order to identify trends. The charts are simple and easy to construct, involve no timescale and only involve price changes of a user determined amount.

Prior to the introduction of computerised techniques this was probably one of the most popular techniques due to its simplicity – it is still a tool used in futures pits. The convention is to plot a chart in vertical columns where the vertical axis consists of **boxes** and the scale is known as the **box size**. For example, a user may decide that each box represents one point in some circumstances and three points in another. **Xs** and **Os** are used to chart price movements. As prices rise an X is placed on the chart for each price rise equal to the chosen box size. An O is used for each price decline equal to the chosen box size. A second parameter used is the number of boxes that constitute a **reversal**. A key feature of these charts over other charts is that the horizontal axis (X-axis) is **not** time dependent. For this reason changes in day are often marked by the day number or by a colour change.

Choosing the box size

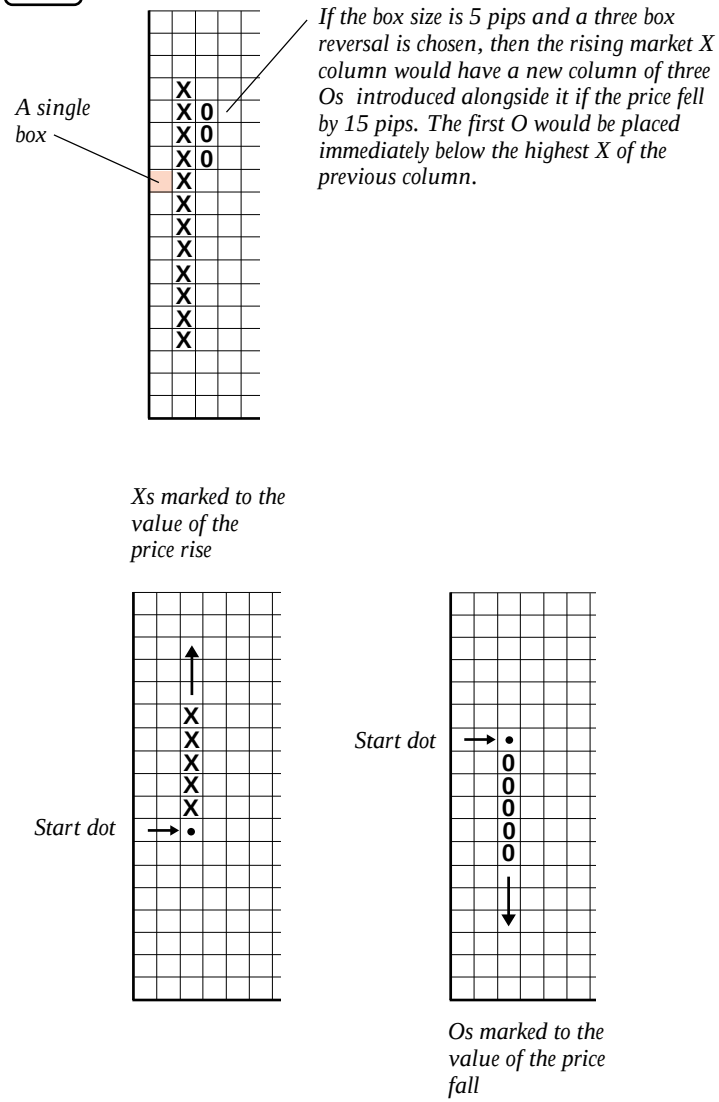
A small box size and small box reversal number will tend to give a large number of X and O columns. The chart can be made coarser by either raising the box size itself or the number of boxes that constitute a reversal. It is more common to increase the box size than the box reversal number – a **three box reversal** is very common.

Depending upon the box size and reversal number, a point and figure chart could cover a day's trading or trading over several months.

Starting the chart

The chart is started by placing a dot in the first box corresponding to the instrument price. Everytime the price rises (or falls) by the selected box size an X (or O) is placed in the **same** column. Xs (or Os) are marked in boxes to the value of the move.

Xs and Os



Point and figure charts

Charting

Xs (or Os) are placed in the boxes until there is a price reversal and the price falls (or rises) by the selected box size. The chart now moves to the **next** column.

If the price **falls**, thus moving from X → O, then the O is placed **one box across and down** from the last X.

If the price **rises**, thus moving from O → X, then the X is placed **one box across and up** from the last O.

The horizontal axis is therefore a series of columns showing up and down price movements. Price movements of less than the point size selected are filtered out.

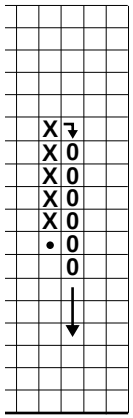
Uses

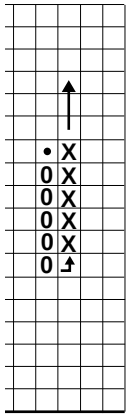
Point and figure charts are used to indicate buy/sell signals and to identify the following:

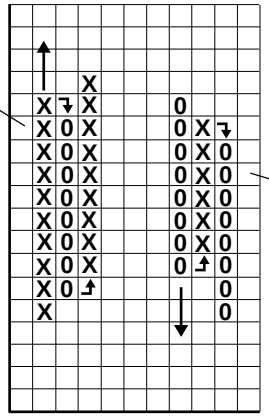
Market behaviour	Point and figure chart
Demand exceeding supply	Long up columns – Xs
Supply exceeding demand	Long down columns – Os
Supply and demand in balance	Short up and down columns moving sideways

Price fall –
- *Move one column to right*
- *Move down a box for first O*
- *Mark as many Os as necessary for the price fall*

Price rise –
- *Move one column to right*
- *Move up a box for first X*
- *Mark as many Xs as necessary for the price rise*







Point and figure charts

An example

The following is a list of prices which are to be plotted on a point and figure chart. A chart using a box size of one and a three box reversal is required.

Prices

15 25 10 15 10 15 5 15 12 15

In all cases the price changes are greater than 3 so Xs and Os are required for every price movement. A chart with a box range 5 to 25 will be sufficient for the plot.

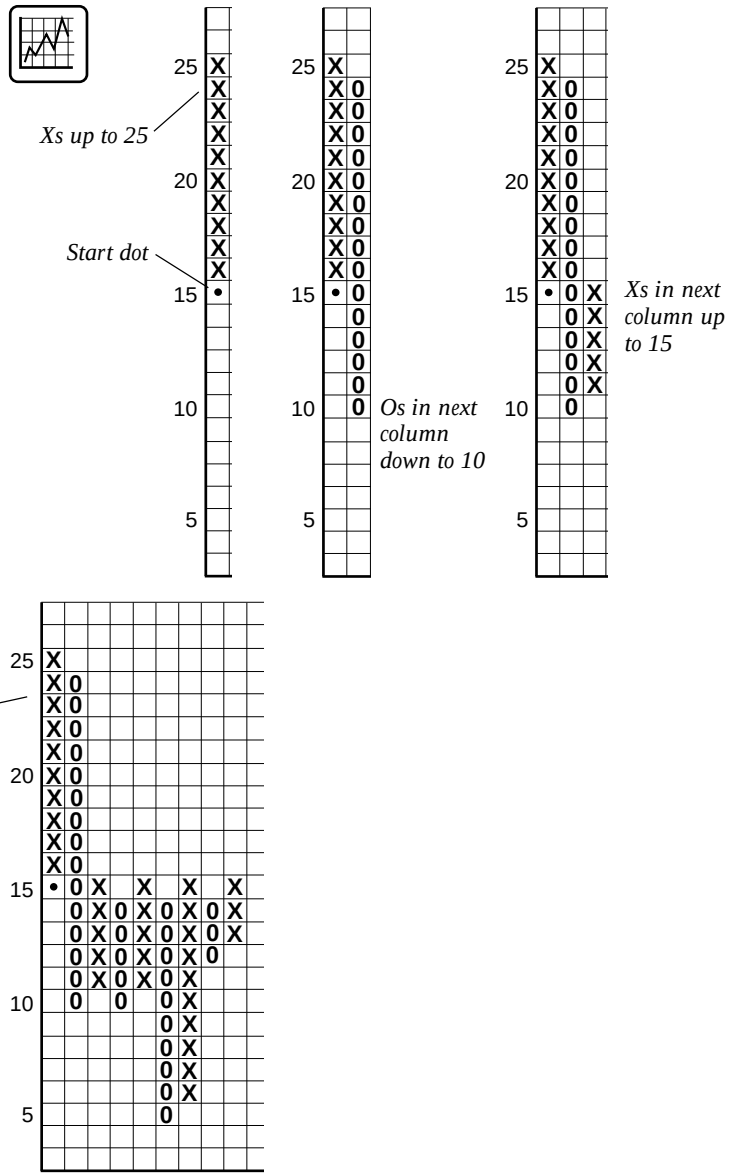
The chart is started by placing a dot in box 15 and then placing Xs in the first column up to 25.

At this point the price reverses by more than 3 points – it goes down to 10. Therefore an O is placed in the next column, one box down and Os continued down to 10.

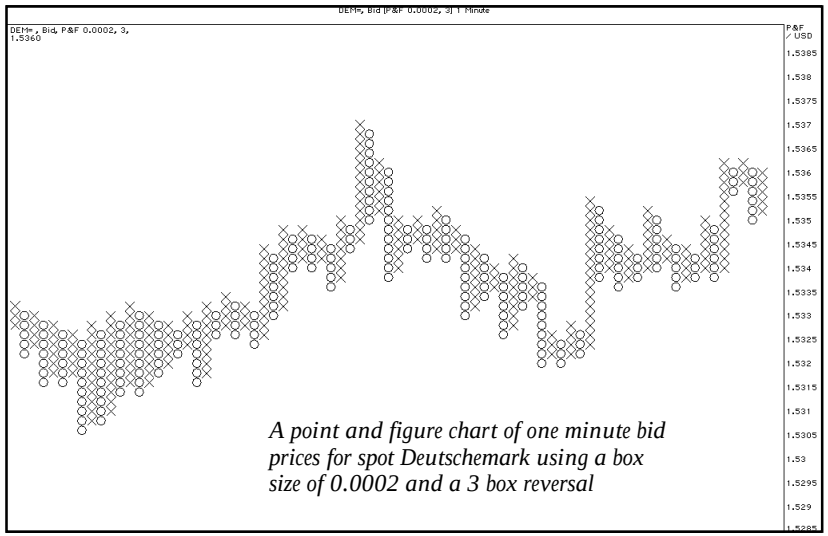
The price reverses again to 15. Now an X is placed in the next column, one box up and Xs continued to 15.

You have probably got the idea by now. Why not check the rest of the chart?

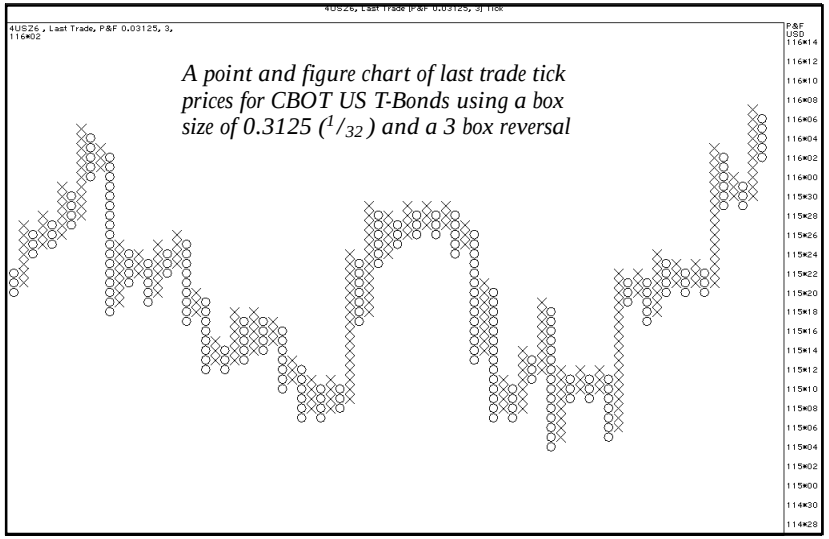
It is worth remembering that if the price does not rise or fall by the selected box size, then no entry is required. A point and figure chart only records price movement – it is not dependent on time.



Point and figure charts



A point and figure chart of one minute bid prices for spot Deutschemark using a box size of 0.0002 and a 3 box reversal



A point and figure chart of last trade tick prices for CBOT US T-Bonds using a box size of 0.3125 ($^{1}/_{32}$) and a 3 box reversal

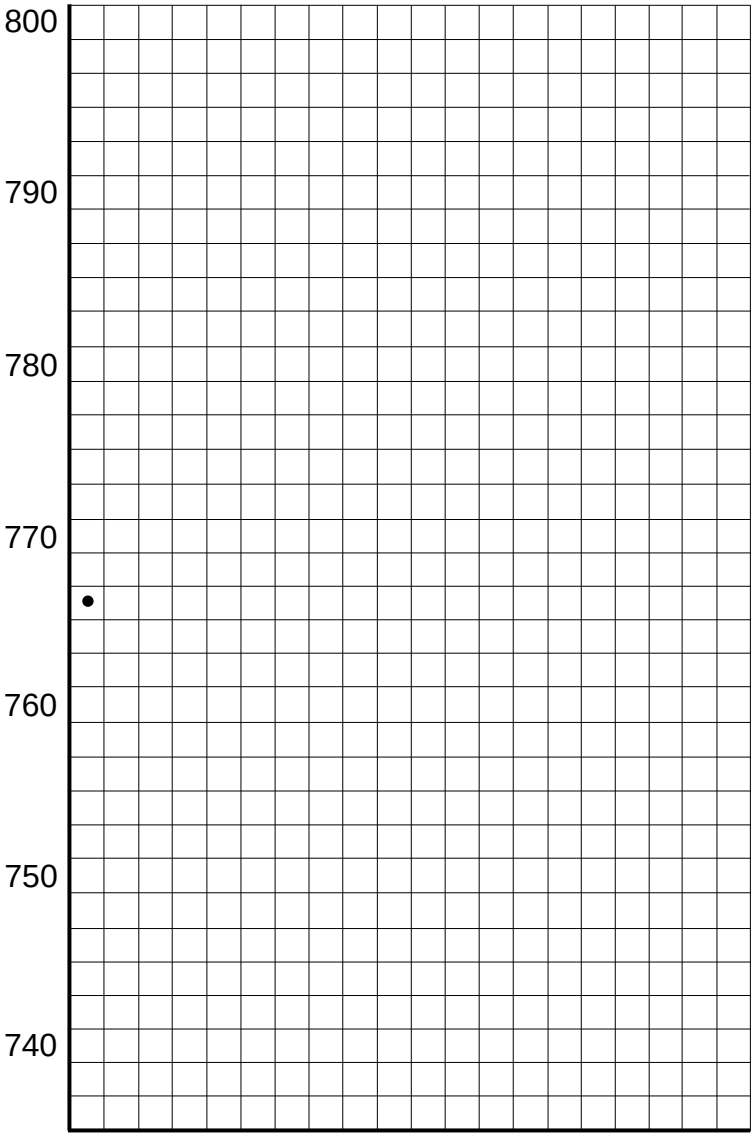
Exercise 3
Plot the Reuters data as a point and figure chart.

Use a box size of 2 and a three box reversal.

You can check your answer on page 48.

Day	Price	Day	Price
1	766.5	26	797
2	770	27	784
3	769	28	789
4	758	29	789
5	751	30	779
6	749	31	778
7	753.5	32	770
8	777	33	765
9	794	34	765
10	782	35	756
11	764	36	750.5
12	771	37	747
13	773	38	755
14	773	39	751.5
15	761	40	756
16	752	41	746
17	758	42	746
18	750	43	756
19	743	44	762
20	745	45	777
21	747	46	781
22	764	47	777
23	789	48	767
24	780	49	767
25	792	50	760.5

Chart types



Volume charts

Volume represents the total trading activity in a specific period for a commodity or financial instrument. For example, overall volume is the total number of contracts traded during the day of all contract months of the LIFFE FTSE-100 futures contract; also, it is the total number of Reuter ordinary shares that are bought and sold during the day on the London Stock Exchange. Usually the volume is recorded as a vertical bar at the bottom of a line or bar chart, so that the price and volume data correspond. The greater the volume the higher the vertical bar.

Volume charts give a measure of the amount of buying and selling that is taking place in a market. There is a saying in the markets which many analysts subscribe to:

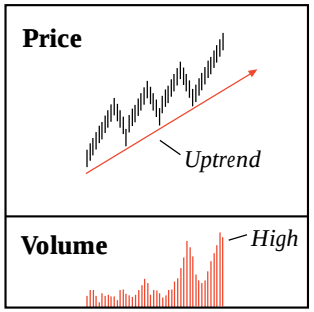
Volume confirms price action

The Dow Theory places some emphasis on volume as a method of confirming market signals and trends. Volume is also a useful measure of the strength of price movements. High volume acts as a confirmation of price direction. Low volume tends to be a warning of lack of market interest at that price level and hence a risk that the price direction may change.

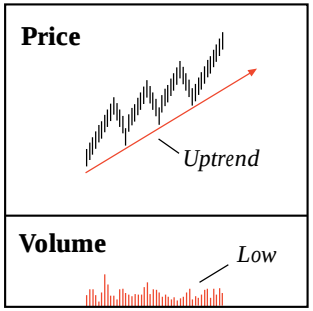
When using volume charts to confirm price directions it is useful to remember that market volumes can be **light** immediately before market holidays or before the release of major market statistics.

Drawing a volume chart

The most common way of drawing a volume chart is as a sub-plot on the same chart as that used to plot the data for a line, bar chart etc. for prices. The volume data is usually plotted at the bottom of the price chart using the same horizontal time axis. The vertical axis (Y-axis) is usually an arithmetic scale that fits beneath the main chart.



If prices are in uptrend and volumes high, then this is taken as confirming the direction of the trend



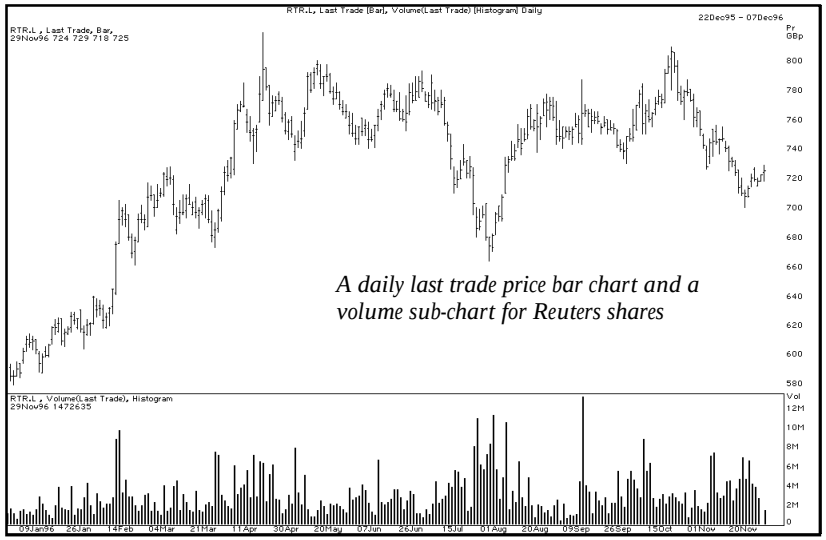
If prices are in uptrend but volumes are low, then this may indicate that buyers are losing interest and a trend change is on the way

Volume is seldom used by itself but in conjunction with chart patterns and indicators which are described later in the relevant sections. The following chart summarises the basic market signals that can be gauged from price/volume charts:

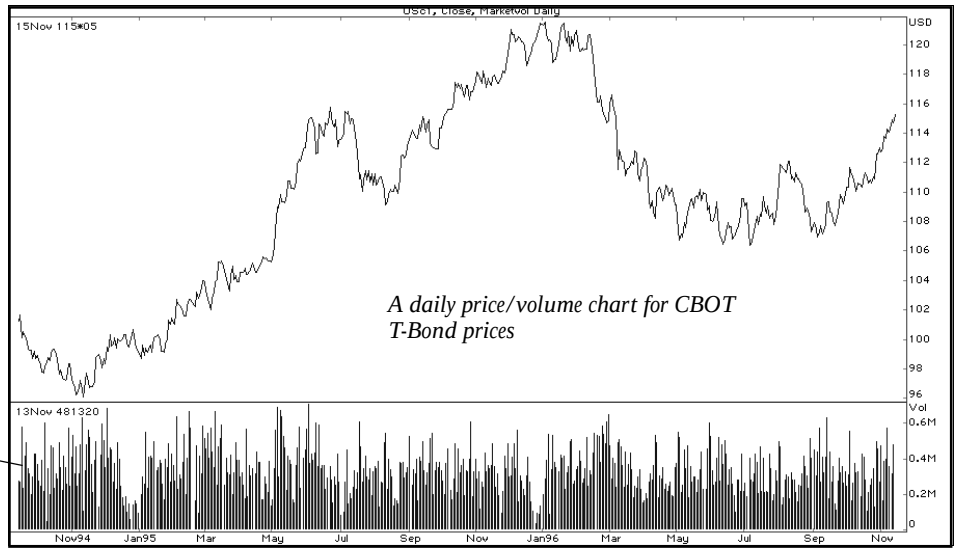
Price	Volume	Market
↑	↑	Strong
↑	↓	Warning sign
↓	↑	Weak
↓	↓	Warning sign

Warning sign indicates that the price trend may change.

Volume charts



A daily last trade price bar chart and a volume sub-chart for Reuters shares



A daily price/volume chart for CBOT T-Bond prices

This continuation futures chart shows the volume data for the front month contracts which are joined together

Open interest charts

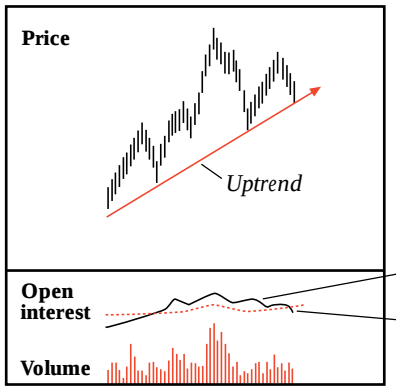
Open interest is the total number of contracts which are still outstanding in a futures market for a specified futures contract. A futures contract is formed when a buyer and a seller take opposite positions in a transaction. This means that the buyer goes long and the seller goes short. Open interest is calculated by looking at **either** the total number of outstanding long or short positions – not both. Open interest is therefore a measure of contracts that have **not** been matched and closed out. The number of open long contracts must equal exactly the number of open short contracts. It is worth remembering that the reason a player holds an open futures position may be for hedging rather than speculative purposes. The following chart summarises how changes in open interest may result.

Action	Resulting open interest
New buyer (long) and new seller (short)trade to form a new contract	**Rise**
Existing buyer sells and existing seller buys – the old contract is closed	**Fall**
New buyer buys from existing buyer. The existing buyer closes his position by selling to new buyer	**No change** – there is no increase in long contracts being held
Existing seller buys from new seller. The existing seller closes his position by buying from new seller	**No change** – there is no increase in short contracts being held

Open interest acts as a confidence measure between bulls and bears in a market. A decline in open interest signals that either bulls or bears are closing their open positions which are not being matched by fresh positions being opened by new bulls or bears. An increase in open interest marks increased market participation by bulls or bears and is normally seen as a validation of any existing price trend.

Drawing an open interest chart

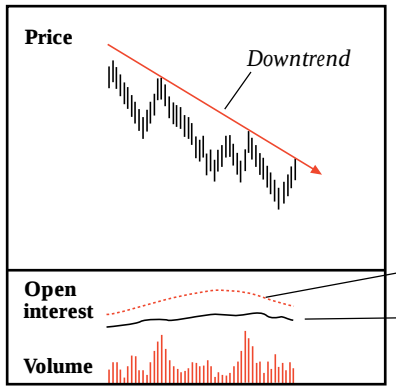
Open interest data are usually plotted, together with volume data, at the bottom of a price chart. **Actual** open interest data is drawn as a **solid** line. However, open interest for certain commodity contracts, for example, Orange juice, can have **seasonal tendencies** which should be taken into account. This is done by plotting the average open interest as a **dotted** line. It is the difference between actual and seasonal open interest lines that gives significance to any changes in open interest.



The solid line is moving above the dotted line which confirms the uptrend

Actual open interest – solid line

Average open interest – dotted line



The solid line is moving below the dotted line which confirms the downtrend

Average open interest – dotted line

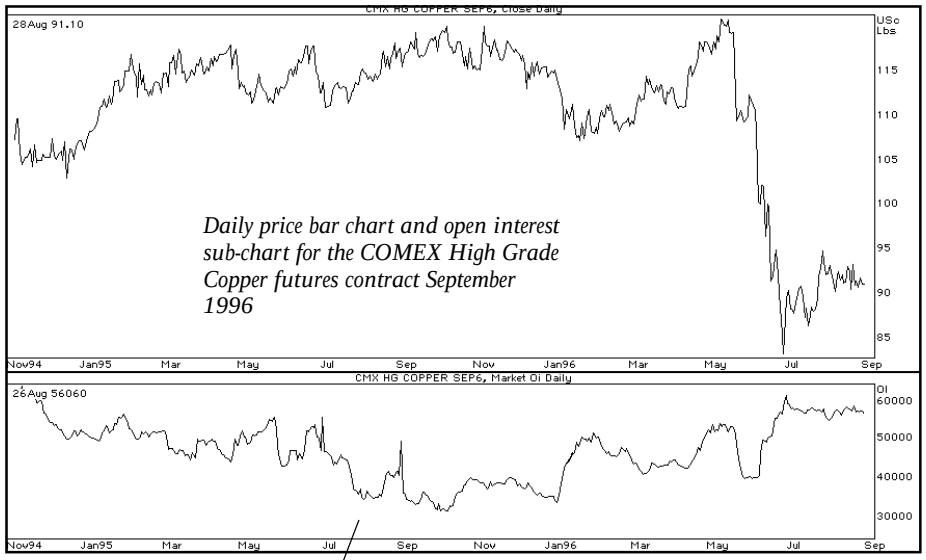
Actual open interest – solid line

Price	Open interest	Market
↑	↑	Strong
↑	↓	Warning sign
↓	↑	Weak
↓	↓	Warning sign

This chart summarises the basic market signals that can be gauged from price/open interest charts.

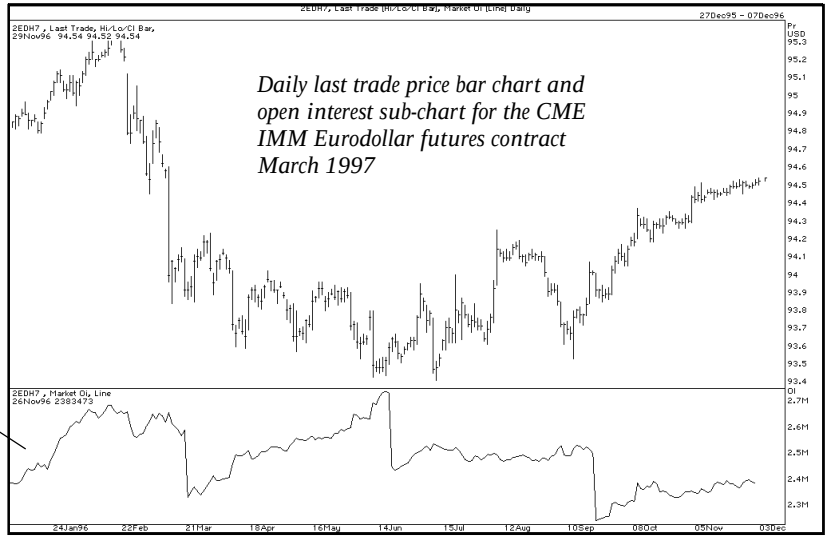
***Warning sign** indicates that the Open interest is not supporting the price direction.*

Open interest charts



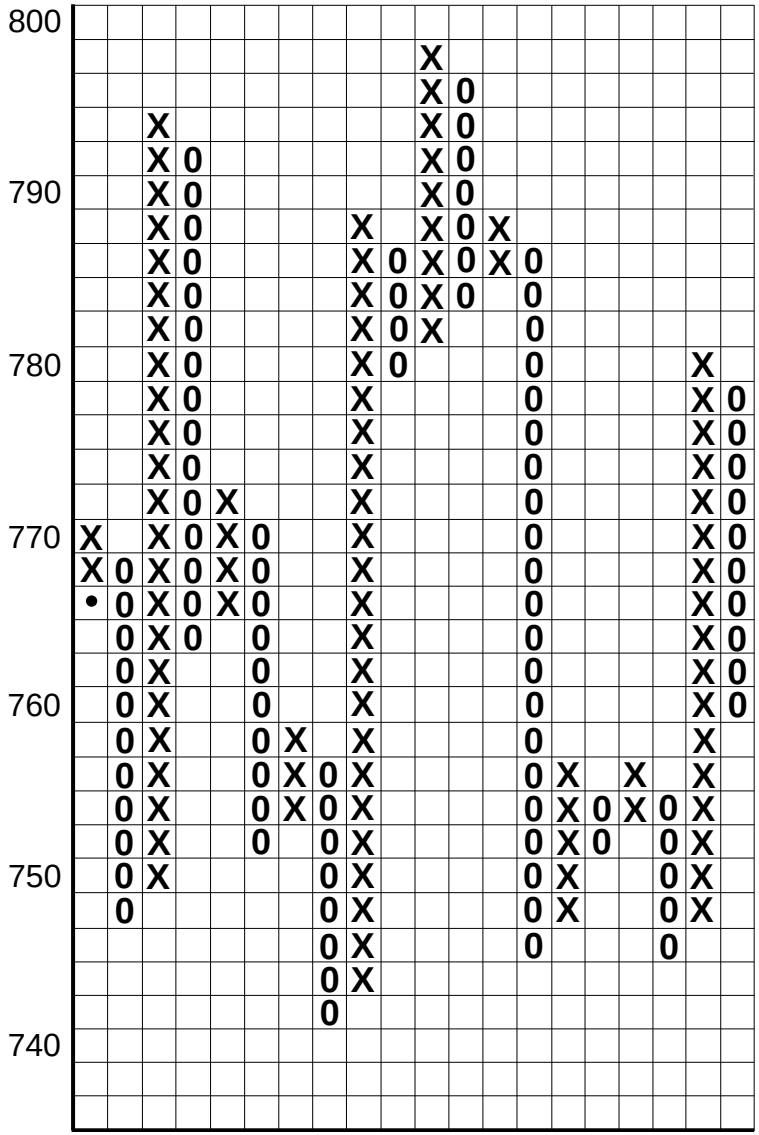
Daily price bar chart and open interest sub-chart for the COMEX High Grade Copper futures contract September 1996

Open interest charts are only applicable for futures contracts



Daily last trade price bar chart and open interest sub-chart for the CME IMM Eurodollar futures contract March 1997

Exercise 3
Your chart should have looked something like this.

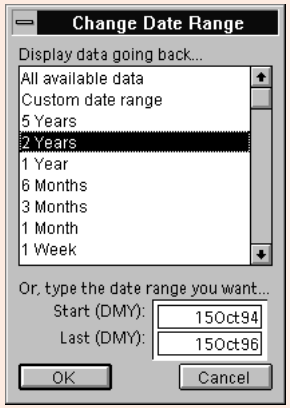


Charting exercises

If you have access to Reuters Graphics and/or Reuters 3000 you may like to have a look at the following exercises which have been designed to help you understand more fully the various chart types described in this section.

Chart exercise 1

Open Reuters 3000 and in a new workspace type in **CBRY.L@BAR** to display a daily bar chart for **Cadbury** shares. The system will default a 6 month history. You should see a screen similar to this.



Now click on the **X-axis** button in the bottom toolbar and change the data to be viewed to 2 years.

Finally click the **Daily, Weekly, Monthy** Page tab to display all three charts for the 2 year period. You should now see a screen similar to this.

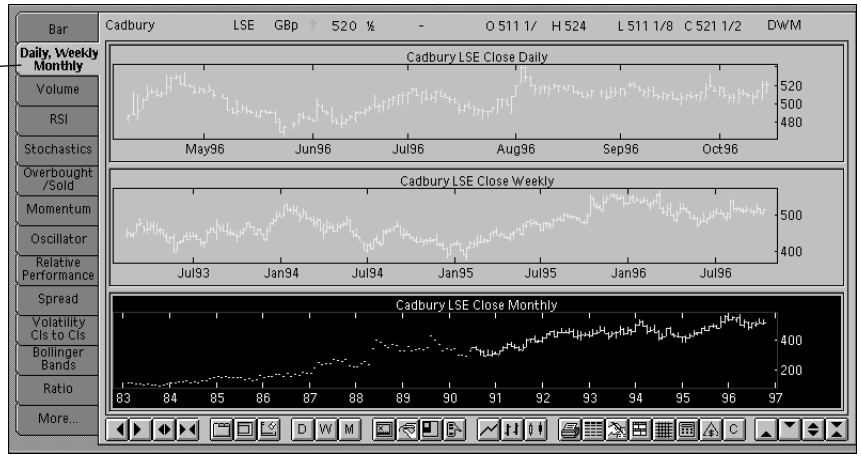
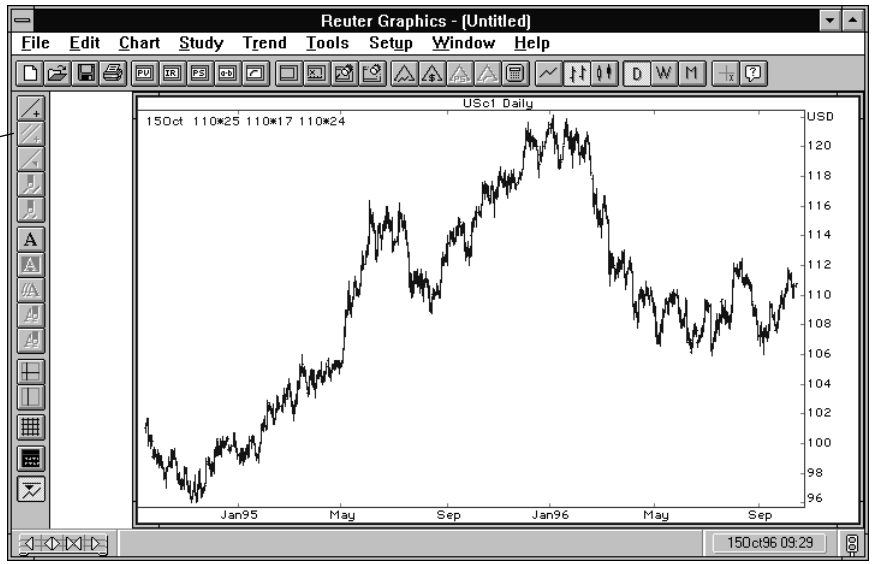


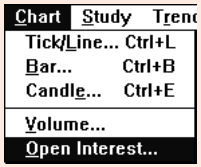
Chart types

Chart exercise 2

Open Reuters Graphics (v3.1) and enter **USc1** to display a 2 year daily bar chart for US T-bonds.

The screen should look something like this.

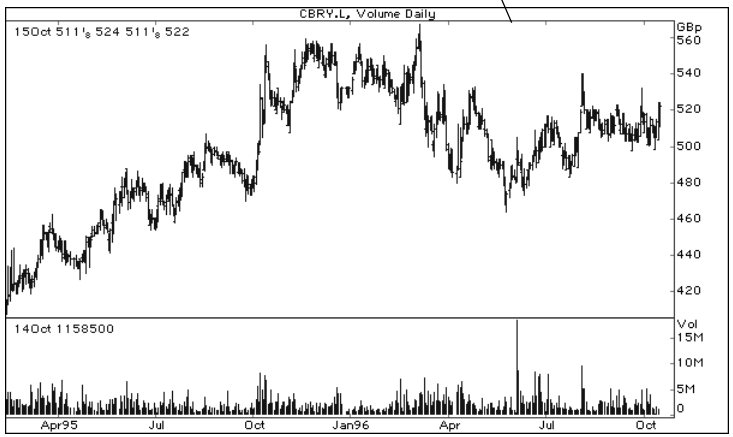




Open a new window and using the Chart menu, open an **Open Interest** chart for USc1 in the new window. The windows should look something like those shown here.

Now delete your charts for USc1 and create a bar chart for **CBRY.L**. Click on the **PV** button in the toolbar to generate a Price/Volume chart.

This chart should look something like this.



REUTERS

Summary

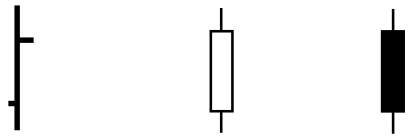
You have now finished the second section of the workbook and you should have a clear understanding of the following charts:

- Line
- Bar
- Candlestick
- Point and figure
- Volume
- Open interest

As a check on your understanding of this section you should try the Quick quiz questions. You may also find the section Overview a useful revision aid.

Quick quiz questions

1. For each of the following diagrams indicate the location of the High / Low / Open / Close prices.



2. Match the following statements concerning Point and Figure charts.

A. Demand exceeding supply	**1**. Long down columns – Os
B. Supply exceeding demand	**2**. Short up and down columns moving sideways
C. Supply and demand in balance	**3**. Long up columns – Xs

A &		**B** &		**C** &	

3. Which of the following statements are true and which are false concerning volume and open interest charts?

	True	False
a) Price up and volume up indicate a weak market		
b) Price up and volume down are a warning sign		
c) Price up and open interest up indicate a strong market		
d) Price down and open interest up indicate a weak market		

You can check your answers on page 54.

Chart types

Overview

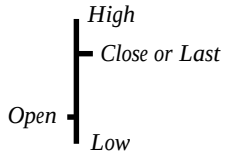
Chart types

Line charts

- Typically joins a series of , Bid, Ask, High, Low or Close prices
- Vertical axis – Y-axis – can be an **Arithmetic** or **Logarithmic** scale
- Horizontal axis – X-axis – can be tick, hour, day, week, month etc

Bar charts

- Instrument prices plotted as a series of **vertical** bars
- Bar can indicate Open / High / Low / Close or Last prices



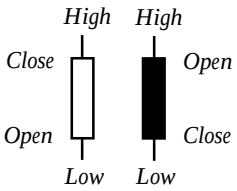
Point and figure charts

- Plot of stock or commodity prices which charts significant changes using a vertical axis of **boxes** and a scale known as the **box size**
- Price **rise** indicated by an **X** when the movement equals the box size
- Price **fall** indicated by an **O** when the movement equals the box size
- Typical charts use a **three box reversal**

Market behaviour	Point and figure chart
Demand exceeding supply	Long up columns – Xs
Supply exceeding demand	Long down columns – Os
Supply and demand in balance	Short up and down columns moving sideways

Candlestick charts

- Prices plotted as candles and wicks. **Candle** body indicates **Open/Close** or **Last** prices; **wick** indicates **High/Low** prices.
- If Close or Last price is **lower** than Open price, then the candle is **black**
- If Close or Last price is **higher** than Open price, then the candle is **white** or **red**



Open interest charts

- Line plot of **total number of contracts still outstanding** in a futures market for a specified contract month
- Open interest is calculated by either looking at the total number of outstanding long or short positions – **not both**

Price	Open interest	Market
↑	↑	Strong
↑	↓	Warning sign
↓	↑	Weak
↓	↓	Warning sign

Volume charts

- Vertical bars representing the **total trading activity** in a specific period for a commodity or financial instrument – the greater the volume the higher the vertical bar
- Measure of the amount of **buying** and **selling**

Price	Volume	Market
↑	↑	Strong
↑	↓	Warning sign
↓	↑	Weak
↓	↓	Warning sign

Further resources

Books

Japanese Candlestick Charting Techniques
Steve Nison, New York Institute of Finance, 1991
ISBN 0 1393 1650 7

Candlestick Charting Explained
Gregory Morris, Probus Publishing Co., 1995
ISBN 1 55738 891 1

Study Help for Point & Figure Techniques
Alexander Wheelan, Fraser Publishing, 1990
ISBN 0 8703 4091 3

Technical Analysis of Stocks and Commodities

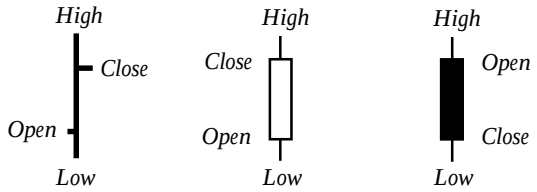
Technical analysis of volume by H.K. Waxenberg
Vol. 4:2 (65-68), 1986

Point and Figure Charting by G. van Powell
Vol. 11:1 (30-33), 1993

Candlesticks and Intraday Market Analysis by G.S. Wagner & B.L Matheny
Vol. 11:4 (169-173), 1993

Quick quiz answers

1. *For each of the following diagrams indicate the location of the High/Low/Open/Close prices.*



2. *Match the following statements concerning Point and Figure charts.*

A. Demand exceeding supply	**1**. Long down columns – Os
B. Supply exceeding demand	**2**. Short up and down columns moving sideways
C. Supply and demand in balance	**3**. Long up columns – Xs

A &	**3**	**B** &	**1**	**C** &	**2**

3. *Which of the following statements are true and which are false concerning volume and open interest charts?*

	True	False
a) Price up and volume up indicate a weak market		✔
b) Price up and volume down are a warning sign	✔	
c) Price up and open interest up indicate a strong market	✔	
d) Price down and open interest up indicate a weak market	✔	

Your notes

Patterns

Contents

This section of the module should take about 2 hours of study time. You may not take as long as this or it may take a little longer – remember your learning is individual to you.

The longer a trendline is in effect and the more data points that are used to establish the line, the greater the significance is. Significant penetration of the trendline usually indicates a reversal or a slowing of the trend.

On Trendlines, Money Flow Index and the Elliott Wave by Brian D.Green Technical Analysis of Stocks and Commodities , Vol. 12:8 (321-324), 1994

Introduction

Charting the market behaviour of any particular financial instrument may be considered to be the result of a 'battle' between buyers – bulls – and sellers – bears. Market prices do not move in a straight line but zig-zag as prices rise and fall depending on who is winning the buyer/seller battle. In order to help market players decide if they should buy or sell they need tools to help decide their trading strategy. One such tool is the market **trend** and is simply defined as:

The direction of the market – the way the market is moving.

There are two basic **trend** directions and the situation when a market is within a sideways **consolidation** to consider:

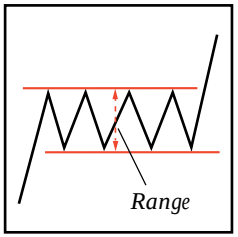
Uptrend

This is considered to be the time to **buy** or **go long**. A major uptrend is also known as a **Bull** market. Market players have the opportunity to profit by being **bullish** – buying and staying with the uptrend.

Downtrend

This is considered to be the time to **sell** or **go short**. A major downtrend is also known as a **Bear** market. Market players have the opportunity to profit by being **bearish** – selling with a view to buying later. In equity markets it is not always possible for normal investors to be short – they are either in or out of the market.

Sideways market



This situation arises when there is no strong conviction by either bulls or bears. As a result market prices rise and fall in a more congested space – hence the term **congestion** or **consolidation** is sometimes used. This type of pattern is generally considered to be a signal to stay out of the market. However, some traders use congestion patterns as an opportunity for **range** trading – selling on the high side of the congestion and buying back and reversing long at the low side.

Sideways patterns eventually result in a **breakout** and reversal or continuation of the original trend. Reversals and continuations have characteristic patterns which the chartist uses to make trading decisions. However, these patterns are not always easy to recognise!

Within the zig-zag trend patterns you may also see temporary corrections in price movements – these are known as **pullbacks**.

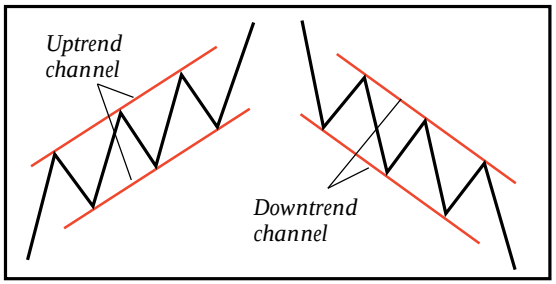
You have already been introduced to market sayings such as

The trend is your friend

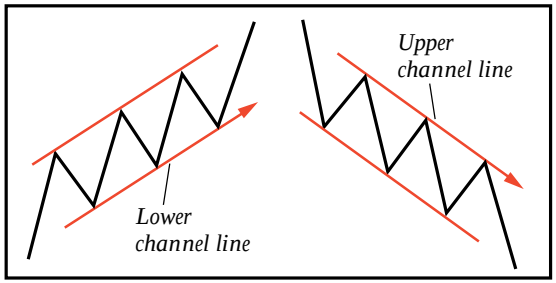
Go with the trend

and as long as the trend is intact the situation is stable.

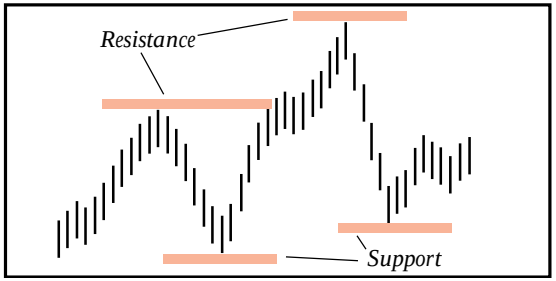
Whilst the situation is stable if you look carefully at the zig-zag pattern of a trend you may notice that it is possible to draw two more or less parallel lines – one joining the high points of the peaks and the other the lower points. These lines bound what is known as a trend **channel**.



Both of the lines bounding a channel can be viewed as retaining 'walls' against which prices keep hitting and bouncing off. In an uptrending channel if the **lower** channel line is broken then this may warn of a possible reversal of the uptrend. If the **upper** channel line is broken then this suggests an acceleration and strengthening of the uptrend. In the case of a downtrend it is breach of the upper channel line that warns that the existing trend may be ending.



What is actually happening during these ups and downs in the zig-zag patterns? The patterns are caused by the constant battle between bulls and bears in the market place. At market peaks the bears gain ascendancy and take control, whilst in the troughs the situation is reversed and the bulls gain ascendancy. If market players move to stop a price fall, then they buy and provide **support** to the market. If they move to stop a price rise, then they sell and **resistance** to the rise is the outcome.



Observing how markets react to support and resistance is a good barometer of the measure of an underlying trend.

In any market there will be short, medium and long -term trends. In some cases all these trends work in the same direction resulting in a strongly trending market. In other cases the different trends conflict with each other which results in a much more subdued market price action. The essence of using trends for both long term investors and short term traders is to be able to assess when trends are likely to **change**.

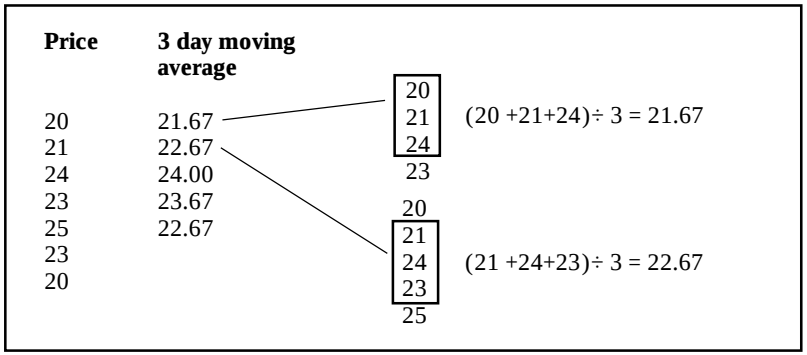
Chartists are looking for a trendline to be broken – a **breakout**. This is a signal to examine charts and market events closely. What do the signals mean?

- ❑ Has the trendline / channel been broken?
- ❑ Are prices just fluctuating in their channel?
- ❑ Are there any pullbacks?
- ❑ Are prices moving sideways?
- ❑ Are there any continuation / reversal patterns?

So far the approach taken in considering patterns has only concerned trends. What would Dow have had to say about such an approach?

Although Dow Theory concentrates on trends in the market, any movement has to be **confirmed** – Dow used his stock indices and volume of trading for this purpose.

More modern techniques of pattern confirmation used by chartists include **moving averages** which are a variation on trendlines. An average is calculated for a number of prices by summing the prices and dividing the result by the number involved. In moving averages, although the number of prices remains constant, the actual prices used change on a period-by-period basis – as the period moves on one the oldest price in the sequence is dropped and replaced by the current one.



Within moving average charts it is also possible to see price action moving within a channel with walls a certain percentage above and below the moving average. Conventional price channel analysis has the upper/lower bands as a fixed percentage above/below the underlying moving average. However, John Bollinger, the US chartist, has further developed this technique by introducing a volatilty measure such that the bands **broaden** in a volatile market and **constrict** in a market where trading is subdued. These bands are known as **Bollinger bands**.

Another type of chart which is used to confirm trends is based on **relative performance**. This is a measure of how well a particular instrument is performing relative to the rest of the market as gauged by comparing it with a broad market measure or another instrument. For example, if you have shares in Reuters Ltd you may want to see how well your shares are performing relative to the FT-Actuaries All-Share Index. A rising relative performance means that the share is outperforming the market whilst a falling value means the share is underperforming. In the equity market this performance measure is referred to as **relative strength** which should not be confused with the Relative Strength Index, which is an indicator described in the next section.

Careful inspection of daily charts may also indicate the presence of **gaps** or blank spaces in the price chart. For example, in an uptrending market, if the highest price for any one day is lower than the lowest price for the following day, then a gap will appear in the chart. True gaps are an indication of a bull/bear market conviction which is so strong that a given price range has been completely ignored. Gaps are often seen in futures markets and to a lesser extent in equity markets. Gaps are rarely seen in 24-hour markets such as the spot FX majors for USD/DEM etc.

In order to help you identify the basic patterns that have been discussed here, and to give an overview of how chartists use them, information is given on the following:

- ❑ Trendlines/channels
- ❑ Continuation/consolidation patterns
- ❑ Reversal patterns
- ❑ Support and resistance
- ❑ Moving averages
- ❑ Relative performance/strength
- ❑ Gaps

The format for each section follows the same as adopted for the previous section.

It is important to remember that this workbook is not an exhaustive treatment of chart patterns – it only provides an overview to the subject. If you want to find out more then you can have a look at some of the materials given in **Further resources**.

Trendlines

A **trendline** is a line connecting consecutive high or low data points in order to identify the direction of a market. The longer an unbroken trendline can be drawn the more significant the trend.

Trendlines are used to identify the following characteristics in market trends:

- Direction of the trend
- Reversal of a trend
- Continuation of a trend
- Support and resistance

Once a trend line is broken it is an early signal of a trend change and sideways movement in prices – it is not necessarily a signal to immediately buy or sell.

Uptrend

This is a line drawn joining **low** data points. It is drawn **under** the low points and connects at least **three consecutive rising low points**. Classically the line does not cross any other data points but recent research shows this is permissible under certain conditions.

Downtrend

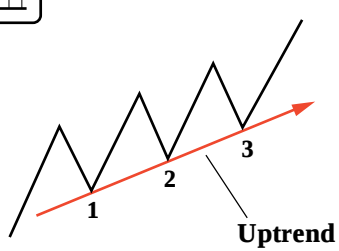
This is a line drawn joining **high** data points. It is drawn **above** the high points and connects at least **three consecutive falling high points**. Classically the line does not cross any other data points but recent research shows this is permissible under certain conditions.

Reversal

This is when the validity of the current trend ends and the trendline is broken. Immediately following a reversal it is quite common for the market to move sideways. However, there are instances where the end of a trend is followed by a violent and strongly trending market in an opposite direction to the original trend.

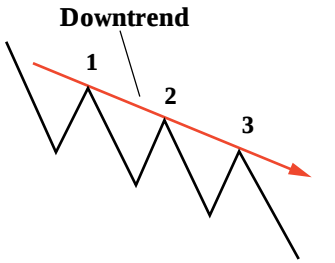
Continuation/consolidation

Prices often fluctuate back and forth towards the trendline giving rise to a number of patterns such as pennants and triangles. The sideways trend produced is generally an indication of a temporary pause in the prevailing trend.

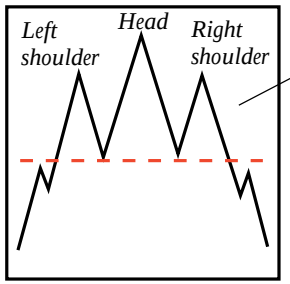


For an uptrend the line is drawn below the data points. Consecutive low points must be higher than the previous point, for example, 2 is higher than 1.

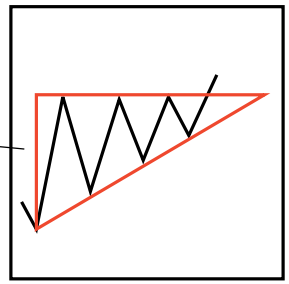
For a downtrend the line is drawn above the data points. Consecutive high points must be lower than the previous point, for example, 2 is lower than 1.



Traditionally, in uptrends and downtrends the line does not cross any other data points. However, new research is introducing concepts on trendlines and channels that permit this.



A common reversal showing a head and shoulders pattern



A flat top triangle continuation pattern

Trendlines

A line chart of daily closing prices for Reuter Holdings shares

Uptrend line – the more times the chart hits the line and the longer the line the more reliable the trend

Downtrend line – the more times the chart hits the line and the longer the line the more reliable the trend

A line chart of daily bid prices for the Italian Lira against the US Dollar

Continuation/consolidation patterns

Continuation patterns occur during periods of **consolidation** when prices are moving sideways following an up or down trend. The patterns are not always easy to recognise and do not always have the regular shapes described below! Continuation patterns have names based on geometric shapes:

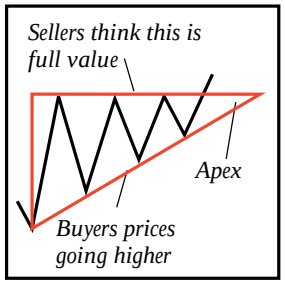
- Triangles
- Rectangles
- Flags and pennants

Continuation patterns last for varying periods of time – flags and pennants only last a few days, rectangles can last up to a year.

Market players use continuation patterns to determine a **target price** for their trading strategy. This target price is the level they expect the market to reach following breakout of the consolidation and resumption of the continuation trend.

Triangles

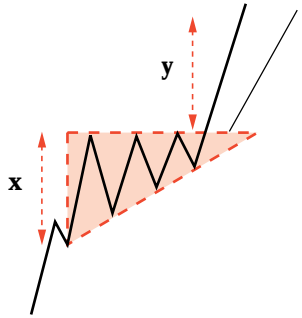
These occur in both up and down trends and represent a battle between buyers and sellers. Triangles can have flat tops, flat bottoms or sloping sides as with an equilateral triangle. For example, in this triangle the flat top indicates that the sellers think that the price is the full value, whereas the buyers are putting in orders for higher and higher prices. Eventually one side will win and a breakout will occur.



It is interesting that the closer the price gets to the apex of the triangle the less reliable the pattern becomes.

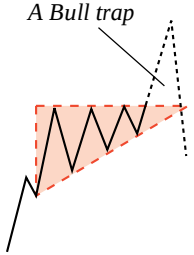
It is common to see that the breakout of a triangle following an uptrend gives rise to a short, sharp rise before a price fall occurs. Such breakouts are referred to as **Bull traps** and quite often mark major bull market tops. In a downtrending market the inverse situation is called a **Bear trap** which often marks a major bear market bottom.

Flat top triangle

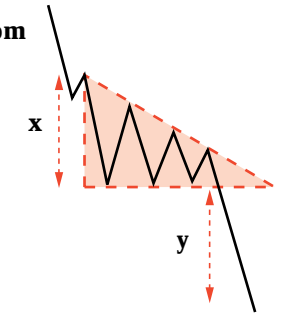


Ideally, as a minimum, there should be three points of contact on each side of the triangle.

A Bull trap

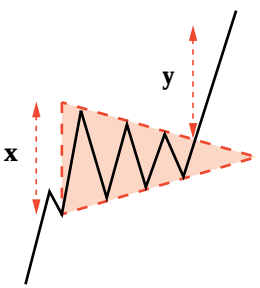


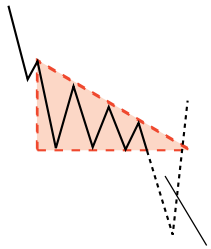
Flat bottom triangle



The target price for each triangle is taken when the price difference for x = y. Market players then decide their strategy. Long term investors may just use the pattern to confirm a trend whilst short term traders may decide to buy/sell at this signal.

Equilateral triangle



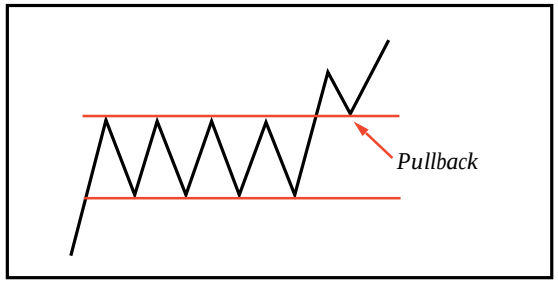


A Bear trap

Continuation/consolidation patterns

Rectangles

These represent a straight forward battle of support and resistance between buyers and sellers. Rectangles may build up over a period of months and last up to a year. If the breakout follows the direction of the trend then prices will continue to rise but if the breakout is in the opposite direction then this should be considered a major reversal pattern. Sometimes after a breakout there is a small correction before a new trend direction is established. This correction, or pullback, retests the old resistance level which has now become support before the original trend direction is resumed.

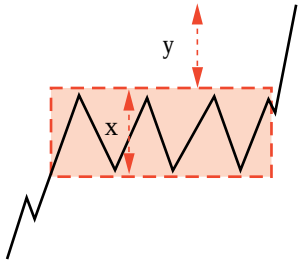


Flags and pennants

These are short term patterns usually lasting no more than a few days and occur in fast moving markets involving steep rises. They usually mark the half way point in a continuing price movement. Flags are shaped like downward sloping parallelograms whilst pennants are downward sloping and have a triangle like shape. The shapes are often difficult to identify but usually involve the following conditions:

- They occur after a sharp up or down price move
- The volume should decline for the duration of the pattern
- Prices should breakout of the pattern within a few weeks otherwise it is unlikely that it is a flag or pennant

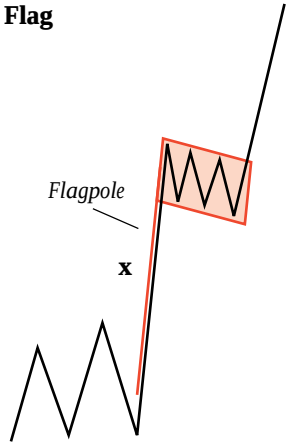
Rectangle



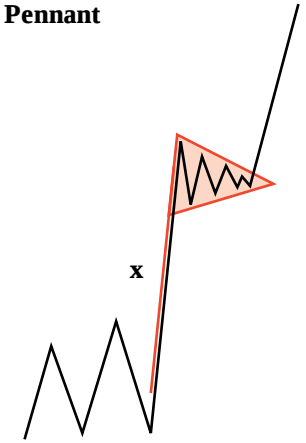
The target price for a rectangle is taken when the price difference for x = y as in the case for a triangle.

The target price for a flag or pennant is taken when the price difference for the flagpole, x , is reached in the direction of the trend following the breakout and trend continuation.

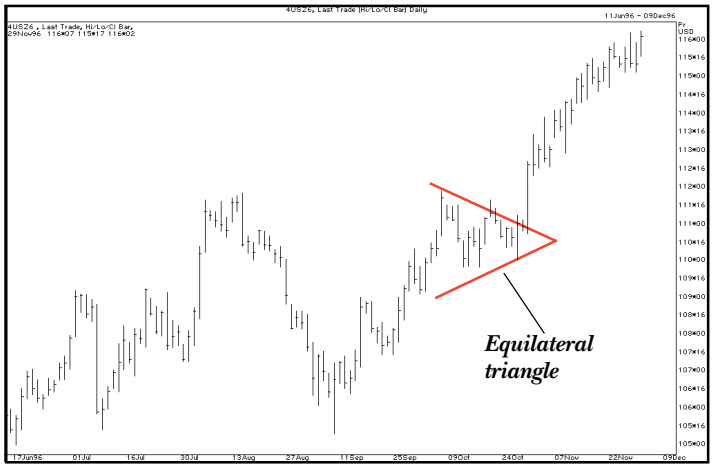
Flag



Pennant



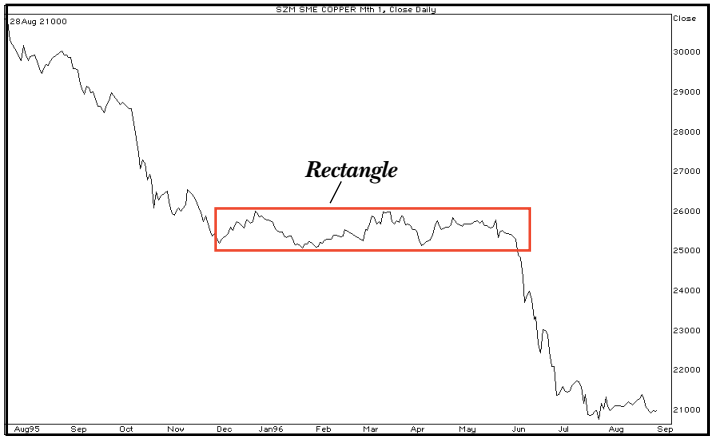
Continuation/consolidation patterns



Bar chart of daily last trade prices for CBOT US T-Bond futures, December 1996

Bar chart of daily prices for Nikkei 225 Index

Bar chart of daily prices for GBP against USD



Line chart of daily close Shenzen 3 month Copper futures prices

Continuation/consolidation patterns

A candlestick chart of daily bid prices for DEM/JPY cross rate

Periods of continuation are indicated by price action between the lines shown in red on the charts

A weekly bar chart of last trade values for the DAX Index

Reversal patterns

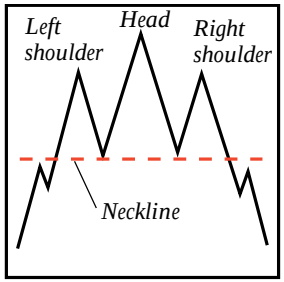
A **reversal pattern**, as the name implies, indicates a top or bottom in market prices usually accompanied by a trend reversal. Some of the patterns are relatively easy to identify and reliable in their interpretation – others are more complex. Reversal patterns are only important if they occur in a strong and marked current up or down trend. A pattern observed in a downtrend is the **inverse**, or mirror image, of that seen in an uptrend although it is not always as prominent. The most common patterns which indicate market reversal are:

- Head and shoulders
- Double and triple tops/bottoms
- Wedges
- Rounding or saucer top/bottom – also known as 'scalloped'

Market players use reversal patterns to identify top and bottom price structures and select target prices for subsequent breakouts and reversals in market trends. To help establish a target price a chartist will draw a **neckline** which, in a head and shoulders pattern, is a line joining certain specified low points of the pattern.

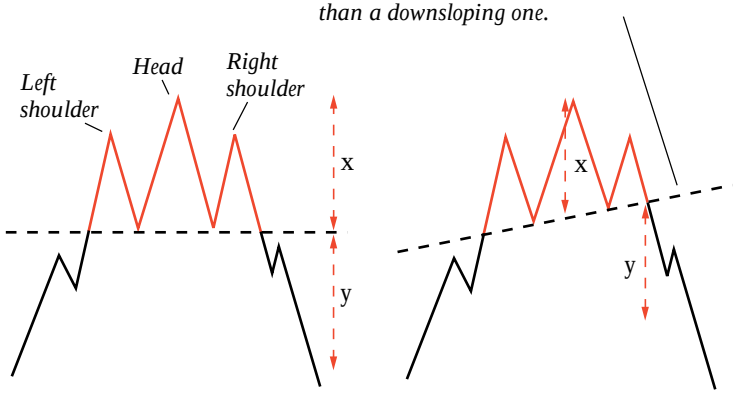
Head and shoulders

This pattern is made up of three peaks. The centre peak is higher then the outer two which are approximately the same height – the shape is supposed to resemble someone shrugging. The pattern usually occurs at the end of a long uptrend and is one of the most common and reliable of patterns. The left shoulder and head represent the struggle between buyers and sellers and high volumes are traded. On the appearance of the right shoulder the volume declines and if the support line – the neckline – is broken, then this is a strong indication that prices will continue in that direction. Interestingly an inverse head and shoulders, in an equity market, is often less pronounced and flatter than seen in an uptrend.

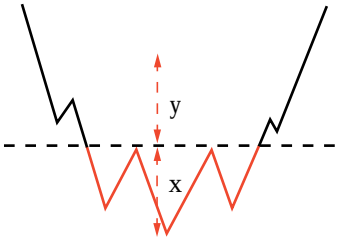


The neckline can be horizontal or slant up or down. More significance is attached to an upward sloping neckline in an uptrend than a downsloping one.

Head and shoulders



Inverse head and shoulders



Once prices breakthrough the neckline the target price for market players to take profit on positions taken at the breakout can be determined using the price difference x = y. This technique assumes that the price moved at least y prior to the emergence of the pattern.

Reversal patterns

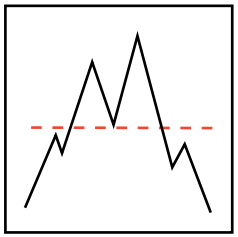
Double and triple tops/bottoms

Double and triple tops and bottoms are successive peaks and troughs, of approximately the same height and depth, which represent the continuing struggle of buyers and sellers to dominate the market. The patterns usually signal intermediate or long term changes in the trend. Eventually buyers or sellers win and the trend is reversed.

A double top looks like the letter M – a double bottom a W. Triple tops and bottoms resemble a head and shoulders but do not have such a pronounced head.

Double and triple tops/bottoms can be distinguished from head and shoulders patterns by looking at volumes, for example, the number of shares being traded. In double and triple tops/bottoms the volumes usually decrease for each peak whereas in a head and shoulders pattern the volume of right shoulder normally changes dramatically.

For a double top a neckline is drawn through the mid-point of the M as the support level.

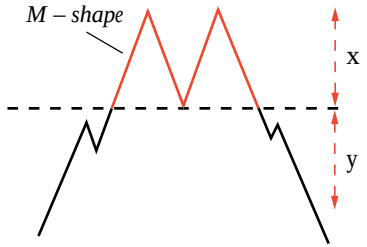


Care is needed in using double and triple tops/bottoms as you need to be confident that the previous trend has been reversed. For example, two double top formations following each other could form part of a rectangular continuation pattern. It is worth noting that double and triple tops/bottoms need not have exactly equidistant peaks and troughs. Also the peaks and troughs can be deep or shallow, though major tops and bottoms are usually assciated with a deep consolidation area.

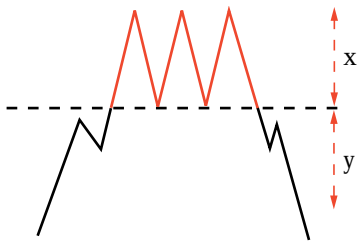
In general double tops/bottoms occur more often than head and shoulders or triple tops/bottoms. However, the likelihood of a full reversal is greater with head and shoulders and triple tops/bottoms.

The neckline can be horizontal or slant up or down slightly.

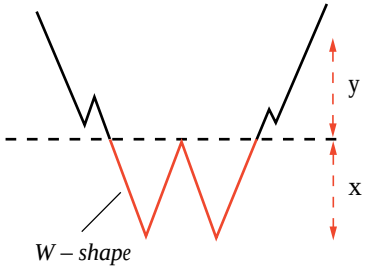
Double top



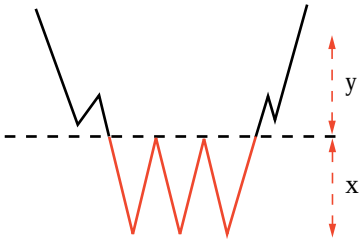
Triple top



Double bottom



Triple bottom

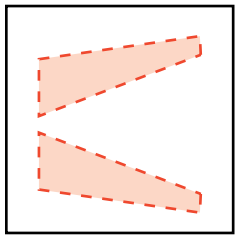


Once prices breakthrough the neckline the target level for the reversal can be determined taking the price difference x = y.

Reversal patterns

Wedges

Triangles and wedges define converging prices before a reversal and can take several weeks or months to develop. These patterns are taken as signals as an opportunity to profit.



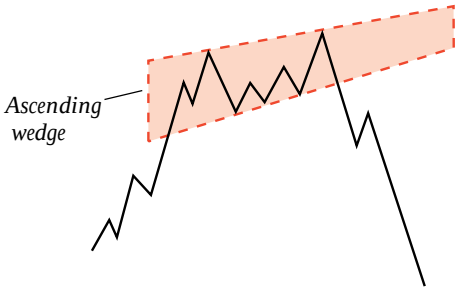
Wedges have boundaries that gently slope towards each other. Wedges can **rise** or **fall** – slope up or down. Just as with triangles, a wedge breakout should occur before the apex of the wedge is reached.

Rounding or saucer tops/bottoms

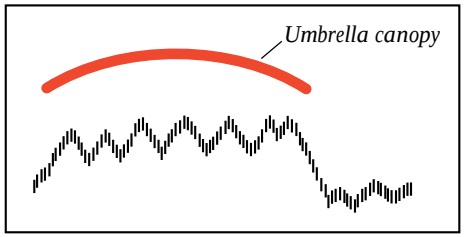
These are not common types of reversal patterns. They tend to form slowly over a period of months indicating a protracted struggle between buyers and sellers with neither really gaining ascendancy.

A rounding top is roughly shaped like an umbrella canopy whereas a rounding bottom has a saucer shape. These patterns offer no clear-cut buy or sell signals but when considered in conjunction with fundamental analysis, chartists can use them to predict long term investment opportunities.

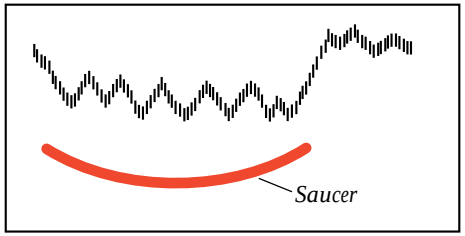
Wedge



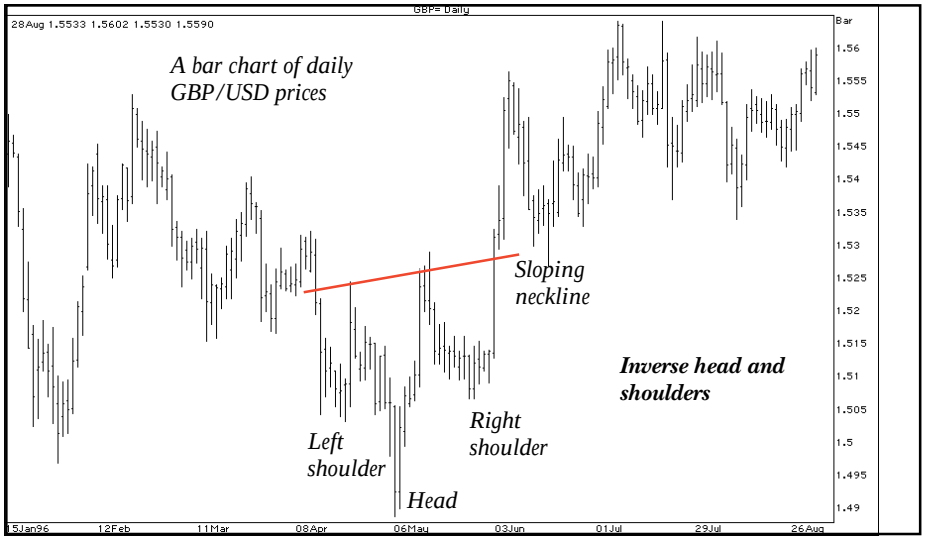
Rounding top



Rounding bottom or scalloped

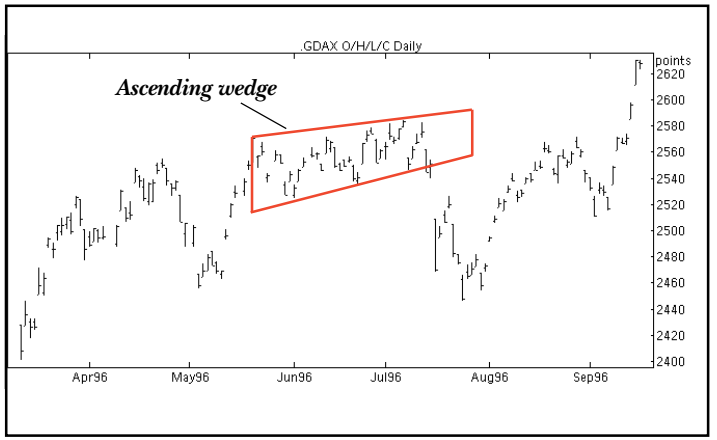


Reversal patterns



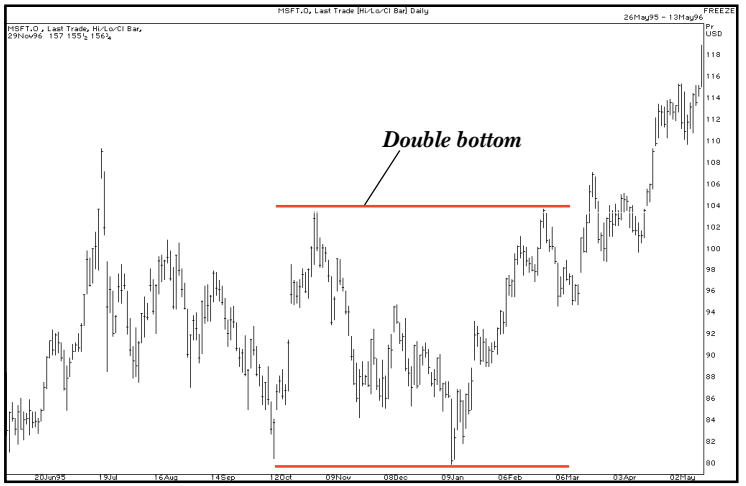
Reversal patterns

Bar chart of daily prices for USD/DKK



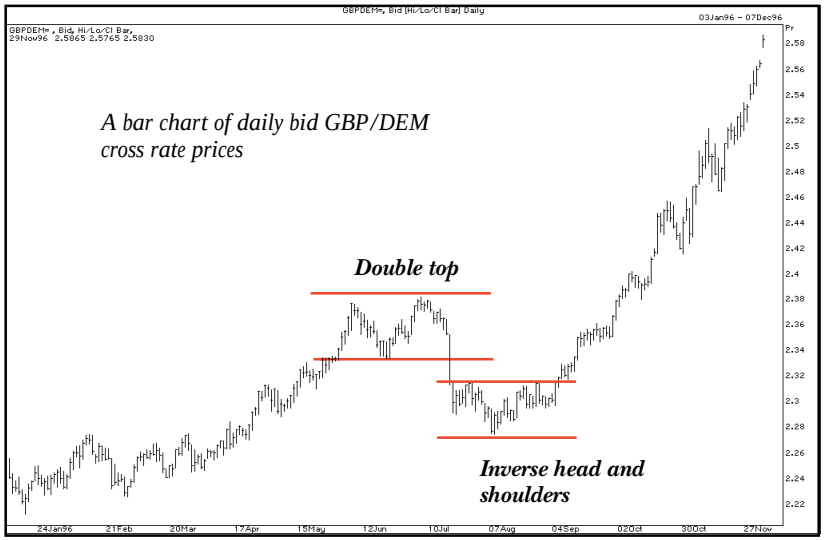
Bar chart of daily prices for DAX Index

Bar chart of daily last trade prices for CBOT US T-Bond futures for December 1996



Bar chart of daily last trade prices for Microsoft shares

Reversal patterns

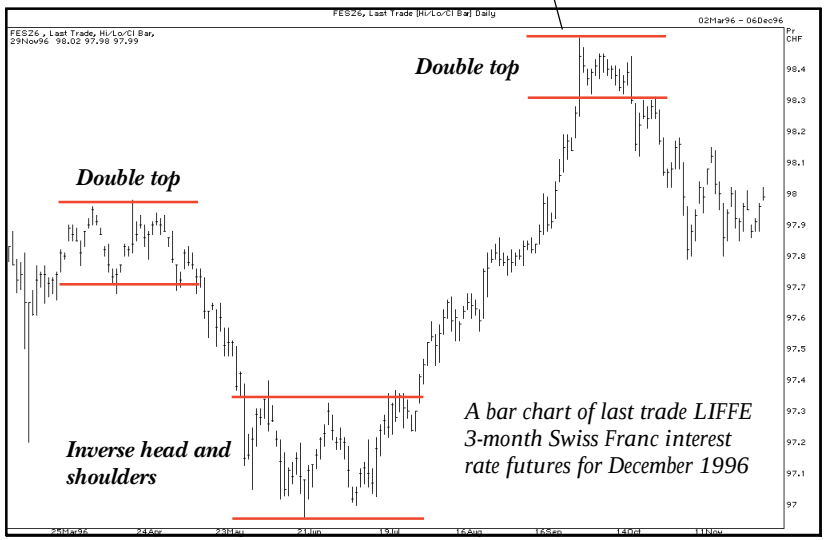


A bar chart of daily bid GBP/DEM cross rate prices

Double top

Inverse head and shoulders

Sometimes the patterns are not quite 'classical' in appearance



Double top

Double top

Inverse head and shoulders

A bar chart of last trade LIFFE 3-month Swiss Franc interest rate futures for December 1996

Support and resistance lines

Support and **resistance lines** are one of the basic components of charting and are important in the understanding of trends and their associated patterns such as continuations and reversals.

Support level
This is the level that supports market price action for a period of time. It is the level where buying interest is strong enough to overcome selling pressure. The result is that the market does not fall below that level.

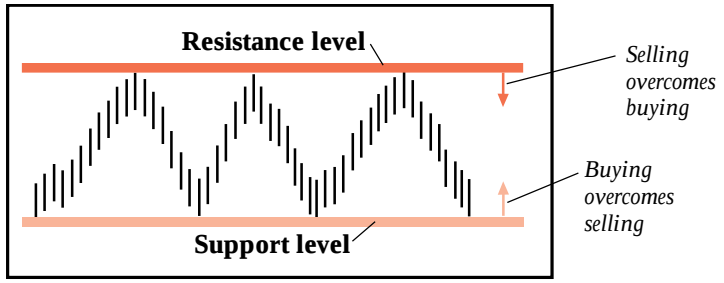
Resistance level
This is the opposite of support and is the level that resists market price action for a period of time. It is the level where selling interest is strong enough to overcome buying pressure so the market does not exceed that level.

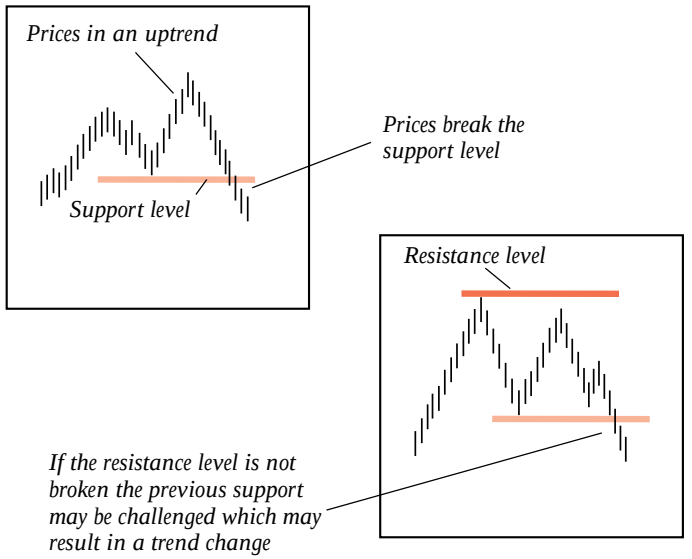
Support and resistance lines are used by traders involved with both short and long-term timescales, for example, futures traders and traders in the equities markets. The performance of price action when support and resistance levels are approached is investigated closely by analysts for signals of continuation or a reversal of the previous trend.

If prices have been in an uptrend and then fall, breaking an important support level in the process, then this is taken as a warning of a trend reversal.

If a resistance level has been tested and not broken, then this is usually taken as an early warning of a possible trend change.

Support and resistance levels

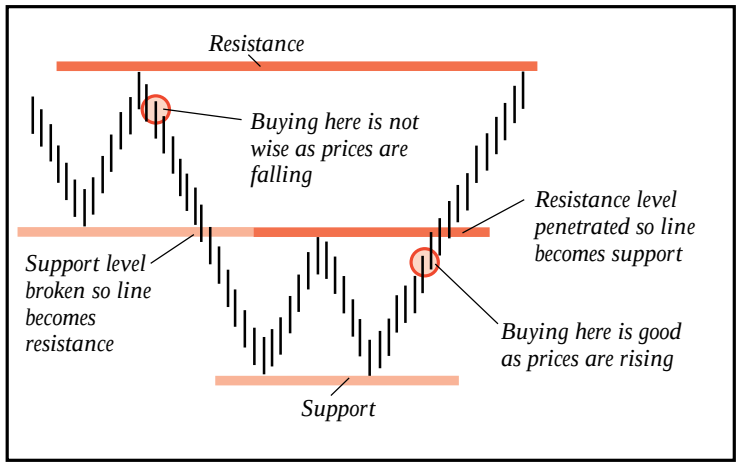




Support and resistance lines

Support/resistance reversal

When a support level is broken then the level takes on the new role of resistance and when a resistance level is penetrated it takes on the new role of support.

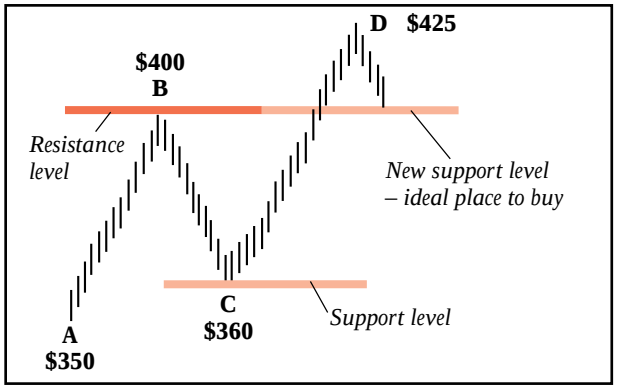


Open interest – Future markets

There is a relationship between support and resistance levels in an uptrend / downtrend. As a market moves away from support / resistance, that is, new buyers / sellers are entering the market then the open interest should **increase**. However, if such an increase is not observed, then this is taken as a warning signal.

Example of support/resistance reversal

A gold trader buys at $350 at A and sells his position at $400 – the resistance level, B. The market slides back to C, the support level at $360, and then rises quickly to D at $425. When should the trader buy? A popular price to buy back is at the $400 level – the previous resistance level which has now reversed to become the new support level. However, a sensible trader would have a stop loss level beneath the $400 level in case the expected support level failed to halt the downtrend in prices.



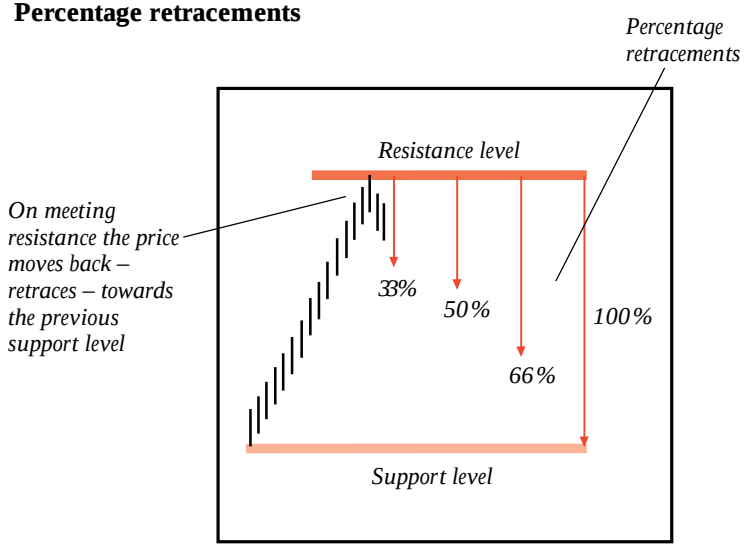
Support and resistance lines

Retracement

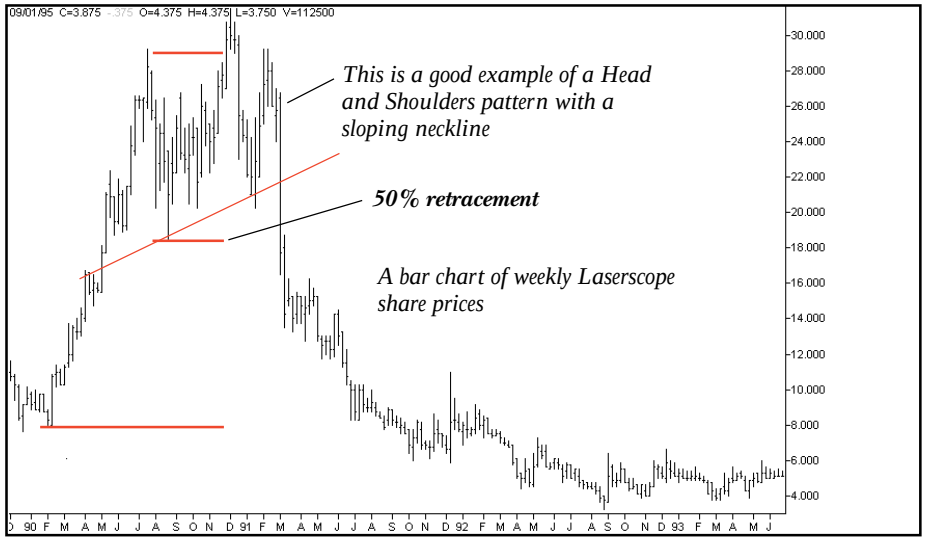
As a market reacts or rallies following a strongly trending move, part of that price move is retraced – this is known as **retracement**. If the amount of retracement can be predicted then trading levels can be set to a trader's advantage. Chartists use **percentage retracements** to determine support and resistance levels. Quite often a correction in a trending market will retrace to approximately half or 50% of the previous move and so this figure is favoured by many traders. Other common retracements in a bull trend are approximately 33% and 66%.

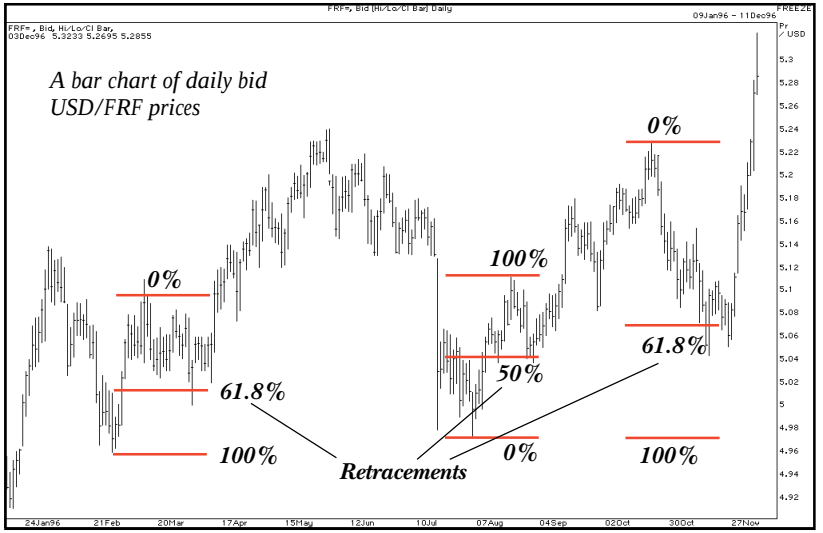
As you will see in the later section on *Waves, numbers and cycles* Gann charts and Elliott Wave Theory pay particular attention to retracements. Gann lines are often drawn in eighths or tenths and Elliott Wave Theory predicts retracement levels at 0.382 (about 33%) and 0.618 (about 66%) which are based on the reciprocals of the Fibonacci numbers 2.618 and 1.618 respectively.

Percentage retracements



Support and resistance lines





Moving averages

A **moving average** is usually created by adding a series of closing prices and then averaging the data on a period-by-period basis. As the period moves on, the oldest price in the sequence is dropped and replaced by the current price in the period.

Price	3 day moving average
20	21.67
21	21.67
24	24.00
23	23.67
25	?
23	
20	

What is the next moving average in this sequence? You can check your answer on page 59.

A moving average is a lagging indicator that provides a way of 'smoothing out' data and which is used to confirm price trends. The period chosen for a moving average depends on the type of instrument being charted – the most common periods used are 9/10, 18/20, 40/50, 100 and 200 periods. Futures markets tend to use shorter-term moving averages, for example, 9 and 18 periods, whereas for long-term investment instruments, such as equities, 50/100/200 are more popular periods. Assuming that the instrument being charted has a cyclical trading pattern, research has shown that the most successful moving average is associated with the cycle period for the instrument. There are three types of moving average used widely, all having benefits and drawbacks, which are:

- ❑ Simple Moving Average (SMA)
- ❑ Weighted Moving Average (WMA)
- ❑ Exponential Moving Average (EMA)

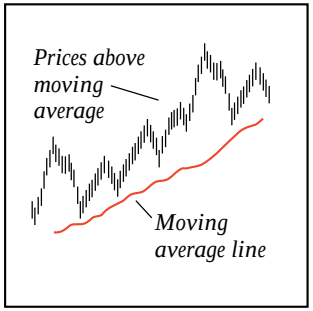
In general all three types of moving average are used for the following:

- ❑ To detect trend directions
- ❑ To determine buy/sell signals

When using moving averages it is important to remember that you need to examine the relationship between the **actual price** and the **moving average**. This means that the plot for a moving average must appear on the price chart using the same X-axis as the instrument being analysed.

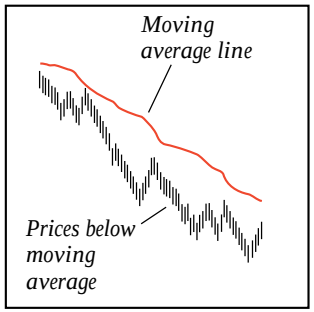
Trend directions

Bullish



The position of the moving average plot can be used to indicate the trend direction of a market

Bearish



Market signal	Price/moving average relationship
Bullish	Prices **above** moving average and moving average moving **up**
Bearish	Prices **below** moving average and moving average moving **down**

Moving averages

Using classical charting techniques for a single moving average, the signal for buying is taken as the moving average turning **up** with price action **above** the moving average. However, trading using such a strategy can result in severe losses if the market prices oscillate violently – known as 'whipsawing'. In an attempt to avoid losses, analysts use a two moving average **crossover** technique to indicate buy/sell signals. The two moving averages typically comprise a short-term 5-10 period and a longer-term 15-35 period – 9/10 short-term and 10/20 long-term periods are particularly popular with analysts.

The lines are usually distinguished using different colours in charting applications although solid and dotted lines may be used for publications.

Buy and sell signals are indicated as follows:

If the short-term moving average comes from **below** and **crosses above** the long-term moving average, then this is a **buy** signal if the price action is **above** the moving average cross-over point.

If the short-term moving average comes from **above** and **crosses below** the long-term moving average, then this is a **sell** signal if the price action is **below** the moving average cross-over point.

The crossover is considered to be much more significant if both averages are moving in the same direction.

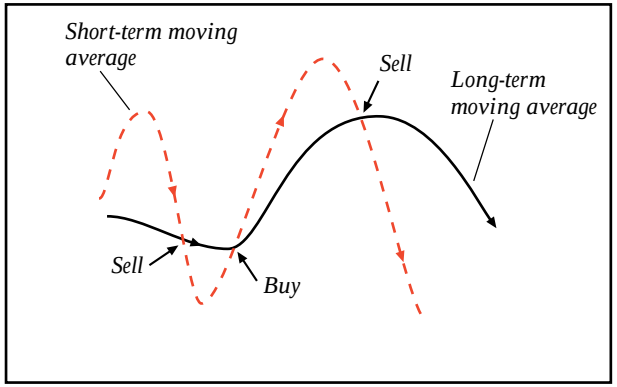
If both averages are moving up, then it is known as a **Golden Cross**. If both averages are moving down, then it is known as a **Death Cross**.

Simple Moving Averages

This is the type of moving average which has already been described. It is simply the arithmetic average of the number of data points in the selected period.

A SMA inherently lags behind the market price action and therefore any signals produced will inevitably lag behind the trend change that caused the moving average(s) to reverse direction. Though SMAs provide a simple analytical technique they are still used widely by chartists.

Buy/sell signals



Simple Moving Average formula

$$SMA = \frac{P_1 + P_2 + P_3 + \ldots\ldots P_n}{n}$$

P = Price or value
n = Number of days in period

Moving averages

Short-term SMAs are more responsive and more 'whippy' to price action than those for long-term averages. So what period should be used for moving averages? As has been mentioned already the trading cycle period for a particular market is often used as too is the half cycle period. For example, in a 50-day futures market trading cycle the average period used is 25-days.

A SMA also assigns an **equal weight** to all the prices used to calculate the average. This approach disregards the importance and relevance of the most recent data as compared with the earlier data of the time series used to calculate the moving average. Something important may have happened very recently to affect the market which is not given sufficient weight. In order to take into account some of the criticisms of SMAs two different moving averages can be used:

- ❑ Weighted Moving Average (WMA)
- ❑ Exponential Moving Average (EMA)

Both these averages are used in the same way as SMAs but differ in the way the average is calculated.

Weighted Moving Average

This technique uses a mathematical algorithm which assigns a **greater weight** or importance to the most recent data.

The example for a five day period illustrates the process. The price for each day is multiplied by its day number and added together. This total is divided by the sum of the day multipliers to determine the WMA. The older the day in the period the smaller the multiplier used.

Exponential Moving Average

This is similar to a WMA in that the average also assigns a greater weight to the most recent data. However, in this case, instead of using a fixed number of data points (the periodicity), the EMA uses **all** the data that is available. Each price entry becomes less significant but is still included in the calculation which uses a complicated formula.

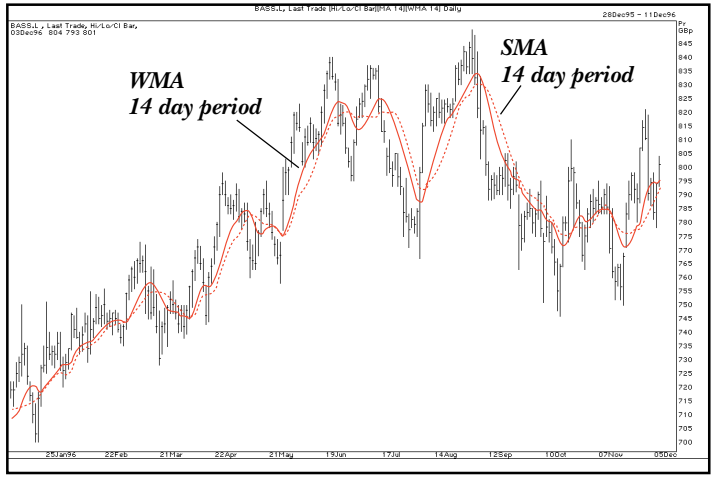
Example of a Weighted Moving Average calculation

$$WMA = \frac{5 \times (P_1) + 4 \times (P_2) + 3 \times (P_3) + 2 \times (P_4) + 1 \times (P_5)}{(5 + 4 + 3 + 2 + 1) = 15}$$

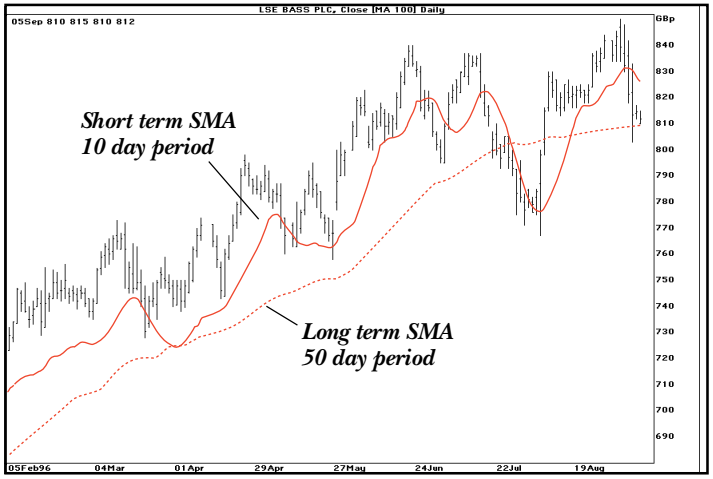
P = Price or value

Moving averages

Bar chart of daily close prices for Bass PLC shares



Bar chart of daily close prices for Bass PLC shares



Bar chart of daily close prices for Bass PLC shares

Bar chart of daily close prices for Bass PLC shares

Relative performance

Relative performance is a measure of how well an individual stock or stock market group of companies are performing relative to the market as a whole or relative to another stock, over a specified period.

If the relative performance is positive and rising, then the stock is outperforming the index. If the relative performance is falling, then this indicates underperformance.

As relative performance is a comparison, it is normal to plot the data at the bottom of a price chart as a sub-plot. The relative performance plots produced are used as indicators to detect and confirm market trends.

A change in trend of the relative performance chart may be a warning signal that something is changing in the share price itself. A move in a share price accompanied by a similar move in relative performance is taken as a reliable signal and confirmation to buy or sell.

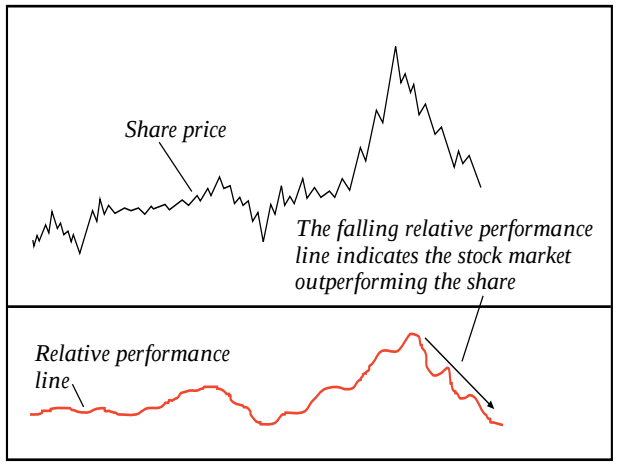
Calculating relative strength

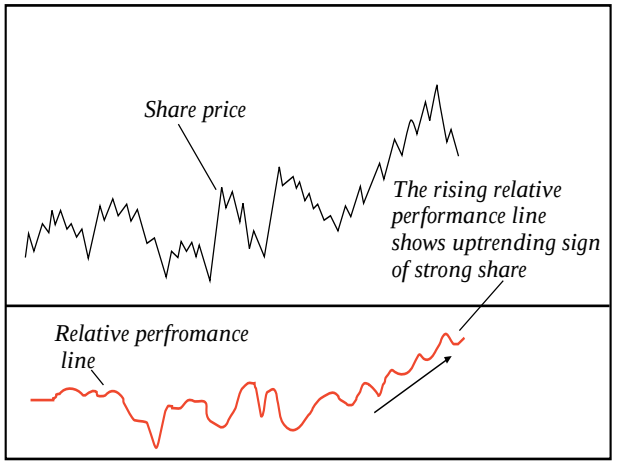
The formula to calculate Relative strength for the closing prices of a share against a Stock index is as follows:

$$\text{Relative performance} = \frac{\frac{A2}{B2} - \frac{A1}{B1}}{\frac{A1}{B1}}$$

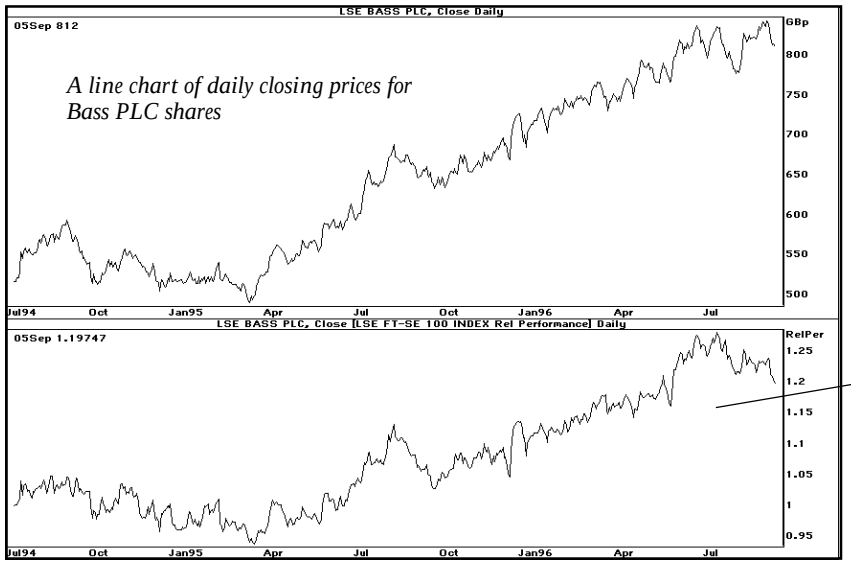
A1 = Latest closing price for share
B1 = Latest closing price for Stock index

A2 = Reference (start) closing price for share
B2 = Reference (start) closing price for Stock index





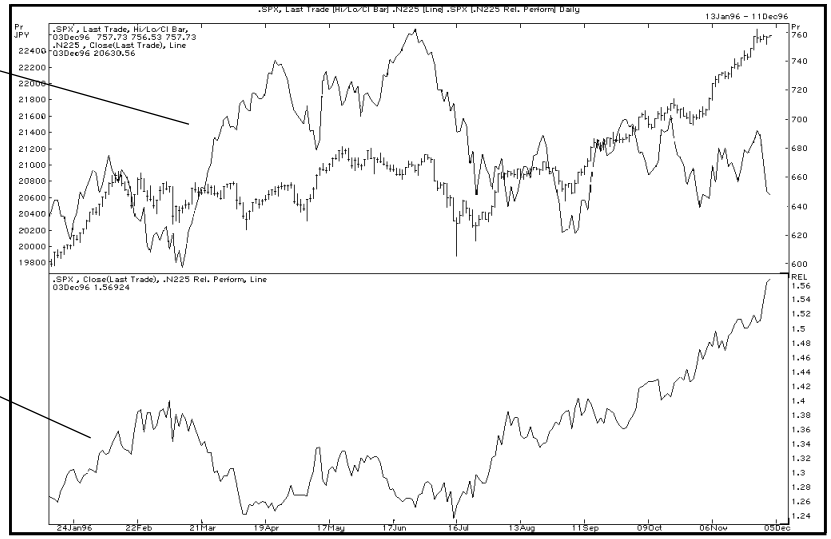
Relative performance



A line chart of daily closing prices for Bass PLC shares

Relative performance of Bass PLC shares compared with the FT-SE 100 Index over the same period

This shows a line chart for daily last trade values for the Nikkei 225 Index and a bar chart for daily last trade S&P 500 Index values



The Relative performance sub-chart shows that the S&P 500 starts to perform consistently better than the Nikkei from the middle of July

Gaps

If price action evolves such that no trading occurs between, for example, the close of one price and where it next opens, then a **gap** or hole is produced in a price chart. However, subsequent trading within the new period may succeed in filling this gap. A true gap means that there is no trading price overlap because the prices have skipped a price area. A gap occurs when the majority of market players simultaneously decide that prices should be adjusted swiftly. Thus a gap may be defined as follows:

The **low** price of a period is **higher** than the high price of the preceeding period or conversely the **high** of the period is **lower** than the preceding low.

Gaps are commonly seen in futures markets, much less so in equity markets and rarely in spot FX currency markets.

Gaps are patterns which are used to determine and confirm price moves. There are four basic types of gap which have different uses:

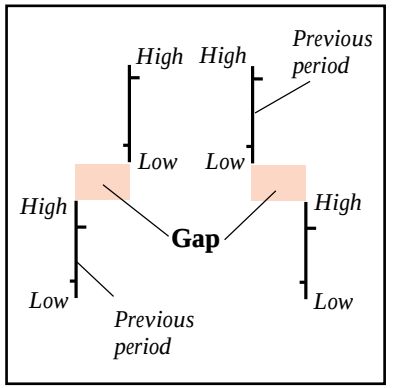
- Common
- Breakaway
- Runaway
- Exhaustion

Common gap

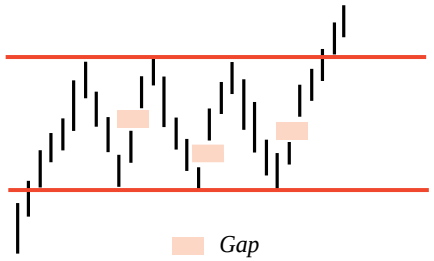
This type is seen in a sideways or congestion trading area and usually indicates a market lack of interest in the price of an instrument. This type of gap is also found typically with low volume trading where there are few active market participants.

Breakaway gap

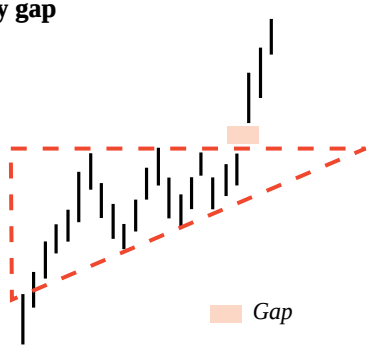
This type of gap occurs usually at the end of a consolidation such as an ascending triangle and signals the start of a significant market move. This type also usually occurs on a heavy volume of trading and is associated with a volume increase at the time of the gap.



Common gap



Breakaway gap



Gaps

Runaway or measuring gap

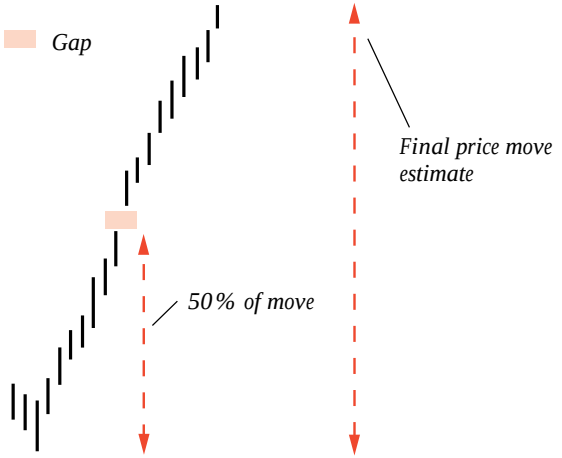
This occurs typically in the middle of price move and is used to estimate the size of a move – it is taken as signal of a continuing trend. The volume may not increase at the gap but if it does, then it usually indicates a strong trend.

As the gap usually occurs in the middle of a price move the final price move is easily calculated using the price difference from the beginning of the move to the gap.

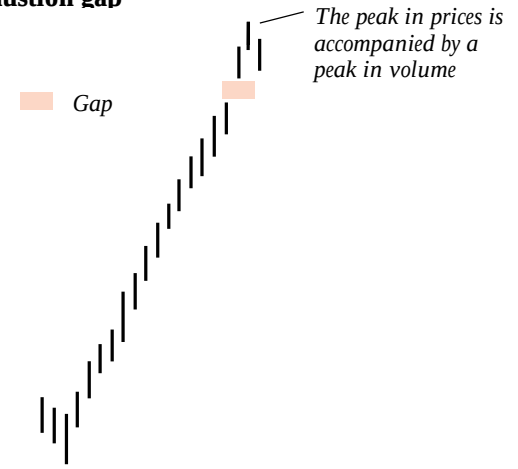
Exhaustion gap

This type signals the end of a price move and can be confused with a runaway gap. Typically an exhaustion gap occurs very near to the last day of a price trend which then reverses. The difference between an exhaustion and a runaway gap is that the former involves a very high volume of trading.

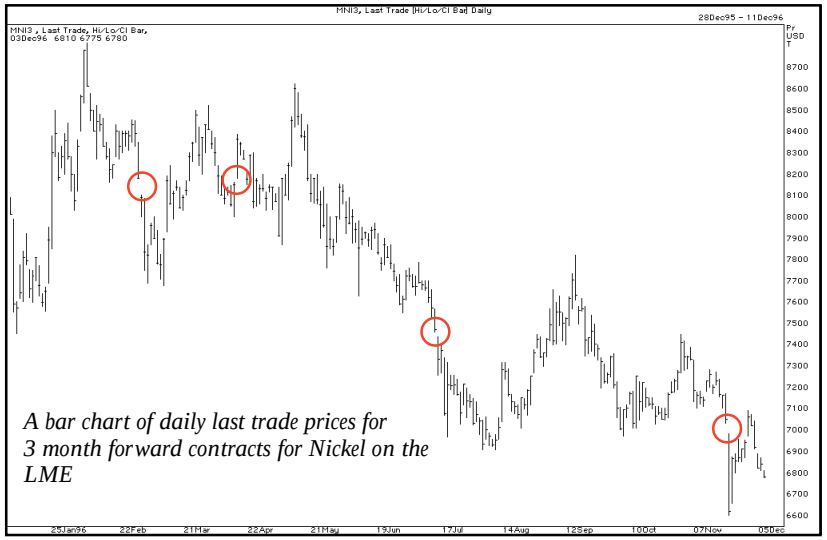
Runaway gap



Exhaustion gap

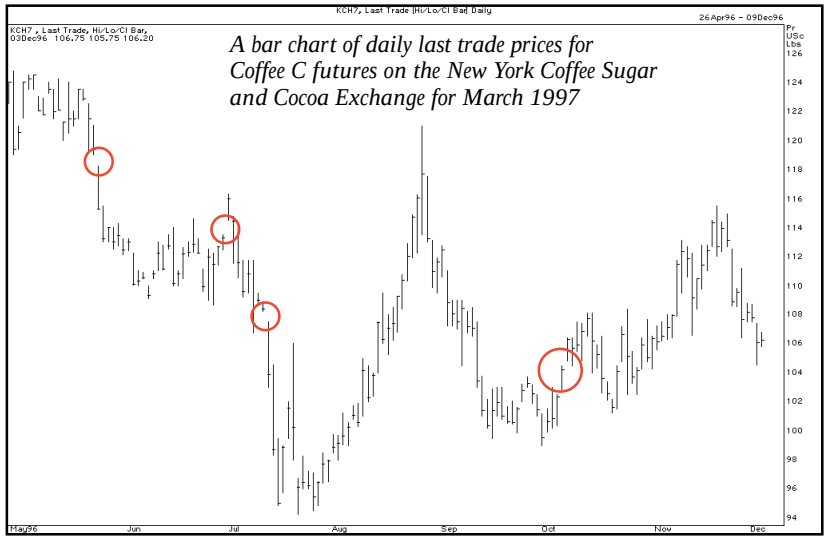


Gaps



A bar chart of daily last trade prices for 3 month forward contracts for Nickel on the LME

Some of the more obvious gaps are within the highlighted areas



A bar chart of daily last trade prices for Coffee C futures on the New York Coffee Sugar and Cocoa Exchange for March 1997

Charting exercises

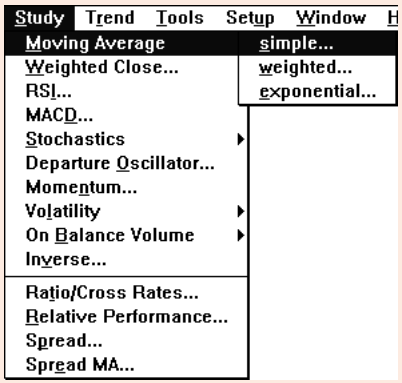
If you have access to Reuters Graphics and/or Reuters 3000 you may like to have a look at the following exercises which have been designed to help you understand more fully the various patterns described in this section.

Chart exercise 1

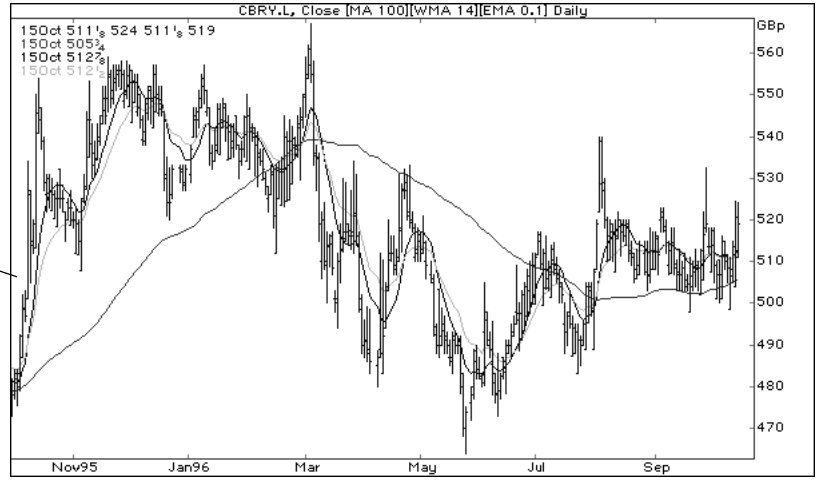
Open Reuters 3000 and in a new workspace type in **CBRY.L** for **Cadbury** shares. Make sure the Technicals tab is to the front and click on the **Relative Performance** page tab. You should now see Relative Performance charts of **Cadbury** shares relative to the **FT All Share index** and to the **FTFM index** – the appropriate FT market sector for Food Processing.

Chart exercise 2

Open Reuters Graphics (v3.1) and enter **CBRY.L** to display a 2 year daily bar chart for Cadbury shares. From the Study menu first select the Moving Average simple option and display a chart with an average period of 100 days. You should see a chart like this.



Now add a 14 day Weighted Moving Average and an Exponential Moving Average to the chart and you can investigate the moving averages. You will need to alter the X-axis to view different time periods.



Summary

You have now finished the third section of the workbook and you should have a clear understanding of the following patterns:

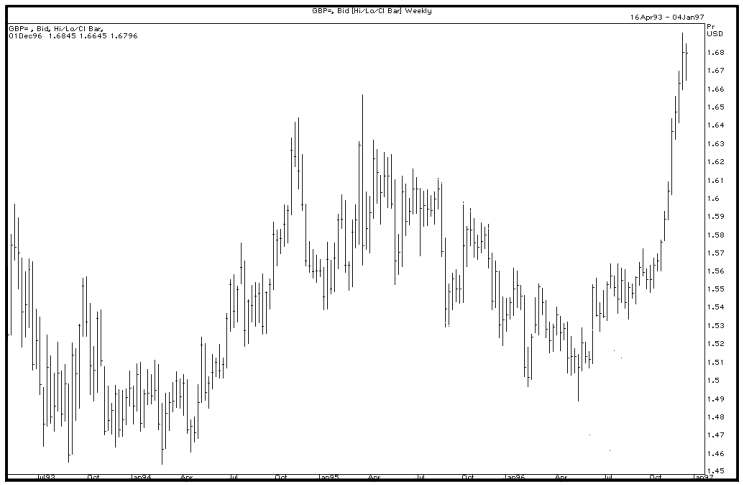
- ☞ Trendlines
- ☞ Continuation / consolidation patterns
- ☞ Reversal patterns
- ☞ Support and resistance
- ☞ Moving averages
- ☞ Relative performance
- ☞ Gaps

As a check on your understanding of this section you should try the Quick quiz questions. You may also find the section Overview a useful revision aid.

Quick quiz questions

1. This chart has a number of patterns. Indicate and name as many as you can.

2. This chart has a wedge pattern. Indicate its position.



You can check your answers on page 90.

Overview

Trendlines

- Line connecting consecutive high or low data points in order to identify the **direction** of a market
- **Uptrend** is a line connecting at least 3 consecutive rising low points and is drawn **under** the points
- **Downtrend** is a line connecting at least 3 consecutive falling high points and is drawn **above** the points

Support and resistance lines

- **Support line** – level that supports market price action for a period of time
- **Resistance line** – level that resists market price action for a period of time
- **Retracement**– as a market reacts back following a strongly trending move part of the price move is retraced

Continuation/consolidation patterns

- Occur during consolidation where prices are moving **sideways** rather than in an up or down trend
- Most common continuation patterns are:
  - **Triangles**
  - **Rectangles**
  - **Flags and pennants**

Relative performance

- Measure of how well an individual stock or group of stocks are performing **relative** to the market as a whole, or relative to another stock, over a specified period

Patterns

Reversal patterns

- Indicate an impending **top** or **bottom** in market prices coupled with a **trend reversal**
- Patterns in downtrend are **inverse** of those in uptrend
- Most common reversal patterns are:
  - **Head and Shoulders**
  - **Double and Triple tops/bottoms**
  - **Wedges**
  - **Rounding or saucer top/bottom**

Moving averages

- Moving averages are produced by adding a series of closing prices, then averaging the data on a period-by-period basis. As the period moves on, the oldest price is dropped and replaced with current price in the period.
- **Simple Moving Average** (SMA) is a simple arithmetic average in the selected period
- **Weighted Moving Average** (WMA) assigns a greater weight to more recent prices
- **Exponential Moving Average** (EMA) assigns a greater weight to more recent prices but uses all the prices – the oldest price is not dropped off

Gaps

- A gap in prices occurs when there is no trading price overlap because the prices have skipped an area
- There are four types:
  - **Common**
  - **Breakaway**
  - **Runaway or measuring**
  - **Exhaustion**

Further resources

Books

Technical Analysis of the Futures Markets
John J. Murphy, New York Institute of Finance, 1986
ISBN 0 13 898008 X

Technical Analysis Explained
Martin Pring, McGraw-Hill, 1991
ISBN 0 0705 1042 3

The New Commodity Trading Systems and Methods
Perry Kaufman, J. Wiley & Sons, 1987
ISBN 0 4718 7879 0

Technical Analysis from A – X
Steven Achelis, Probus Publishing Co., 1995
ISBN 1 55738 816 4

Technical Analysis of Stocks and Commodities

Reversal Patterns by M.F. Bowman
Vol. 8:10 (371-376), 1990

Consolidation Patterns by M.F. Bowman and T. Hartle
Vol. 8:11 (405-409), 1990

Gaps by T. Hartle and M.F. Bowman
Vol. 8:12 (453-455), 1990

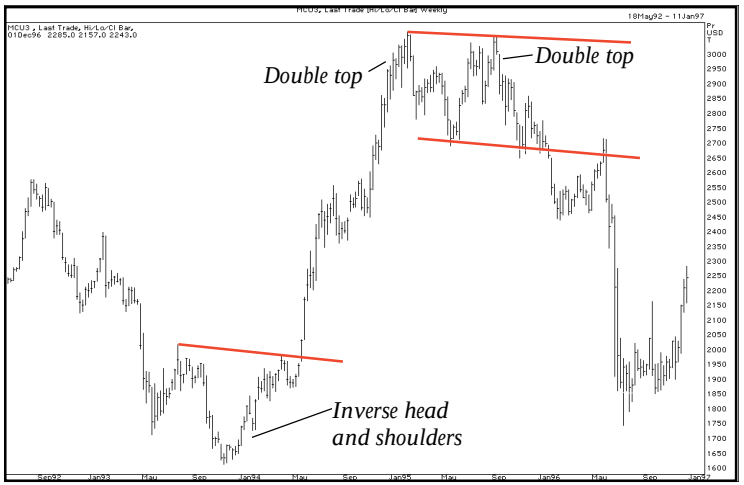
Calculating Relative Strength of Stocks by R. L. Hand
Vol. 10:5 (235-237), 1992

Support and Resistance Levels by J.J. Kosar
Vol. 11:1 (17-19), 1993

Trade with Moving Averages by C. Alexander
Vol. 11:6 (257-260), 1993

Quick quiz answers

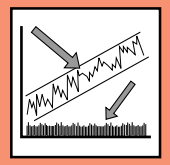
1. *This chart has a number of patterns. Indicate and name as many as you can.*



2. *This chart has a wedge pattern. Indicate its position.*

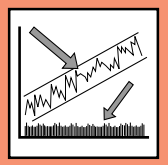
Your notes

Indicators



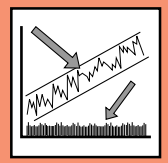
Contents

This section of the module should take about 60 minutes of study time. You may not take as long as this or it may take a little longer – remember your learning is individual to you.



In 1954, I was fortunate to join Investment Educators as a 'gopher'. I carried luggage, ran the projector, made charts and took attendance for the owner, Ralph Dystant, and for the technical 'guru', Roy Larson.

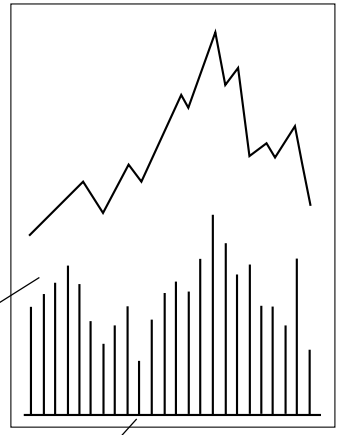
Lane's Stochastics by George C. Lane MD
Technical Analysis of Stocks and Commodities , Vol. 2:3 (87-90), 1984



Introduction

The construction of charts is relatively straightforward but as you have seen the process of identifying patterns is much more complicated. The patterns seen in charts are seldom exact text-book versions of ones you are seeking. The result is that predictions based on price movement charts exclusively are never completely reliable.

What can market players do to improve the reliability of their predictions of future market trends? What kind of tools and techniques are available? You will probably remember that even Dow recognised that he needed confirmation of a trend before implementing any particular trading strategy. Dow used volume as one of his indicators.

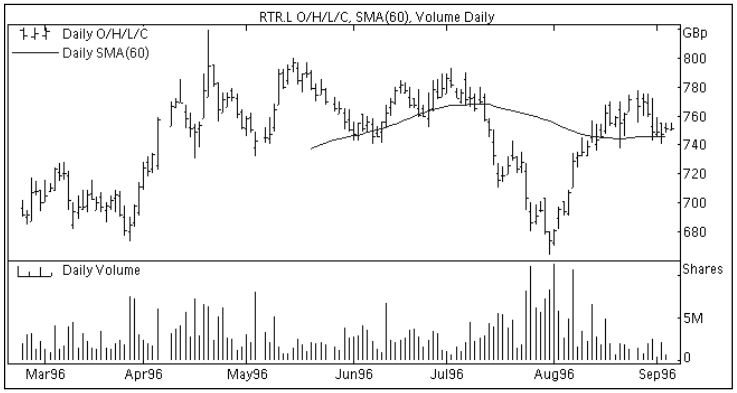


Confirmation when: Increasing volume on uptrend highs and decreasing volume on uptrend lows – opposite for downtrend

Volume data

Market players use a variety of **indicators** to confirm or reinforce their trading strategies which they have derived from charting. Many indicators are now in use, some are easy to use and others involve complex mathematical calculations which have been developed by market practitioners. It is important to recognise that different indicators can be more suited to different types of market instruments, for example, equities and spot FX currencies. Successful analysts use a 'cocktail' of indicators to derive a trading strategy – it would be a mistake to use a single indicator in isolation. Indicators which are used in fast moving commodities futures markets will not necessarily be so successful in the more long term equities markets or those used for stock indices. It is also worth noting that as the power of computing techniques is constantly being improved and as markets are expanded so to are the numbers of indicators – either new or adaptations of existing techniques.

In most cases indicators are themselves plotted on sub-charts using the vertical axis for the indicator and the horizontal axis for time. These indicator plots are usually placed beneath the price movement plot so that both plots use the same time axis. The chart below shows a typical combination of price movement and volume charts for an equity.

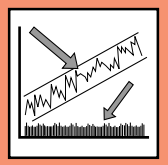


Types of indicators

There are two basic types of indicators you will encounter:

- **Confirmation** or **divergence indicators**
  As their name implies, confirmation indicators confirm underlying **trends.** Divergence is when the indicator line moves away from the price line in an opposite direction. In effect divergence is non-confirmation which is seen as a warning signal.

- **Momentum indicators** or **oscillators**
  These indicators measure the rate of change, or velocity, of price movements as opposed to the actual price levels and are used to help determine a **trading strategy**. Divergence is also a very important factor in utilising these indicators.



Confirmation or divergence indicators

These indicators are based on, or associated with, the primary price movement chart. You have already been introduced to most of these indicators either in the *Chart types* or *Patterns* sections and they include:

- ❑ Volume
- ❑ Open interest
- ❑ Relative performance
- ❑ Moving averages

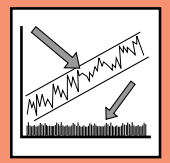
Volume	This is one of the oldest indicators – orginally used by Dow. The values are obtained from separate data associated with the instrument prices. Generally volume is used to confirm price movement – divergence is taken as a warning signal.
Open interest	This is similar to volume in use. The values are also obtained from separate data associated with the instrument prices. Futures traders use this indicator – a strong up trend should be confirmed by rising open interest.
Relative performance	Relative performance measures the relationship between a particular instrument and the overall performance of the market or market sector. Any rises or falls must be put in context – for example, a share price rise of 15% is not impressive if the average market sector rise is 25%. A change in the relative performance trend can indicate an impending change in the underlying price trend.
Moving average	Moving averages are used to smooth price information in order to confirm trends and support and resistance levels. They are also useful in deciding on a trading strategy particularly in futures trading or a market with a strong up or down trend. For **simple moving averages** the price is averaged over a number of days. On each successive day the oldest price drops out of the average and is replaced by the current price – hence the average moves daily. **Exponential** and **weighted moving averages** use the same technique but weight the figures – least weight to the oldest price, most to the current price.

Momentum indicators or oscillators

These indicators measure the rate of change, or velocity, of directional price movement and are used to give warning of short term turning points.

When prices move up rapidly they are said to be **overbought** and this is taken as a signal **not to buy**. When prices move down rapidly they are said to be **oversold** and the signal is **not to sell**. A heavily overbought/oversold situation is generally taken as an indication that a market reaction or possibly even a reversal is imminent. The reaction to a heavily overbought market can be a period of sideways consolidation. Oscillators include:

- ❑ Relative Strength Index (RSI)
- ❑ Stochastic oscillator
- ❑ Moving Average Convergence Divergence (MACD)



Relative Strength Index (RSI)

This index was created by the US analyst J. Welles Wilder and is a popular indicator which is applied to FX, commodity and equity markets. The indicator compares an instrument only with its **own** past performance.

The RSI measures the ratio of up-moves to down-moves and normalises the calculation so that the index is expressed in a range 0 – 100. If the RSI is 70 or greater then the instrument is seen as overbought – a situation whereby prices have risen more than market expectations. An RSI of 30 or less is taken as a signal that the instrument may be oversold – a situation whereby prices have fallen more than market expectations. Many analysts prefer to use overbought / oversold levels of 80 / 20 rather than 70 / 30.

Stochastic oscillator

This is used to indicate overbought / oversold conditions on a scale 0 – 100%. The indicator is based on the observation that in a strongly trending uptrend market, closing prices for periods tend to concentrate in the higher part of the period's range. Conversely as prices fall in a strongly trending downtrend market, close prices tend to be near to the extreme low of the period range.

Stochastic calculations produce two lines, %K and %D which are used to indicate overbought / oversold areas on a chart. Divergence between the stochastic lines and the price action of the underlying analysis gives a powerful trading signal.

Moving Average Convergence Divergence (MACD)

This indicator was devised by Gerald Appel and involves plotting two momentum lines. The **MACD line** is the difference between two exponentially moving averages and the **signal** or **trigger** line which is an exponentially smoothed moving average. If the MACD and trigger lines cross, then this is taken as a signal that a change in trend is likely.

Volume, Open interest, Relative performance and Moving average as chart types or patterns have already been discussed but examples of their use as indicators are covered in this section.

Momentum indicators are described using the same format as used in previous sections and cover:

- ❑ Relative Strength Index (RSI)
- ❑ Stochastic oscillator
- ❑ Moving Average Convergence Divergence (MACD)

It is important to remember that this workbook is not an exhaustive treatment of indicators – it only provides an overview to the subject. If you want to find out more then you might like to have a look at some of the materials given in **Further resources**.

Relative Strength Index

J. Welles Wilder originally developed the **Relative Strength Index** indicator for use with price bar charts of individual stocks, commodities or stock indices. However, the RSI is now used in all markets. The indicator compares an instrument only with its **own past performance.** It is not a comparison with other instruments or the market in general – this is Relative performance.

The RSI should be used in conjunction with price movement charts but not together with other indicators of the same type, for example, stochastics. RSI values lie in the range 0 – 100 which may be used to indicate the following:

- **Overbought / oversold** conditions
  A line is drawn at 70 / 80 above which the instrument is said conventionally to be overbought and is a signal to exercise caution in buying at that level. Below a line at 30 / 20 the instrument is said to be oversold and it is a signal to think carefully before selling.

- **Tops** and **bottoms**
  A top may be signified when a RSI peak is seen through the 80 / 70 level followed by a down-turn; similarly a bottom may be signified by a RSI trough through the 30 / 20 level followed by an up-turn. The RSI analysis provides only part of the evidence needed for market confidence that a top / bottom has been formed.

- **Patterns**
  Typical patterns such as head and shoulders, tops / bottoms and pennants may be more obvious in the RSI chart than in the price chart.

- **Divergence**
  Divergence between price action and RSI is often taken as a strong indication of a market turning point. Thus in an uptrend, price action makes new highs compared with the previous peak but the RSI indicator fails to reach and surpass its equivalent previous high point.

Calculating the index

The RSI measures the ratio of average prices and normalises the calculations so the index values lie between 0 and 100. The index may be calculated using the following formula although others are used:

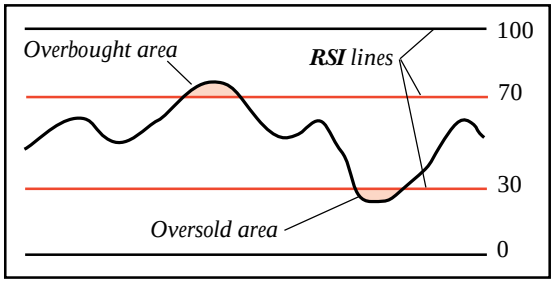
$$RSI = 100 - \left[\frac{100}{1 + RS}\right]$$

Where:

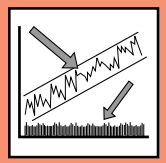
$$RS = \frac{\text{Sum of the '}\textbf{up closes}\text{' in }\textbf{n}\text{ days'}}{\text{Sum of the '}\textbf{down closes}\text{' in the same }\textbf{n}\text{ days'}}$$

Up close is the **price change** between consecutive periods where the close has moved higher
Down close is the **price change** between consecutive periods where the close has moved lower

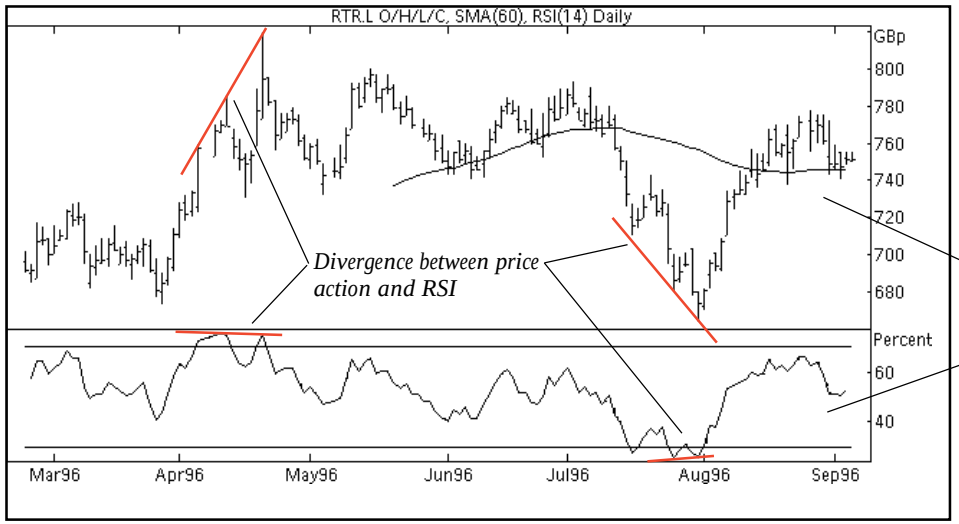
Wilder originally used **n** = 14 but other periods in common use are 9 and 21 days.



One technique is to vary the level of the overbought/ oversold lines according to whether the market is in up or down trend. For example, in an uptrending chart the lines may be drawn at 80 and 40, whereas in a downtrending chart they may be drawn at 60 and 20.



Relative Strength Index



Divergence between price action and RSI

A bar chart of daily prices for Reuter Holdings shares

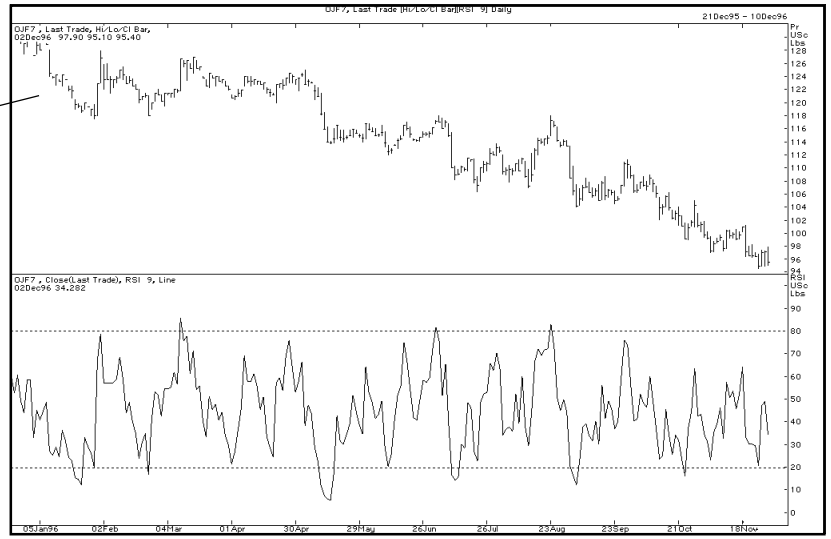
The RSI chart is based on a 14 day period

The upper line is drawn at 70% and the lower at 30%

A bar chart of daily last trade prices for Orange Juice futures on the New York Cotton Exchange

The RSI chart is based on a 9 day period

The upper line is drawn at 80% and the lower at 20%



Stochastic oscillators

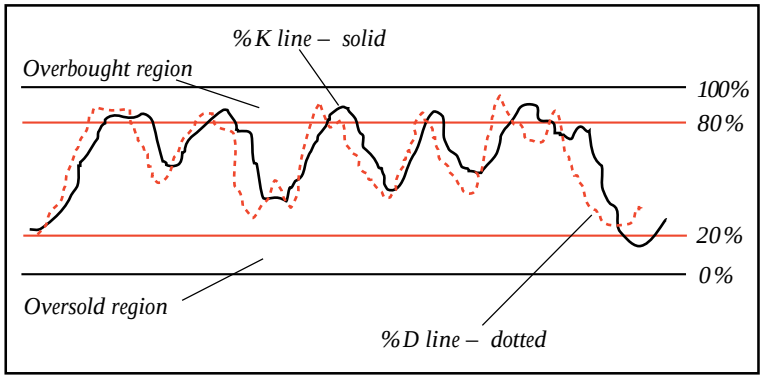
Stochastic oscillators originated as an engineering analytical technique and were adopted by the US analyst George C. Lane as a way of indicating overbought/oversold conditions using a simple % scale. A key use of the indicator is to look for divergence between the stochastic lines and that of the instrument price itself. This information can be used to reinforce buy/sell trading decisions.

Stochastics are based on observations of instrument prices:

- As prices **decrease** in a trending market the **closes** tend to be nearer the extreme **lows** of the period price range
- As prices **increase** in a trending market the **closes** tend to be nearer the extreme **highs** of the period price range

The stochastic analysis is available in two forms – **fast** and **slow**. **Fast** stochastics use two **oscillating lines** which are shown as different colours in charting applications or as solid or broken lines in publications. The **raw value** or **%K line** (solid line) is shown on a chart scale 0 – 100. The other line, shown on the same chart, is a simple **moving average** of %K and is called the **%D line** (broken line).

Slow stochastics use the %D line of fast stochastics together with a simple moving average of this line – usually called the **Slow D**. Fast stochastics give a strongly oscillating chart and it is for this reason that many analysts prefer now to use slow stochastics.



As for the RSI indicator, Stochastics are used to identify potentially overbought/oversold situations. Divergence between the stochastics' performance and that of the underlying price action is very important.

Overbought conditions are generally taken as occurring when the lines move **over 70/80%**; **oversold** is taken when the lines move **below 30/20%**.

Stochastic oscillators

The fact that a market is indicated as overbought should not be seen necessarily as a sell signal or indication of an imminent trend reversal. In any strongly trending market, overbought / oversold conditions can exist for a considerable perod of time. One of the most powerful signals that stochastics can deliver is that of divergence. However, the key to the successful use of stochastics is to use them in association with other indicators / analyses to indicate when a market is grossly overbought / oversold.

Calculations

$$\%K = 100 \times \left[\frac{\text{Current close} - \text{Lowest low over } n_1 \text{ periods}}{\text{Highest high} - \text{Lowest low over } n_1 \text{ periods}} \right]$$

$$\%D = SMA(\%K n_2)$$

$$\text{Slow D} = SMA(\%D n_3)$$

By far the commonest value used for n_2 is 3. Thus for fast stochastics, %D, is the 3 period simple moving average of %K. For slow stochastics, almost without exception, the value for n_3 is 3. Thus Slow D is the 3 period simple moving average of %D.

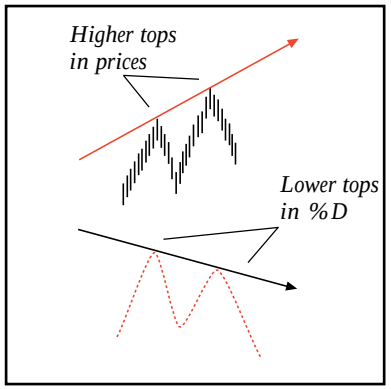
Bearish divergence

This is indicated when %D forms **two** peaks, the second lower than the first, in the **overbought** region, while the underlying prices are rising. Confirmation to **sell** comes when, for Slow stochastics, the %D line comes from **above** and crosses **below** the Slow D line.

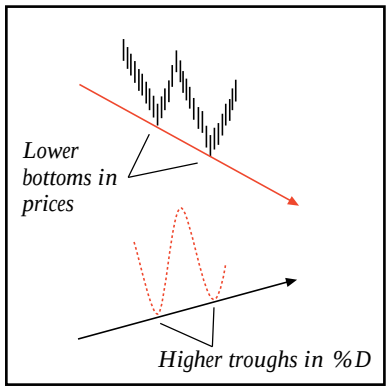
Bullish divergence

This is indicated when %D forms **two** troughs, the second higher than the first, in the **oversold** region, while the underlying prices are falling. Confirmation to **buy** comes when for Slow stochastics, the %D line comes from **below** and crosses **above** the Slow D line.

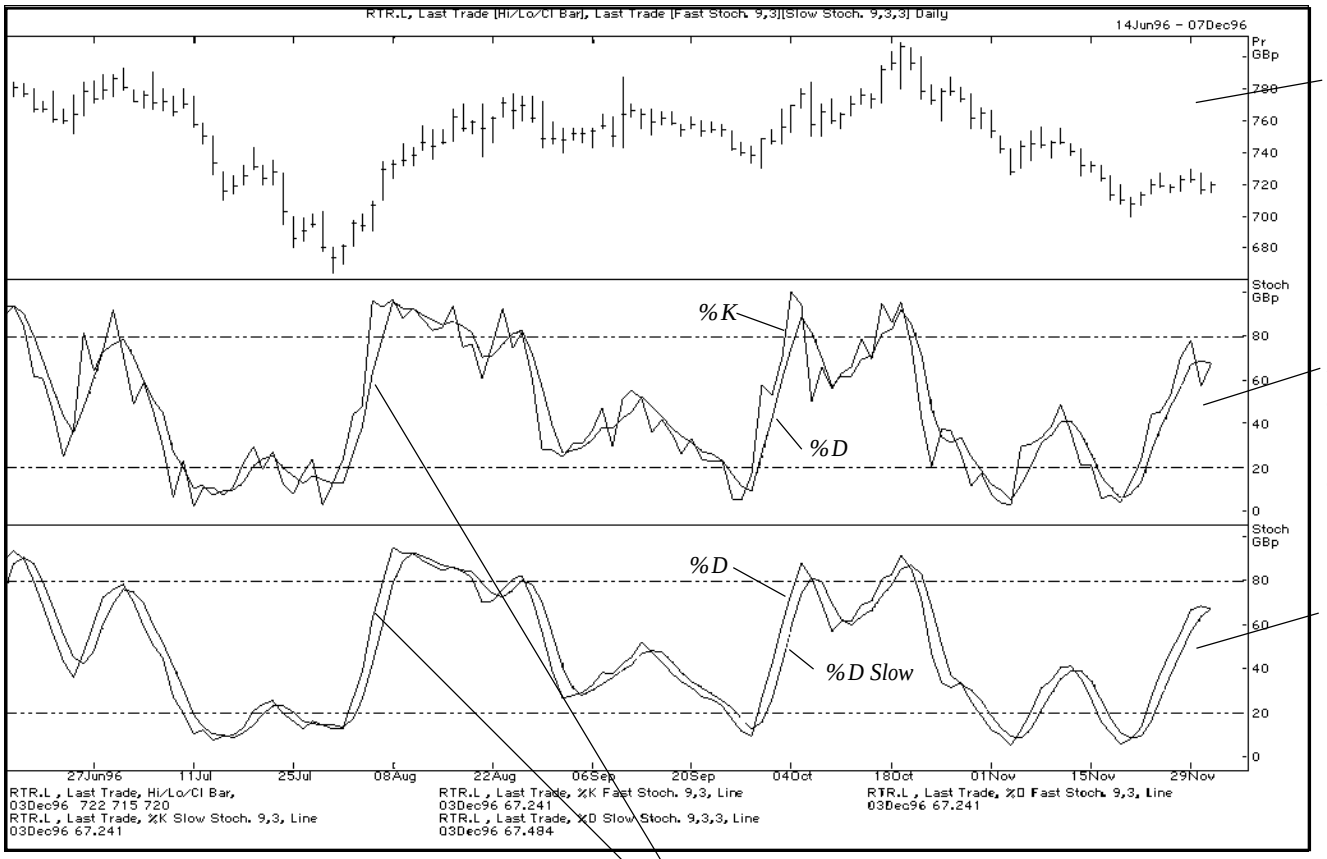
Bearish divergence



Bullish divergence



Stochastic oscillators



A bar chart of daily last trade prices for Reuter Holdings shares

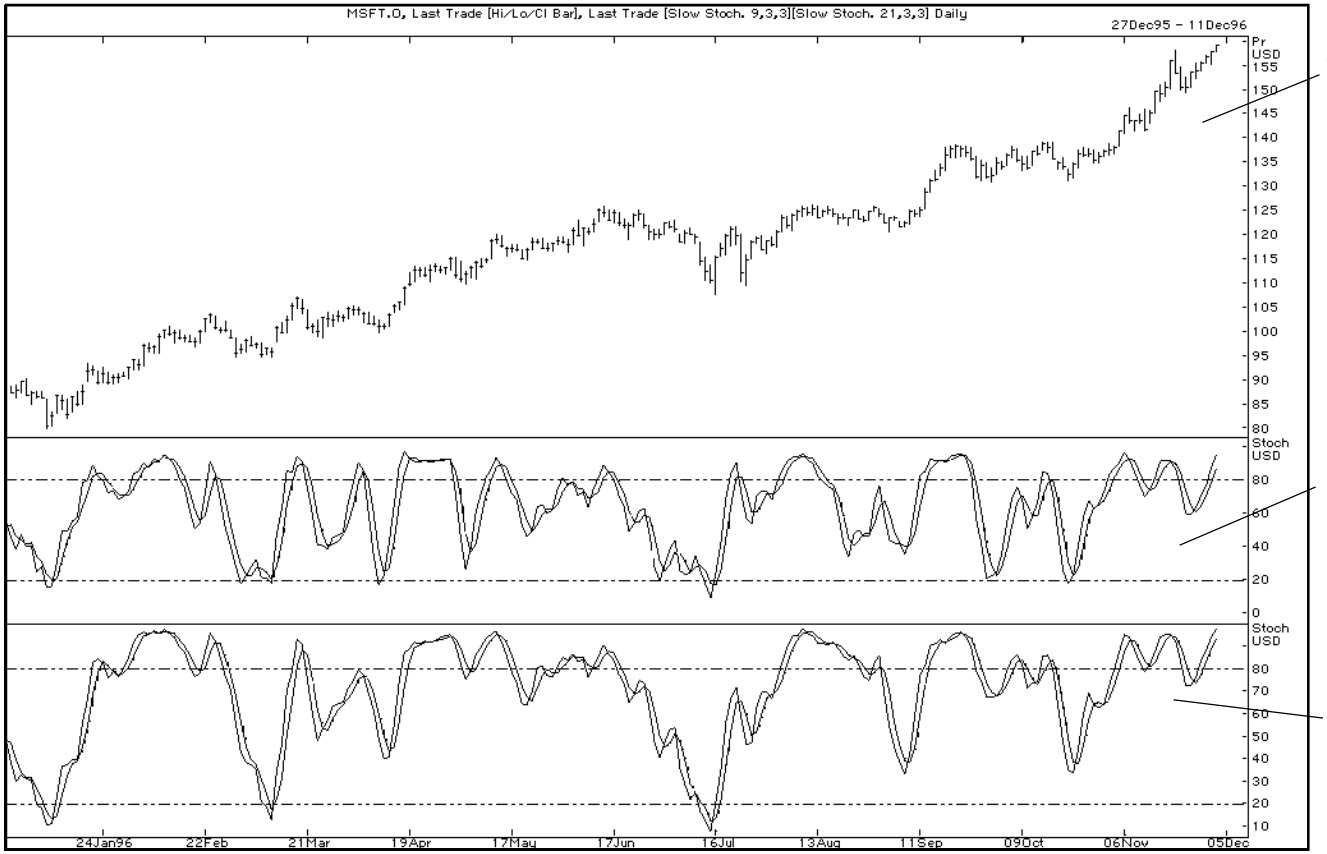
*The middle section shows the **Fast stochastic** %D (9,3) and %K (9) lines, which are shown in different colours onscreen – the overbought and oversold lines are shown at 80% and 20% respectively*

*The lower section shows the **Slow stochastic** %D Slow (9,3,3) and %D (9,3) lines, which are shown in different colours onscreen – the overbought and oversold lines are shown at 80% and 20% respectively*

The first of the figures shown in brackets relating to %D and %Kindicate the length of period used. The second and third figures represent the moving average for the number of periods used.

You may see the %D line referred to as the %K Slow line as in Reuters 3000

Stochastic oscillators



A bar chart of daily last trade prices for Microsoft shares

*The middle section shows the **Slow stochastic** %D Slow (9,3,3) and %D (9,3) lines, which are shown in different colours onscreen – the overbought and oversold lines are shown at 80% and 20% respectively*

*The lower section shows the **Slow stochastic** %D Slow (21,3,3) and %D (21,3) lines, which are shown in different colours onscreen – the overbought and oversold lines are shown at 80% and 20% respectively*

The first of the figures shown in brackets relating to %D and %K indicate the length of period used. The second and third figures represent the moving average for the number of periods used.

Moving Average Convergence Divergence

The **Moving Average Convergence Divergence (MACD)** oscillator indicator was devised by Gerald Appel as a technique to signal trend changes and indicate trend direction. It was originally designed to observe the stock market's 26 and 13 week cycles. The procedure uses two exponential moving average lines to indicate overbought/oversold signals that oscillate above and below a zero line. There are no upper or lower boundaries, for example 0 - 100, as used in stochastics or the RSI.

First line

This is usually displayed as a solid line and is called the **Fast MACD line** or plot. This line is the difference between a short and long moving average of the price – usually with smoothing factors equivalent to 12/13 and 26 period EMAs being used.

Second line

This is often displayed as a dotted line, or a line of different colour in charting applications, and is called the **Slow MACD** or **signal** line. This line is an exponential moving average of the Fast MACD line. It is usual to see a smoothing factor equivalent to 9 periods used in the EMA. Gerald Appel recommended 9, 12 and 26 as the periods which should be used for the MACD lines.

In common with moving averages, MACD is used to determine buy/sell signals and to detect trend changes.

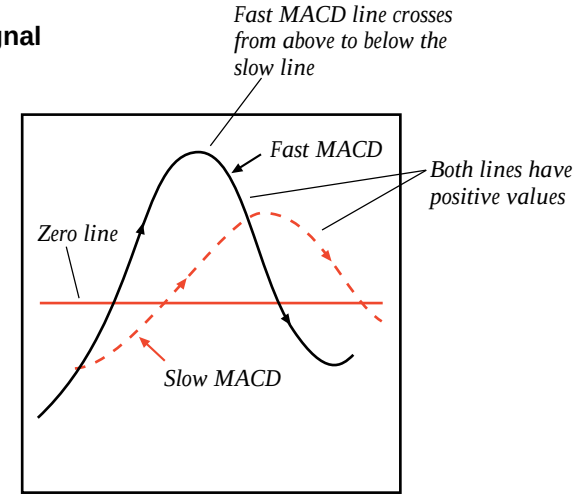
Sell signal

This is indicated when the Fast MACD line crosses from **above to below** the signal line when both have positive values. The higher **above** the zero line this crossover occurs, the stronger the signal is said to be. Crossovers which occur with negative values should be ignored.

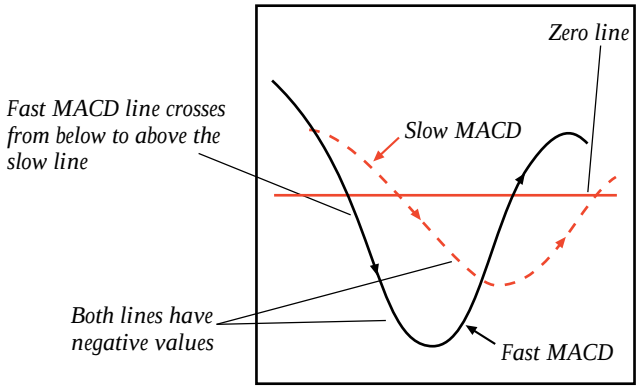
Buy signal

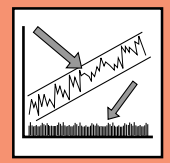
This is indicated when the Fast MACD line crosses from **below to above** the signal line when both have negative values. The further **below** the zero line this crossover occurs, the stronger the signal is said to be.

Sell signal



Buy signal





Moving Average Convergence Divergence

Rather than plotting the analysis as two lines, a further technique is to plot the **difference** between the lines as a **forest graph**. This technique is very important as it is used to look for any divergence which may occur between the price action for the instrument and the MACD forest graph.

Fast MACD line

Traditionally this is produced by subtracting a 26 equivalent period EMA from that for the 13 equivalent period EMA.

Slow MACD line

This is formed by smoothing the fast line with a 9 equivalent period EMA.

Trends

Successive highest highs (or lowest lows) of market prices are compared with highest highs (or lowest lows) of MACD when plotted in forest graph form. If there is a divergence in trend between price action of the instrument and that of the MACD forest graph then this is taken as a good indicator of a possible trend reversal.

The criticisms of the MACD indicator are the same as those applied to moving averages in general – the most significant being that they lag the market.

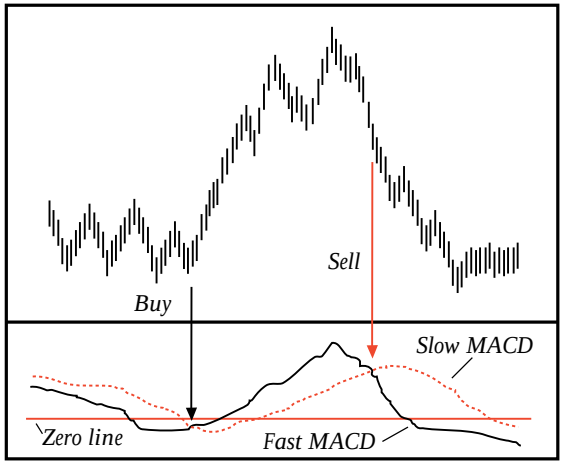
Smoothing factors

There is a simple formula which gives a good approximation between smoothing factor used in the EMA algorithm and the equivalent number of periods (n):

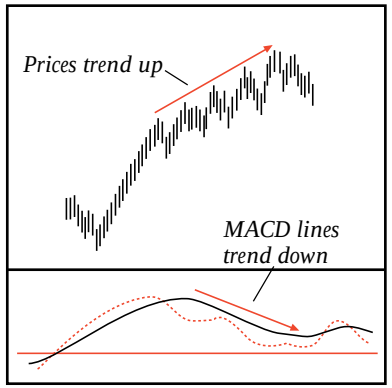
$$\text{Smoothing factor} = \frac{2}{n + 1}$$

Smoothing factor	n
0.20	9
0.15	12
0.075	26

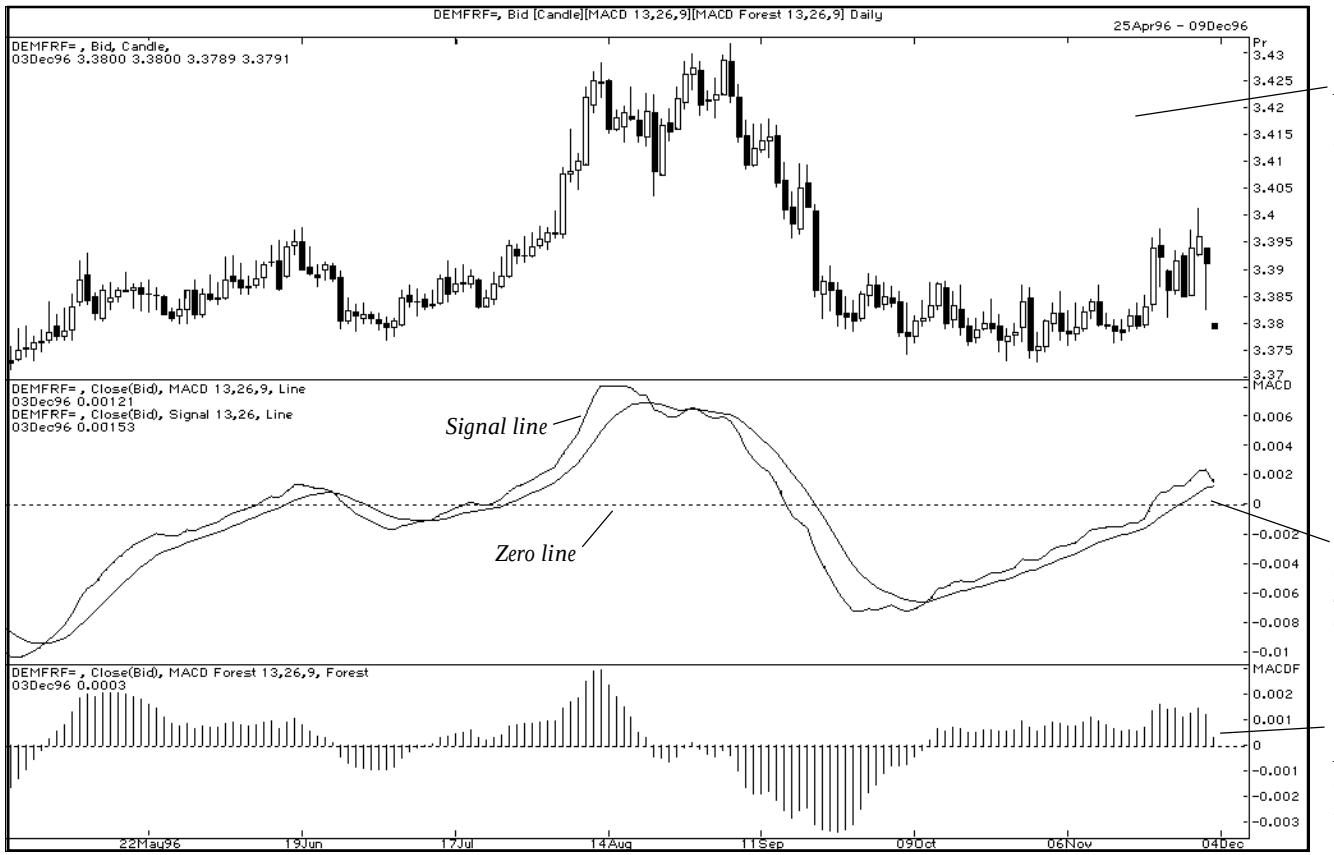
Buy/sell signals



Divergence



Moving Average Convergence Divergence

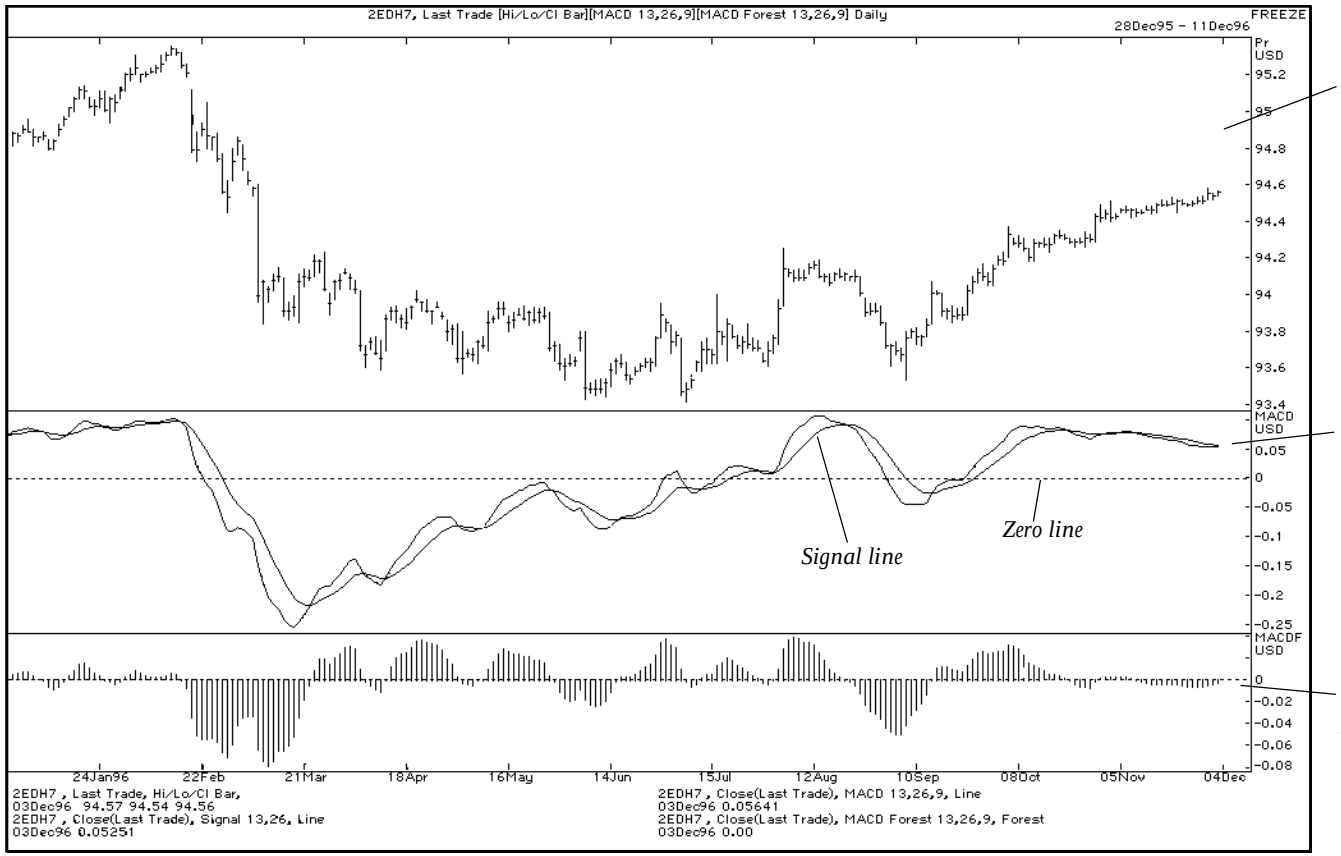


A candlestick chart of daily bid prices for DEM/FRF cross rates

*The **Fast MACD** and **Slow MACD signal** lines are shown in different colours onscreen*

*A **forest graph** showing the difference between the two MACD lines*

Moving Average Convergence Divergence



A bar chart of daily last trade prices for Eurodollar futures for March 1997 on the CME

*The **Fast MACD** and **Slow MACD signal** lines are shown in different colours onscreen*

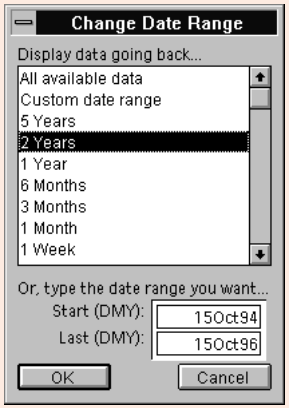
*A **forest graph** showing the difference between the two MACD lines*

Charting exercises

If you have access to Reuters Graphics and/or Reuters 3000 you may like to have a look at the following exercises which have been designed to help you understand more fully the various indicators described in this section.

Chart exercise 1

Open Reuters 3000 and in a new workspace type in **BAY.L@RSI** to display a daily bar chart for **British Airways** shares together with the Relative Strength Index indicator sub-chart based on a 14-day period. The system will default a 6 month history.



Now click on the **X-axis** button in the bottom toolbar and change the data to be viewed to 2 years.

You should now see a screen similar to this. If you are unsure of what the charts mean then try using **Help**. You will find a lot of useful information such as shown here.

Stack:	Overlay:	Shows:	Upper left corner:
upper	1	bar chart with up to 2 years of daily open, high, low and close	date of last day plotted with open, high, low and close
	2	line chart with 60 day simple moving average of closing prices (or index values)	date of last day plotted with moving average price (or index value)
lower	1	line chart showing a 14-day RSI line. The scale of the chart is 0 to 100.	date of last day plotted with RSI value
	2	a horizontal upper boundary line through 70	
	3	a horizontal lower boundary line through 30	

Use the toolbar to modify the graph. Use the Edit button on the toolbar to open the Edit dialogue box to modify parameters. You can modify the moving average period for the upper graph and the RSI period, upper boundary and lower boundary for the lower graph.

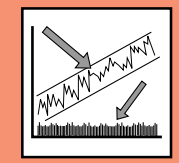
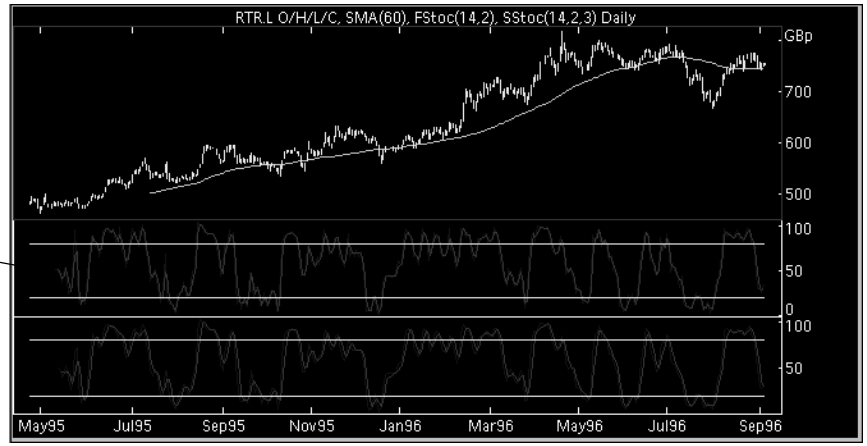


Chart exercise 2

Open Reuters 3000 and in a new workspace type in **RTR.L@BAR** to display a daily bar chart for **Reuters** shares. Change the X-axis to view 2 years of data.

Click the **Stochastics** Page tab to display sub-charts for both **Fast** and **Slow** stochastics. If you need further explanation on the sub-charts then use the **Help** facility.



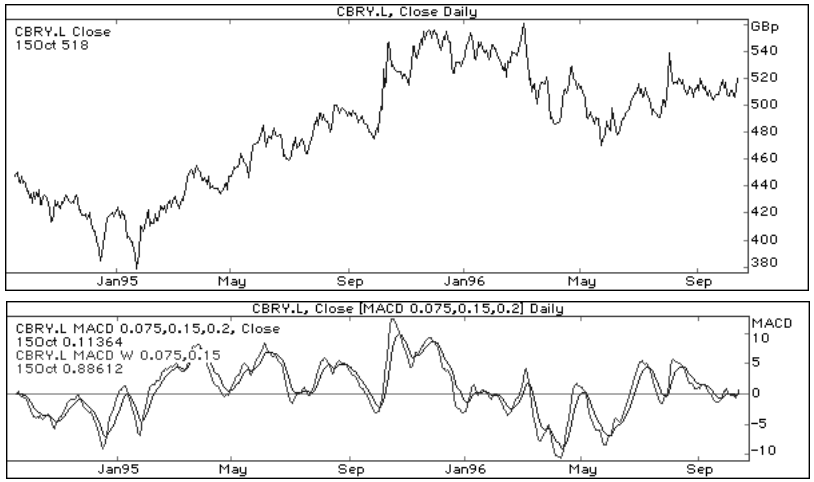
middle	1	corresponding 14-day fast stochastic %K line
	2	3-day fast stochastic %D line
	3	80% upper boundary line, scaled against a 0-100 y-axis
	4	20% lower boundary line
lower	1	corresponding slow stochastic %K line (=%D line above)
	2	slow stochastic %D line (3-day simple moving average of %K)
	3	80% upper boundary line, scaled against a 0-100 y-axis
	4	20% lower boundary line

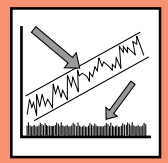
Use the toolbar to modify the graph. Use the Edit button on the toolbar to open the Edit dialogue box to modify parameters. You can modify several

Chart exercise 3

Open Reuters Graphics (v3.1) and enter **CBRY.L** to display a 2 year daily bar chart for **Cadbury** shares. Now open a new chart and from the Study menu select the **MACD** option and display a sub-chart.

The **fast** MACD line is the red line with the MACD W (Weighted) legend – the **slow** or signal MACD line is the blue line with the MACD legend.





Summary

You have now finished the fourth section of the workbook and you should have a clear understanding of the following indicators:

- ☞ Relative Strength Index (RSI)
- ☞ Stochastic oscillator
- ☞ Moving Average Convergence Divergence (MACD)

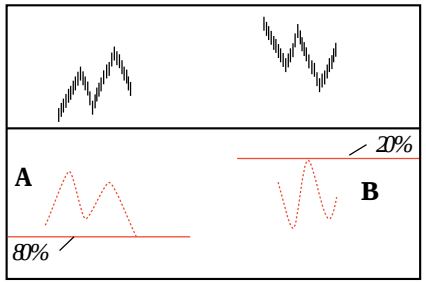
As a check on your understanding of this section you should try the Quick quiz questions. You may also find the section Overview a useful revision aid.

Quick quiz questions

1. Which of the following statements are true and which are false concerning the Relative Strength Index indicator?

	True	False
a) The indicator compares an instrument with another instrument's past performance		
b) If the RSI chart line is over a line drawn at 80, the instrument is said to be overbought		
c) Divergence between price action and RSI is often an indication of a market turning point		
d) Patterns such as head and shoulders are not very obvious in an RSI chart		

2. The following diagram shows two sections, A & B, of a Stochastic %D line sub-chart. A & B are examples of Bullish and Bearish divergence, but which is which?



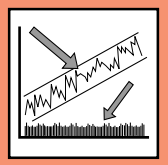
A =

B =

3. Complete the missing words in the following statement.

When using the MACD indicator a selling signal is indicated when the Fast MACD line crosses from [ ] **to** [ ] the signal line when both have positive values. The further [ ] the zero line this crossover occurs, the stronger the signal is said to be.

You can check your answers on page 112.



Overview

Relative Strength Index (RSI)

- Developed by **Welles Wilder**, this indicator is applied to FX, commodity and equity markets
- Compares an instrument only with its **own** past performance
- **RSI values lie in the range 0 – 100:**
  Overbought line is usually set at 70/80
  Oversold line is usually set at 30/20

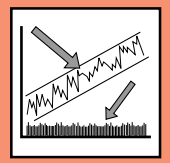
Stochastic oscillator

- Adopted by **Lane** as a way of indicating **overbought/oversold** conditions using a simple **% scale**
- Provides a way of signalling **divergence** between a stochastic line and instrument price
- Two types of stochastic analysis – **Fast** and **Slow**
- **Fast** stochastics uses two oscillating lines – the **raw value** or **%K line** and a simple moving average of %K line called the **%D line**
- **Slow** stochastics uses the **%D line** together with a simple moving average of this line called the **Slow D line**
- **Overbought conditions are usually over 70/80%**
- **Oversold conditions are usually under 30/20%**

Indicators

Moving Average Convergence Divergence (MACD)

- Devised by **Appel** this oscillator signals **trend changes** and indicates **trend directions**
- **Fast MACD** line is difference between a short and long moving average of the price
- **Slow MACD** or **signal** line is an exponential moving average of the Fast MACD line
- **Sell signal –** when the Fast MACD line crosses from **above to below** the signal line when both have **positive** values
- **Buy signal –** when the Fast MACD line crosses from **below to above** the signal line when both have **negative** values



Further resources

Books

Technical Analysis of the Futures Markets
John J. Murphy, New York Institute of Finance, 1986
ISBN 0 13 898008 X

Technical Analysis Explained
Martin Pring, McGraw-Hill, 1991
ISBN 0 0705 1042 3

The New Commodity Trading Systems and Methods
Perry Kaufman, J. Wiley & Sons, 1987
ISBN 0 4718 7879 0

Technical Analysis from A – X
Steven Achelis, Probus Publishing Co., 1995
ISBN 1 55738 816 4

Technical Analysis of Stocks and Commodities

Lane's Stochastics by G.C. Lane
Vol. 2:3 (87-90), 1984

Stochastic oscillator by M. Takano
Vol. 7:3 (86-86), 1989

Stochastic Oscillator: Sidebar
Vol. 8:2 (469-472), 1990

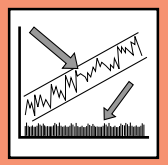
Stochastics by T. Hartle
Vol. 9:3 (103-103), 1991

Stochastics Indicators and Trading by D. Lundgren
Vol. 11:3 (144-146), 1993

RSI Variations by B. Star
Vol. 11:7 (292-297), 1993

The MACD Momentum Oscillator by B. Star
Vol. 12:2 (81-85), 1994

Using Indicators in Trading Ranges and Trends by B.C. Kramer
Vol. 12:4 (153-157), 1994

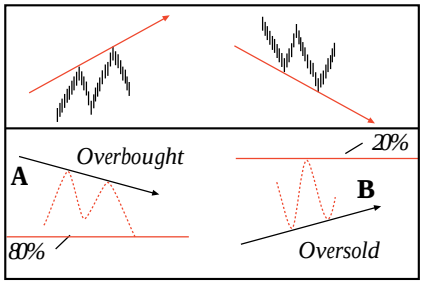


Quick quiz answers

1. *Which of the following statements are true and which are false concerning the Relative Strength Index indicator?*

	True	False
a) The indicator compares an instrument with another instrument's past performance		✔
b) If the RSI chart line is over a line drawn at 80, the instrument is said to be overbought	✔	
c) Divergence between price action and RSI is often an indication of a market turning point	✔	
d) Patterns such as head and shoulders are not very obvious in an RSI chart		✔

2. *The following diagram shows two sections, A & B, of a Stochastic %D line sub-chart. A & B are examples of Bullish and Bearish divergence, but which is which?*



A = Bearish

B = Bullish

3. *Complete the missing words in the following statement.*

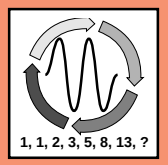
When using the MACD indicator a selling signal is indicated when the Fast MACD line crosses from **above** **to** **below** the signal line when both have positive values. The further **above** the zero line this crossover occurs, the stronger the signal is said to be.

Your notes

Waves, numbers and cycles

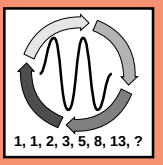
Contents

This section of the module should take about 60 minutes of study time. You may not take as long as this or it may take a little longer – remember your learning is individual to you.



Betting on a horse, that's gambling; betting you can make three spades, that's entertainment; betting that cotton will go up three points, that's business. See the difference?

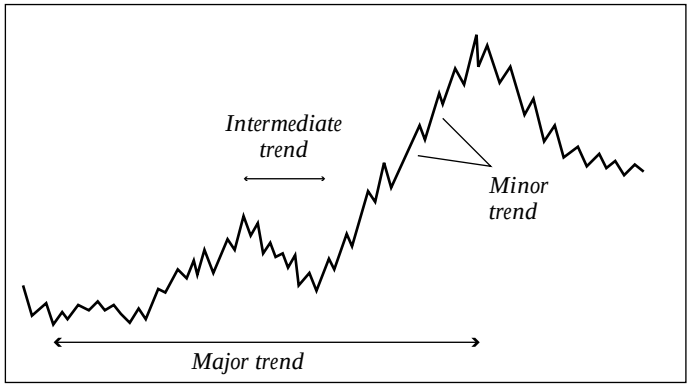
Gann Lines and Angles by Robert Pardo
Technical Analysis of Stocks and Commodities , Vol. 3:5 (177-183), 1985



Introduction

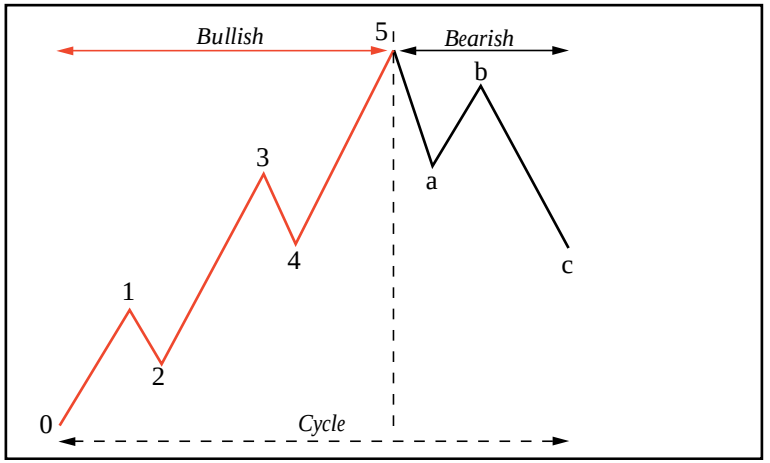
So far you have seen that trendlines combined with pattern recognition and a variety of indicators can be used to predict future prices and help determine trading strategies. You have also seen the importance of using different techniques for different instruments and market situations.

Dow identified trends in the market and thought of the various types as major – the tide, intermediate – waves, and minor – ripples.



Whilst recovering after an illness in 1927 a retired accountant, Ralph Nelson Elliott, spent time in analysing the events in numerous Dow major trends. Like Dow, Elliott was interested in an overall perspective of market movements rather than how individual stocks performed.

In 1938 Elliott published his **Wave Theory** which was devised to help explain why and where certain chart patterns develop and what they signalled. Elliott took Dow's original three phases of a bullish trend but considered the pattern to be closer to a repetitive rhythm of **five waves advancing** (bullish) and **three waves declining** (bearish). This rhythmic pattern was repeated over a wide range of time periods and was called a **cycle**.



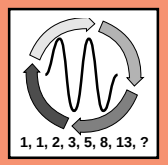
Elliott noticed that within cycles the same pattern was apparent – an advancing phase with peaks at 1,3 and 5 which he called **impulse waves** and troughs at 2 and 4 which he called **corrective waves**. Once the five wave movement was complete the market moved into a three wave corrective movement – a,b and c.

Elliott's Wave Theory has been applied to many markets now and has three important aspects.

- **Patterns**
  The most important element of the theory is that wave patterns exist which are repeated in cycles.

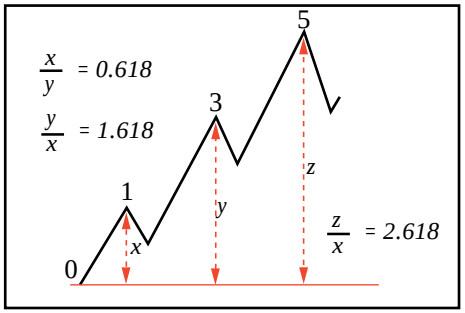
- **Time**
  Time relationships are used to confirm wave patterns. Elliott identified a number of time periods for cycles – the grand supercycle lasted 150 - 200 years whereas the sub-minuette lasted less than a day.

- **Ratio**
  Elliott noticed that there were 8 waves in some complete cycles; others had 34 and 144 waves. He also discovered there were mathematical relationships between the proportions of different waves.



Waves, numbers and cycles

What were these relationships and what was the significance of the ratios Elliott found? In measuring the proportions of peaks and troughs Elliott discovered that the ratio of wave height to the next



higher wave was often, approximately **0.618** and the ratio to the previous **low** wave was approximately **1.618**. The ratio between **alternate** wave numbers was also consistently, approximately **2.618**. The reciprocal value of **1.618** is **0.618** and the reciprocal value of **2.618** is **0.382** which is another important number in Elliott Wave Theory.

What, if anything, did all these numbers mean? In the natural world there is a well established sequence of numbers governing events and phenomena such as plant leaf arrangements and the numbers of rabbits that can breed from a single pair. This sequence was first identified by an Italian mathematician in the thirteenth century – Leonardo Pisano or **Fibonacci**. Fibonacci identified the sequence as:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144,...

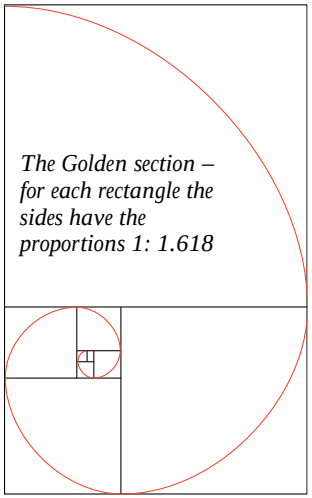
The sequence is often referred to as Fibonacci numbers and is easily calculated as each number in the sequence is obtained by summing the previous **two** digits. If you test these numbers, the further you move down the series, the truer the following statements:

- ❑ The ratio of any number to its **higher** number is **0.618**
- ❑ The ratio of any number to its **lower** number is **1.618**
- ❑ The ratio of **alternate** numbers is **2.618**

Why not prove these statements to yourself?

$$\frac{34}{55} = \quad \frac{55}{34} = \quad \frac{144}{55} =$$

The ratios of 0.618 and 1.618 were also known to ancient Greek and Eygptian scholars, artists and builders. The Golden Ratio, Section or Mean proportions were used in constructions such as the Great Pyramid of Giza and the Parthenon.



The Golden section – for each rectangle the sides have the proportions 1: 1.618

You will probably have noticed by now the striking similarity in the numbers associated with Elliott waves –

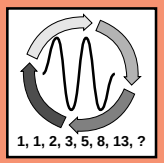
Ascending waves

3, 5, 8, 34, 144

Declining waves *Wave patterns*

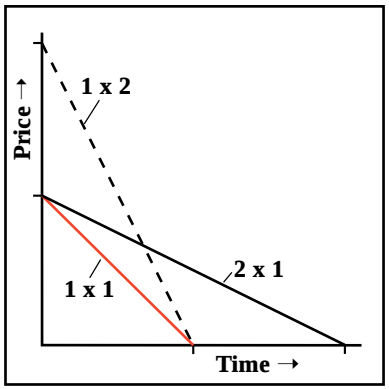
and wave ratios with Fibonacci numbers.

Waves, numbers and cycles



A different use of numbers and geometry was devised by William D. Gann who was a stock and commodity trader working in the first half of this century. Gann noticed that for particular stocks price movements of 25%, 50% and 100% were quite common – price moves of 33.33% and 66.67% ocurred but less frequently. So price rises and falls tended to follow ratios of 1, $^{2}/_{3}$, $^{1}/_{2}$, $^{1}/_{3}$, and $^{1}/_{4}$.

Gann also noted that there was a relationship between the **extent** of a price movement and the **time** the price took to reach its new level. If a share price moves one unit of price per one unit of time this results in a trendline of 45°. Gann described this as a **1 x 1** relationship or **squaring** of price and time.

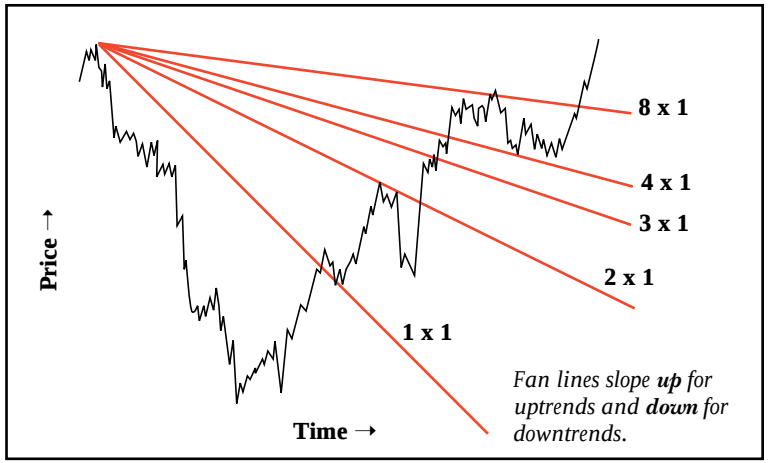


Not all charts use the same scales for prices and time so a 1 x 1 line will not necessarily be drawn at 45°.

The first number indicates time units – the second price units. So 2 x 1 means a line for two units of time/1 price unit and 1 x 2 represents one unit of time/2 price units.

Gann reasoned that if the price breaks through the trendline the new trendline will have a mathematical relationship with the original one. For example, it could be 2x, 3x or 4x the price or it could be $^{1}/_{2}$, $^{1}/_{3}$, or $^{1}/_{4}$ of the original.

A Gann chart uses a series of parallel horizontal lines which act as price targets together with a series of trendlines which **fan** out at the various Gann ratios from the start of a trend.



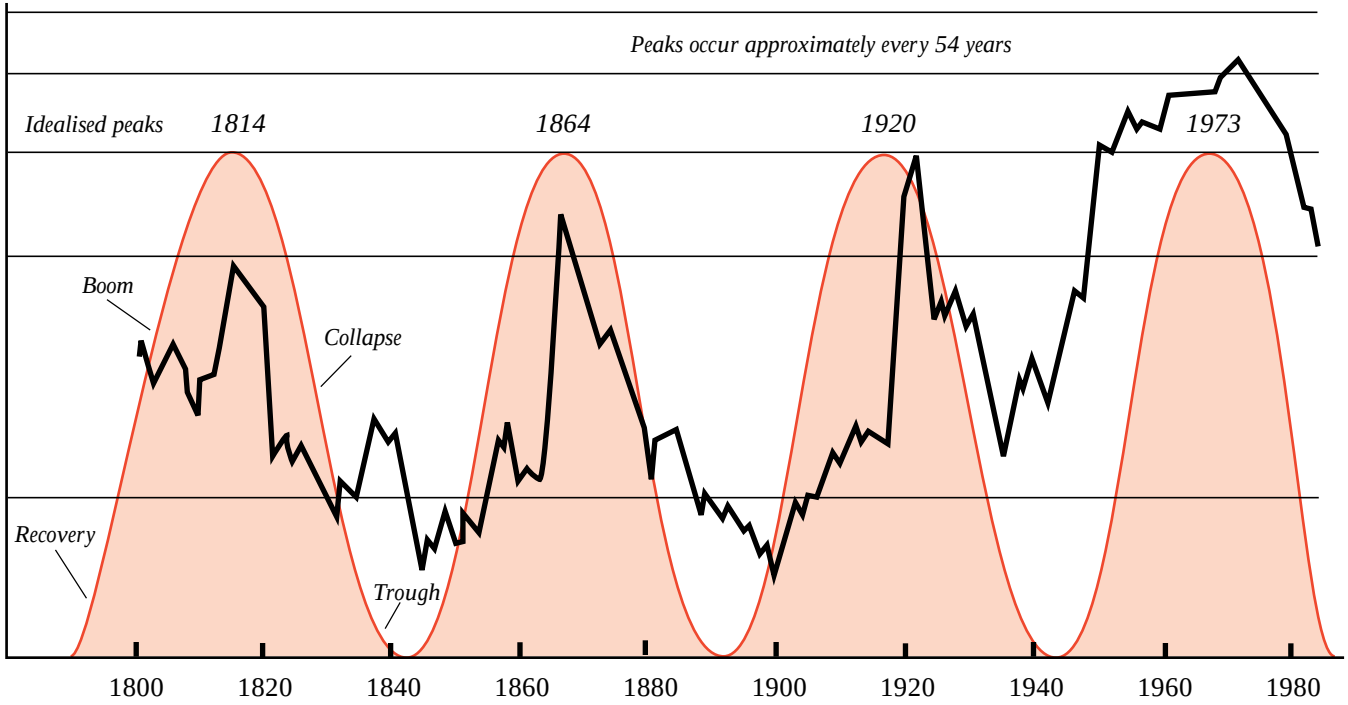
During his career Gann also produced many other tools and techniques such as 'trading rules' to help chartists and traders.

Most of the charts you have seen so far involve relatively short time periods. However, an investigation of price movements and market behaviour over much longer periods reveals some interesting **cycles** in stock market performance and individual price movements.

Edward R. Dewey noted that 18.2, 9.2 and 4 year cycle periods are important in stock markets – he also found that international battles follow a 22.2 year cycle!

In the 1920s a Russian economist Nickolai D Kondratieff studied commodity prices, interest rates, wage levels and production indices in the US, UK, France and Germany. He concluded that there was a cycle of market behaviour repeating itself approximately every 54 years – quite close to the Fibonacci number 55.

The Kondratieff wave

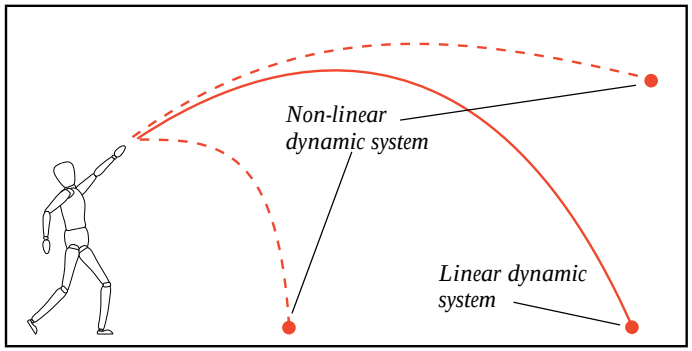


Pattern of events approximately every 50 years		
	First decade	= Recovery
	Second decade	= Boom
	Third decade	= Peak
	Fourth decade	= Collapse
	Fifth decade	= Trough

Waves, numbers and cycles

The wave and pattern theories that have been described so far are all based on **linear dynamics** – the patterns are based on orderly, recognisable and rhythmic patterns. However, as you may already know market behaviour is not always so predictable and dramatic deviations from patterns occur – the stock market crash of 1987 is a good example.

More recently some mathematicians have shown that there is a correlation between price behaviour in the market place and the new science of **non-linear dynamic** – sometimes termed **Chaos Theory**. Non-linearity is simply explained as 'the effect is not proportional to the cause', as is the case in linear dynamics. A classic and well known saying describing the situation is 'It is the last straw that breaks the camel's back'. In a linear system if you throw a ball into the air with a certain force and at a certain trajectory you would be able to predict, accurately where the ball would land. In non-linear dynamics, although you know the ball will travel in a curve shape this time when you throw the ball you would not be able to predict accurately its trajectory or where it would land.



Non-linear systems require the massive computational power of a computer to produce a solution as to the relationship between cause and effect with any speed. Currently only those relationships that are slightly non-linear can be solved and be of use for forecasting markets – highly non-linear systems still lie outside the reach of present computing power.

One of the foundations of Chaos Theory is **fractal geometry** – objects that are fractals are similarly shaped however closely you examine them. There are many good examples of fractal patterns in nature, for instance, looking at the branches of a tree at a distance and then looking closely at the twigs on one of the branches. The fractal nature of a freely trading market can be demonstrated through the observation that a weekly chart looks very much the same as those of daily, hourly, 5-minute etc charts. A fractal object is one that occupies a non-whole number set of dimensions. What does this mean? A flat piece of paper is two-dimensional but crumple it into a ball and it is now neither solid – three-dimensional – nor flat but somewhere in between. Mathematicians have shown that in some markets prices can be shown to be performing as fractals and thus Chaos Theory can be applied potentially in explaining market behaviour. But how can Chaos Theory help the trader if it cannot predict the future?

It is not necessary to be able to predict the future precisely in order to be able to make a trading profit. What is important is the ability to be able to predict shapes, patterns, trends in trading – Chaos Theory recognises shapes but not their precise size and movement.

Neither wave, cycle nor chaos theories completely explain all events in all markets. You have the choice now of selecting the tools and techniques you want to use to help determine your trading strategy for the markets you are involved with. It is well recognised that a successful strategy is made up of different techniques, for example, a combination of bar charts together with trend analysis and Bollinger bands.

You could toss a coin to decide whether to buy or sell in the market place but then there is no guarantee that you would get an accurate answer – the coin could be double-headed or someone else could grab the coin in mid-air or it may land on its rim and roll off the table and be lost...Even if your coin does land properly then, at best, over a period of time you will break-even using this technique. However, experience shows you will probably be a net loser! One of the greatest problems facing a trader is to learn when to take profits from a successful trade and when to exit a trade which is going wrong.

Waves, numbers and cycles are described using the same format as used in previous sections and cover:

- ❑ Elliott Wave Theory and Fibonacci numbers
- ❑ Gann Charts

Elliott Wave Theory and Fibonacci numbers

The **Elliott Wave Theory** was devised by Ralph N. Elliott and has as its underlying principle the assumption that markets move in a **five wave pattern** in the direction of the trend, followed by a **three wave pattern** in the counter direction.

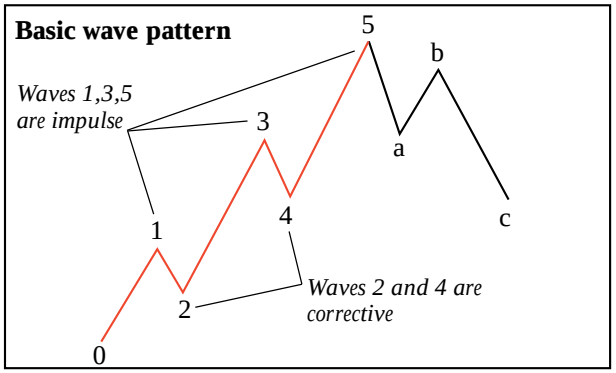
Elliott based his orginal work on stock market indices where it is still used successfully to classify and forecast market movements. Using Elliott wave techniques does not work well for individual stocks. The techniques are used successfully for heavily traded instruments in a liquid market place, for example, spot FX, gold and actively traded futures. The techniques are not so successful for thinly traded instruments.

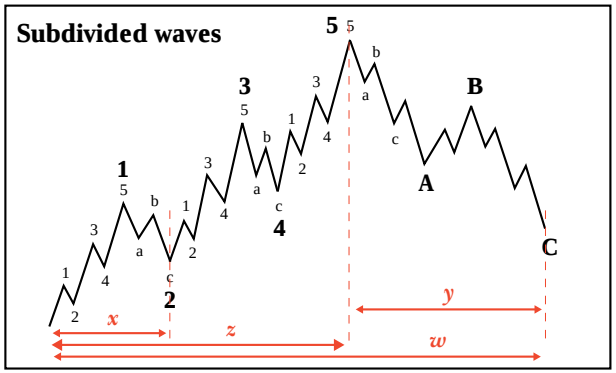
Patterns

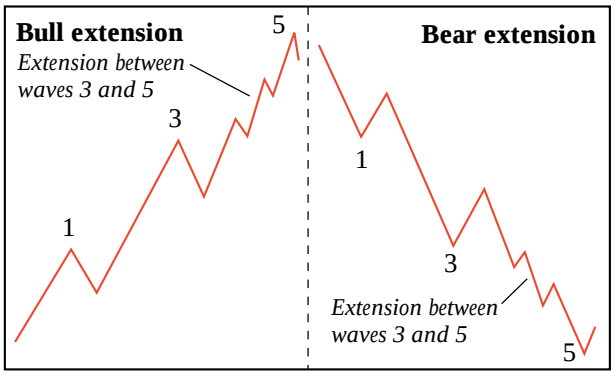
These refer to the basic wave shapes which are repeated in **cycles**. Depending on the magnitude of the cycle, each complete set of waves can be **expanded** or **subdivided** into further sets of 5 and 3 waves. The number of waves resulting always follows the **Fibonacci sequence**. The diagram opposite shows the various subdivided wave patterns and the numbers of waves involved where:

Pattern	Number of waves	Total
x	5+3	8
y	3 + 5 + 5	13
z	5 + 3 + 5 + 3 + 5	21
w	y + z	34

However, market wave patterns do not always follow their 'theoretical' shape and **extensions** of an **impulse** wave can occur. It is very unusual to see an extension in the first wave – they are commonly seen in the third and fifth waves, especially in the third waves.





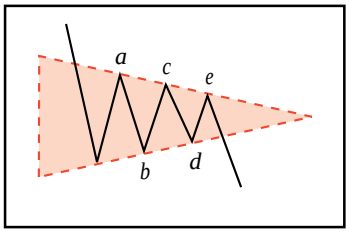


Elliott Wave Theory and Fibonacci numbers

Patterns

Correction waves – a,b,c – can also exhibit patterns which are identified as follows:

- **Zig-zags** – 5,3,5
- **Flats** – 3,3,5
- **Triangles** – ascending, descending, contracting and expanding. In Elliott Wave Theory, triangles are always made up of 5 bars – a to e.



- **Complex** – Double, triple or multiple threes. In complex corrections these threes can be made up of combinations of zig-zags, flats and triangles.

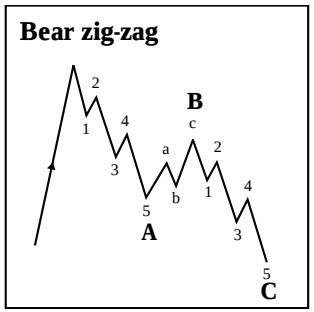
These corrective patterns can become very complicated and difficult to recognise!

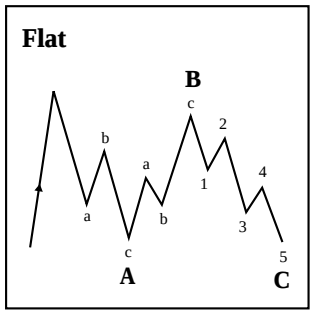
Ratio

Ratio analysis is used to determine where prices should move – a retracement is a movement in the opposite direction to the previous trend. Typically the Fibonacci ratios of 0.382, 0.618, 1.618 and 2.618 are used to predict price targets for retracements and combinations.

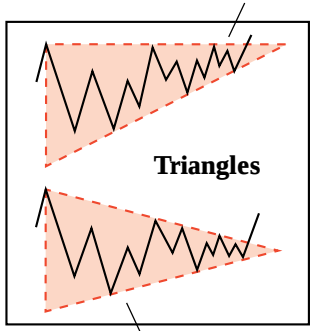
Time

It is not quite so easy to predict cycles based on time using Elliott Wave Theory. Although cycles exist it is more difficult to predict or identify significant peaks and troughs corresponding to Fibonacci numbers.

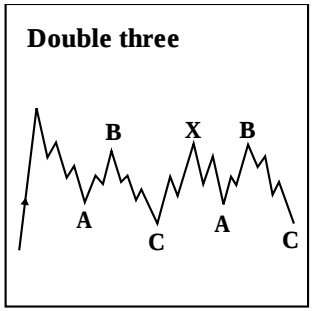




Ascending – Flat top, bottom sloping up



Contracting or symmetrical – Top sloping down, bottom sloping up



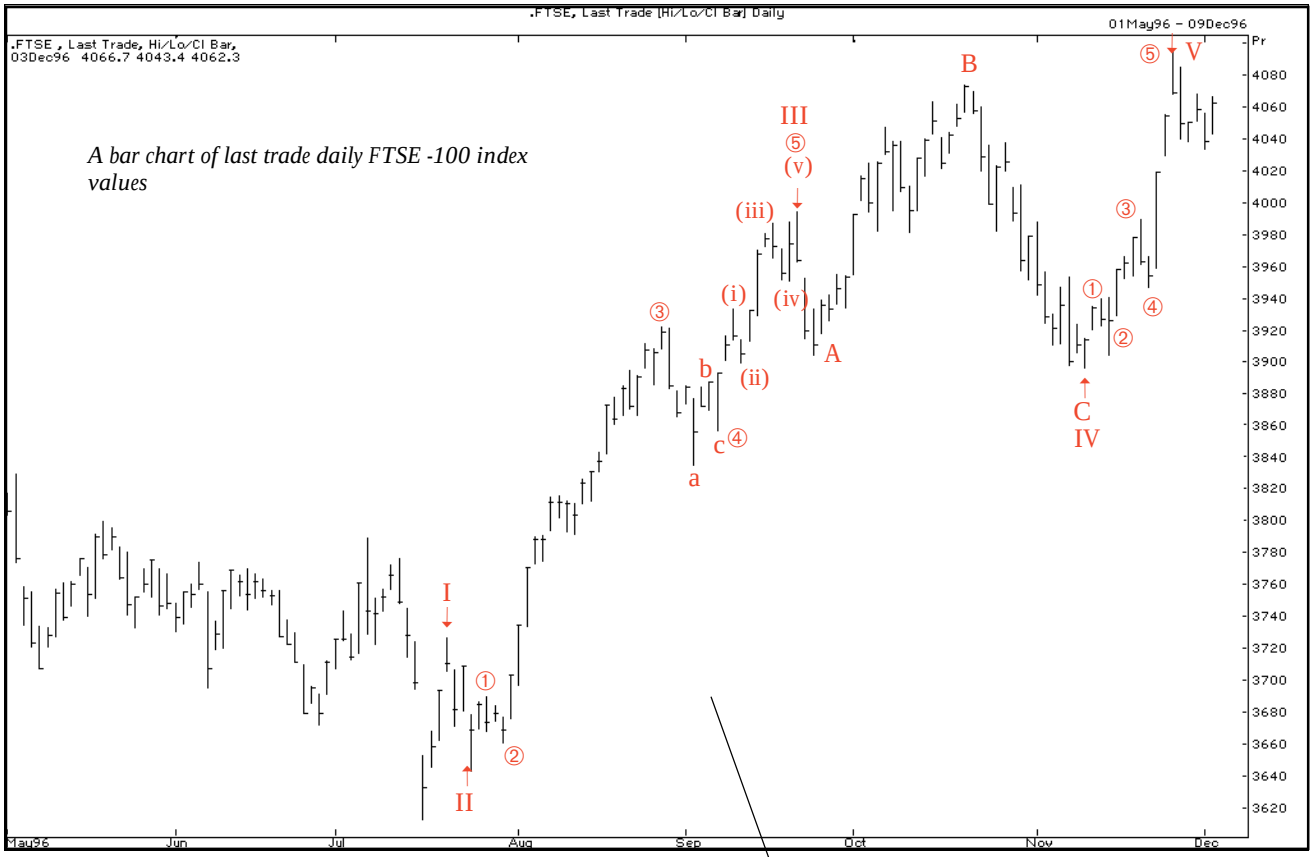
Elliott Wave Theory and Fibonacci numbers

Elliott Wave Theory

Summary

- The underlying principle is that market prices are **cyclic** and can be identified according to **patterns**, **ratios** and **time**
- A complete **cycle** is made up of **8 wave**s. In a bull market 5 waves up are followed by 3 down and vice versa in a bear market
- Waves can be **expanded** into longer waves and **subdivided** in shorter waves. Thus a completed 5 bar wave can itself be seen as a single wave in what is known as a wave of **one higher degree**. Alternatively the third wave of a completed 5 wave structure can be sub-divided into 5 waves.
- **Impulse waves** may have **extensions**. Normally the third wave, less often the fifth and rarely the first wave.
- **Corrective waves** – a, b, c – are made up of **patterns** including:
  - Zig-zags
  - Flats
  - Triangles
  - Double, triple and multiple threes
- The **Fibonacci sequence** and **numbers** are an integral part of the theory – the numbers of waves, ratios of one wave to another, retracements of impulse waves and price targets for both impulse and corrective moves

Elliott Wave Theory and Fibonacci numbers



A bar chart of last trade daily FTSE -100 index values

*Elliott Wave analysis is very complicated and different technical analysts may interpret the same chart in different ways. The various counts here are **suggested** Elliott wave patterns only – you may interpret the chart differently!*

Gann charts

W.D Gann was a stock and commodity trader working in the first half of this century who reputedly made over $50 million in the markets. He made his fortune using techniques and methods which he developed based on the relationships between **price movement** and **time** for instruments known as the **time/price equivalents**. There is no easy explanation for Gann's methods but in essence he used **lines** and **angles** in charts to determine support and resistance areas and predict the times of future trend changes.

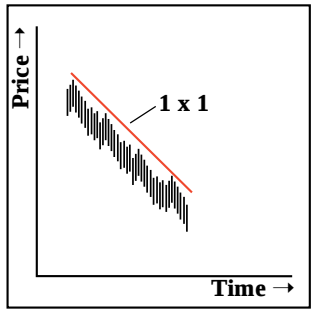
Gann noticed that the majority of price movements followed a simple ratio – typically they were $^1/_4$, $^1/_2$, 1 x, or 2 x the price at a particular starting point. This starting point was termed the **pivot point**. Sometimes the price movement was $^1/_3$ or $^2/_3$ the price from the pivot point. Gann also noticed that there was an important relationship between these price movements and time – in particular it was quite common to see a unit price movement take place in unit time. This Gann called **squaring the price** which lies at 45° from the pivot point providing the scales on both chart axes are the same.

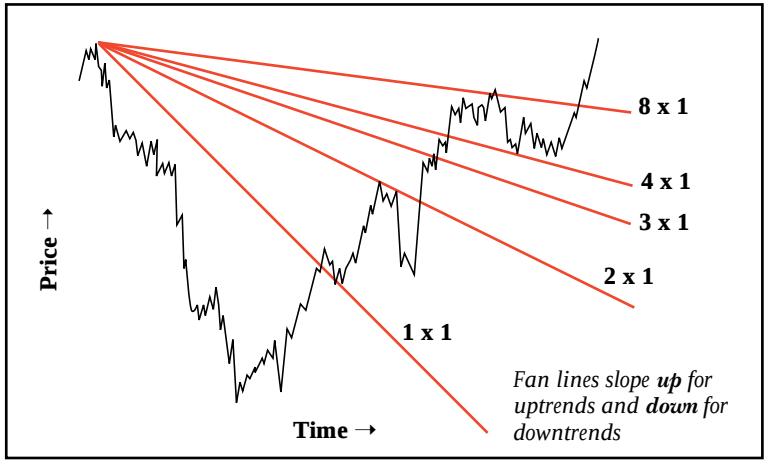
Gann used a number of other lines to indicate future support and resistance areas for different price/time ratios using Gann Angles. These are expressed as **Time x Price**. For example, a 2 x 1 Gann Angle line is drawn such that for every two time units there is an increase in one price unit; a 1 x 2 line means that for every time unit increase the price increases twice.

Pivot point

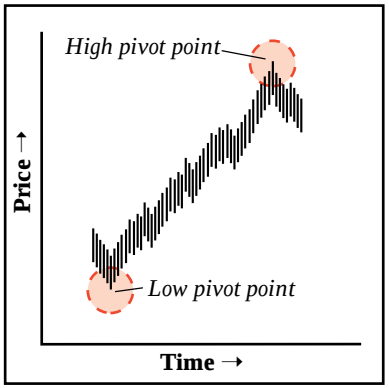
This is a particular point in a time and price chart when the trend direction changes. Depending on the instrument being charted, pivot points can be seen on a tick, hourly, daily, weekly etc. basis.

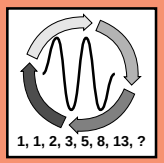
Squaring the price





Pivot points





Gann charts

Gann lines

These are lines which can be drawn to predict the future levels of support and resistance calculated from a high and low pivot point.

All that is required is to divide the height of the price movement by the number of divisions required – typically 8 or 10. These lines then provide the forward support/resistance levels. Gann emphasised the importance of the 50% retracement level line.

Gann angles

These are ascending/descending lines drawn from a high or low pivot point, each having a specific angle known as the Gann angle. The lines, projecting into the future, represent different rates of price movement/change with time.

The lines for Gann angles also provide an indication for support and resistance levels. As a price reaches and intersects a Gann angle you should see either support or resistance for this price.

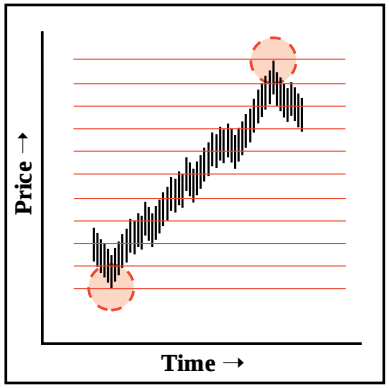
Time x Price	Line angle	Time x Price	Line angle
1 x 8	82.50°	2 x 1	26.25°
1 x 4	75.00°	3 x 1	18.75°
1 x 3	71.25°	4 x 1	15.00°
1 x 2	63.75°	8 x 1	7.50°
1 x 1	45.00°		

Gann charts

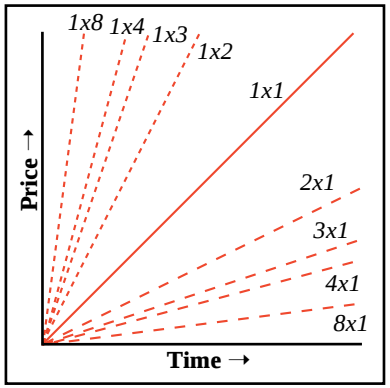
Gann lines, with their associated Gann angles, provide an enhanced indication of future support and resistance levels.

Gann lines

The price difference between the high and low pivot points has been divided into 10



Gann angles

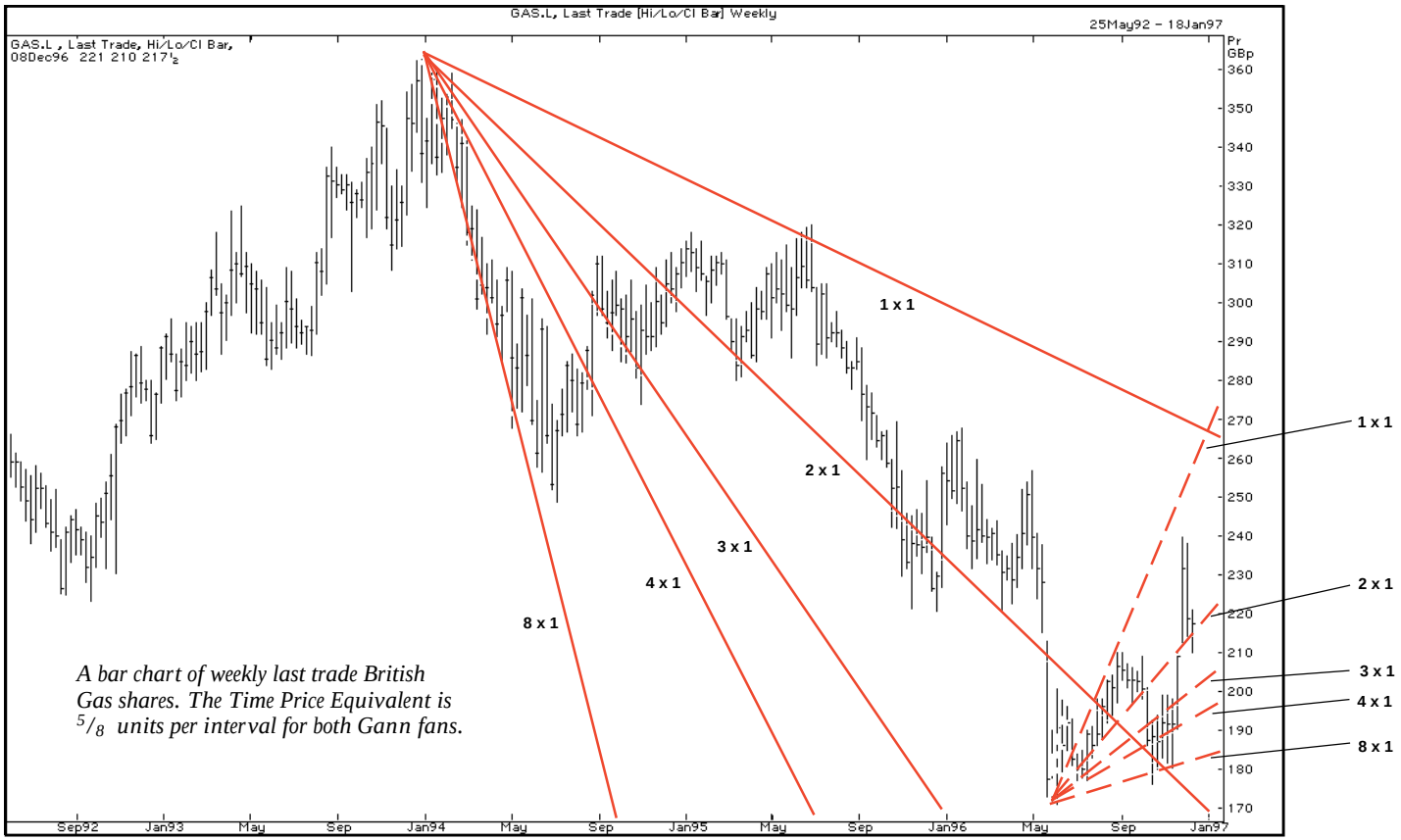


Gann charts

A bar chart of weekly last trade DAX index values. The Time Price Equivalent is one price unit per interval for both Gann fans.

A bar chart of weekly prices for Iomega Corporation shares. The Time Price Equivalent is one price unit per interval for the Gann fan.

Gann charts

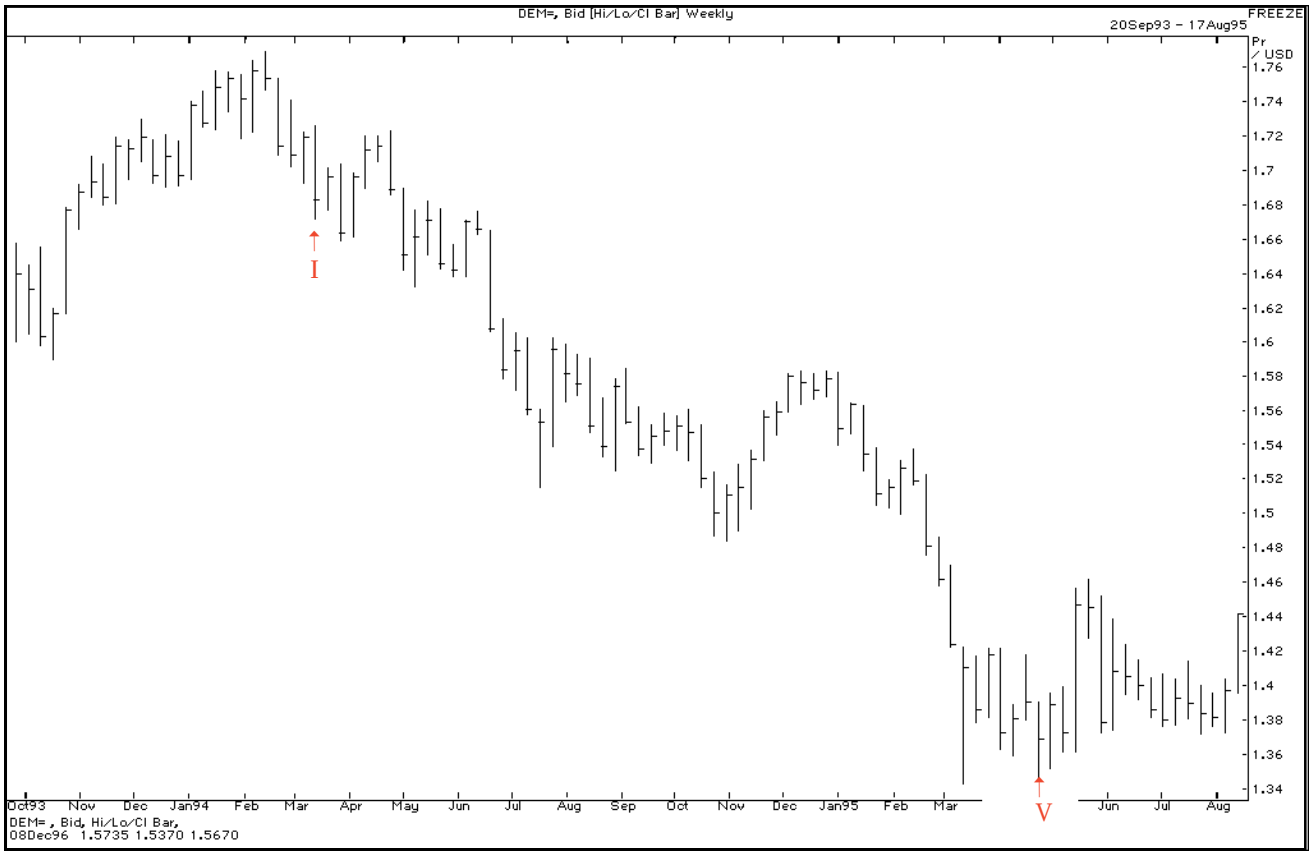


A bar chart of weekly last trade British Gas shares. The Time Price Equivalent is $^{5}/_{8}$ units per interval for both Gann fans.

Charting exercise

Although Gann Fans are available on the new version of Reuters Graphics, Elliott Wave software charting packages are only available for the specialist market. The following exercise allows you to try and find the Elliott Wave patterns in a chart.

Chart exercise
Using the bar chart for weekly bid USD/DEM prices indicate any Elliott Wave patterns you think are present. As this is quite a complicated task the start and finish points are indicated as I and V. Check your chart with that on page 130.



Summary

You have now finished the fifth section of the workbook and you should have a clear understanding of the following waves, numbers and cycles:

- ☞ Elliott Wave Theory
- ☞ Fibonacci numbers
- ☞ Gann charts

As a check on your understanding of this section you should try the Quick quiz questions. You may also find the section Overview a useful revision aid.

Quick quiz questions

1. What are the four most important Fibonacci ratios and reciprocals of ratios? You should be able to quote the values to three decimal places.

2. In Elliott Wave Theory **corrective** waves – a, b, c – are made up of patterns. Name at least three of these patterns:

   i)

   ii)

   iii)

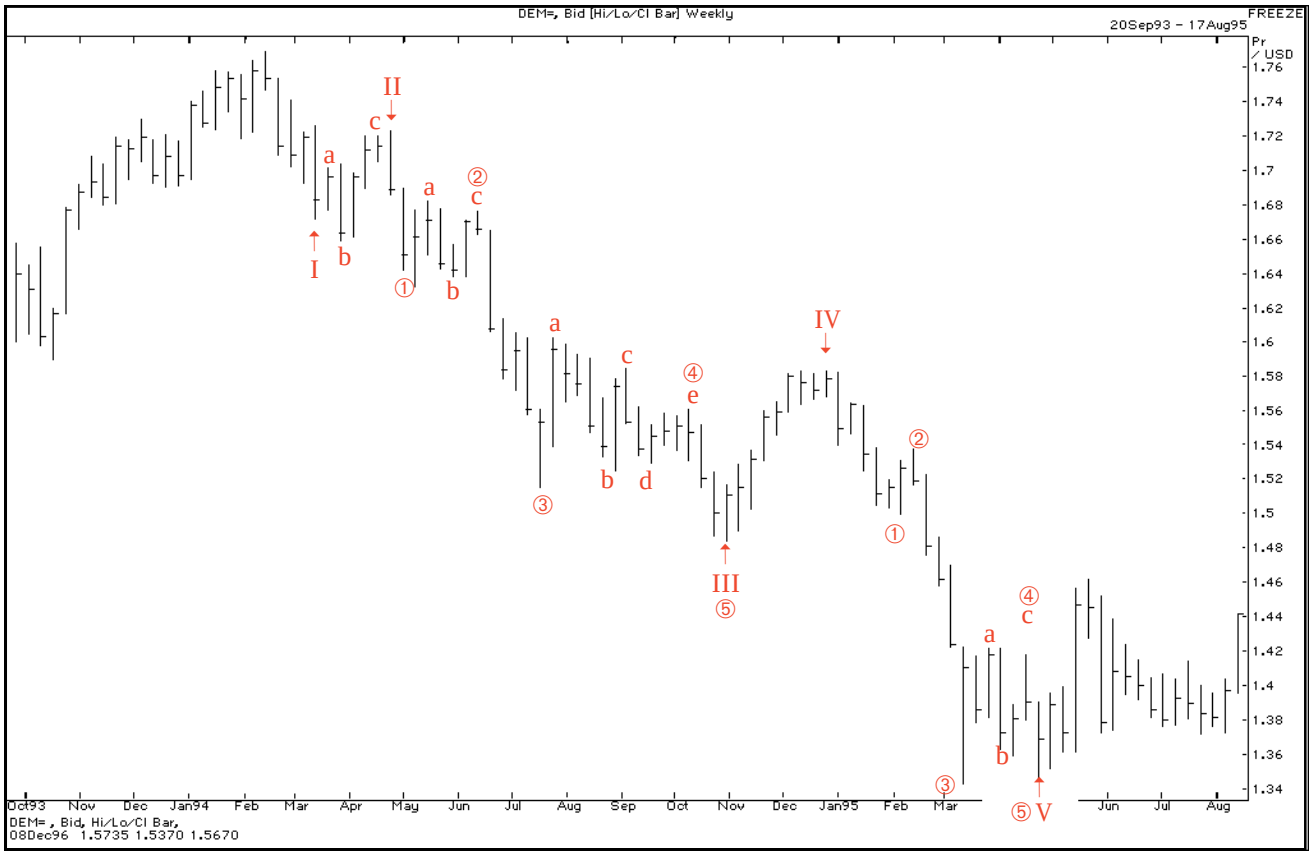
   iv)

3. Which of the following statements are true and which are false concerning Gann charts?

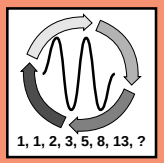
	True	False
a) The start position for Gann lines is termed the pilot point		
b) Gann Lines predict the future levels of support and resistance from a particular high or low start position		
c) A 1 x 8 Time / Price line means that for every 8 time units there is an increase of one price unit		
d) The 1 x 1 Time / Price line is known as squaring the price		

You can check your answers on page 133.

Chart exercise – Answer
Remember that Elliott Wave analysis is very complicated and different technical analysts may interpret the same chart in different ways. The various counts here are **suggested** Elliott wave patterns only – you may have interpreted the chart differently!



Waves, numbers and cycles



Overview

Fibonacci numbers

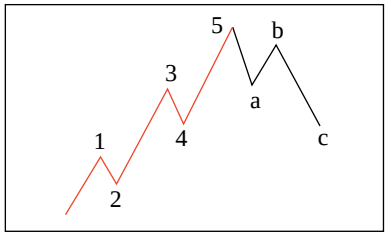
- **Leonardo Pisano** or **Fibonacci** identified a mathematical sequence of numbers in the thirteenth century:

  0,1,1,2,3,5,8,13,21,34,55,89,144...
- Each number in the sequence is the **sum of the previous two digits**
- Ratio of any number to its **higher** number is **0.618**
- Ratio of any number to its **lower** number is **1.618**
- Ratio of **alternate numbers** is **2.618**
- Reciprocal value of **1.618** is **0.618**
- Reciprocal value of **2.618** is **0.382**

Waves, numbers and cycles

Elliott Wave Theory

- Elliott Wave Theory is applied to many markets and has three aspects – **Pattern, Time** and **Ratio**
- Devised by **Elliott** with the underlying principle that markets move in a **five wave pattern in the direction of the trend**, followed by a **three wave pattern in the counter direction**



- Patterns of waves follow the **Fibonacci sequence of numbers**
- Fibonacci ratios of 0.382, 0.618, 1.618 and 2.618 are used to predict price targets for retracements and continuations
- Most common pattern shapes for correctional waves as opposed to impulse waves are:
  - **Zig-zags**
  - **Flats**
  - **Triangles**
  - **Complex – Double, triple and multiple threes**

Gann charts

- **Gann** developed charting techniques based on the relationship between price movement and time for instruments known as **time / price equivalents**
- **Gann Lines** are used in charts to predict future levels of Support / Resistance calculated from a high and low **pivot point**
- Support / Resistance lines for different time / price ratios are expressed as **Time x Price** lines. For example, 2 x 1 means one price unit increase for every 2 time units.
- Ascending / descending lines drawn from a high or low pivot point, each have a specific angle known as the **Gann angle**.
- Unit price movement in unit time is called **squaring the price**

Time x Price	Line angle	Time x Price	Line angle
1 x 8	82.50°	2 x 1	26.25°
1 x 4	75.00°	3 x 1	18.75°
1 x 3	71.25°	4 x 1	15.00°
1 x 2	63.75°	8 x 1	7.50°
1 x 1	45.00°		

Further resources

Books

Elliott Wave Principle applied to the Foreign Exchange Markets
Robert Balan, Financial Publications, 1989
ISBN None

Elliott Wave Principle
Robert Prechter and Alfred Frost, Probus Publishing Co., 1990
ISBN 0 9327 5017 6

Mastering Elliott Wave
Glenn Neely, Probus Publishing Co., 1990
ISBN 0 9302 3344 1

Gann made easy: How to trade using the methods of W.D. Gann
W. McLaren

The W.D.Gann Method of Trading
Gerald Marisch
ISBN 0 9302 3342 5

Technical Analysis of Stocks and Commodities

Gann by C. Arnold
Vol. 1:3 (48-51), 1982/3

Gann Lines and Angles by R. Pardo
Vol. 3:5 (177-183), 1985

What K-wave? by J. Walker
Vol. 7:7 (227-229), 1989

Trading with Gann lines by D. Lamarr
Vol. 8:4 (142-144), 1990

The Elliott Wave: Sidebar
Vol. 12:3 (106-111), 1994

Quick quiz answers

1. *What are the four most important Fibonacci ratios and reciprocals of ratios? You should be able to quote the values to three decimal places.*

0.382	**0.618**	**1.618**	**2.618**

2. *In Elliott Wave Theory **corrective** waves – a, b, c – are made up of patterns. Name at least three of these patterns:*

   i) Zig-zags

   ii) Flats

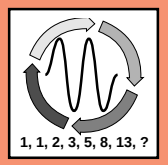
   iii) Triangles

   iv) Double, triple and multiple threes

3. *Which of the following statements are true and which are false concerning Gann charts?*

	True	False
a) The start position for Gann lines is termed the pilot point		✔
b) Gann Lines predict the future levels of support and resistance from a particular high or low start position	✔	
c) A 1 x 8 Time/Price line means that for every 8 time units there is an increase of one price unit		✔
d) The 1 x 1 Time/Price line is known as squaring the price	✔	

Your notes



Your notes

A day in the life of a technical analyst

Contents

This section of the module should take about 45 minutes of study time. You may not take as long as this or it may take a little longer – remember your learning is individual to you.

A day in the life of a technical analyst

'You cannot get something good for nothing. You must pay with time, money or knowledge for success – W. D. Gann'

The Gann Method by John J. Blasic
Technical Analysis of Stocks and Commodities , Vol. 10:6 (268-271), 1992

'Asking the market what is happening is always a better approach than telling the market what to do'

Using Bollinger Bands by John Bollinger
Technical Analysis of Stocks and Commodities , Vol. 10:2 (47-51), 1992

A day in the life of a technical analyst

Introduction

This final section in the workbook is concerned with the day-to-day activities of a few Technical Analysts which has been included to give you a 'flavour' of what they do. But why are there Technical Analysts? The following brief summary of technical analysis may help to put the role of the practitioners and the techniques used in perspective.

The birth of Technical Analysis is widely agreed as occurring in Japan during the eighteenth century. This was the first time that prices were recorded with a view to predicting future events. Rice was the key commodity at that time, and the very first Futures Exchange came into being around 1700 to trade Rice futures, or 'empty baskets' as they were known. A successful merchant and moneylender from the **Honma** family named **Munehisha**, together with his nephew **Mitsuoka**, are popularly recorded as having invented the Candlestick method of plotting price action. This method was little known outside of Japan until about 1989/90 when Steve Nison, an American analyst, succeeded in introducing and massively popularising the technique into Western markets.

Charles Dow, famed for the **Dow-Jones Index** and the **Dow Theory**, is the person who comes most readily to mind when talking of the modern history of charting/technical analysis. Also the founder of *The Wall Street Journal*, what is not so well known is that Charles Dow was the originator of the Point and Figure method of charting. Dow's work up to his death in 1902 was principally concerned with stockmarkets.

W.D.Gann is another famous American whose work on commodities and stockmarkets spanned 50 years to 1950. A complete and unique branch of theory is named after him – Gann Theory. Between the years of 1940-1955, Ralph Nelson Elliott, another American formulated his theory – **Elliott Wave Theory** – again essentially a complete Technical Analysis branch in itself.

The beginning of the 1960s was a particularly difficult period for technical analysts as this was the time that the **Efficient Market Theory** held sway. This theory, held by fundamentalists in particular, suggested that price action in the market is random and cannot be predicted. It is also worth noting that up to this point all chart construction was accomplished by hand, both a time intensive and laborious process. But all this was about to change particularly by events in the Foreign Exchange (FX) market.

Up to 1970 the FX market was a comparatively calm place compared with the frantic arena that it is today. Almost all trading took place between 9am and 5pm London time with participants reluctant to quote outside these hours. This was especially so in the USA where prices were then quoted **inversely**, for example, USD/DEM. Indeed in London very often the first price quoted at around 9am would be virtually identical to that last quoted before 5pm the previous afternoon. Spot Yen was a minor currency for the dealing room junior to handle, along with the likes of Singapore Dollar and Saudi Riyal. But by late 1971 this situation was to change dramatically.

The reasons for the changes in 1971 have their origins in the Bretton Woods conference, held in 1944 in the USA. This was when the framework for the post-World War II economic order was discussed. From this meeting came the World Bank (International Bank for Reconstruction and Development) and the International Monetary Fund (IMF). Crucially all the mainline currencies were pegged to the US Dollar. As economic performances between nations diverged and with the reluctance of governments to revalue their currencies, it was clear that the Bretton Woods exchange parity agreement was in jeopardy. Temporary measures such as exchange controls and trade barriers failed and in the autumn of 1971 the USA suspended the Gold Standard.

A day in the life of a technical analyst

The Bretton Woods exchange parity agreement was replaced with a new era of floating exchange rates.

The result of floating exchange rates was **volatility** which was of an intensity that had not been seen before. This introduced profound new risk into the commercial world. Where previously companies had accepted exchange exposure with equanimity, they realised now that to hedge and lock in their exposure was a wise move. However, markets moving with no defined limits also offered the opportunity for speculative gain and the probability of loss for the foolish and unwary.

Thus there was the need to attempt to understand why prices moved in the way they did. Could prices be predicted? In 1974 the International Monetary Market (IMM) was established as a subsidiary of the Chicago Mercantile Exchange (CME). The IMM was set up to deal in financial futures and began with contracts for the mainline currencies against the dollar, plus an (unsuccessful) Certificate of Deposit contract. Chicago's fame grew from its expertise in trading commodity futures, it was the young traders from the commodity pits who moved across into the newly instituted IMM, bringing with them one of their principal tools –technical analysis.

To begin with the IMM turnover was small and had little impact on the main FX market. However, as their market grew so did the confidence of the traders within it and before long their activities started to impact on the massive Spot market. 'Who are these crazy people at the IMM?' was an increasingly common question to be heard in London in the mid-seventies. And what is this technique called Technical Analysis that they are all using?

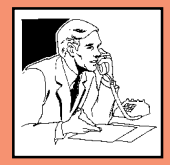
1976 is a notable year in that it saw the introduction of the first commercial PC in the UK - the Commodore Pet. Seen as something of a novelty at the time it was not until IBM introduced their own machine in 1981, and set the standard for everyone else to follow, that the PC market took off. Computers can store vast quantities of data and then utilise this data in performing large numbers of complex mathematical calculations at astonishing speed. Here then was the final piece of the jigsaw that lit the blue touchpaper and sent the 'Technical Analysis Rocket' into orbit.

The need to understand price action in the marketplace was ever greater due to increasing volatility. Somehow certain chartists / technical analysts seemed to have a very discernible edge over other market participants – they made consistently, accurate calls. The techniques they used and research into new techniques were ideally suited to the personal computer. It is probably true to say that if it was the wheel that revolutionised transport, then it was the PC that revolutionised technical analysis.

Today the power and speed of desktop PCs are constantly improving and what was considered to be a state of the art machine a year ago is now out of date! Testing technical analysis ideas requiring massive computational power is now possible which was but a pipe-dream until recently. Right at the 'cutting edge' we have now a merging between traditional technical analysis and the new technologies of Neural Networks, Expert Systems, Fuzzy Logic etc. Astonishing advances have been made since the mid-1980s in analysing market behaviour, but this may only be the beginning?

To give you an idea of the real world of technical analysis there are two brief diaries taken from the activities of analysts. If you want to know more then read on...

A day in the life of a technical analyst



It's what people say...

You know I sometimes wonder why I do this job! Why didn't I go into accountancy after leaving school like my mother suggested – a regular nine-to-five job, good prospects, and little stress. Sorry!, should have said – I'm a technical analyst working for a medium sized Bank advising the dealers on the technical perspective for the various markets the Bank's trading and investing in. This covers the spot FX desk, the guys trading Futures on LIFFE, CME, and CBOT, and – oh yes – we've got a big Funds Management division upstairs that I have to keep briefed on just about every Equity market you can think of! You couldn't think of a less routine job – every day's different! It sure isn't 9-to-5, 7-to-7 might be more accurate when the markets are hectic. But in truth I love it! Let me tell you about a crazy day that's just passed.

News is the fuel that drives the markets. That's why dealers are always hanging on the latest headlines from premier news providers such as Reuters. Guess there's two types of news, the 'scheduled' normally concerning prime economic data releases from the G7 countries ... and then there's the 'bolt from the blue' variety. Fashions change, but for several years the key monthly economic indicators for the global markets have been the US employment figures issued at 1:30pm London time on the first Friday of each month. To be more specific it's the **Non-farm Payroll** component which 10 years ago no dealer had ever heard of! It's a strange world, time and again the two hours following the release of 'Non-farms' sees the most active and volatile trading in the whole month. The November figures were due on Friday the 6th Dec, and I'd gone home on the Thursday night thinking of the virtually certain hectic day ahead plus prospects for my own trading position short of Dec FTSE futures on LIFFE. But more of that later.

There I was relaxing watching one of the kid's James Bond movies when the mobile rang. My Treasurer on the line telling me that Greenspan had made comments in a late NY speech regarding 'inflated asset values' and 'euphoric markets'. Now if there's one guy on the planet that can send the world markets into a tail-spin with one sentence it's Alan Greenspan, the chairman of the mighty US Federal Reserve – effectively the US Central Bank. And here we had it, the dreaded 'bolt from the blue' news shock, and to cap it all the night before the US employment figures! It was going to be a very early start in the morning – the boss had moved the morning strategy meeting to 7:30.

At my desk just after 6:00am and work like a mad thing preparing to brief the section heads at the 7:30 meeting. Far East equity markets have taken a dive, it looks like gloom and doom for Europe on equities and interest rates. Suddenly I'm the most popular person in the Bank, everybody, but everybody, wants to know what I think. *'Is this the start of the crash everyone's feared? Where are the downside targets? Isn't it overdone, shouldn't it bounce from here? etc etc'*. At least my own position short of FTSE is looking good, and for that I offer up thanks to Alan Greenspan – last month I was cursing him!

It would take for ever to cover all the markets we looked at in that meeting, so I'll just pick one – US T-Bond futures on Chicago's CBOT – and then show you what I got up to in my own trading.

I've been into Candlesticks since reading Steve Nison's book and like combining them with trendlines, slow stochastics, and Bollinger bands – a volatility envelope analysis. Every analyst has his own 'pet' analyses and the ways he/she interprets them. Successful technical analysis is about using a cocktail of different techniques that complement each other rather than using one single analysis in isolation – and I'm no different.

A day in the life of a technical analyst

This is the daily candlestick chart of the December T-Bond on the CBOT.

❶ Bit of backtracking (OK, boasting really). I'd thought that the sideways structure that formed during October was shaping up like a triangle –breakout should resume the uptrend. So fingers crossed and gave the bond desk a buy signal should 111 $^{20}/_{32}$ be broken on the strong uptrending market developing during the 29th –**Candle A**. All rather excited when it went like a rocket and closed at 112 $^{19}/_{32}$ – virtually a big figure in – but getting 'right-side' of the market is just half of the story, once you're in you have to decide when to get out!

❷ OK the Close on the 29th was outside the Bollinger volatility envelope, but the key thing was the envelope was expanding – top line going up, bottom going down – volatility therefore rising. It was a big breakout of a major horizontal resistance at 111 $^{28}/_{32}$ so we thought this might be one to ride. Next few days saw some topsy-turvy conditions but no doubts the bulls had control. Come late evening on the 12th Nov got called at home by our late shift. T-Bonds about to close outside the Bollingers with the top and bottom Bollinger lines 'in synch' (both moving together) – **Candle B**. Now one of the golden rules of the game is *'Bulls make money, Bears make money, but greedy Pigs just make losses!'* So prudence rules, put some money in the till, and we close half of the long position at 114 $^{28}/_{32}$. Two days later and we've got pretty well the same situation but this time we've run slap bang into what we see as the outer channel line. So close out the remaining 25 long position at 115 $^{9}/_{32}$ just before the close, thank you very much indeed and good night nurse!

❸ However, in the trading world you can't rest on your laurels for long, question *'What do we do next?'* The guys on the Bond desk were split as to what strategic position to run, if any. The older heads were saying *'the trend is your friend'* so let's get back long, the younger *'burn 'em up'* brigade that it had gone too far and was 'bound' to reverse soon – DANGEROUS!

Me? – I preferred sitting on the fence!

A day in the life of a technical analyst

This is the daily candlestick chart of the December T-Bond on the CBOT.

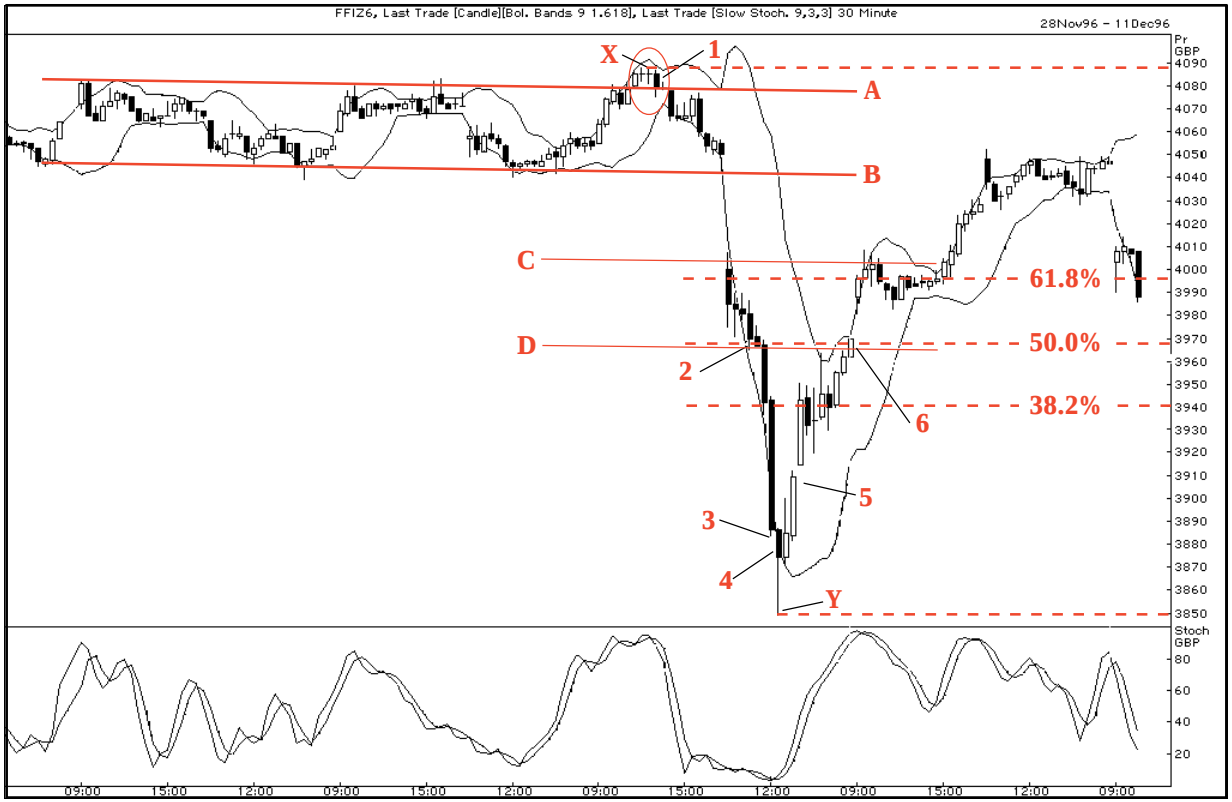
❹ Close of Friday 22nd Nov saw a classic Stochastic Divergence (**Stoch Diverge 1**). The T-Bond desk were mumbling that I'd lost my nerve (don't they ever have any of their own trading ideas?) and so I told them *'Sell the Opening'* on the 25th. What looked good at the off, 115 $^{5}/_{32}$, had a nasty smell about it near the close, 115 $^{15}/_{32}$, so swallowed hard and told the late shift to cut it. Just 10 pips loss but I sure was popular with the bond jockeys next morning - short memories, what about the 3 big figures I'd recently made them!

❺ 4th December and I'm getting interested in the bonds again. As a down day develops it's possible we could be left with another confirmed stochastic divergence (**Stoch Diverge 2**) plus a nice long black candle would give us a pattern with strong characteristics of an Evening Star – a potent bull market reversal signal. So it's agree what we'll do with the bond desk if we get the right set-up near the close, make the call to the brokers and sell at 115 $^{22}/_{32}$ on the death – **Candle C**. Next day we get an acceleration on the downside – **Candle D** – and I'm the blue-eyed boy again! However, tomorrow's the dreaded Non-farm payrolls so the boss says he wants the profit on half the position come what may – and we leave a 'profit take' at the expected resistance level of 114 $^{18}/_{32}$ which happily gets executed. Shortly afterwards 'Bang!' and Mr Greenspan pulls the trigger!

❻ Next morning as I said all markets are in turmoil and we haven't even heard the 'Non-farms' yet! Boss must be thinking of his bonus as he says he wants the profit and to be flat before the figures. So everybody looks at me and says where? – Thanks! Well we know it's going to open loads lower and will be trading for 10 minutes before the figures. There's an old gap formed between the 4th and 5th November, 113 $^{3}/_{32}$ to 113 $^{10}/_{32}$. Old gaps act as support/resistance and the market adage is to look to see this halfway between the gap. So fingers and legs crossed we put in an order on the off to buy at 113 $^{7}/_{32}$ and 'bingo' we get filled! A few minutes later out come the 'Non-farms' significantly better than expected and it's all change for a bull rally! How lucky can you be! Boss was walking round like a Cheshire cat!

A day in the life of a technical analyst

But what about my own trading in this mayhem – I do like to try and keep my hand in with a bit of 'live action' besides advising people all day long. My normal patch for trading is the S&P 500 futures contract on the CME and the FTSE future on LIFFE – main reason for trading these contracts is to stay on the ball for Equity markets given that I get so many '*What's going to happen?*' calls from the fund boys upstairs. Of late I'd been flying the Union Jack and just concentrating on the FTSE.



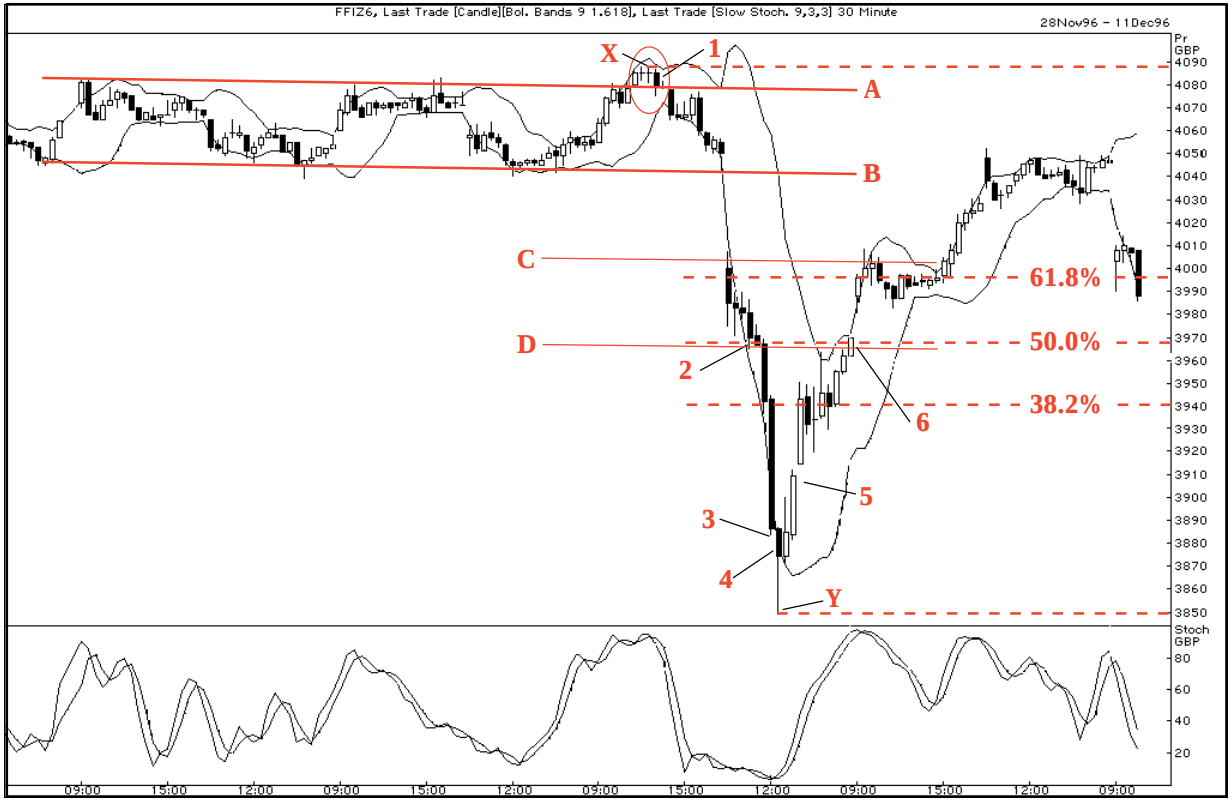
As said I was short of the Dec. FTSE futures going home on Thursday night. For short term trading I like half hourly charts, and round about midday on the 5th we'd developed a nice set-up.

❶ The ringed area that shows a long white candle followed by two Dojis (a Doji is a small candle where the Open and Close are about the same – looks like a cross and is a sign of weakness in a trending market). The next candle was a long black that enveloped the bodies of the previous three candles. As it was also a confirmed stochastic divergence I sold just before the close of the half hour at 4078. It all developed very nicely on the downside going into the daily close,so I decided to hold the position overnight. My hope was we might challenge the **B** line of the **A/B** channel that had dictated trading for the previous two days.

❷ Well overnight Uncle Greenspan came and did me a big favour and we opened gap down, not only under **B** but also beneath the 'one channel down' line at **C**. I have this theory about parallel channels, that when they break the market moves one and then two channels down as the energy released is dissipated. So I was looking for a rendezvous with the second channel down at **D** which we duly got just before 10:30. Nearly took the whole position out as I could hardly think given all the phone calls I was getting plus all the shouting and shrieking going on around the room! However, I cashed in for half the position at 3967 and decided to give the rest a bit more rope.

A day in the life of a technical analyst

❸ Good (lucky?) decision as the bears came in as we approached midday and gave the market a right seeing to! Just before 12:00 I'd got one of my classic scenarios – a truly wicked long black candle **3** closing outside the volatility envelope with upper and lower bands moving 'in synch'. Sit on the fence time, don't be greedy! So out we come to go flat at 3888 – not bad result for what's not even a day's trading!



❹ Always a dangerous time after a big profit. It's so easy to let euphoria and 'I'm the greatest' swamp rational analysis, and before you know what's happened you've done something really stupid and handed a large part of the profits back! So having learnt this painful message in the past several times, I keep telling myself to calm down and concentrate. Next candle **4** looks very much like a Hammer – a classic bear market candlestick reversal pattern. However, with the Non-farms only an hour away I haven't got the guts – maybe I'm being sensible for once. Normally I'd go like a shot to get long at the end of the period marked by candle **5** – but Non-farms were but seconds away. Out they come and with screams of *'Buy,buy...'* echoing around the room I manage to get some on board and go long at 3926.

❺ Well not a lot of chance to do much more as throughout the afternoon it seemed 'the whole world' wanted to speak to me. But for my running position the eternal problem – where to come out? Haven't said, but I'm also a bit of a Fibonacci fan – that centuries old Italian was one clever bloke! I particularly like the fibonacci retracements for pullbacks from big moves – 38.2%, 50%, 61.8%. The overall move spawned by the Greenspan shambles was **X** to **Y** as marked on the chart together with the 'fib' retracement levels based off this **X – Y** move. You know sometimes one just has days where everything goes right, and this was one of them! 50% was 3968 and just before 5:30pm we manage to nick in and close out during the APT (late electronic trading as opposed to pit open outcry) session.

What a day, you don't get too many like that thank goodness! Feeling shattered as I've been at the desk for 12 hours without a break. You can tell that it's been a great day for the dealing room from all the excited buzz, and I think there's a bit of a party mood afoot. Yep, the Boss says all down the local wine bar and the champagne's on him!

A day in the life of a technical analyst

An early start ...

Pete is a technical analyst working for ABC who specialise in providing live technical analysis on the various markets over Reuters. Two of Pete's main clients are Danny and Hans.

Danny is a speculator running a small fund. He trades in various markets, usually holding positions for no longer than a few days.

Hans is a corporate dealer at XYZ Bank in Frankfurt. His client is an importer of Italian shoes who requires a favourable exchange rate to purchase foreign currency.

Pete advises both Danny and Hans on timing the market.

It's 6.45 am in London, on 9th October. Pete is at his desk. He checks the overnight movements on the currency and US T-Bond markets to get an indication of how the European markets will open.

Between 7.00 – 8.00 am – when most LIFFE Markets open – Pete analyses the markets he will be covering today. He writes a technical commentary on the markets providing trading recommendations for the day ahead.

He reads the *Reuter Insight Debt News Analysis*, **BXNB**, on his RT to see if any important economic data is due today. The US Gross Domestic Product (GDP) figure is out at 1.30pm – Pete envisages an active afternoon!

The next few hours are quiet which allows Pete time to prepare his Elliott Wave outlook of the US Stock Market for a client in New York...

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---- REUTER INSIGHT CONSENSUS OF GLOBAL MARKET FORECAST     BXNB
 GMT -----------KEY INDICATORS----------FORECAST---RANGE---PREVS
 0630  THU   JPN. INDUSTRIAL PROD OCT  +3.4  PCT +2.5/+4.1  +1.5
 0630  THU   JPN. INDUST PREL Y/Y OCT  +6.0  PCT +5.1/+6.7  +3.4
 0745  THU   FRA. GDP (PREL)  Q/Q Q3   +0.8  PCT +0.3/+1.1  -0.4
 0745  THU   FRA. GDP (PREL)  Y/Y Q3   +1.1  PCT +0.9/+1.4  +0.5
 1330  THU   CAN. AVG. WEEKLY ERN SEP  +2.6  PCT +2.6/+2.7  +2.6
 0030  FRI   JPN. CONSUMER PRICES OCT  -0.1  PCT -0.1/+0.1  +0.4
 0030  FRI   JPN. CPI (NAT'L) Y/Y OCT  +0.2  PCT +0.1/+0.3  FLAT
 0030  FRI   JPN. CONSUMER PRICES NOV  FLAT  PCT -0.3/+0.2  FLAT
 0030  FRI   JPN. CPI TOKYO  Y/Y  NOV  +0.1  PCT -0.1/+0.4  -0.1
 N/A   FRI   JPN. JOB RATIO       OCT  0.72  PCT 0.71/0.73  0.71
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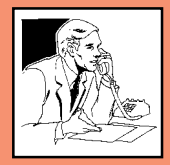
A day in the life of a technical analyst



It's 11.30 – Pete's phone rings.

Pete: Hello.

Danny: Hi, it's Danny. What do you think of DEM/ITL?

Pete: I'll take a look and call you back in 5.

Pete calls up a **weekly bar chart** of DEM/ITL using Reuter Technical Analysis. This allows Pete to get an overall picture of the medium-term trend. Pete examines over 3 years of price action and has the following observations:

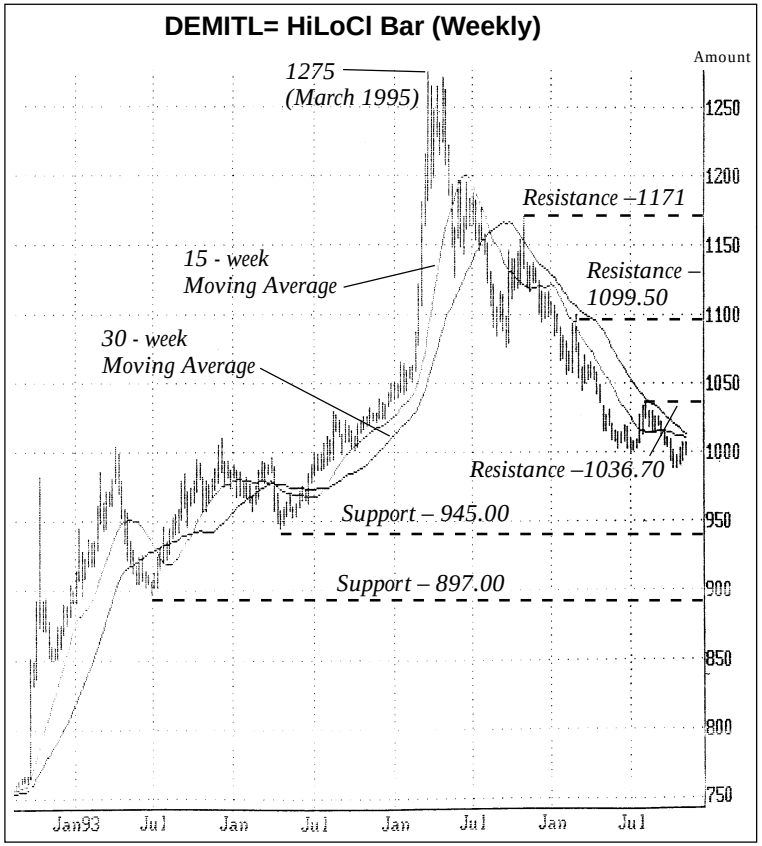
1. A major bull market ended at 1275.00 in March 1995. The market has been a bear since. The **impulsive** moves are down whereas the **corrective** moves are up.

2. The 15 and 30 week **moving averages** are bearishly aligned, with recent rally attempts thwarted by these.

3. Important **supports** are at 945.00 and 897.00. **Resistances** are at 1036.70. 1099.50 and 1171.00.

Impulsive moves are the sharp moves which go to make up the overall trend. **Corrective** moves are temporary reactions against the trend as profit-taking ensues.

The short-term average is under the long-term average. Both are pointing down.



A day in the life of a technical analyst

Having ascertained the medium-term trend, Pete now calls up a **daily bar chart** of DEM/ITL using Reuter Technical Analysis. Pete examines daily – sometimes intra-day – charts to time entry into the medium-term trend. Pete observes the following:

1. The market failed to hold under 3rd October low of 989.40, rebounding back above 990.00 level.

Signs of waning bear momentum are noted when the market cannot sustain a push into new lows.

2. 9-day **RSI** basing in oversold territory having shown a bull divergence.

Another sign of fading bear momentum

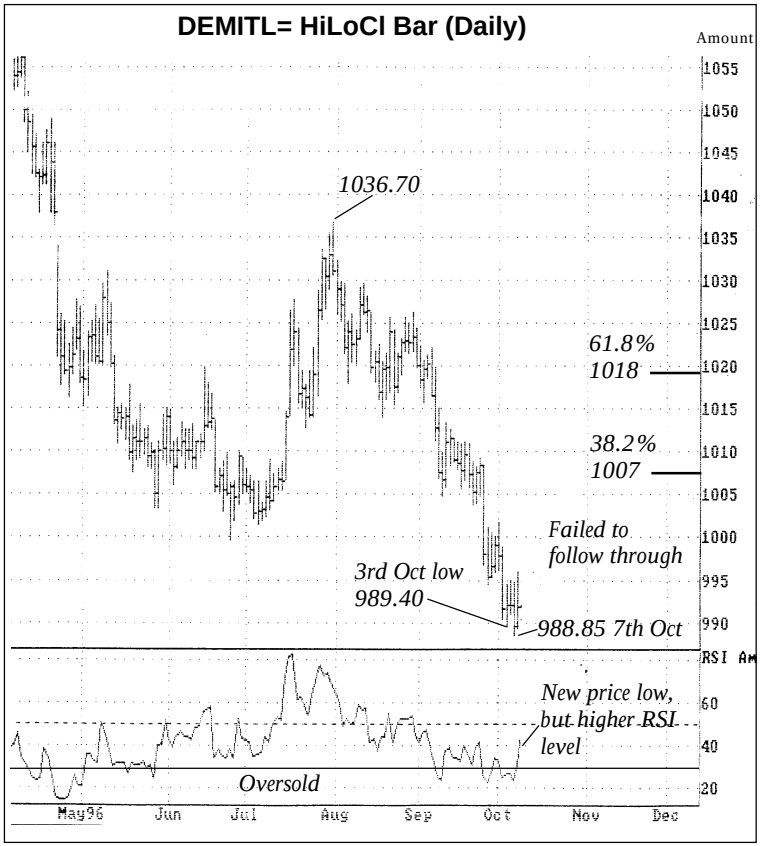
Pete's **conclusions**:
The medium-term bear trend looks over extended in the short-term. A correction of between **38.2** and **61.8**% of the impulsive decline from 1036.70 looks due over the next few weeks.

Corrective moves usually retrace 38.2 to 61.8% of the preceding impulsive move. These retracement values are based on Fibonacci numbers.

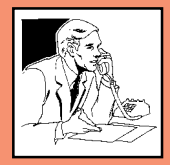
Once the correction is complete, the medium-term bear trend should resume towards support at 945.00 and 897.00 as the next impulsive phase gets underway.

Breach of the 61.8% retracement at 1018.00 will warn that the bear trend is in the process of reversing.

Once Pete has decided what DEM/ITL will do over the next few weeks he rings Danny...



A day in the life of a technical analyst



Pete: Hi, Danny. DEM/ITL looks good for a rally to 1007/1012 over the next few weeks. Play the long side with a stop-loss under 988.85.

Danny: Thanks Pete – I'll call my broker.

Pete pops out for lunch and on his return about 1.20 pm starts to monitor US T-Bond futures ahead of the US GDP data. The figure is out at 1.30 pm and is weaker than expectations. The Bond markets rise initially but swiftly reverse early gains. Five minutes later Pete's phone rings again...

Danny: Pete, have you seen the BTPs?

Pete: Yeah, I hope you're short!

Danny: Looks like I should be – with T-Bonds struggling and DEM/ITL going to 1007 - 12!

The Bond markets sell off and the DEM rallies throughout the afternoon. About 3.30 pm Hans phones Pete...

Hans: Pete I want to buy some Lire. When should I get in?

Pete: I'd wait a week or two. The market's due for a correction towards 1007/1012 before the next leg down to 945/897. Give me a call then and we'll discuss short-term timing.

Finally, about 4.20 pm, Pete writes closing comments on his markets which include a review of the day and an outline of anticipated action for tomorrow.

A stop-loss level is a pre-defined point at which a losing trade is exited. Stops are used to minimise market risk.

Buoni del Tesoro Poliennali (BTP) are Italian fixed rate Treasury bonds with varying maturities from 5, 10 and 30 years – the most liquid market being for 10 year bonds.

A day in the life of a technical analyst

Summary

You have now finished the final section of the workbook and you should now have some understanding and knowledge of the following:

- ☞ The development of technical analysis
- ☞ The basic tools and techniques used by technical analysts covering –
  - Chart types
  - Patterns
  - Indicators
  - Waves, numbers and cycles
- ☞ The ways in which technical analysts use the various tools and techniques

If you decide you wish to study more about the ways traders and analysts use Technical Analysis then the final **Further resources** section may be of use.

What next?

If you work in a sales, client training or customer support role and you need a more detailed picture of a particular market or markets, then you may find the Level 2 and 3 workbooks in the *Know your Customer* series useful. The following sets of workbooks are available:

- ❑ The Debt Markets
- ❑ The Securities Markets
- ❑ Foreign Exchange and Money Markets
- ❑ Commodity, Energy and Shipping Markets

You may also find the Level 1 workbooks – *Introduction to the City; Volume 1: History & Structure* and *Volume 2: Institutions & Trading* may be of interest. Alternatively you may want to study further for whatever reasons. The choice is yours... if your decision means you would like to study more workbooks, then contact your training department for the titles you require.

Good luck!

Further resources

Books

Market Wizards: Interviews with Top Traders
J. Schwager, Harper Business, 1989
ISBN 0 8873 0601 1

Intermarket Technical Analysis
John Murphy, J. Wiley & Sons, 1991
ISBN 0 4715 2433 6

The Psychology of Technical Analysis
Tony Plummer, Probus Publishing Co., 1993
ISBN 1 55738 543 2

Steidlmayer on Markets
J. Peter Steidlmayer, J. Wiley & Sons, 1989
ISBN 0 4716 2115 3

Mind over Markets
J.F. Dalton, E.T. Jones and R.B. Dalton, Probus Publishing Co., 1993
ISBN 1 55738 489 4

Technical Analysis of Stocks and Commodities

The publishers of this monthly journal can be contacted at the following address:

Technical Analysis Inc.
4757 California Avenue, SW
Seattle
WA 98116
USA

Reprints of the articles mentioned in the *Further resources* sections of this workbook can be obtained from Technical Analysis Inc. together with a CD-ROM of all the monthly journals, 1982 – 1994.

Your notes