TOPIC 6 - OVERVIEW

1. FUNDAMENTAL ANALYSIS AND TECHNICAL ANALYSIS

- This topic covers how to:
  - ➢ Analyse a stock
  - ➢ Track the performance of a company
  - ➢ Compare companies; and
  - ➢ Value the shares of a company

- The two common methods used to analyse securities are:
  - ➢ **Fundamental analysis**: assigns an intrinsic value to a stock by considering the company's financials and operations, asset values, anticipated earnings and growth potential, and the economic environment and business cycles
  - ➢ **Technical analysis**: studies technical factors such as price movements, volume and trading activity as indicators of future trends
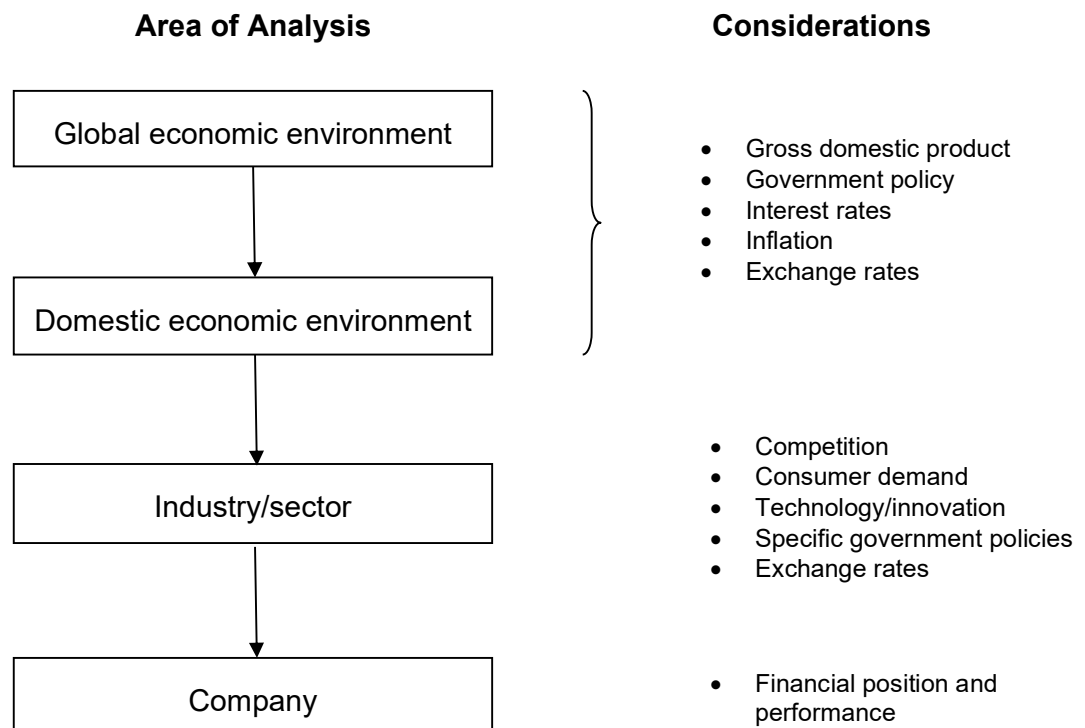
2. FUNDAMENTAL ANALYSIS

- There are two basic approaches to fundamental analysis: top-down analysis and bottom up analysis

2.1 Top-down Analysis and Bottom-up Analysis

Top-down Analysis

- Takes a macro view, gradually moving down to a micro view

Area of Analysis	Considerations
Global economic environment	• Gross domestic product • Government policy • Interest rates • Inflation • Exchange rates
Domestic economic environment	
Industry/sector	• Competition • Consumer demand • Technology/innovation • Specific government policies • Exchange rates
Company	• Financial position and performance

Bottom-up Analysis

- Starts by focusing on a particular company to establish its intrinsic value

- Looks at a company's financial performance first and then considers the industry sector finishing with a review of the economy as a whole

- In practice, an analyst would most likely use a combination of the two analysis approaches

2.2   Industry Analysis and Competitive Analysis

- When conducting industry analysis, an analyst would concentrate on the following issues:

  - ➢ **Strengths/weaknesses/opportunities/threats** of the industry

  - ➢ **Competition**: how competitive is the industry and how will this affect price, sales and profitability of companies in the industry?

  - ➢ **Technology/innovation**: how will technology factors affect the industry? You don't want a Nokia/Blackberry situation

  - ➢ **Economic variables**: how will the industry be affected by changes in interest rates, exchange rates or inflation? Is demand elastic or inelastic?

  - ➢ **Financial and operating variables**: Does the industry rely upon capital, raw materials and/or labour?

  - ➢ **Government policy**: is the industry regulated? Will the industry be affected by subsidies, tariffs or other benefits from the government? Are labour reforms expected?

- Industry analysis will be significantly affected by the stage of the **business cycle** that the industry finds itself in. There are four stages to the business cycle:

  - ➢ *Peak to contraction*: there is a decrease in economic growth, driven by falling investment and industrial production

  - ➢ *Contraction to trough*: a fall in inflation and private consumption expenditure is accompanied by an increase in unemployment

  - ➢ *Trough to expansion*: economic recovery occurs with a fall in interest rates and an increase in investment activity

  - ➢ *Expansion to peak*: continued economic growth leads to increases in household and business spending, with higher inflation and low unemployment
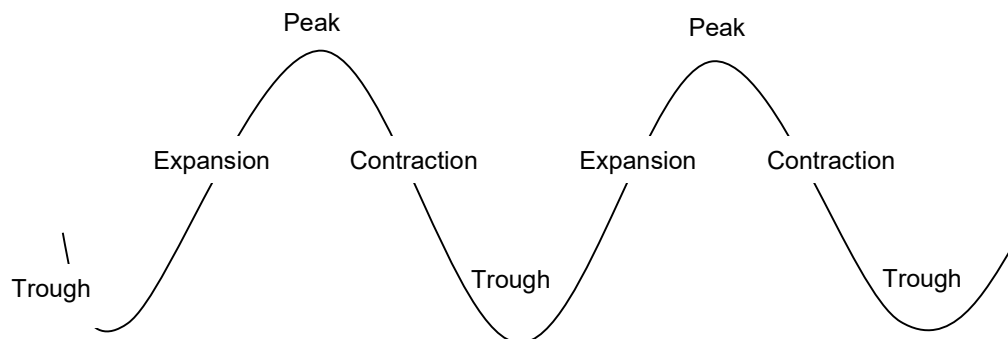

Figure 1: The Business Cycle

- Industry analysis also considers the stage of the industry growth cycle. There are four stages of the industry growth cycle:
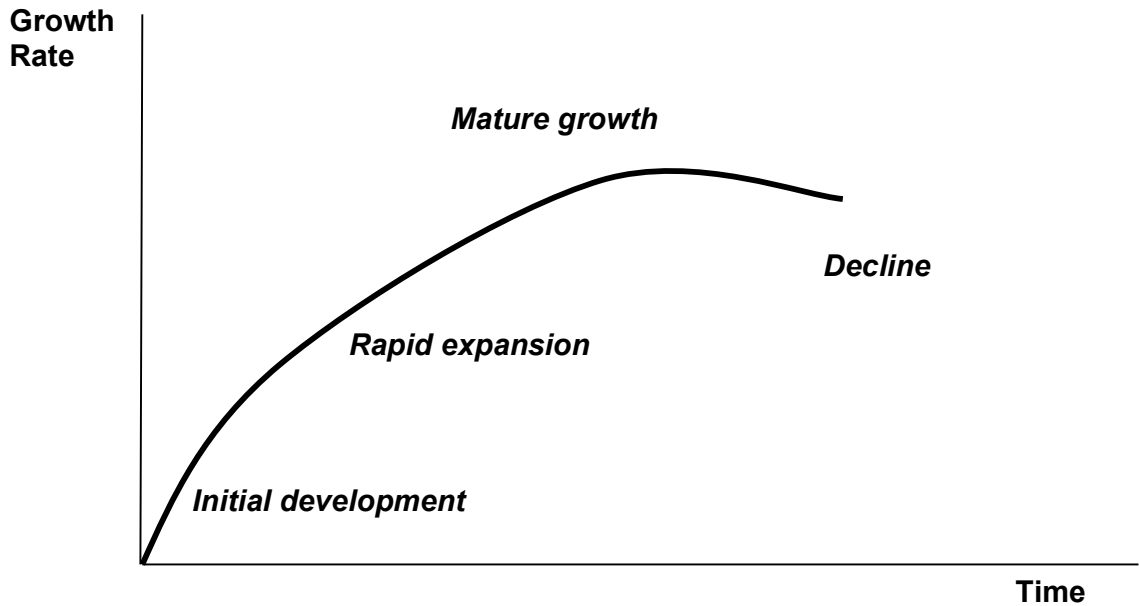
**Growth
Rate**

Mature growth

Decline

Rapid expansion

Initial development

Time

Figure 2: Industry Growth Cycle

2.3   Ratio Analysis of a Specific Company

- Ratios can be divided into three main categories:

    1.   Liquidity ratios

    2.   Profitability ratios

    3.   Solvency ratios

- Ratios use **cost-based accounting data** which come with limitations. This makes **interpretation** of ratios very important

- Consideration and calculation of a number of ratios will use data from the financial statements of a fictitious company, Exam Knowledge Limited

Exam Knowledge Limited

Statement of financial position as at 30 September 2020

	2020 HKD'000	2019 HKD'000
Current Assets		
Cash	504,000	600,000
Receivables	750,000	630,000
Inventories	2,118,000	1,740,000
Prepayments	36,000	24,000
Total Current Assets	3,408,000	2,994,000
Non-current assets		
Property, plant & equipment	1,170,000	1,094,000
Intangible assets	45,000	30,000
Total non-current assets	1,215,000	1,124,000
Total assets	4,623,000	4,118,000
Current liabilities		
Payables	810,000	870,000
Borrowings	216,000	206,000
Provisions	108,000	104,000
Total current liabilities	1,134,000	1,180,000
Non-current liabilities		
Borrowings	450,000	600,000
Total liabilities	1,584,000	1,780,000
Net assets	3,039,000	2,338,000
Shareholders' equity		
Contributed equity	1,500,000	1,500,000
Reserves	588,000	428,000
Retained profits	951,000	410,000
Total equity	3,039,000	2,338,000

Other relevant information:

	HKD'000	HKD'000
Sales	6,980,000	6,048,000
Cost of goods sold	4,988,000	4,550,000
Interest expenses	240,000	270,000
Profit before tax	840,000	760,000
Profit after tax	588,000	532,000
Dividends	330,000	300,000

2.3.1   Liquidity Ratios

- Measure a company's ability to meet its short-term financial obligations. We will consider the following four liquidity ratios:
  - ➢ Current ratio
  - ➢ Quick ratio
  - ➢ Inventory turnover
  - ➢ Debtors' turnover

Current Ratio

- Reflects a company's ability to repay its current liabilities

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

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2020	2019
$\dfrac{3,408,000}{1,134,000}$	$\dfrac{2,994,000}{1,180,000}$
= 3.01	= 2.54

- Rule of thumb is a current ratio should be greater than 2.0

Quick Ratio

- Provides a more accurate measure of short-term liquidity as inventory is excluded from current assets

$$\text{Quick ratio} = \frac{\text{Current assets - inventories}}{\text{Current liabilities}}$$

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2020	2019
$\dfrac{3,408,000 - 2,118,000}{1,134,000}$	$\dfrac{2,994,000 - 1,740,000}{1,180,000}$
= 1.14	= 1.06

- Rule of thumb is a quick ratio should be greater than 1.0

Inventory Turnover

- Measures how quickly inventories are turned over or sold. Generally, the quicker inventories are sold, the better, however it is important to be aware of the types of goods involved. Expensive goods usually turn over more slowly than cheaper goods

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventories}}$$

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2020	2019
$\dfrac{4,988,000}{(2,118,000 + 1,740,000)/2}$	Not enough information
= 2.59	

- Inventories were turned over 2.59 times in a year or once every 141 days (ie 365days/2.59)

Debtors' Turnover

- Shows how long it takes for a company, on average, to collect its receivables

$$\text{Debtors' turnover} = \frac{\text{Sales}}{\text{Average receivables}}$$

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2020	2019
$\dfrac{6,980,000}{(750,000 + 630,000)/2}$	Not enough information
= 10.12	

- Receivables were turned over 10.12 times in a year or it takes the company, on average, 36 days (365 days/10.12) to collect its debts

2.3.2   Profitability Ratios

- Measure a company's overall profitability and management's performance. We will consider the following eight liquidity ratios:
  - ➢ Asset turnover
  - ➢ Return on assets
  - ➢ Gross profit margin
  - ➢ Net profit margin
  - ➢ Return on equity
  - ➢ Earnings per share
  - ➢ Price earnings ratio (P/E ratio)
  - ➢ Dividend yield

Asset Turnover

- Shows the ratio of sales to investment in total assets

$$\text{Asset turnover} \ = \ \frac{\text{Sales}}{\text{Total assets}}$$

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2020	2019
$\dfrac{6,980,000}{4,623,000}$	$\dfrac{6,048,000}{4,118,000}$
= 1.51	= 1.47

- Sales of HKD1.51 per dollar invested is an improvement on the previous year

Return on Assets

- Showing the net profit generated by assets, it provides a guide to asset profitability

$$\text{Return on assets} = \frac{\text{Profit after tax}}{\text{Total assets}}$$

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2020	2019
$\dfrac{588{,}000}{4{,}623{,}000}$	$\dfrac{532{,}000}{4{,}118{,}000}$
= 12.7%	= 12.9%

- Return on assets slipped slightly from the previous year

Gross Profit Margin

- Measures the percentage of gross profit generated by sales and can be considered the engine-room of a company's profitability

$$\text{Gross profit margin} = \frac{\text{Sales} - \text{cost of goods sold}}{\text{Sales}}$$

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2020	2019
$\dfrac{6{,}980{,}000 - 4{,}988{,}000}{6{,}980{,}000}$	$\dfrac{6{,}048{,}000 - 4{,}550{,}000}{6{,}048{,}000}$
= 28.5%	= 24.8%

- The result shows that the gross profit margin has improved. This is a relative measure. More insight can be gained from a comparison with the industry norm

Net Profit Margin

- Shows the percentage of profit (or margin) generated by sales

$$\text{Net profit margin} = \frac{\text{Profit after Tax}}{\text{Sales}}$$

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2020	**2019**
$\dfrac{588{,}000}{6{,}980{,}000}$	$\dfrac{532{,}000}{6{,}048{,}000}$
= 8.4%	= 8.8%

- Although the net profit margin has fallen, more information is required on the performance of other companies in the industry before making a conclusion

Return on Equity

- Measures the return on shareholders' investment

$$\text{Return on equity} = \frac{\text{Profit after tax}}{\text{Average equity}}$$

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2020	**2019**
$\dfrac{588{,}000}{(3{,}039{,}000 + 2{,}338{,}000)/2}$	Not enough information
= 21.9%	

- The company generated a return of 21.9% on shareholders' invested equity

Earnings per Share (EPS)

- The most quoted reference in the financial markets

$$\text{Earnings per share} = \frac{\text{Profit after tax}}{\text{Weighted average number of shares}}$$

To calculate EPS for Exam Knowledge Limited, we need the following extra information:

- Shares in issue at 1 October 2015: 95,000,000

- Shares in issue at 30 September 2016: 135,000,000

- 40,000,000 additional shares we issued on 31 March 2016

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2020	**2019**
$\dfrac{588,000,000}{(95,000,000 + (40,000,000 \times 6/12))}$	Not enough information
= HKD5.11	

Price Earnings Ratio (PE ratio)

- Represents the multiple of current year's earnings that must be paid to buy a share

- A relatively high PE stock implies strong future earnings growth and is referred to as a growth stock

- A relatively low PE stock implies that the stock is cheap and is referred to as a value stock

- The **historical PE ratio** is based on current earnings, the **prospective PE** ratio is based on expected future earnings

$$\text{PE ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

To calculate PE ratio for Exam Knowledge Limited, we need the following extra information:

- The current market share price is HKD55

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2020	**2019**
$\dfrac{55}{5.11}$	Not enough information
= 10.76 times	

Dividend Yield

- Shows the level of income an investor can expect to receive from a share

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Share price}}$$

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2020	**2019**
$\dfrac{330{,}000\ /\ 135{,}000}{55}$	Not enough information
= 4.4%	

2.3.3 Solvency Ratios

- Indicate a company's ability to meet its long-term and short-term obligations. We will consider the following three solvency ratios:
    - ➢ Debt ratio
    - ➢ Debt-to-equity ratio
    - ➢ Interest coverage

Debt Ratio

- Measures the percentage of assets financed by debt. The debt ratio is considered a measure of risk

$$\text{Debt ratio} = \frac{\text{Total debt}}{\text{Total assets}}$$

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2020	**2019**
$\dfrac{1{,}584{,}000}{4{,}623{,}000}$	$\dfrac{1{,}780{,}000}{4{,}118{,}000}$
= 34.3%	= 43.2%

- The debt ratio has improved over the two years in question

Debt-to-equity Ratio

- Also known as the gearing ratio
- Measures the level of debt to that of equity and is an indicator of a company's financial structure.

$$\text{Debt to equity ratio} = \frac{\text{Total debt}}{\text{Total equity}}$$

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2020	2019
$\dfrac{1,584,000}{3,039,000}$	$\dfrac{1,780,000}{2,338,000}$
= 52.1%	= 76.1%

- The debt-to-equity ratio has improved over the two years in question

Interest Coverage

- Measures a company's ability to pay interest payments

$$\text{Interest coverage} = \frac{\text{Profit before tax + interest expenses}}{\text{Interest expenses}}$$

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2020	2019
$\dfrac{840,000 + 240,000}{240,000}$	$\dfrac{760,000 + 270,000}{270,000}$
= 4.50 times	= 3.81 times

- The company has improved its ability to cover interest payments

2.4   Valuation of Equity Securities

- There are a number of methods by which to value equity securities. The four that are considered in this section are:
  - ➢ Dividend discount model
  - ➢ Dividend growth model
  - ➢ Price earnings model
  - ➢ Capital asset pricing model

2.4.1   Dividend Discount Model

- Takes the view that the value of an equity security is equal to the present value of the expected future dividends

Formula

$$P = \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \ldots\ldots + \frac{D_n}{(1+r)^n}$$

P   =   price of the share

D   =   expected annual dividend per share

r   =   investor required rate of return (discount rate)

Assuming that the same amount of dividend is paid every year in perpetuity, the formula simplifies to:

$$P = \frac{D}{r}$$

Dividend Discount Model Example
Calculate the expected share price of Stable Limited if the company is expected to pay the same dividend every year of HKD4 per share and an investor's required rate of return is 10%

Answer
Share price   = HKD4/0.10

                = HKD40

2.4.2 Dividend Growth Model

- The dividend valuation model is made more realistic by assuming that a company's dividend grows each year at a constant rate

Formula

$$P = \frac{D(1+g)}{r-g}$$

P	=	price of the share
D	=	annual dividend just paid
r	=	investor required rate of return (discount rate)
g	=	expected dividend growth rate

Dividend Growth Model Example
Calculate the expected share price of Growco Limited if the company has just paid a dividend of HKD10 per share and the dividend is expected to grow 5% per year. The investor's required rate of return is 10%

Answer
Share price   = HKD10 x (1.05)/(0.10 – 0.05)

              = HKD210

2.4.3 Price Earnings Model

- The PE model is simple. The PE of a similar company is applied to a company's earnings to arrive at an estimated value

- This approach to company valuation is easy and straight forward, but the resulting value is usually adjusted for a company's unique circumstances

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Price Earnings Model Example
Calculate the value of a share of Growco Limited if the company has just reported Earnings per Share of HKD10 and a similar listed company is trading at a PE of 23

Answer
Share value   = HKD10 x 23

              = HKD230

2.4.4   Capital Asset Pricing Model (CAPM)

- CAPM provides the expected return on an equity, given the risk-free return and the risk-weighted market premium of the stock in question
- Beta (β) is a measure of the sensitivity of company's return on equity to a change in the overall market return

<u>Formula</u>

$$R = R_f + \beta(R_m - R_f)$$

R   =   expected rate of return

R_f =   risk-free rate

R_m =   expected rate of return on a market portfolio

β =   stock's beta value

Capital Asset Pricing Model Example
What is the expected return on shares of Growco Limited if:

Expected market return   *5%*

Risk-free rate of return   *1%*

Company beta of Growco   *1.5*

Answer
Expected return   = 1% + 1.5(5% - 1%)
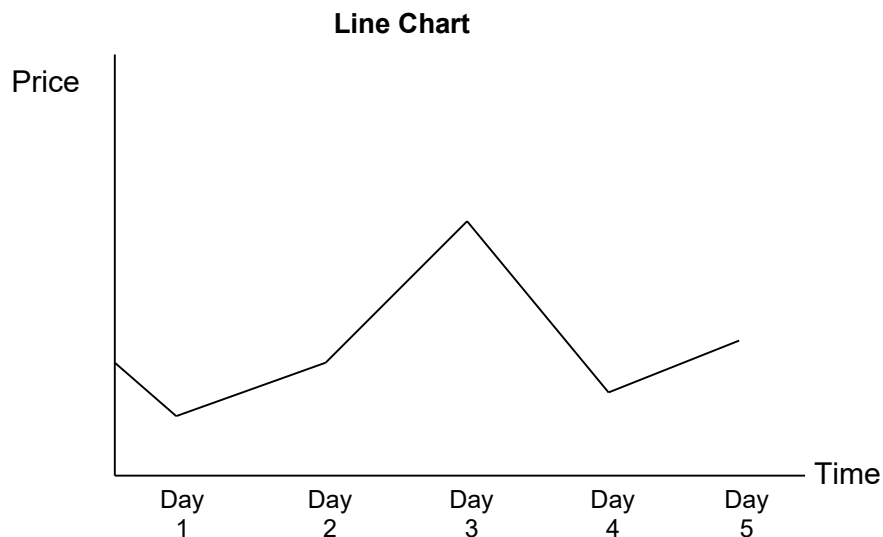
= 7%

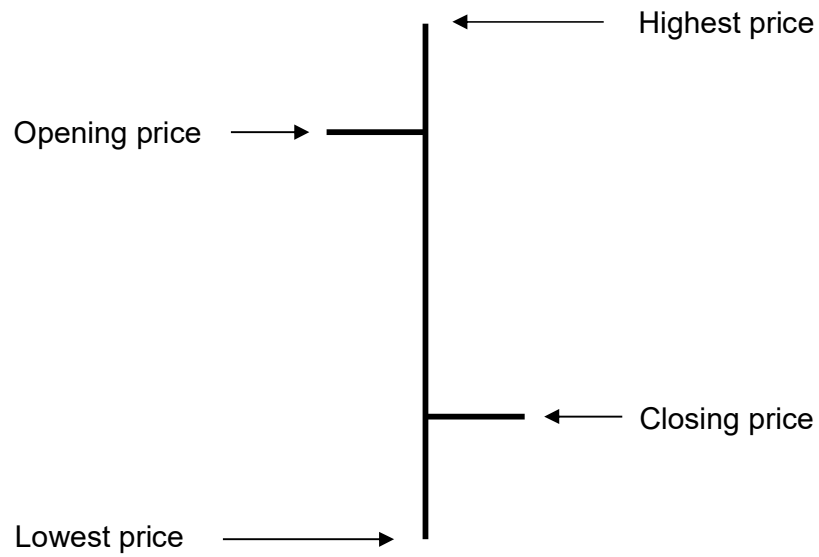## 3.   TECHNICAL ANALYSIS

3.1   Historical Data

- Technical analysis evaluates securities by using historical market data to predict future market trends

- Technical analysts assume that previous patterns in price movements will repeat themselves

- Technical analysis relies heavily on charts and historic data
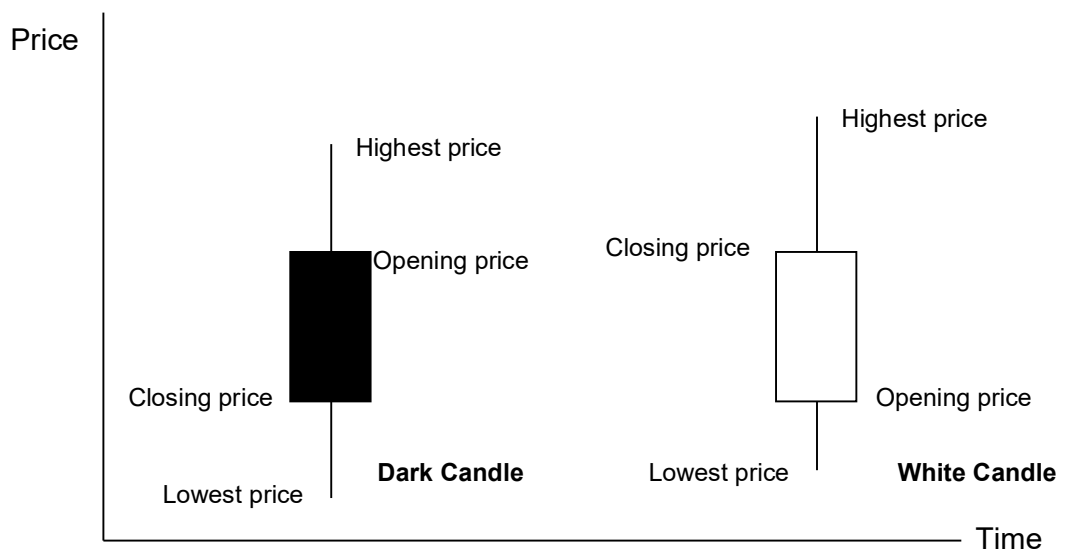
3.2   Charts and Trend Lines

- Technical analysis uses four basic types of charts:

  - ➢ **Line charts**: closing prices for the chosen time period are plotted and a line is drawn connecting all the plots

  - ➢ **Bar charts**: highest, lowest, opening and closing prices for the chosen time period are plotted as vertical bars

  - ➢ **Candlesticks**: are diagrams showing the opening, highest, lowest and closing prices as price movements

  - ➢ **Point and figure charts**: use a system of Xs and Os to show downward and upward price movements
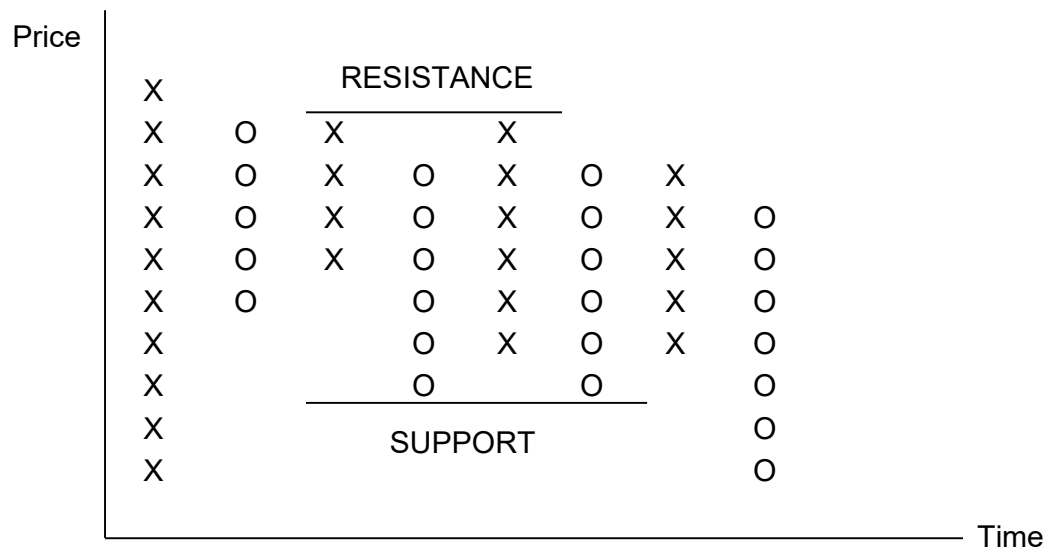
- Examples of each type of chart follow

Line Chart

Price

Time

Day 1   Day 2   Day 3   Day 4   Day 5

Bar Chart

```
                                    ←———— Highest price


Opening price  ———→  ┤


                      │


                      │


                      ├—  ←———— Closing price


Lowest price  ———————→
```

Candlestick

Price

```
              │ Highest price                      │ Highest price
              │                                     │
              │                          Closing    ┌──┐
              ┌──┐ Opening price          price  —→ │  │
              │██│                                  │  │
              │██│                                  │  │
    Closing   │██│                                  │  │ Opening price
    price  —→ │██│                                  └──┘
              │                                     │
              │                                     │
              │ Lowest price    Dark Candle         │ Lowest price   White Candle
```

Time

Point and Figure Chart

X upward price movement   O downward price movement

Trends

- Market prices trend in **three possible directions**: up, down or sideways
- An **up-trend** is a series of ascending price peaks and troughs
- A **down-trend** is a series of descending price peaks and troughs
- A **sideways-trending** market has no new highs or lows
- Trend lines are used by technical analysts to establish critical price levels called **support and resistance levels**
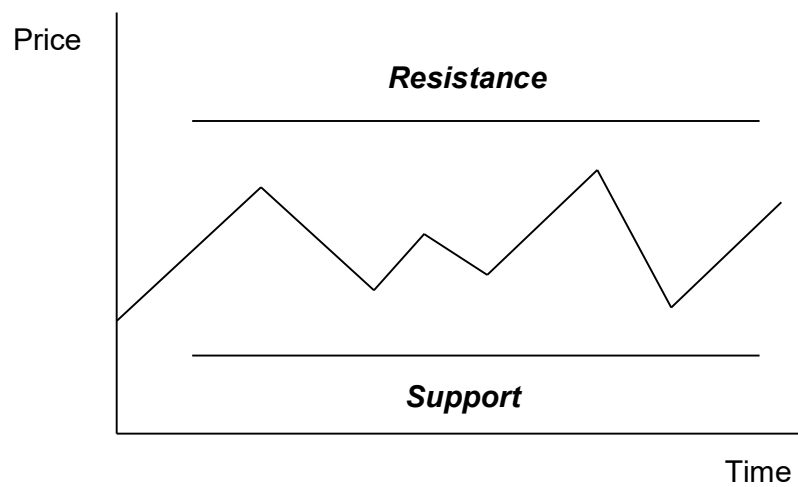
An Up-Trend Line
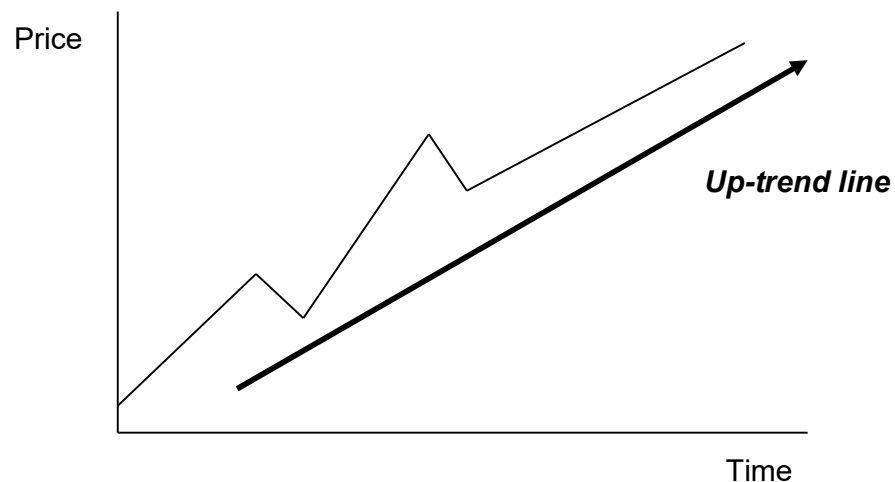
A Down-Trend Line
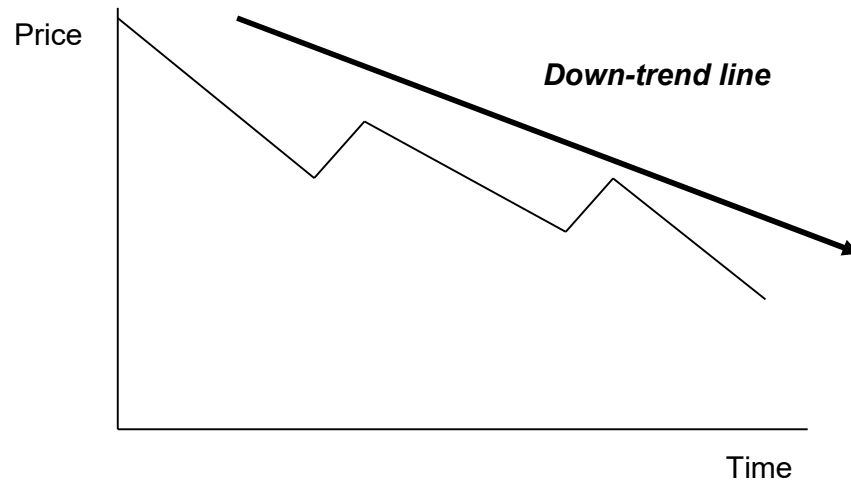
A Sideways Trend

Support and Resistance

- Resistance levels are price peaks and support levels are price troughs

- **Support** occurs when market buying activities are sufficiently strong to overcome selling pressures, pushing the price higher

- **Resistance** occurs when selling pressure is strong enough to overcome buying pressure, pushing the price lower

- A support or a resistance level **grows in significance**:

  ➢ the longer it is traded

  ➢ the higher the volume of activity at the support/resistance levels

- Once a support/resistance level is **broken through**, it reverses. That is, a resistance level becomes a support level and a support level becomes a resistance level

3.3   Technical Indicators

- Technical analysts use a number of indicators to read market trends. Three such indicators are now considered:

  ➢ Moving average

  ➢ Relative strength indicator

  ➢ Moving average convergence-divergence indicator

Moving Average (MA)

- A MA is the average of a number of closing prices over a period of time, smoothing out price fluctuations so that a general trend is revealed

- MAs are used by analysts to determine whether a market is trading on an up-trend or a down-trend

- Equity analysts can use a number of MA measures: a 10 day MA can reveal short-term trends while a 250-day MA can show a longer-term trend

Relative Strength Indicator (RSI)

- RSI is a rate of change indicator, measuring a stock's strength relative to its own past performance

  Formula

$$R = 100 - \frac{100}{1 + RS}$$

$$RS \quad \frac{\text{Sum of "up closes" of n days}}{\text{Sum of "down closes" of n days}}$$

- RSI is a momentum measure showing whether a stock has risen or fallen too quickly

- If a **stock price rises too quickly**, it may be **overbought** or relatively too strong and may well fall in the near future

- If a **stock price falls too quickly**, it may be **oversold** or relatively too weak and may well rebound in the near future

- Common RSI time horizons are 9, 14 and 21 days

- RSI values range from 0 to 100

- An **RSI above 70** is believed to reflect an **overbought** stock

- An **RSI below 30** is believed to reflect an **oversold** stock

Moving Average Convergence-Divergence Indicator (MACD)

- Shows the relative movements of the short- and long-term MAs and measures the extent to which a price leads or lags the MA or the trend deviation

- On an upward moving trend, the shorter-term MA line would react faster to the change in the stock price than the longer-term line (ie the upward slope of the shorter-term line would be steeper) and vice versa for a downward moving trend

- When a stock is rebounding from a trough, the fast line would cross the slow line from below

- When a stock is declining from a peak, the fast line would cross the slow line from above

- The above effects can be shown by calculating the difference between the two lines, known as the **MACD line**:

  ➢ When the slow line is above the fast line, the MACD line will have negative values

  ➢ When the fast line is above the slow line, the MACD line will have positive values

3.4   Common Technical Analysis Methods

- The two most common technical analysis methods (theories) are the **Dow** and **Elliot Wave** theories

- The **Dow theory** states that simultaneous movements of the Dow Jones Industrial average and the Dow Jones Transportation Average to new highs or new lows confirms a major trend in the stock market

- **Elliot wave theory** is a market timing strategy that predicts price movements based on historical price wave patterns and their underlying psychological motives

- Elliot wave theory is the more widely used, not only for equities but also for foreign exchange