FINANCIAL MANAGEMENT

STUDY GUIDE


Mancosa
[GSB]
Education Reimagin[ed]

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INTRODUCTION TO THE FINANCIAL MANAGEMENT STUDY GUIDE

1. INTRODUCTION

The global financial crisis experienced between 2007 and 2008, as well as the ensuing global turmoil with particular reference to the most recent Greek crisis has renewed the emphasis on the building blocks of the financial sector. The slowdown in growth, volatility in commodity prices, reduction in liquidity and failing financial institutions have all placed prudent financial management at the core of the solution.

This study guide will introduce concepts within financial management that will enhance decision making abilities of students. These decisions revolve around concepts such as the evaluation of different investment propositions for companies by choosing appropriate funding mixes, managing risk as well as satisfying investor expectations.

Module Outcomes

By the end of this study guide, students should be able to:

- Display knowledge of the financial implications of the different forms of business entities;
- Estimate a project's cash flow and business risk, and its suitability for inclusion in a firm's portfolio of investments;
- Recognise the variety of sources of finance that exist, and appreciate the implications of this;
- Apply various methods to assess the cost of capital;
- Evaluate the actual capital structure of a firm;
- Appreciate the problems of exchange-rate fluctuations and the avoidance of exchange rate risk and other related risk factors;
- Consider the implications of valuations, acquisitions and mergers to firms.

CHAPTER 1: INTRODUCTION TO FINANCIAL MANAGEMENT

Specific Learning Outcomes

The overall outcome for this section n is that, on its completion, the learner should be able to display knowledge of the financial implications of the different forms of business entities. This overall outcome will be achieved through the learner's mastery of the following specific outcomes, in that the learner will be able to:

1.1 Identify the basic types of financial management decisions.

1.2 Evaluate the financial implications of different business entities.

1.3 Understand the role of financial management in the market place.

READINGS

Prescribed

1. **International Textbook - Adapted for South Africa**

   Firer, C, Ross, S.A; Westerfield, R.W; Jordan, B.D (2012), Fundamentals of Corporate Finance, 5th South African Edition, United Kingdom: McGraw-Hill Limited.

   Chapter 1, pp 1-17

2. **South African (Local) Textbook**

   Skae. F.O; Vigario, F.A.A (2012), Managerial Finance, 5th Edition, LexisNexis, Durban.

   *Chapter 1. pp 1-18*β

1.1 FINANCIAL MANAGEMENT DECISIONS

Financial management can be described as a discipline that seeks to optimise the financial resources of and returns to the entity (Skae and Vigario, 2012:1). This is normally attained by optimising two primary activities, namely financing and investing activities.

The financial manager must be concerned with the following three types of decisions:

- Capital Budgeting – the process of planning and managing a firm's long-term investments.
- Capital Structure – the mixture of debt and equity maintained by a firm.
- Working Capital Management - managing a firm's working capital (short-term assets and liabilities) is a day-to-day activity that ensures the firm has sufficient resources to continue its operations without experiencing liquidity problems.

1.2 THE FINANCIAL IMPLICATIONS OF THE DIFFERENT FORMS OF BUSINESS ENTITIES

The ***three*** most common legal forms of business organisations are the *sole proprietorship, the partnership* and the *company.* Other forms of business organisations also exist. The sole proprietorship is the most common. However, companies are dominant with respect to their contribution of revenue and profits in a given economy.

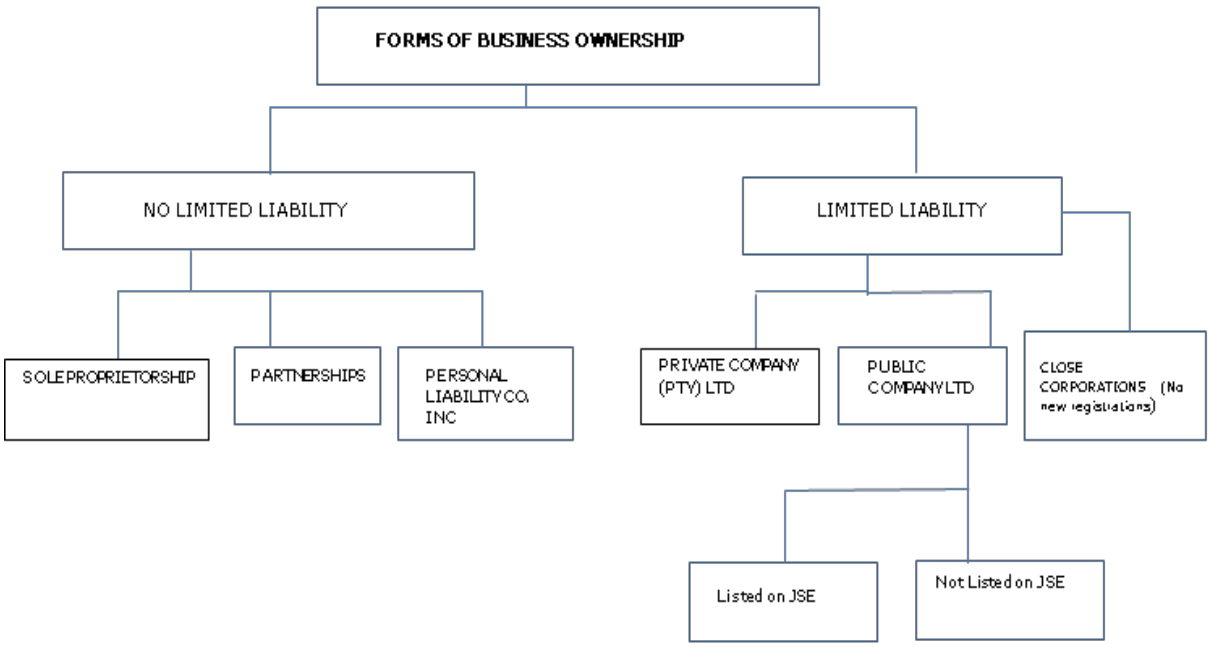


Diagram: Forms of Ownership

1.2.1 Sole Proprietorships

A *sole proprietorship* is a business owned by one person who operates it for his or her own benefit. The typical sole proprietorship is a small business, example a plumber. The sole proprietor has unlimited liability; his or her total wealth can be taken to satisfy claims (liabilities) against the company.

1.2.2 Partnerships

A *partnership* consists of 2 or more owners not exceeding 20 in number, conducting business together for profit. They are usually larger than sole proprietorships. Finance, insurance and real estate firms are the most common types of partnership. Most partnerships are established by a written contract. They have unlimited liability, and each partner is legally liable for all the debts of the partnership. Partners are taxed in their personal capacities.

1.2.3 Companies

A company can be designated as a public company (in which case its name ends with the word Limited, abbreviated as Ltd), or as a private company (its name ending with the words proprietary limited, abbreviated as (Pty) Ltd.) A private company is not allowed to offer its shares to the general public however a public company may raise capital from the public at large. In South Africa, a company can either be a profit company or a non-profit company (Companies Act 71 of 2008). Often called a "legal entity", a company has the powers of an individual in so far as it can sue and be sued, be a party to a contract, and acquire property in its own name.

The owners are known as shareholders. The ownership of a company is divided into a number of shares, each of equal size. Each shareholder owns one or more shares in the company. The shareholders elect directors to manage the company on a day-to-day basis on behalf of those shareholders.

The relative ease of transferring ownership, unlimited life of the business entity and limited liability (debts) are the main reasons why this form of ownership is preferred when it comes to raising cash. For example, a company can increase its equity position by selling new shares to attract new investors.

A **Close Corporation (CC)** is a simple, inexpensive form of ownership, existin separate from its owners (members). Under the Act (Companies Act-2008),

A private company is designed to take the place of a close corporation as no new CC's may be allowed to be registered. However, existing CC's may continue to operate until they are deregistered or converted into a private company.

1.3 FINANCIAL MANAGEMENT GOALS

The owners of a company are distinct from its managers. Actions of the financial manager should be in accordance with meeting the objectives of the firm's owners; its shareholders.

THINK POINT

Is the primary motive of a business to make a profit?

Goal 1: Maximise Profit

Most financial managers believe that maximising profit is the firm's objective. To do this, the financial manager must take certain actions that are expected to make a major contribution to the firm's overall profits, for example maximising sales and minimising costs. Financial managers make decisions based on continuously maximising profits of the company through managing profitability, liquidity and solvency of the business. . A company measures profits in terms of indicators such as earnings per share (EPS), net profit and return of equity.

Goal 2: Maximise Shareholder Wealth

The goal of the firm is to maximise the wealth of its owners for whom it is being operated. The wealth of the company's owners is measured by the return the shareholders receive from their investment. This return is measured by both the share price and the dividends received.

Goal 3: Ethics and Social Responsibility

Managers are often faced with having to make ethical decisions that may lead to a conflict between their responsibility to the firm's shareholders and the broader interests of society. In the long-run firms' need the goodwill of the society in which they operate as this commitment to good citizenship (social responsibility) not only benefits the community but also creates an awareness of the firm's brand thus ultimately increasing the value for its shareholders.

1.1 THE ROLE OF FINANCIAL MANAGEMENT IN THE MARKET PLACE

1.4.1 Financial Institutions

These serve as intermediaries by channeling the savings of individuals, businesses, and governments into loans or investments. Financial intermediaries act as agents who channel funds or services between different parties. Other intermediaries put buyers and sellers together without taking ownership of the product, service or property. They act as go-betweens. They are not wholesalers or distributors, which buy products and then resell them.

Financial institutions accept customer's savings deposits and lend this money to other customers or to firms; others invest customers' savings in earning assets such as real estate or shares and bonds, Examples of intermediaries include insurance brokers, banks and real estate agents.

1.4.2 Financial Markets

A financial market is any marketplace where buyers and sellers participate in the trade of assets such as equities, bonds, currencies and derivatives. Examples of this include the New York Stock Exchange (NYSE), London Stock Exchange (LSE). In South Africa we have markets such as the Johannesburg Stock Exchange (JSE), Bond Exchange and ALTX.

ALTX is an alternative public equity exchange for small and medium-sized companies in South Africa operated in parallel with and wholly owned by the JSE Securities Exchange.

Two key financial markets are the money market (i.e. short-term debt instruments or marketable securities) and the capital market (long-term securities – bonds and shares.)

1.5 THE RELATIONSHIP BETWEEN INSTITUTIONS AND MARKETS

Financial institutions actively participate in the financial markets as both suppliers and users of funds. Institutions supply capital in the form of investments in either equity or debt instruments that other institutions utilise in their businesses.

1.5.1 The Money Market

The money market exists because some individuals, businesses, governments, and financial institutions have temporarily idle funds that they wish to put to some interest-earning use. Most money market transactions are made in marketable securities – short-term debt instruments. By definition, the duration of transactions is up to one year.

1.5.2 The Capital Market

The capital market is a market that enables suppliers and users of long-term funds to conduct long-term transactions. The backbone of the capital market is formed by various securities exchanges that provide a marketplace for debt and equity transactions. By definition, the duration of transactions are longer than one year.

CHAPTER 2: RISK AND RETURN

Specific Learning Outcomes

The overall outcome for this section is that, on its completion, the learner should be able to estimate a project's cash flow and business risk, and its suitability for inclusion in a firm's portfolio of investments. This overall outcome will be achieved through the learner's mastery of the following specific outcomes, in that the learner will be able to:

2.1 Calculate returns of different share portfolios.

2.2 Discuss the risks associated with different portfolios.

2.3 Evaluate CAPM as a measure of risk.

READINGS:

Prescribed Textbook

1. **International Textbooks - Adapted for South Africa**

   Firer, C, Ross, S.A; Westerfield, R.W; Jordan, B.D (2012), Fundamentals of Corporate Finance, 5th South African Edition, United Kingdom: McGraw-Hill Limited.

   Chapter 13, pp 391-430

2. **South African (Local) Textbook**

   Skae. F.O; Vigario, F.A.A (2012), Managerial Finance, 5th Edition, LexisNexis, Durban.

   Chapter 4. pp 103-135

3. **Journal Article**

   Gonenc. H. (2005) *"Comparison of Debt Financing between International and Domestic Firms: Evidence from Turkey, Germany and UK."*
   International Journal of Managerial Finance, Vol. 1 Issue: 1 pp 49 – 68. (available from Emerald).

   Vega. J. G., Smolarsk. J, Zhou. H. (2015) *"Sarbanes-Oxley: changes in risk premium and return volatility"*, Asian Review of Accounting, Vol. 23 Iss: 1, pp.86 – 106.

2.1 INTRODUCTION

The analysis of risk and return is important, not only because it underlies shareholders' investment strategies, but also as its principles are used by financial managers to structure their firms' portfolio of assets. The financial manager is faced with decisions that carry both risk and return. Risk is the potential that a chosen action or activity (including inaction) will lead to a loss (an undesirable outcome). This notion implies that choice has an influence on the outcome.

A fundamental idea in finance is the relationship between risk and return. The greater the amount of risk that an investor is willing to take on, the greater the potential return. The reason for this is that investors need to be compensated for taking on additional risk. Within financial management, the management of risk has an impact on the share price of an organisation. Understanding these risks is critical in making informed financial decisions.

2.2 TYPES OF RISK

2.2.1 Business Risk

Business risk means the possibility of experiencing a financial loss in business. Business risk arises from the nature of the environment in which a specific or individual company operates. Business risk is influenced by the general economic conditions (inflation, labour unrest etc.) to which the firm is exposed and the type of industry in which a company is involved.

2.2.2 Operating Risk

Operating risk arises from the nature of the operating activities of the firm. The type of industry often determines the general cost structure of a firm (proportions of fixed and variable costs, capital or labour-intensive production processes) and/or the pattern of sales revenue.

2.2.3 Financial Risk

Financial risk arises from the extent to which a firm relies on debt to finance its operations. When a firm borrows, it is liable for the repayment of the debt and this includes interest payments on that debt.

Whilst operating risk refers to the proportions of the firm's fixed total production costs, financial risk is essentially illustrated by the proportion of debt capital to the total capital of the firm. Interest payments can be thought of as the firm's fixed cost of finance. Financial risk is entirely under the control of the firm's management.

Total Risk

The total risk of a company is a combination of business, operating and financial risks. Controlling the degree of total risk is an important managerial function.

Practical experience shows that companies with a high degree of business and operating risks usually have a low degree of financial risk, while companies with a low degree of business and operating risk have more scope for using debt capital (higher financial risk).

An important consideration when understanding risk profiles of firms is to compare firms within the same industry. This provides useful insights into changes in the composition of risks over time.

Comparison with other firms allows the assessment of both the risk inherent in an industry and the risk specific to each firm. Analysing changes in risk components and total risk over time illustrates the firm's performance and gives an indication of changes in the cost and financial structures that occur within a company.

2.3 EXPECTED RETURN AND RISK PREMIUM

In order to understand risk and return concepts it's necessary to appreciate specific terms first. A risk free asset is defined as the return provided from a risk free investment. Usually a risk free investment is considered to be investments in government bonds, since the government has close to zero probability of defaulting on these bonds.

A risky investment is an investment that carries a higher risk and higher return, when compared to a government bond or risk free investment.

The return on a risky asset expected in the future is termed **expected return**. The difference between the return on a risky investment and a risk-free investment is defined as **risk premium**.

By way of example, suppose a risk free investment (r_f) offers a 9 percent return (%). The expected return on share A is 22%. The risk premium is:

Risk premium = Expected return – Risk-free rate

$= E(R_A) - R_f$

$= 22\% - 9\%$

$= 13\%$

The 13% above represents the additional return investors require to invest in a risky asset, over the risk free rate. The higher the risk premium the more risk the investor takes on.

The premium for risk required for the market portfolio, $r_m - r_f$, will vary according to the perceived riskiness of share/investment A.

2.4 ANNOUNCEMENTS AND SURPRISES

The return achieved on any share traded in a financial market is composed of two parts. Expected or normal return from a share/investment is the first part of the return that shareholders in the market predict or expect.

The second part of the return on the share is the uncertain or risky part (Firer, Ross, Westerfield, Jordan, 2012:404).

The following list comprises of examples of unexpected information:

- ✓ news from a company's research and development programme
- ✓ release of gross domestic product (GDP) government figures
- ✓ actual sales figures exceeding projected/budgeted figures
- ✓ a surprise announcement of a drop in interest rates.

For an in-depth discussion on this topic refer to Firer-pp 404-406 and www.moneyweb.co.za (website)

We can now summarise return as:

Total return = Expected return + Unexpected return

2.5 RISK IN A PORTFOLIO OF INVESTMENTS

Every financial manager of a business will consider the total risk of the business carefully and attempt to manage the risk in such a way that shareholders receive the best advantage. From an investment analysis point of view, investors consider the most effective way of investing funds. It is well known that placing all one's funds in one investment only is more risky than spreading the funds. This is known as **diversification** and the different investments, into which one diversifies is known as a portfolio of investments.

The first risk concept, when considering a portfolio of investments can be labeled as systematic risk. **Systematic risk** which may sometimes be referred to as market risks or non-diversifiable risks, relates to the economy and the stock market as a whole. Share prices generally are subject to fluctuations. Any investor who invests in these markets must thus be subject to this risk as it cannot be eliminated through diversification.

Unsystematic risk relates to diversifiable risk, or asset specific-risk. This risk can be eliminated through investing in a portfolio. Quite simply, it is based on the principle that some companies will perform well when others do badly and vice versa. The differences between company risk can be eliminated but the overall market risk cannot.

The above can be explained by using the diagram below: Let us consider what happens to the risk of a portfolio consisting of a single security (asset), to which we add securities randomly selected from, say the population of all actively traded securities.

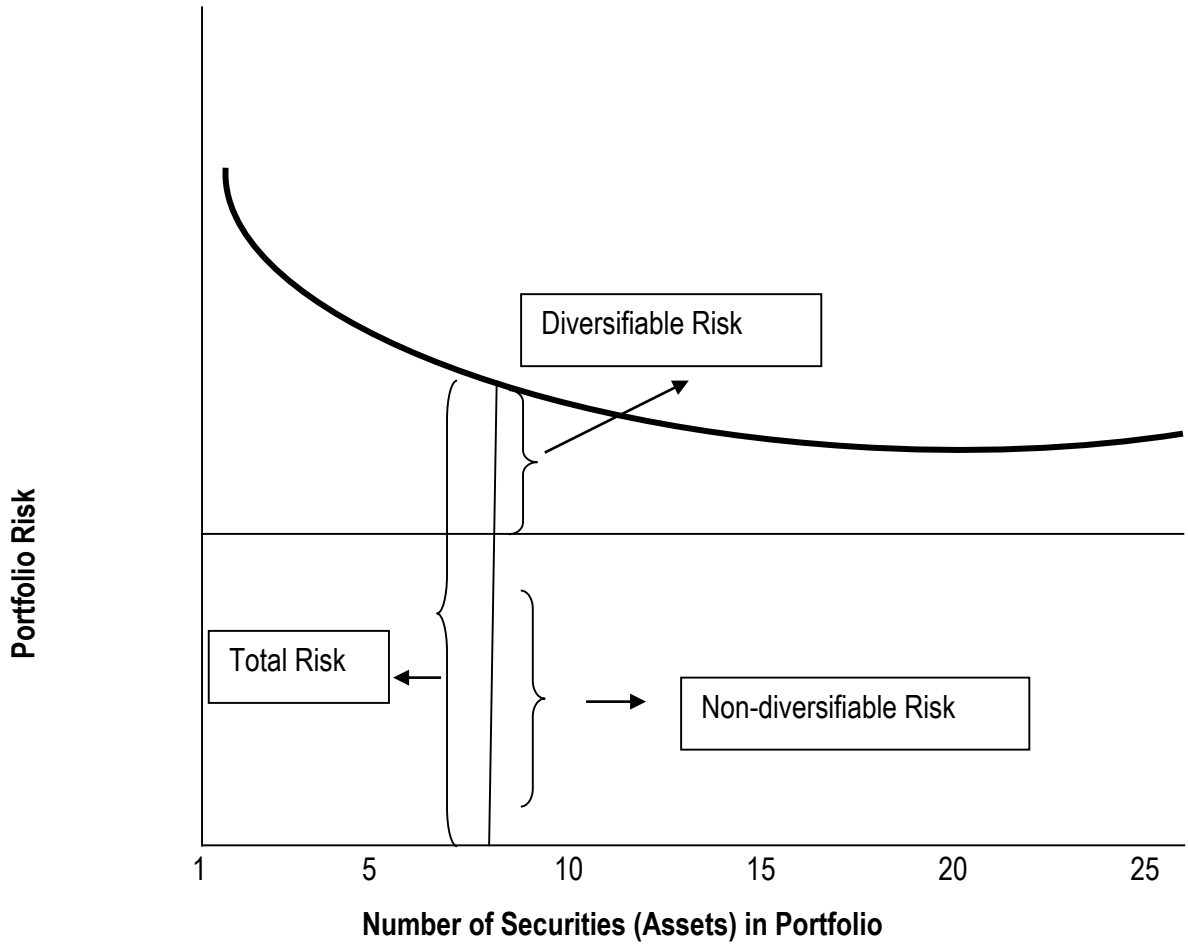


Diagram: Portfolio Risk vs. Number of Securities Diagram

In statistics and probability theory, standard deviation (represented by the symbol sigma, σ) shows how much variation or "dispersion" exists from the average (mean, or expected value). A low standard deviation indicates that the data points tend to be very close to the average or expected return, revealing a lower expectation of risk. A high standard deviation indicates that the data points are spread out over a large range of values and inherently carries more risk.

Using the standard deviation of return, to measure the total portfolio risk, the diagram depicts the behaviour of the total portfolio risk (*y* axis) as more securities are added *(x* axis). With the addition of securities, the total portfolio risk declines, as a result of the effects of diversification, and tends to approach a lower limit. Research has shown that, on average, most of the risk-reduction benefits of diversification can be gained by forming portfolios containing 15 to 20 randomly selected securities.

The **total risk** of a security can be viewed as consisting of two parts:

Total security risk = Non-diversifiable risk + Diversifiable risk

THINK POINT

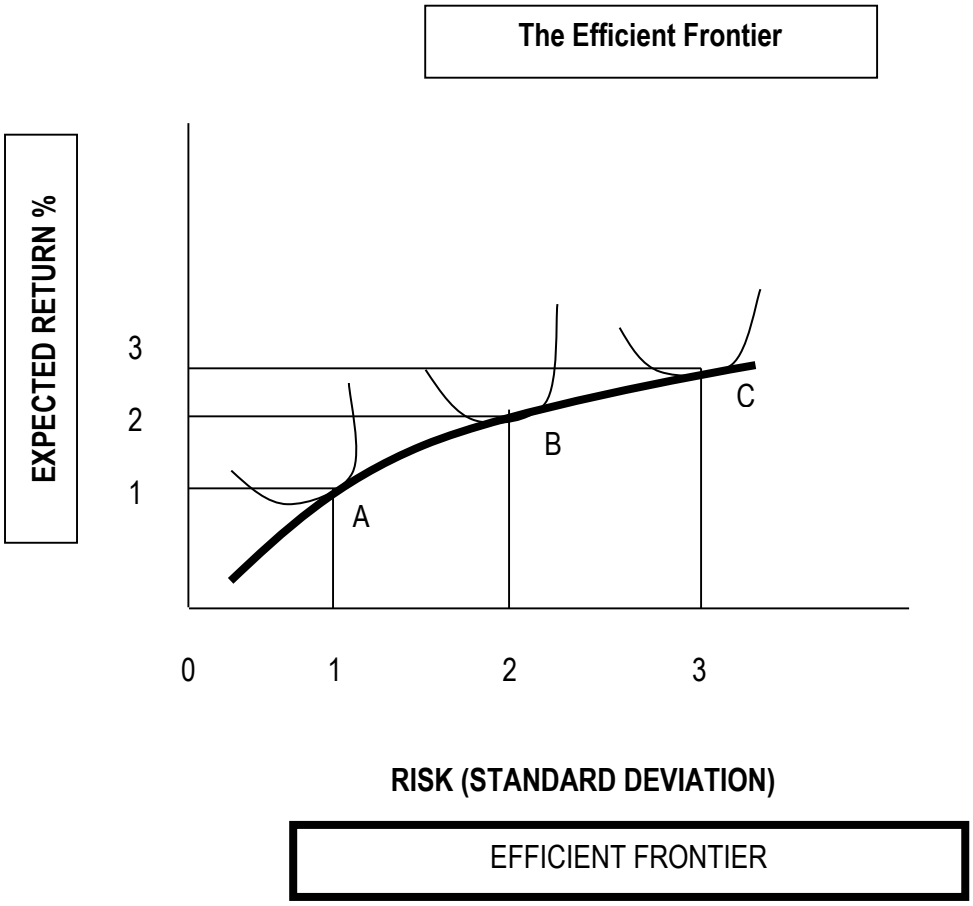
How are total risk, non-diversifiable risk and diversifiable risk related?

Why is non-diversifiable risk the only relevant risk?

2.5.1 Allowing for Systematic risk

A discussion of systematic risk needs to begin with grasping the concept of the efficient frontier. A combination of assets, i.e. a portfolio, is referred to as "efficient" if it has the best possible expected level of return for its level of risk (usually revealed by the standard deviation of the portfolio's return. In the diagram below, each point on the line representing this frontier corresponds to a portfolio made up of some of the securities available in the capital market, with all specific risk diversified.

If there were any remaining specific risk in any of these portfolios, it would be possible to move this efficient frontier further upwards to the left, that is to a position with less risk for the return indicated.



Efficient Frontier Diagram

The points marked on the efficient frontier correspond to the positions of three different investors, each of whom prefers the level of return and risk associated with the chosen point to any other on the frontier. Each investor has a series of indifference curves, and will choose to be situated on the highest indifference curve that is tangential to the best available investment opportunities.

The average investor is risk averse, and so will only support more risky undertakings if the reward for doing so is at a suitably high level, hence the slope of these indifference curves.

The most advantageous result an investor can obtain would therefore be where one of his/her indifference curves is tangential to the efficient frontier, for at that point all specific risk would have been removed, and no greater utility could be derived from moving to any other position.

- An investor choosing position A does not wish to be exposed to too much risk, and is therefore satisfied with a limited expected return.
- An investor choosing position B is willing to take on more risk, for an additional return.

- An investor choosing position C is less risk averse still, but must be compensated by a higher return than investor B.

No investor would wish to remain in a position to the right, or below, the efficient frontier as in that case specific risk would still exist. No opportunities currently exist to the left, or above, the frontier.

Note: the efficient frontier is a curve, because the extra return for accepting extra risk is not constant – eventually no additional return will be on offer, no matter what the risk, so the curve flattens.

2.5.2 Using CAPM to measure Systematic Risk

CAPM allows investors to determine the required rate of return on a share, based on the risk associated with that share. The CAPM is a model for pricing an individual security or portfolio. For individual securities, we make use of the security market line (SML) and its relation to expected return and systematic risk (beta) to show how the market must price individual securities in relation to their security risk class. The expected return on a risky investment depends on three things:

1. R_f = rate of return on risk-free investments
2. β = beta coefficient, systematic (market) risk of equity
3. $R_m - R_f$ = market risk premium

The **beta** (β) measures the volatility of the returns of the share relative to the overall market, which has a beta of one (1). A company with a beta greater than one is more volatile (risky) than the average, while a beta of lower than 1 indicates less volatility. Hence the greater the risk, the greater the return.

Therefore is company X had a β of 1.2 and company Y had a β 0.8, X is considered to carry more risk than the market and Y would carry less risk.

CAPM is defined as follows:

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

Where, R_e = the return expected from the share

R_f = the risk free state of return (β=0)

R_m = the return expected from the market as a whole

β = the beta (relative volatility) of the share

The beta of a company requires statistical calculation of the covariance of the share relative to that of the market as a whole. A number of investment analysts offer the service of calculating and providing company betas. A **covariance** is the measure of relative dispersion that is useful in comparing the risks of assets with differing expected returns.

Let us use an example

Ramaphosa Rand Limited has a beta of 1.2. Calculate the required return of an investment if the average market return is 26% and the risk free rate of 14%.

Using the formula

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

$= 14\% + 1.2(26\% - 14\%)$

$= 28.4\%$

The returns of Ramaphosa Rand Limited are expected to be more volatile than the average share on the market, due to a β of 1.2. Therefore an investor who considers holding this share within a portfolio requires a higher return than the market.

The beta of a share is a measure of the volatility of its returns compared with that of the market. The market return is considered to have a beta of 1. So a share that has an above-average response to changes in economic circumstances will have a beta greater than 1, whereas any share which has below-average change will have a beta less than 1. This means that if company Z has a β of 1.5, during a boom in the economy, company Z will response very positively. The opposite is also true, during a recession, company Z will response very negatively.

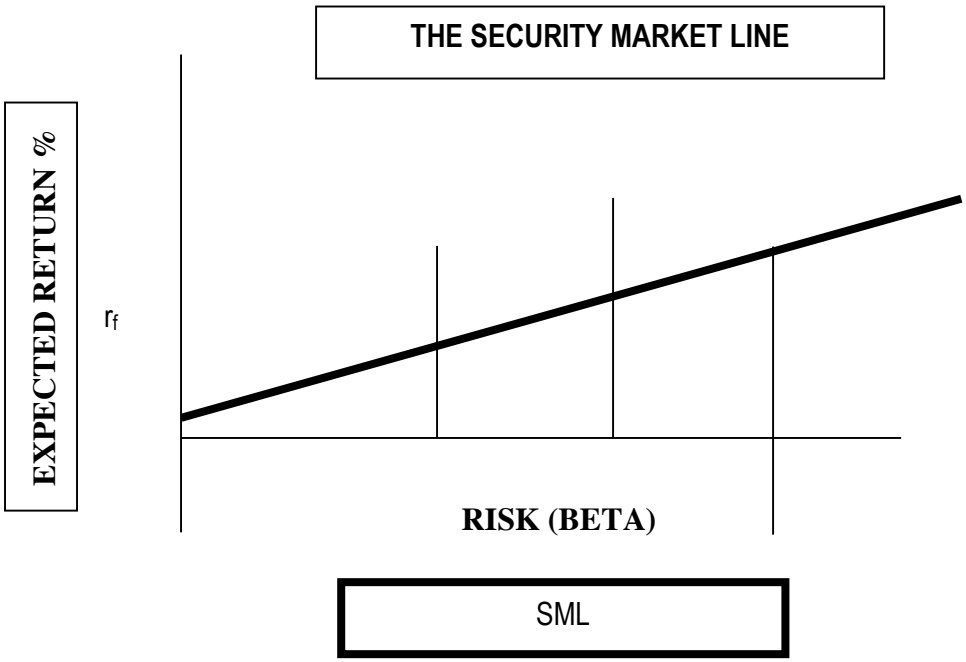
It is possible to have negative betas if we consider that some economic changes which adversely affect most firms could be beneficial to others. However, in practice several factors that influence returns seem to occur at once, and so overall shares are likely to have positive betas.

If an investor has a portfolio such that specific risk has been diversified, each of the securities making up that portfolio could have different systematic risks. The beta for any portfolio of securities will therefore be the weighted average of the betas of the components of that portfolio.

2.6 THE SECURITY MARKET LINE (SML)

We can draw another diagram to show the relationship between expected returns and risk, represented this time by beta instead of by standard deviation. We have a straight line, representing a linear relationship, starting from r_f which we can refer to as the Security Market Line or SML.

A positively sloped straight line displaying the relationship between expected return and systematic risk (beta) is usually called the **security market line**.



You should note that, while high betas correspond to high-expected returns, this does not necessarily mean that these returns will be achieved.

2.7.1 CAPM and Investment Projects

We can now apply what we have learned about CAPM, betas and shares to the cost of capital used to appraise investment projects.

It would seem sensible to include in this cost of capital an allowance for systematic risk, if the beta of the shares of our company enables us to calculate the return required for investing in our risky shares.

However, we should note that the value of the beta, and therefore R_e, is based on existing perceived systematic risk. If we change the nature of our business or the way it is financed we are also changing systematic risk, and thus beta.

So, when we need to appraise a project, which does not fit in our usual type of business, we could use, instead of the beta already given for our company's activities, the beta relating to companies already dealing in projects of the type we are now considering.

For example, if a furniture manufacturer were contemplating a project in gardening, the average beta for gardening firms could be used to estimate a cost of capital (the required return) rather than the beta of the furniture manufacturer at this date. If the project has a positive NPV when discounted at the cost of capital so calculated, then it would be acceptable, and its systematic risk would have been allowed for.

Does CAPM Work?

There are a number of assumptions behind the derivation of CAPM, some of which we shall be referring to again when looking at a firm's gearing and its dividend policy. The problem areas are:

- Taxes are ignored
- Charges for dealing in securities are ignored
- All investors and lenders can borrow as much as they like at the risk-free rate
- All investors have the same perceptions with regard to risk and return of each security/project.

As these assumptions are not true in real life, some managers may well decide that CAPM is flawed and thus not worth using.

Many researchers have carried out tests to see how well CAPM can explain and predict event. For example, by calculating betas for securities based on monthly returns (dividends and capital gains) for those securities compared to those for the market portfolio, it is possible to assess whether CAPM adequately explains the returns for the securities for the period in question. Most tests until relatively recently obtained results which supported CAPM.

However, more recent research has suggested that, while there is a correlation between expected returns and beta, other factors such as the size of the company are also important.

There are also difficulties in measuring the expected market return (over what period? Which starting point should we take?) and deciding what can be taken as a risk-free asset to identify the risk-free rate. (Note: CAPM is derived post-tax – it is important to ensure that r_f as well as r_m is a post-tax figure.)

While there are undoubtedly imperfections in CAPM's assumptions (more complicated models have been derived to try to compensate for these) it is certainly worth considering as a practical method with a logical background for financial managers to use to determine the cost of capital.

THINK POINT

Why do financial managers have some difficulty applying CAPM in financial decision-making? Generally, what benefits does CAPM provide them?

2.8 CONCLUSION

A firm's risk and expected return directly affect its share price. Risk and return are the two key determinants of the firm's value. It is therefore the financial manager's responsibility to assess carefully the risk and return of all major decisions in order to make sure that the expected returns justify the level of risk being introduced.

The way the financial manager can expect to achieve the firm's goal of increasing its share price (and thereby benefiting its owners) is to take only those actions that earn returns at least commensurate with their risk. Clearly, financial managers need to recognise, measure, and evaluate risk-return tradeoffs in order to ensure that their decisions contribute to the creation of value for the organisation.

Additional exercise

SELF-CHECK QUESTION

Suppose we have the following investments:

SHARE	AMOUNT INVESTED	PERCENTAGE	EXPECTED RETURN	BETA
V	R1 000	10%	8%	0.80
X	R2 000	20%	12%	0.95
Y	R3 000	30%	15%	1.10
Z	R4 000	40%	18%	1.40
TOTAL	R10 000	100%		

Calculate:

1. The expected return on the portfolio

2. The Beta of the portfolio

3. Does the portfolio have more or less systematic risk than an average risk?

SOLUTION TO SELF-CHECK QUESTION

1. Expected Return

$E(R_P) = 0.10 \times E(R_V) + 0.20 \times E(R_X) + 0.30 \times E(R_Y) + 0.40\ E(R_Z)$

$= 0.10 \times 8\% + 0.20 \times 12\% + 0.30 \times 15\% + 0.40 \times 18\%$

$= 0.8 + 2.4 + 4.5 + 7.2$

$=$ **14.9%**

2. The Portfolio Beta

$B_P = 0.10 \times B_V + 0.20 \times B_X + 0.30 \times B_Y + 0.40 \times B_Z$

$= 0.10 \times 0.80 + 0.20 \times 0.95 + 0.30 \times 1.10 + 0.40 \times 1.40$

$= 0.08 + 0.19 + 0.33 + 0.56$

$=$ **1.16**

3. Since the Beta is higher than 1.0, this portfolio has a greater systematic risk than an average asset.

CHAPTER 3: LONG-TERM FINANCING

Specific Learning Outcomes

The overall outcome for this section is that, on its completion, the learner should be able to recognise the variety of sources of finance that exist, and appreciate the implications thereof. This overall outcome will be achieved through the learner's mastery of the following specific outcomes, in that the learner will be able to:

3.1 Display knowledge of equity and debt financing as sources of finance.

3.2 Appreciate dividend policy decisions.

3.3 Gain an insight into venture capital and venture capital markets.

3.4 Discern between lease and buy decisions.

READINGS:

Prescribed Textbooks

1. International Textbook - Adapted for South Africa

Firer, C, Ross, S.A; Westerfield, R.W; Jordan, B.D (2012), Fundamentals of Corporate Finance, 5th South African Edition, United Kingdom: McGraw-Hill Limited.

Chapter 15, pp 463 - 488

Chapter 25, pp 767 - 783

2. Journal Article

Morais, A.I , (2014) *"Why companies choose to lease instead of buy? Insights from academic literature"*, Academia Revista Latinoamericana de Administración, Vol. 26 Iss: 3, pp.432 – 446.

3.1 INTRODUCTION

All companies require capital or funding either to start the business of for expansion. A company could either borrow the money (debt financing), sell off shares (equity financing) or engage in a combination of the two. In this chapter we briefly examine some of the ways in which a firm raises capital, an insight into venture capital for start-ups is discussed and finally a decision to either lease or buy an asset is evaluated.

3.2 EQUITY FINANCING - ORDINARY SHARES

Equity is the capital provided to a firm by its owners, and its most important characteristic is the ownership claim it represents. Equity is often defined as the residual value of the company i.e. the difference between the value of a firm's total assets and total liabilities.

In the process of ordinary business, shareholders have a claim on the residual earnings of a firm, after all expenses, including interest, have been paid. Shareholders may receive these residual earnings in the form of dividends, but a firm is not obliged to automatically pay dividends.

An equity shareholder makes a return through only ways, the first is through receiving dividends and the second is capital appreciation of their shares.

Equity holders, being the owners of the company, have the right to control the firm and do so through voting for and choosing directors/managers who run the company on their behalf. In addition, shareholders have the right to vote on major decisions affecting the firm, such as merger and take-over offers, or the sale of subsidiaries.

3.3 EQUITY FINANCING

3.3.1 Preference Shares

In addition to ordinary shares, companies may also issue preference shares, which have some of the characteristic of ordinary equity and some of the characteristics of debt. Preference shares typically have stated fixed dividend and can be redeemable, therefore resembling debt as far as the firm has a fixed commitment and the original capital can be repaid. Alternatively, preference shares may be participating, which means that preference shareholders are entitled to a share of the residual earnings of a firm. Some preference shares may have a convertibility provision, which allows them to be converted into ordinary shares under certain circumstances. For tax purposes, preference shares are treated, as equity and preference dividends are not tax-deductible.

3.3.2 New Issues

Additional equity capital is obtained via the sale of new shares. Access to equity capital is easiest to obtain if a company is listed on the Johannesburg Securities Exchange (JSE), South Africa's most important financial market. The JSE is divided into 3 sections, allowing companies of different size and characteristics to obtain a listing. The main board of the JSE has stringent listing criteria, which can typically be met only by relatively large companies.

The Development Capital Market (DCM), Venture Capital Market (VCM) and Alternative Exchange (ALT^X) provide opportunities for smaller companies to access capital. The Development Capital Market sector of the JSE was established to facilitate trading of shares of companies that do not meet the criteria for a primary listing. Smaller, growing companies in need of finance can list on the DCM. This enables the public to invest in relatively newer companies. The **Venture Capital Market** was introduced as a sector of the JSE to encourage entrepreneurship and to give investors the opportunity to participate in high risk, speculative projects.

3.3.3 Rights Issues

In a rights issue, the company sets out to raise additional funds from its existing shareholders. A rights issue provides existing shareholders the opportunity to purchase additional shares. These shares are normally offered at a price lower than the current share price quoted, otherwise shareholders will not be prepared to buy, since they could have purchased more shares at the existing price anyway.

The company cannot offer an unlimited supply at this lower price; otherwise the market price would fall to this value. Accordingly, the offer they make to the existing shareholders is limited. For example, they may offer one new share for every four held.

Assuming this rights issue is taken up by the existing shareholders, the market price of the shares will readjust to a value above that of the rights issue but below the original market price. All things being equal, the new value of the shareholders' investment should equal the original value plus the money paid for the shares in the rights issue. If a shareholder ignores the rights issue, the number of shares held will have remained the same but the value of each will have dropped. So ignoring the rights issue is not a recommended course of action.

Let us look at an **example**, a company's shares are trading at 500c each, and the directors announce a 1 for 4 rights issue at 400c. After the issue, the company's shares can be expected to fall to (4 x 500c + 1 x 400 c)/5 = 480c.

This means that the right to buy 1 new share at 400c is worth 480c – 400c i.e. 80c. This will determine the value of the rights in the market place. The company will sell any rights not taken up, and compensate the shareholders accordingly.

3.3.4 Retained Earnings

The equity capital used by a firm effectively comes from two sources: funds directly raised by the firm through the sale of newly issued shares, and funds retained from the cash flows generated during the course of business. The latter is commonly known as retained income (earnings), and represents the accumulated funds that the company chooses not to distribute to shareholders in the form of dividends. Retained earnings has an impact on the growth rate of a business, the more funds a business chooses to retain the quicker their growth rate.

3.3.5 Dividend and Dividend Policy

A dividend refers to a cash payout from profits of a company. Dividend policies differ from company to company and often take into account the needs of the shareholders. The controversial question of how dividend policy affects a company's value has varied opinions. Some believe that an increase in dividend payout reduces the value of the company, whilst others believe that it actually increases the company value.

The Miller and Modigliani theory states that the dividend decision in a perfect capital market (no taxes, transaction costs etc.) is irrelevant, as investors are indifferent to returns in the form of dividends (Skae & Vigario, 2012, 427).

It would appear that financial managers favour a fair level of dividends payment policy, with a long-term payout rate, dividends are increased slowly, in order to avoid wild fluctuations as sudden shifts in dividend policy will directly affect the share price.

The dividend policy in a perfect world has no effect on market value. However, in reality, where dividends and capital gains are taxed, investors would require a higher returns to compensate for their tax disadvantage.. It is therefore impossible to provide a formula that can be used to establish the correct dividend payout ratio for any given situation. Financial advisors/managers have to exercise their judgements and at the same time consider the following factors:

- ✓ The tax position of shareholders
- ✓ The clientele effect
- ✓ The tax position of the firm
- ✓ The cash position of the firm and debt repayment schedule
- ✓ The rate of growth and profit level
- ✓ The stability of earnings
- ✓ The maintenance of a target dividend policy.

(Skae &Vigario, 2012, 433)

3.4 DEBT FINANCING

The ultimate goal of long term financing is to acquire capital at the lowest possible cost. Debt is generally referred to as the capital that a firm borrows for a limited period of time.

The most important characteristic of debt is that it does not constitute an ownership claim on a firm. A debt obligation is a contractual agreement, which usually states the amount borrowed, the interest payable and the dates at which interest payments and capital repayments are due. An important feature of debt financing is that interest payments are tax-deductible i.e. the firm's tax liability is calculated only after interest payments have been deducted from the firm's earnings.

3.4.1 Debentures

A debenture is a document issued by a company containing an acknowledgement of debt. It need not give, although it usually does, a charge on the assets of the company. Usually a debenture is a bond provided in exchange for money lent to the company. Debentures can be offered to the public only if the application form is accompanied by a prospectus. The company agrees to repay the principal to the lender by some future date, as well as a fixed coupon or interest payment for a specific period. These periods can be semi-annually or annually. A debenture holder is considered a senior creditor of the company and the interest has to be paid to debenture holders before a dividend is paid to any class of shareholder.

3.4.2 Convertibles

A convertible is a loan which may be converted into ordinary shares in the company under specific conditions.

One advantage, which is often quoted for convertible debt, is that it is cheaper than ordinary debt finance since the conversion option allows the security to be issued with a lower coupon rate than would otherwise be the case. Convertibles are seen as a way of issuing deferred equity. This may be particularly advantageous if existing shareholders want to minimise any loss of control since the number of shares issued via a convertible will be smaller than if straight equity were issued.

While convertibles remain as debt, the interest is tax deductible. This gives rise to the tax advantage, which also accompanies other forms of debt finance. However, since the coupon rate on this security is lower than that associated with normal debt, the tax advantage is consequently reduced also.

3.4.4 Loans

Long term loans are private contracts, usually between a company and a financial institution. Loans can either be secured or unsecured loans. A secured loan means the debt is secured over assets within the company and if that company were to be liquidated the creditor has a preferential claim over the specified asset, often some fixed property of the company.

The amount that can be raised through a secured loan depends on how much value the financial institution involved attaches to the specific property. Unsecured debt has no preferential claim over assets and it is therefore more risky and carries a higher interest rate than secured loans. In the case of liquidation, unsecured creditors have a claim only on the assets of the company remaining after secured claims have been satisfied.

Long-term loans can have a fixed interest rate for the duration of the loan or they can bear a variable interest rate. Variable interest debt means that interest payments fluctuate with changes in market rates. A familiar example is a mortgage bond, where the amount of interest payable is tied to a specified reference rate such as the prime rate.

3.5 VENTURE CAPITAL

Venture capital refers to financing for new, often high-risk ventures. It is a type of private equity financing which is growing quite rapidly in **emerging markets** such as South Africa.

Venture capital is considered too risky for normal bank-lending, and the investors usually expect an equity stake and some control – for example, a representative on the board of directors. This could extend to the appointment of actual managers, and the imposition of covenants (for example concerning dividends).

The following key considerations when choosing a venture capitalist is summarised below:

- Financial strength
- Management style
- References - previous track record
- Contacts/networks
- Exit strategy

For a further discussion in this interesting area refer to your prescribed textbook (Firer, 2012, 464-465) and the following website - www.vfinance.com or www.savca.co.za.

3.6 LEASES

Lease agreements are a common source of finance for the funding of moveable assets. Under the terms of a lease agreement, the **lessee** has use of the asset for the duration of its useful life, whilst the lessor still retains control/ownership of the asset in exchange for an agreed lease payment. It must be stated clearly here that leases are financing decisions, not capital budgeting decisions.

International Accounting Standards (IAS 17) classifies leases as finance leases or operating leases**. Finance leases** are leases that have substantially all the risks and rewards incidental to ownership transferred to the lessee. All other leases are classified as operating leases.

Operating leases are treated very much like contract hire. They do not appear on the lessee's statement of financial position (balance sheet), and the fee for the hire is charged directly against profits. These agreements will usually not last for the full life of an asset. They are offered by companies who manufacture or deal in the particular product, often incorporating repairs, maintenance and other services. Operating leases are common for office and business equipment, e.g. multi-function copiers, computers and motor vehicles.

Lease payments, similarly to interest payments, are known in advance hence the degree of risk associated with future cash flows (lease or interest payments) is the same. Lease payments are a tax-deductible business expense, making the after-tax cost of leasing relevant for decision making.

The comparison between leasing and borrowing requires a careful consideration of the cash flows associated with each financing alternative. The cash flows associated with leasing are the amount of each lease payment and the tax shield associated with each payment. The cash flow associated with borrowing and purchasing the asset is somewhat more complex because purchasing means ownership, hence the asset can be depreciated, implying an annual depreciation tax shield.

In addition, borrowing means interest payments, which are tax-deductible hence the interest tax shield is a relevant cash flow. The determination of the annual interest tax shield is not always easy, because most loans used for this type of asset purchase are amortised over the life of the asset.

Reasons in favour of leasing

- ✓ Taxes may be reduced by leasing
- ✓ The lease contract may reduce certain types of uncertainty that might otherwise decrease the value of the firm
- ✓ Transaction costs may be lower for a lease contract than for buying the asset
- ✓ Leasing may require fewer restrictive covenants than secured borrowing
- ✓ Leasing may encumber fewer assets than secured borrowing.

  (Firer et al., 2012:776)

Worked Example

Lasernet Ltd needs to acquire advanced security monitoring equipment costing R500 000 to expand their facilities in order to be more competitive. The equipment can be purchased or leased. The after-tax cost of the debt is 7% and the company is in the 30% tax bracket.

The terms of the lease and purchase plans are as follows:

Lease

The leasing agreement would require annual end-of-year payments of R96 700 over the five years. The lessee will exercise its option to purchase the equipment for R33 400 at the termination of the lease.

Purchase

The cost could be financed with a five year, 15% loan, requiring equal annual payments of R119 326. The company will pay R12 000 per year for a service contract that covers all costs. The straight-line method of depreciation is used. The company plans to keep the machine beyond its five year recovery period.

The interest payments for the respective five years are R60 000; R51 100; R40 868; R29 090 and R15 500.

Required:

a. Determine the after-tax cash outflows and the net present value of the cash outflows under each alternative (round off to the nearest rand) **(23)**

b. Which alternative would you recommend? Why? **(2)**

a. LEASE					
	Y1	Y2	Y3	Y4	Y5
Lease payment	(96 700)	(96 700)	(96 700)	(96 700)	(96 700)
Tax shield 0.3	29 010	29 010	29 010	29 010	29 010
Purchase option					(33 400)
Net cash flow	(67 690)	(67 690)	(67 690)	(67 690)	(101 090)
PV factor @ 7%	0.9346	0.8734	0.8163	0.7629	0.713
PV cash outflows	(63263)	(59 120)	(55 255)	(51 641)	(72 077)
				NPV	**(R301 356)**
PURCHASE					
Loan payments	(119 326)	(119 326)	(119 326)	(119 326)	(119 326)
Service costs 0.7	(8 400)	(8 400)	(8 400)	(8 400)	(8 400)
Dep. Tax shield 0.3	24 000	24 000	24 000	24 000	24 000
Int. tax shield 0.3	18 000	15 330	12 260	8 727	4 650

Net cash flows	(85 726)	(88 396)	(91 466)	(94 999)	(99 076)
PV factor @ 7%	0.9346	0.8734	0.8163	0.7629	0.713
PV cash outflows	(80 120)	(77 205)	(74 664)	(72 475)	(70 641)
				NPV	**(R375 105)**

3.7 CONCLUSION

The primary responsibility of the financial manager is to explore and initiate investment projects which are consistent with the objectives of the company and which offer returns at least equal to the cost of capital. As new projects are accepted, financing must be found in order to proceed. There are various methods which can be used to finance such projects, the choice of which has significant implications for both risk and return of the business.

CHAPTER 4: COST OF CAPITAL

Specific Learning Outcomes

The overall outcome for this section is that, on its completion, the learner should be able to apply various methods to assess the cost of capital. This overall outcome will be achieved through the learner's mastery of the following specific outcomes, in that the learner will be able to:

4.1 Calculate the Weighted Average Cost of Capital (WACC) using the Traditional Approach.

4.2 Calculate WACC using the Conventional Approach.

4.3 Describe adjustments made to the WACC using the CAPM and Gordon Growth Model.

READINGS:

Prescribed Textbooks

1. **International Textbook - Adapted for South Africa**

   Firer, C, Ross, S.A; Westerfield, R.W; Jordan, B.D (2012), Fundamentals of Corporate Finance, 5th South African Edition, United Kingdom: McGraw-Hill Limited.

   Chapter 14, pp 431 – 462

2. **South African (Local) Textbook**

   Skae. F.O; Vigario, F.A.A (2012), Managerial Finance, 5th Edition, LexisNexis, Durban.

   Chapter 3, pp 65 – 76

3. **Journal Article**

   Tatiana Albanez. T, (2015) "Impact of the cost of capital on the financing decisions of Brazilian companies", International Journal of Managerial Finance, Vol. 11 Iss: 3, pp.285 - 307

4.1 INTRODUCTION

The cost of capital is the minimum return a company needs to make in order to compensate their funders of capital. Most companies finance their operations from a combination of equity and debt. In order to calculate the cost of capital, the weighted average of the costs of different sources of finance must be determined. As financing is raised to fund future projects, the appropriate cost is that of future funding. This is fully described as the weighted average cost of capital.

THINK POINT

What is the cost of capital? What role does it play in long-term investment decisions?

4.2 THE TRADITIONAL APPROACH - WACC

WACC stands for **Weighted Average Cost of Capital**. WACC is the rate that a company is expected to pay on average to all its security holders to finance its assets.

The WACC is the minimum return that a company must earn on an existing asset base to satisfy its creditors, owners, and other providers of capital, or they will invest elsewhere. Different securities, which represent different sources of finance, are expected to generate different returns. The WACC is calculated taking into account the relative weights of each component of the capital structure.

There are a few assumptions regarding the WACC calculation, we will assume that:

- Dividends on ordinary shares are expected to remain at their current rate during the project lifespan we need to appraise.
- Preference shares and debentures are irredeemable (not redeemable).

The cost of equity capital will therefore be based on the current rate of dividend.

We need to know the market prices of the different sources of capital. There is no market price for a bank loan, for example, but there are market prices for shares and debentures.

The market prices measure what the investors could get if they sold their shares or debentures. Their investment must be sufficient to persuade them to retain their investments. The market prices of equity capital and debt capital are calculated, along with their proportions and then multiply the cost of the relevant type of capital by this weighting.

Imagine that our firm has the following capital structure

Equity : 5,000,000 R1 ordinary shares, market price currently R1.70

Preference : 2,000,000 R0.50 10% preference shares, market price currently R0.55

Debentures : R2,000,000 15% debentures, market price currently R1.08

Bank loan : R1,000,000 10% bank loan.

The current and expected rate of ordinary share dividend is 20%, and the tax rate is 28%.

What are the implications of this information and how can we turn it into one 'cost of capital' figure?

Firstly, we need to calculate the overall **market value** of these investments, by multiplying the original values by the market price divided by the nominal value in each case. The total of the individual investment values constitutes the overall market value.

	R
Equity	
R5,000,000 x 1.7/1	8,500,000
Preference shares	
R1,000,000 x 0.55/0.50	1,100,000
Debentures	
R2,000,000 x 108/100	2,160,000
Bank Loan	
R1,000,000 (not traded)	1,000,000
Overall market value	12,760,000

Now let's find the **proportion** of this total represented by each type of capital:

Equity:	8,500,000/12,760,000	=	0.6661	or	66.61%
Preference:	1,100,000/12,760,000	=	0.0862	or	8.62%
Debentures:	2,160,000/12,760,000	=	0.1693	or	16.93%
Bank loan:	1,000,000/12,760,000	=	**0.0784**	or	**7.84%**
			1.00	or	**100.0%**

What are the **returns** to each type of capital?

Equity (think of dividend yield): $20 \times \frac{1}{1.7} = 11.76\%$

Preference shares: $10 \times \frac{50}{55} = 9.09\%$

Debentures: $15 \times \frac{100}{108} = 13.89\%$

Bank Loan: 10% (not traded)

These proportions must now be multiplied by the relevant returns to arrive at the Weighted Average Cost of Capital i.e.

Equity:	0.6661 x 11.76	=	7.833
Preference:	0.0862 x 9.09	=	0.784
Debentures:	0.1693 x 13.89 x 72/100	=	1.693
Bank loan:	0.0784 x 10 x 72/100	=	0.564
			10.87%

This would be the minimum rate to apply for investment appraisal, assuming that all projects to be evaluated bear the same risk, and that finance would be raised in the same proportions as they currently exist.

You may be wondering why the calculation for the debentures and the bank loan interest is multiplied by 72%? Think back to profit and loss accounts (income statement)…debenture and bank-loan interest comes **before** profit before tax, and so do not bear tax – the same is **not** true of dividends. In order to equalise the tax effect, the debenture and bank-loan interest weighting is reduced, by multiplying it by 1 minus the current company tax rate (28%). i.e. (1-0.28 = 0.72)

The reason we ignored the retained earnings in the company's capital structure is that we are using the market price for equity. This covers not only the face value of the shares, but also the proportion of the accumulated reserves that would belong to each equity holder if the firm were to be wound up at its current face value.

4.3 THE CONVENTIONAL APPROACH (MODERN APPROACH) WACC

MARKET VALUES

Market value of ordinary equity:

The total market value of equity is equal to the market price per share multiplied by the number of shares issued by the company, therefore:

$$E = P_O \text{ X Number of shares} = R5.00 \text{ X } 1 \text{ million shares} = R5\,000\,000$$

Where P_O represents the price of the ordinary equity

Market value of preference capital:

The total market value of preference capital is equal to the market price per share multiplied by the number of shares issued by the company, therefore:

$$P = P_O \text{ X Number of shares} = R10.00 \text{ X } 200\,000 \text{ shares} = R2\,000\,000$$

Where P_O represents the price of the preference shares

Market value of debt:

To derive the market value of debt, the Discounted Cash Flow (DFC) technique is utilized. Current market value of debt is equal to the present value of the interest payments plus the present value of the capital repayment. These future cash flows must be discounted at the current required rate of return given in the question as a current yield-to-maturity. Suppose a company has R2 million, 8% debentures due in 5 years with a current yield-to-maturity of 10%.

The interest payment (coupon rate) made by the company is equal to R160 000 (8% x R2,000,000). Notice that the same amount will be paid every year, hence we are dealing with an annuity.

The current market value of debt can be calculated as follows:

D = Present value of annuity (PVA) of interest + PV of capital repayment amount

D = R160,000 x $PVAIF_{5YEARS,\ 10\%}$ + R2 000,000 x $PVIF_{5\ YEARS,\ 10\%}$

10% is the current yield-to-maturity

Using PVAIF and PVIF **at the back of the book** to obtain the PVA and PV investment factors:

D = R160,000 X 3.7908 + R2 000,000 X 0.6209

= R606 528 + R1 241 800

= **R1 848 325Market value of the firm:**

The total market value of the firm is the sum of the market values of equity, preference capital and debt.

Current market	Rands
Ordinary equity (E)	R 5 000 000
Preference share capital (P)	R 2 000 000
Debt (D)	R 1 848 328
	R8 848 328

Proportions

Ordinary equity (E)	0.56
Preference share capital (P)	0.23
Debt (D)	0.21
	1.00

You would have noticed that bank loan is not traded meaning it does not have a market value. The stated amount (face value) is re-payable with a fixed interest.

4.4 COST OF EQUITY

Imagine a firm is financed with ordinary equity, preference shares and debt capital, the required cost on each source of capital will be the return investors demand as compensation for the expected inflation, the time value of money, and the risk to which their investment is exposed. The major difference between the three sources is the risk associated with each source. The two generally recognised methods for determining the required **return on equity** are the Dividend Discount Model or Gordon Growth Model and the Capital Asset Pricing Model (CAPM).

4.4.1 The Dividend Discount Model (DDM) - Gordon Growth Model

A procedure for valuing the price of shares by using predicted dividends and discounting them back to present value. The idea is that if the value obtained from the DDM is higher than what the shares are currently trading at, then the stock is undervalued

The DDM is an interesting way to estimate the cost of equity capital. Since R_E, is the return that shareholders require, it can be interpreted as the firms cost of equity capital.

To illustrate how we estimate R_E, suppose a company paid a dividend of R0.20 per share last year and the share price is currently R5 and the expected growth is 8% p.a. Using the dividend growth model, the expected dividend for the coming year is:

D_1 = D_0 x (1 + g)

= R0.2 x 1,08

= **R0.216**

Given this, the cost of equity, R_E, is:

$R_E = D_1 + g$ or $= \frac{D_0 (1 + g)}{P_0} + g$

$= P_0$

$= \frac{R0.216}{R5} + 0.08$ $= \frac{0.2 (1.08)}{R5} + 0.08$

$=$ **12.32%** $=$ **12.32%**

Where: R_E = cost of equity

D_0 = last dividend paid

g = estimated growth

P_0 = current market price of share

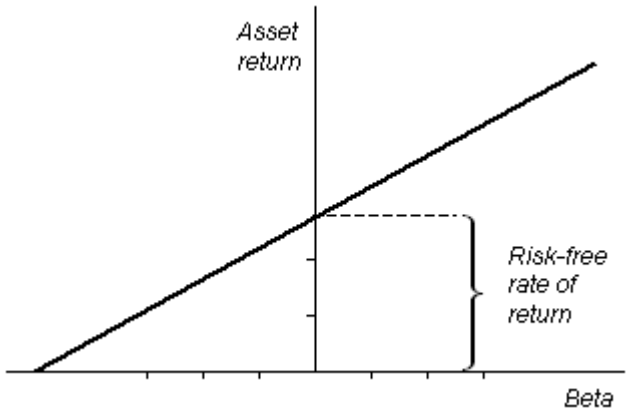
4.4.2 The Capital Asset Pricing Model (CAPM)

CAPM allows investors to determine the required rate of return on a share, based on the risk associated with that share. The CAPM is a model for pricing an individual security or portfolio. For individual securities, we make use of the security market line (SML) and its relation to expected return and systematic risk (beta) to show how the market must price individual securities in relation to their security risk class. The expected return on a risky investment depends on **three** things:

R_f = rate of return on risk-free investments

β = beta coefficient, systematic (market) risk of equity

$R_m - R_f$ = market risk premium



Suppose a company has a beta factor of 1.4, a market return of 12% and a risk free return of 8%.

Given this, the cost of equity, R_E, is:

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

$= 8 + 1.4 (12 - 8)$

$= 8 + 1.4 (4)$

$= \mathbf{13.6\%}$

The choice between the two methods of calculating the cost of equity is usually determined by the information supplied.

A **beta coefficient** is a relative measure of non-diversifiable risk. In short it tells us how much systematic risk a particular asset has relative to an average asset. An asset's historical returns are used in finding the asset's beta coefficient.

4.6.1 Cost of Preference Shares

Preference shares have some debt characteristics. Specifically, the dividend payable is usually a fixed amount, the same way as interest on a typical debenture is fixed.

Suppose a company, Vector Limited (Ltd) paid a dividend of R1 on the current market price and its preference share of R10.

Given this, the cost of preference shares, R_P, is:

$$R_P = \frac{D}{P_0}$$

$$= \frac{1}{10}$$

$$= \mathbf{10\%}$$

Where,
R_P = cost of preference shares
P_o = current market price
D = dividend

4.6.2 Cost of Debt

The cost of debt can be described as the return that the firm's lenders demand on new borrowing. From a company's point of view the cost of debt is the current market interest rate – the rate at which the company could borrow in the market place **today**. This current interest rate, called the current yield-to-maturity (YTM) of the company's debt, can be determined by observing the current market price at which the firm's existing debentures are trading. Yield-to-maturity is defined as the interest rate that will make the present value of a debenture's remaining cash flows (if held to maturity) equal to its current market price.

From the example given on the market values of the debenture (previously under sub-heading **4.3**) the following information is extracted:

- Coupon rate of interest is 8%
- Due in 5 years
- Current yield to maturity is 10%

The YTM on the debt is given at 15%, but the cost from the company's point of view is the **after-tax cost**:

$$R_D = YTM (1 - T_c)$$

$$= 10 (1 - 0.30)$$

$$= \mathbf{7\%}$$

Where,
R_D = cost of debt
YTM = yield-to-maturity
T_c = tax rate

WACC (PROPORTION x COST)

Ordinary shares (using CAPM)	0.56 x 13.6	=	7.60
Preference shares	0.23 x 10	=	2.30
Debt	0.21 x 7	=	1.47
			11.37%

THINK POINT

How does the traditional WACC differ from the modern approach?

CHAPTER 5: FINANCIAL LEVERAGE AND CAPITAL STRUCTURE POLICY

Specific Learning Outcomes

The outcome for this section is that, on its completion, the learner should be able to evaluate the actual capital structure of a firm. This overall outcome will be achieved through the learner's mastery of the following specific outcomes, in that the learner will be able to:

5.1 Determine the effect that gearing has on share prices and WACC.

5.2 Explain the traditional view of gearing on cost of capital (K_e) and WACC.

5.3 Display knowledge of the MM (Modigliani and Miller) view of gearing on (K_e) and WACC.

5.4 Evaluate the actual capital structure of a firm.

READINGS:

Prescribed Textbooks

1. **International Textbook - Adapted for South Africa**

   Firer, C, Ross, S.A; Westerfield, R.W; Jordan, B.D (2012), Fundamentals of Corporate Finance, 5th South African Edition, United Kingdom: McGraw-Hill Limited.

   Chapter 16, pp 490 - 522

2. **South African (Local) Textbook**

   Skae. F.O; Vigario, F.A.A (2012), Managerial Finance, 5th Edition, LexisNexis, Durban.

   Chapter 3, pp 49 - 65

3. **Journal Article**

   Gonenc. H. (2005) *"Comparison of Debt Financing between International and Domestic Firms: Evidence from Turkey, Germany and UK."*
   International Journal of Managerial Finance, Vol. 1 Issue: 1 pp 49 – 68. (available from Emerald).

   Xiaoyan Niu (2008) "Theoretical and Practical Review of Capital Structure and its Determinants." International Journal of Business and Management.

5.1 INTRODUCTION

The 'capital structure' of a company refers to its long-term financing. Companies are financed only by equity or equity plus debt. Financial leverage measures the degree to which a firm's operations are funded by debt as opposed to equity (Skae and Vigario, 2012, 49). The risk attached to financing from equity and debt differs and this impacts the cost of these types of finance. From the point of view of capital providers, debt has low risk because the interest payment and the repayment are fixed, both in terms of size and timing. However, from the point of view of the company, debt has high risk because the firm must ensure that fixed repayments are met, irrespective of the level of earnings in any given year.

Equity finance, in comparison, does not require fixed cash flow commitment and thus carries a lower risk for the company. From the point of view of equity capital providers, equity has high risk because there is no certainty that dividends will be received and the original capital is not repayable. There is also the possibility of a capital loss for an investor when investing in equity.

5.2 THE EFFECT OF LONG-TERM LOANS ON EARNINGS PER SHARE (EPS)

5.2.1 When operating profits are high, shareholders in highly geared firms (heavy reliance on debt financing) do very well, because there are fewer of them to share the additional profits (debt holders are only entitled to a fixed rate of interest).

5.2.2 When operating profits are low, shareholders in high-geared firms suffer, because loan interest will absorb most or all of the operating profit.

In the example below, the geared firm has R5 million of 10% debentures and R5 million of equity. The low-geared firm has a zero debt - in fact it is ungeared, and has only equity of R5 million.

	GEARED RAND	**UNGEARED RAND**
Scenario 1: high operating profit		
Operating profit	2 000 000	2 000 000
Interest	(500 000)	(NIL)
Profit before tax	1 500 000	2 000 000
Tax (30%)	(450 000)	(600 000)
Profit after tax (PAT)	1 050 000	1 400 000
	PAT 1 050 000 No. of shares 5 000 000	1 400 000 5 000 000
EPS	**= 21 cents**	**= 28 cents**
Scenario 2: low operating profit		
Operating profits	600 000	600 000
Interest	(500 000)	(NIL)
Profit before tax	100 000	600 000
Tax (30%)	(30 000)	(180 000)
Profit after tax	70 000	420 000
	70 000 5 000 000	420 000 5 000 000
EPS	**= 1.4 cents**	**= 8.4 cents**

Clearly the shareholders in the geared company are experiencing greater volatility in EPS, and greater **financial risk**. What we should find is that there would be a wider dispersion of possible results for the geared company, so that increased risk-averse investors would require a greater return to compensate them for the increased risk of a very low result.

On the other hand, the fact that loan interest is tax deductible, lowers the firm's tax liability, and leaves a larger sum overall to be distributed to the providers of capital. It seems therefore that many companies will want to make use of debt – so how do shareholders perceive their situation?

Debt is cheaper than equity where the level of risk to debt holders is low. We have seen that most debt is secured over a company's assets; whereas ordinary shareholders are last in the queue for return of their investment if problems arise, secured debt holders can arrange to have assets sold off to meet the sums they have invested. So the risk for debt is less than that for equity.

This doesn't mean that all debt has equally low risk – lenders will be influenced by:

- The apparent risk of the project for The overall perceived risk of the company
- The existing level of gearing.

They will tend to charge more for projects with higher risk, and to companies who are already seen as bearing greater risk or with existing high levels of gearing, because they wish to protect their regular receipts of interest and the repayment of their capital.

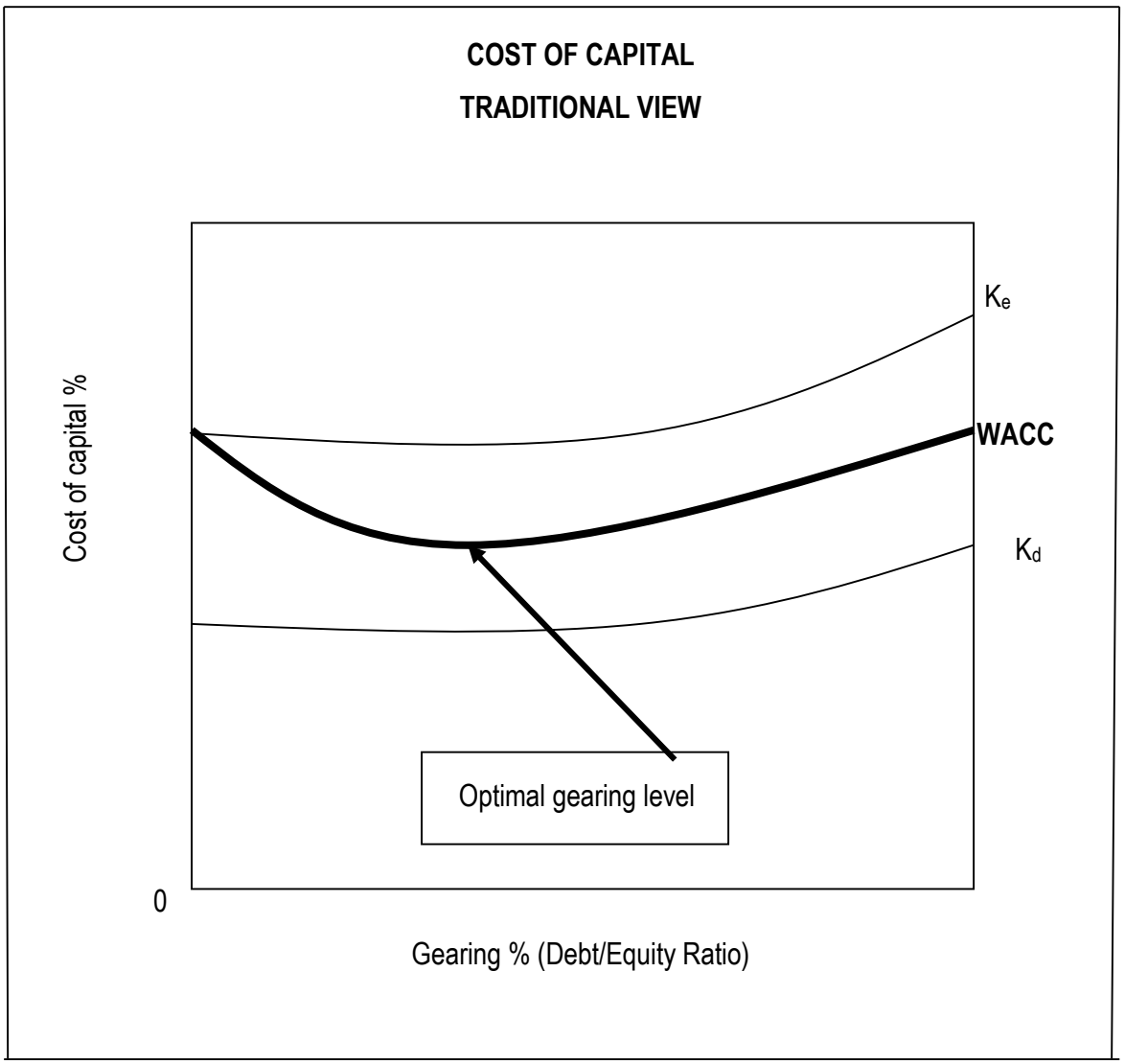
5.3 THE TRADITIONAL VIEW

The **traditional view** of the effect of gearing on K_e and WACC is:

- At relatively low levels of gearing, shareholders do not require a substantial premium for the additional financial risk involved.
- Therefore, as debt capital is cheaper, the overall WACC will fall as larger quantities of debt are introduced.
- The cost of debt will rise gradually as gearing increases, but more rapidly once high levels are reached.
- At such levels, shareholders are demanding a higher rise in their own returns, so WACC starts to rise again.

- At intermediate levels of gearing there is a plateau corresponding to the optimum gearing level shown in the following diagram. Here WACC will be at a minimum, and so projects could be appraised at the lowest cost of capital; more would give positive NPV's and could be accepted, increasing shareholders' wealth.

This can be represented on a diagram:



5.4 MODIGLIANI AND MILLER (MM)

MM stands for Modigliani and Miller, who published research in 1958 reasoning that, if security prices have been set by efficient secondary capital markets, companies are unable to increase their market value simply by borrowing money. They considered that the ability of the firm to produce income was not dependent on how projects were financed.

WACC would therefore remain constant at all levels of gearing. The cost of debt would remain constant until very high gearing levels, offsetting rises in the cost of equity because of its comparative cheapness (debt to equity).

MM argued that shareholders' wealth should not change just because of different methods of financing by a company:

- The value of a geared firm should be the same as that of an ungeared firm with the same expected cash flows
- This value should depend on these cash flows and their business risk
- WACC should therefore remain unchanged as the level of gearing rises; although K_e would increase as soon as gearing is introduced, and continue to rise as financial risk increases, the increasing levels of cheaper debt would offset this. There would be no plateau, and no point after which both K_e and K_d would rise sharply.

They also asserted that shareholders can lend or borrow at the same rates as companies; they themselves could gain any advantages or disadvantages of having a particular level of debt.

In other words, shareholders who wanted a certain level of gearing could obtain it themselves, by changing their portfolios, without the company needing to worry about how individual projects should be financed.

For example, suppose that Bongani holds 25% of the shares (500 000) in Shunduka Limited. The new project has gone ahead, EPS is 25 cents, and share price is R1. Bongani investment is therefore R125 000 (500 000 x 25/100 = R125 000) and his income is R31 250 (125 000 x 0.25 = R31 250).

We now have to imagine that there exists a firm identical to Shunduka in all respects, except that it has chosen to finance an identical project with an additional 500 000 shares. This firm is called **Jakarta Limited**.

If we remember that Shunduka has achieved an EPS of 25 cents after paying interest (assuming an interest rate of 9% on R500 000) of R45 000, we realise that it must have achieved an operating profit of (500 000 * 25 cents) + R45 000, that is R170 000. Jakarta would also achieve this operating profit, but as it has one million shares and its EPS is 17 cents.

Bongani could therefore:

- Use R125 000 obtained from selling his 25% of Shunduka shares.
- Borrow 25% of the amount of Shunduka's debt, that is R125 000 at 9%.
- Invest the total of R250 000 in 25% of Jakarta's shares, that is 250 000 shares at R1.
- Obtain total earnings per share of R42 500 (250 000 * 17 cents)
- Out of this he would have to pay interest on his borrowing of R11 250 (R20 000 x 9/100) leaving him with R31 250 – or the sum he would receive from Shunduka.

Although changing the capital structure of the firm may not change the firm's total value, it does cause important changes in the firm's **debt and equity**. According to the MM Proposition II, the cost of equity capital depends on three things: the required rate of return on the firm's assets, R_A, the firm's cost of debt, R_D, and the firm's debt/equity ratio, D/E.

$$\mathbf{R_E = R_A + (R_A - R_D) \times \frac{D}{E}}$$

The firm raises its debt/equity ratio, the increase in leverage raises the risk of the equity and therefore the required return or cost of equity (R_E). The change in the capital structure weights is exactly offset by the change in the cost of equity (R_E), so the WACC stays the same.

MM held that the relationship between the capital market's expectations of the return on a share in a geared company and the level of gearing is:

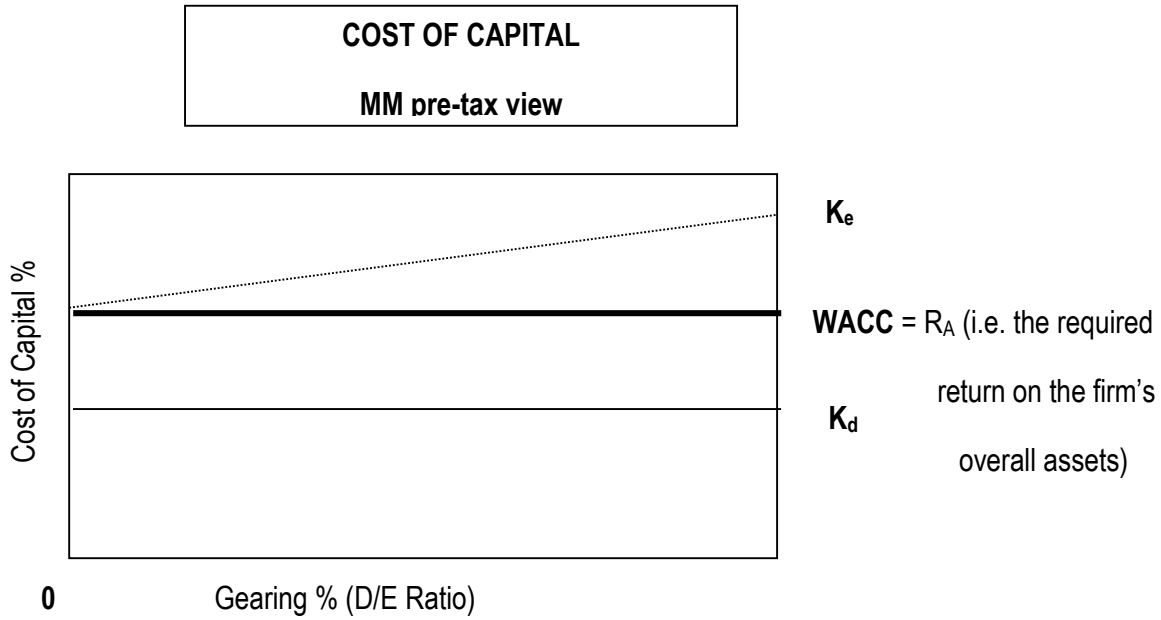
$$R_E = 17 + (17 - 9) * 500\,000/500\,000$$

$$25 = 17 + (8*1)$$

WACC for Jakarta would be 17% that is the same as K_e. For Shunduka it would be:

$$\mathbf{0.25 * 0.5 + 0.9 * 0.5 = 17\%}$$

We can represent MM's original view graphically – we shall refer to it as "pre-tax" for reasons you will discover shortly.



MM's original article was based on several assumptions, most of which have been questioned in previous academic studies:

- Transaction costs are ignored; we know, however, that buying and selling securities does involve such costs,
- Borrowing and lending occur at the same rates of interest for individuals and companies; borrowing is usually more expensive than the reward for lending, and individuals are rarely offered the same rates as companies
- Bankruptcy costs are ignored – in other words, if a firm were to be wound up, shareholders would receive the market value of their shares. This ignores disposal and legal costs, and the fact that the value of assets to the seller and buyer may be very different
- K_d does not increase as gearing rises until a very high level; to offset this increase MM considered that there would be a fall in K_e as risk-seeking purchasers entered the market.
- Taxation is ignored.

5.5 MM POST-TAX

The assumption of ignoring taxation has caused the greatest argument, and MM eventually (1963) restated their findings to take taxation into consideration. Their new equation, post-tax, asserted that the value of the geared company was equal to the value of the ungeared company plus the value of the geared company's borrowings multiplied by the tax rate applied to the interest. The geared firm is denoted with the variable **G**, and the ungeared firm is denoted with the variable **U**.

$$V_G = V_U + T * L_G$$

Where **T** is the company tax rate applicable to interest on debt, and **L** or **D** is the amount of debt of the geared firm. The value of the geared firm is therefore increased by the tax shield on debt interest, and will increase as the level of debt increases.

The relationship between the expected return on a share in a geared company and the level of gearing becomes:

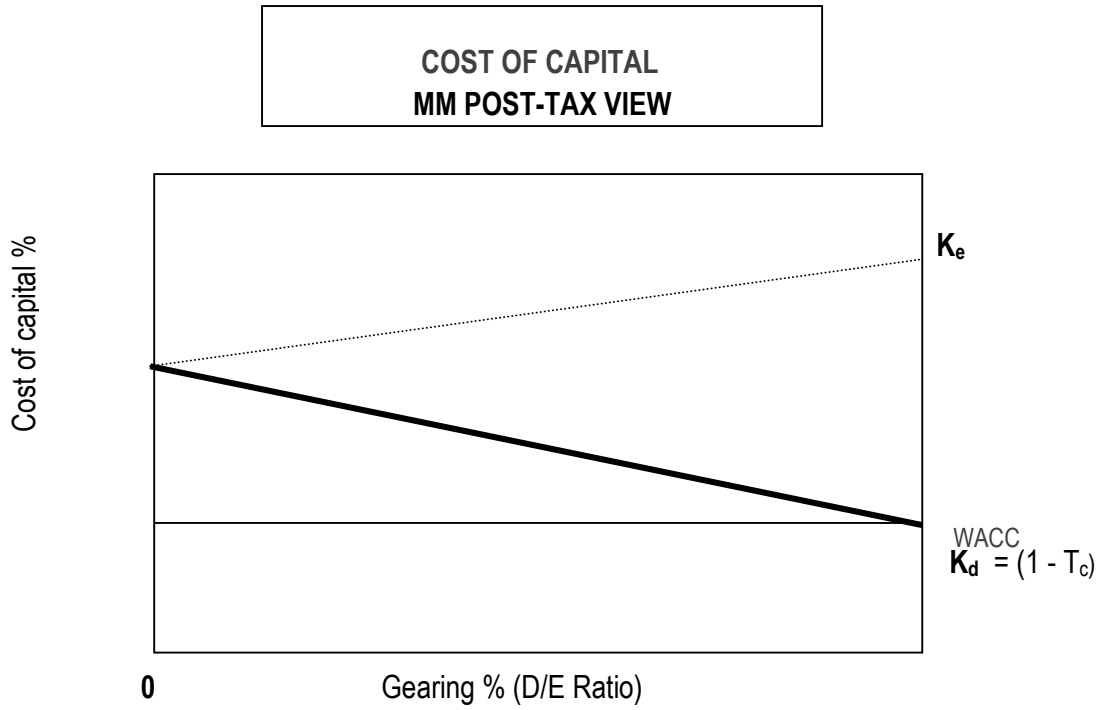
$$R_E = R_U + (R_U - R_D) \times \frac{D}{E} \times (1 - T)$$

If the company tax rate applied to debt interest is 30%, R_E (or K_e) for Shunduka would become:

$$17 + (17 - 9) * 350/500 = 22.6\%$$

WACC reduces to $22.6 * 0.5 + (9 * 0.70 * 0.5) = 14.45\%$

This would mean that WACC would be at a minimum when debt provides all the capital invested in a firm. Graphically, as the cost of debt has now been reduced by tax, this will more than offset the needs of equity for higher returns, so WACC becomes a downwards-sloping line:



While this appears logical up to certain levels of debt, it does not make sense to consider that lenders will provide increasing amounts of capital at no extra cost – their security is diminishing, and projects are likely to be of higher risk. R_D (or K_d) must increase eventually, even allowing for tax shields.

WACC could only continue to fall if the rate of increase of K_e diminishes, which seems even less likely. So the post-tax proposition also has flaws.

Miller also wrote about tax effects in 1977, this time focusing on whether all companies could actually take advantage of tax shields. Because there is no guarantee of a particular profit level, neither is there any guarantee of the size of the tax shield. Also, taxation bases differ from country to country, and tax regulations may allow for the bringing forward of past losses or the offset of profits and losses between companies in the same group, and large initial allowances for the purchase of non-current assets – any of which may result in there being little taxable profit for the tax shields to reduce.

Miller referred to the **clientele effect**, it may be that individuals do prefer different levels of gearing - they may invest in a particular company because of its existing capital structure. If this structure is changed, they may need to move from such a company to one with a gearing structure that suits them better. Because transaction costs do exist, this will disadvantage them – not a good example of maximisation of these particular shareholders' wealth. So a company may be reluctant to change the weighting of its capital.

THINK POINT

Explain the main differences between MM's proposition of pre-tax and post-tax with regards to borrowing.

5.6 INSOLVENCY COSTS

A limiting factor affecting the amount of debt a firm might use comes in the form of insolvency or bankruptcy costs. As the debt/equity ratio rises, so too does the probability that the firm will be unable to pay its debt holders. Ultimately, when this happens, the ownership of the firm's assets are transferred to the debt holders. A firm becomes bankrupt/insolvent when the value of its assets is equal to the value of its debt. The value of equity becomes zero and the bondholders control the firm.

There are legal and administrative costs to bankruptcy. Because of these expenses, the bondholders will not get all that they are owed. These are called direct bankruptcy/insolvency costs. A firm will spend resources to avoid filing for bankruptcy because it is expensive. A firm that is having problems in meeting its outstanding debt is said to be experiencing **financial distress.** These costs are called indirect bankruptcy costs. The term financial distress is referred to as the direct and indirect costs associated with going bankrupt and or avoiding a bankruptcy filing.

Whether or not the firm goes bankrupt, the net effect is a loss of value because the firm chooses to use debt in its capital structure. It is this possibility of loss that limits the amount of debt that a firm will choose to use (Firer et al, 2012:508-509).

5.7 OPTIMAL CAPITAL STRUCTURE

At low debt levels, the probability of bankruptcy and financial distresses is low and the benefits from debt outweigh the cost as the firm also benefits from the interest tax shield. At very high debt levels, the possibility of financial distress is great, so the benefits from debt financing may be more than off-set by the financial distress costs. An optimal capital structure exists somewhere in between these extremes.

The Static Theory of Capital Structure

This theory states that the firms borrow up to a point where the tax benefits from an extra rand in debt is exactly equal to the cost that comes from the increased probability of financial distress. It is called the static theory because it assumes that the firm is fixed in term of its assets and operations and it only considers possible changes in the debt/equity ratio.

CHAPTER 6: FOREIGN EXCHANGE AND INTERNATIONAL CAPITAL BUDGETING

Specific Learning Outcomes

The outcome for this section is that, on its completion, the learner should be able to appreciate the challenges of exchange-rate fluctuations and the avoidance of exchange rate risk and other related risk factors. This outcome will be achieved through the learner's mastery of the following specific outcomes, in that the learner will be able to:

6.1 Discuss how companies manage foreign exchange risk.

6.2 Evaluate investments in foreign countries.

6.3 Assess the implications of inflation, sunk costs and government intervention on foreign capital expenditure projects.

READINGS:

Prescribed Textbooks

1. **International Textbook - Adapted for South Africa**

   Firer, C, Ross, S.A; Westerfield, R.W; Jordan, B.D (2012), Fundamentals of Corporate Finance, 5th South African Edition, United Kingdom: McGraw-Hill Limited.

   Chapter 20, pp 616 - 644

2. **Journal Article**

   Correia, C., Cramer. P., (2008) *"An analysis of cost of capital, capital structure and capital budgeting practices: a survey of South African listed companies"*, Meditari Accountancy Research, Vol. 16 Issue: 2, pp.31 - 52

6.1 FOREIGN EXCHANGE RISK MANAGEMENT

6.1.1 Exchange Rates

An exchange rate is the ratio of exchange for two currencies. It may be expressed in terms of another country's currency. It is also regarded as the value of one country's currency in terms of another currency. In practice, almost all trading of currencies takes place in terms of the US dollar. For example, the South African Rands are traded with their prices quoted in US dollars.

It should be noted that the Lesotho Maloti, Swaziland Elangeni and Namibian Dollar are all pegged to the South African Rand at an equal exchange rate (1:1) (Firer et al., 2012, 620).

Exchange Rate Quotations

A foreign exchange dealer will quote both buying (or bid) rate and a selling (or ask) rate for a currency. The difference represents the dealer's profit margin when buying and selling currencies. For example the US dollar (USD) may be quoted in Rands (internationally referred to as ZAR) as:

Bid ZAR 8.653 Ask ZAR 8.655

If the dealer buys US dollars from an exporter and then sells to an importer, 1 USD million (USD 1 000 000), the exporter will receive from the dealer ZAR 8 653 000 for his dollars and the importer will pay ZAR 8 655 000 for her dollars. The dealer will therefore make a profit of ZAR 2 000 on the two transactions. When an exporter sells US Dollars it's at the lower Bid price, the foreign exchange dealer buys low and sells high at the Ask price – therefore making the margin as profit.

6.2 TYPES OF TRANSACTIONS

There are two basic types of trades in the foreign exchange market: spot trades and forward trades.

6.2.1 Spot Trade Rates

A spot trade is an agreement to exchange currency "on the spot" which actually means that the transaction will be completed or settled within two business days. The exchange rate on a spot trade is called the spot exchange rate. Implicitly, all the exchange rates and transactions discussed so far have referred to the spot market. So, if you are quoted a spot rate for Euro of 10.3155 – 10.3205, you could buy at the first price and sell at the second.

6.2.2 Forward Exchange Rates

A forward trade is an agreement to exchange currency at some time in the future. The exchange rate that will be used is agreed upon today and called the forward exchange rate. A forward trade will normally be settled sometime within the next 12 months.

Companies enter into forward trades based on their opinion of where exchange rates are headed. For instance would it be beneficial to secure a specific rate today for the future or let the markets determine the exchange rates in the future.

An interesting resource is http://www.rmb.co.za/GlobalMarkets/rates_Currencies.asp

Example:

Suppose you were expecting to receive a million British Pounds in three months, and you agree to forward trade to exchange your pounds for rands. Assume that the spot exchange rate and the 90-day forward rate in terms of rand per pound are ZAR 11.125 = GBP1 and ZAR 11.236 = GBP1, respectively.

Solution

If you expect GBP1 million in 90 days, then you will get GBP1 million at ZAR 11.236/GBP = **ZAR 11.236 million**. Since it is more expensive to buy a pound in the forward market than in the spot market (ZAR 11.236 versus ZAR 11.125), the pound is selling at a premium relative to the rand (of 1%)

$$\text{i.e.} \quad \frac{11.236 - 11.125}{11.125}$$

$$= \mathbf{1\%}$$

6.2.3 Forward Exchange Contracts

A **forward trade** is an agreement to exchange currency at some time in the future. **Forward exchange contracts** allow investors to arrange for dealers to sell to them or buy from them a specified amount of a foreign currency at a given future date at an agreed exchange rate – that is, the rate is decided upon now, not when the need to deal in the currency arrives. If the rate of exchange for the dollar strengthens, the firm is protected (eliminating risk) from this change. If it should happen to weaken, then the firm is unable to profit from this, but has swapped this possible profit for the certainty of knowing at what rate it will be able to obtain the necessary dollar. Naturally, a forward exchange contract will cost money to arrange.

For example if the current USD/ZAR exchange rate is USD 1: R9:00, company A is set to receive USD 5 million in 6 months' time. Company A is of the opinion that the currency is going to weaken to USD 1: R9:50 in the coming 6 months. Would company A enter into a forward contract today at USD1: R9:25?

If Company A was comfortable in their expectations that the exchange rate would weaken to R9:50 against the USD, then company A would not enter into the forward trade.

6.3 EXCHANGE RATE RISK

Exchange rate risk is the natural consequence of international operations in a world where relative currency values move up and down. Managing exchange rate risk is an important part of international finance. There are three different types of exchange rate risk or exposure: short-run exposure; long-run exposure; and translation exposure (Firer et al., 2012, 635-636).

- ***Short-Run Exposure***

The day-to-day fluctuations in exchange rates create short-run risks for international firms. These firms have contractual agreements to buy and sell goods in the near future at set prices. When different currencies are involved/ traded, such transactions have an extra element of risk.

- ***Long-Run Exposure***

In the long run, the value of a foreign operation can fluctuate because of unexpected changes in relative economic conditions. For example, imagine that we own a labour-intensive assembly operation located in another country to take advantage of lower wages. Through time, unexpected changes in economic conditions can raise the foreign wage levels to the point where the cost advantage is eliminated or even becomes negative.

Hedging long-run exposure is more difficult than hedging short-term risks. For one thing, organised forward markets do not exist for such long-term needs. Instead, the primary option that firms have is to try to match up foreign currency inflows and outflows. The same thing goes for matching foreign currency-dominated assets and liabilities. For example, a firm that sells in a foreign country might try to concentrate its raw material purchases and labour expense in that country. That way, the rand value of its revenues and costs will move up and down together.

Similarly, a firm can reduce its long-run exchange risk by borrowing in the foreign country. Fluctuations in the value of the foreign subsidiary's assets will then be at least partially offset by changes in the value of the liabilities.

- ***Translation Exposure***

Translation date refers to the financial year end of a local entity. When a South African company calculates its accounting net profit and earnings per share (EPS) for a particular period, it must "translate" its earnings, assets and liabilities into rands. This can create some problems for the accountants when there are significant foreign operations.

In particular, two issues arise:

1. What is the appropriate exchange rate to use for translating each balance sheet account?
2. How should balance sheet accounting gains and losses from foreign currency translation be handled?

As per IAS 21 (Foreign currency transactions), at statement of financial position date (balance sheet date), foreign currency monetary items should be reported at the closing rate. (i.e. the spot rate at the balance sheet date) Any increase or decrease in the outstanding balance is treated as an exchange difference (gain or loss) in the statement of comprehensive income (income statement). When the balance owing/ receivable is finally settled, the difference between the carrying amount of the debtor/creditor and the amount paid/received (foreign currency converted at spot rate on settlement date) is recorded as an exchange difference (gain or loss) in the income statement.

6.4 POLITICAL RISK

One final component of risk in international investing concerns political risk. Political risk refers to changes in value (foreign exchange) that arise as a consequence of political actions. This is not purely a problem faced by international firms (Firer et al., 2012: 638).

6.5 INFLATION, SUNK COSTS AND GOVERNMENT INTERVENTION

Capital projects are generally long term investments and **inflation** is likely to occur during the project life. It is possible that the impact of inflation will cancel out any gains and that the required rate of return will also shift with inflation.

Interest rates in South Africa, where inflation has been significant for a number of decades, were historically much higher than in the major economies of the world. Nominal rates must therefore include an adjustment for expected inflation.

A **sunk cost** is a cost that has already been incurred and cannot be removed and therefore should not be considered on investment decision i.e. to accept or reject a project.

Suppose the South African Maize Board is considering building a new maize silo to store their maize. Should a portion of the Maize Board's existing overhead costs be allocated to the proposed new silo? If the overhead costs are truly sunk and independent of the new project, the answer is no. But if the new silo requires additional maintenance, supervision or cleaning, these overheads should be part of the project analysis.

Governments offer incentives to promote certain types of capital investments and include grants, investment tax credits and subsidised loans. Since these change a project's cash flow, they must be factored into capital budgeting analysis.

Comprehensive Worked Example (International Capital Budgeting)

This is an example evaluating a foreign investment project, taking into consideration all aspects discussed above:

Trellimax (Ltd), South Africa, is a specialist manufacturer of "roller doors." In seeking to expand its operations, it has the opportunity to acquire a Belgium subsidiary company, Rhine Dynamics, or set up a new division in its home market.

The relevant figures for these two options are:

Set up new division at home	**Rand**
Cost of setting up premises	30 400 000
Cost of machinery	22 000 000
Annual sales	13 000 000
Annual variable cost	5 000 000
Additional head office expenses	1 000 000
Existing head office expenses	500 000
Depreciation: machinery 10% on cost annually	2 200 000

Acquisition	**Euro**
Acquire shares from existing shareholders	10 000 000
Redundancy costs	3 500 000
Annual Sales	18 000 000
Annual variable costs	9 500 000
Annual fixed costs	3 500 000
Consultants fees	5 800 000

Additional information:

- The project is expected to last for 10 years.
- Trellimax Ltd, current cost of capital is 12%.
- The Belgian inflation is expected to be below the South African inflation by 1% per year, throughout the life of this investment.
- The current exchange spot rate is R11 to the Euro (€).

Required:

a. Make all necessary calculations for the two options.

b. Advise Trellimax Limited on the viability of these two opportunities.

Suggested Solution

a. Set up new division at home:		Y1 to 10	Y0
		Rm	Rm
Cost of setting up premises			(30.4)
Cost of machinery			(22.0)
Annual sales		13	
Less:	annual variable costs	(5.0)	
	additional head office expenses	(1.0)	
Annual cash flow		7	(52.4)
Annuity factor @ 12% for 10 years		5.6502	39.6
Net present value			**(12.8)**
Acquiring shares			(10.0)
Redundancy costs			(3.5)
Annual sales		18	
Less:	annual variable costs	(9.5)	
	annual fixed costs	(3.5)	
Annual cash flow		5	(13.5)
Annuity factor @ 11% for 10 years		5.8892	29.45
Net present value			**15.95**

Exchange rate €15.95m x 11 = R175.45m

b. Reject the set up at home, negative NPV of (R12.8m).

Accept the Acquisition (Belgium), positive NPV of R175.45m.

CHAPTER 7: MERGERS AND ACQUISITIONS

Specific Learning Outcomes

The outcome for this section is that, on its completion, the learner should be able to **consider the implications of valuations, acquisitions and mergers to firms**. This outcome will be achieved through the learner's mastery of the following specific outcomes, in that the learner will be able to:

7.1 Outline the different techniques used in asset based valuation.

7.2 Undertake various calculations related to the share valuation of a company.

7.3 Discuss the different methods of mergers and acquisitions.

7.4 Explain the different techniques used in evaluating mergers and acquisitions.

7.5 Determine the benefits and gains from a merger and acquisition.

READINGS:

Prescribed Textbooks

1. **International Textbook - Adapted for South Africa**

   Firer, C, Ross, S.A; Westerfield, R.W; Jordan, B.D (2012), Fundamentals of Corporate Finance, 5th South African Edition, United Kingdom: McGraw-Hill Limited.

   Chapter 24, pp 736 - 766

2. **South African (Local) Textbook**

   Skae. F.O; Vigario, F.A.A (2012), Managerial Finance, 5th Edition, LexisNexis, Durban.

   Chapter 8. pp 367 – 381

3. **Journal Article**

   Sylvester. F.A., Ikechukwu. K. (2013) *"The Effects of Mergers and Acquisition on Corporate Growth and Profitability: Evidence from Nigeria."* Global Journal of Business Research (GJBR), Vol. 7 Issue: 1, pp 43 – 58. (Available from Ebsco Host).

7.1 INTRODUCTION

A merger is a process whereby the assets of two or more companies are combined into a new company. A new company is usually formed, the merged companies cease to exist as separate entities and the shareholders of the new company are the shareholders of the original companies.

An acquisition (or takeover) on the other hand is a transaction in which a company, known as the offeror (or acquirer) gains control of the management and assets of another company, known as the offeree (or target). This can be done either directly by becoming the owners of these assets or indirectly by obtaining control of management or by acquiring the majority of the shares.

In an earlier chapter of this module, it was mentioned that in order to assess how well a firm is succeeding in the maximisation of shareholder' wealth, the company value needs to be measured. The approaches in the preceding chapters have focused exclusively on market valuations, based on the current market prices of ordinary shares, preference shares and debt. Alternative methods of valuation use the information provided by the annual financial statements of a company.

7.2 ASSET BASED VALUATIONS

Financial statements serve as the starting point of any asset-based valuation since they can provide a fair reflection of the current circumstances of a business and can provide a reasonable indication of future prospects. The financial statements of a company show the value of a business as the difference between the value of assets and the value of liabilities. The difference is known as Net Asset Value (NAV).

7.2.1 The Balance Sheet Valuation Method

The most basic approach to valuation is the calculation of NAV on the basis of the figures reflected in the annual financial statements. The challenge with this calculation is that the accounting numbers in the balance sheet show assets on the basis of their historic cost (original price when purchased) less accumulated depreciation. These "book" values are rarely a reflection of the current market value of the assets, especially with regard to fixed assets purchased in the more distant past.

For example, imagine that a company owns a piece of land that was purchased 20 years ago. If nothing else, the rate of inflation over the past 20 years would ensure that the nominal value (in rands) of the same land today far exceeds the original cost. Yet, financial statements, unless adjusted, will still reflect the historic purchase price. Even more recent purchases, such as computer equipment, are unlikely to reflect current market values. Currently, computer equipment can be depreciated straight-line over 3 years, but an attempt to sell last year's top-of-the range laptop at two-thirds of purchase price is unlikely to succeed, given the technological improvements make over a year.

7.2.2 The Replacement Cost Valuation Method

A significant improvement on historic cost valuations is the replacement cost valuation approach. This approach requires that balance sheet items are shown at the current cost of replacing them with identical assets.

The term replacement cost or replacement value refers to the amount that an entity would have to pay to replace an asset at the present time, according to its current worth. While a replacement cost valuation obviously reflects the current worth of each asset, it is difficult to implement in practice. Certain assets are likely to have easily identifiable replacement costs, such as tangible assets like delivery vehicles, but other assets are not publicly traded are more difficult to value.

For example, an asset such as a patent on a medicine does not have a readily identifiable approximate cost. The replacement cost valuation method essentially represents the cost of establishing a similar new company, and the result of such a valuation can serve as the maximum value of a business.

7.2.3 The Realisable Value Method

While the replacement cost valuation establishes the maximum value of a business, the realisable value method often determines the minimum value of a business.

The realisable value of assets represents the amount that can be received if the business is closed down and the assets sold off, after payment of any expenses associated with the sale. This net value is often referred to as the "liquidation" value since it fundamentally represents the "worst-case" scenario where a whole company is worth less than the sum of its assets.

Suppose that the Target Company has this abridged Balance Sheet:

	R
Net non-current tangible assets	2 100 000
Net current assets	700 000
Net assets	2 800 000
Equity: R1 ordinary shares	2 200 000
Reserves	600 000
	2 800 000
Each ordinary share should then be	
valued at R2 800 000/2 200 000 shares = R1.27	

7.3.1 The Earnings Basis

The price/earnings ratio is used to evaluate the market price of a company's ordinary shares. It is also used to indicate how the stock market is judging the company's earnings performance and prospects. The formula for the price/earnings ratio is as follows:

$$\frac{\text{Current market price of share}}{\text{Earnings per share}}$$

We could rearrange this to say that:

The market value of a share = EPS x P/E ratio

The EPS figure is not necessarily the one calculated from the latest income statement. It could be an expected future EPS, which, could obviously give higher value to the shares.

The P/E valuation method requires that an investor estimates a company's projected earnings for the next year and then the latest P/E ratio is applied to value the share. For example, if the last P/E ratio of a company is 15, i.e. the current market price of a share is 15 times its current earnings per share then the estimated earnings per share for next year (estimated earnings/no. of shares) multiplied by 15 will constitute a fair estimate of the future price of the individual share. This individual price is then multiplied by all the outstanding shares to get to an overall value of the company.

The market price of shares in listed companies is observable; hence P/E ratios are easily observable and published daily in the financial press. Privately held companies, however, have no observable P/E ratio. Arguably, the most important application of the P/E method is in valuing private company shares. Private companies can be valued by applying the P/E ratio of a similar listed company, typically adjusted downwards, to the forecasted earnings of the private firm. The reasons for adjusting the P/E ratio are few, but they revolve around 2 major issues.

The first one is that investment in private companies is riskier than that investment in identical listed firms because of the lower marketability of the shares, implying that risk is not easily diversifiable. As a result, the P/E ratio applicable to a private company would reflect some unsystematic risk, and not only systematic risk. The second reason is that it is unlikely to find a listed company that has exactly the same characteristics as the private firm valued.

7.3.2 Accounting Rate of Return

Now let's consider another technique for valuing shares which is the ARR (Accounting Rate of Return) method.

The following formula is used:

$$\frac{\textbf{Estimated future profits}}{\textbf{Required return on capital employed}}$$

Suppose that the Target Company's last recorded profit of R245 000 and allows for a 10% increase, giving R269 500. It might then decide that there would be an increase in directors' emoluments of R40 000, but a reduction in loan interest of R25 000 and in audit fees of R20 000. Goods and services traded between the companies would allow profits to increase by a further R50 000.

Our revised figure would then be R324 500. The Acquiring Company expects a return on capital employed of 16%. Therefore, the maximum valuation it would place on the Target Company would be:

R324 500/16% = R2 028 125.

7.3.3 Dividend Yield

Now let's look at something else you've encountered before in ratio analysis, and use it for share valuation – the dividend yield.

This will be extremely useful when we are dealing with unquoted companies, especially where there are a lot of small shareholders who will need to be convinced of the merits of selling their shares. It's based on the expectation that, as small shareholders don't have the influence to affect decisions on future earnings, they are more likely to be interested in the real return on their investment – in other words the dividend yield. So the Acquiring Company will want to offer them a suitable price for giving up their future dividends.

If we assume that future dividends will be constant, i.e. that there is no expected dividend growth, then we could value the Target Company using the formula:

$$\text{Market value} = \frac{\text{Dividend in cents}}{\text{Expected dividend yield \%}}$$

However, as the Target Company has no current market share price, we can't work out the dividend yield, or indeed an expected dividend yield, directly. What we need are the dividend yields of some quoted companies in the same line of business. Suppose that we know that the dividend yields of companies, Silverman and Pinch have been as follows:

	SILVERMAN	PINCH
CURRENT	14	8
LAST YEAR	12	8
TWO YEARS AGO	10	8
AVERAGE	12	8

It would be even better if we had figures for more quoted companies, because the performance of Silverman is known to be different from that of Pinch. The Target Company's profits are expected to continue to grow so, if we were to simply average the dividend yield of Silverman and Pinch this would probably be pessimistic. As the Target Company is a private company, a higher yield may be necessary as the shares are not quoted.

Suppose, we take a yield of 11 for the Target Company. We now need to know the latest dividend form the Target Company. Latest earnings figures are R245 000 so, if the Target Company had distributed 75% of this, we would have R183 750 or 8.35% (183 750/2 220 000) as our dividend per share. This is 8.35 cents per ordinary share. Our market value would then be 8.35/0,11% or 75.91 cents per share or R1 670 020, which is between our optimistic and pessimistic P/E ratio valuation .

If we wanted to use anticipated dividend growth instead of simply the last dividend, and supposed that if profit was going to rise by 10% a slightly higher dividend per share could be paid, we might anticipate a 2% growth rate. Using this formula, we would get:

$$\textbf{Market value} = \frac{D_1}{r - g}$$

So, we would have:

$$\text{Market Value} = \frac{8.35 \times 1.02}{(0{,}11 - 0{,}02)}$$

= 94.63 cents per share, a total valuation of R2 081 860 (2 200 000 x 0.9463).

7.3.4 Discounted Cash-Flow

If the Acquiring Company wanted to make extra investment in The Target Company once the takeover was complete, and is able to estimate the future net cash-flows of the Target Company, and discount them using its own cost of capital, it could calculate the maximum price it would be willing to pay for Target Company now.

Suppose the Acquiring Company calculates that, immediately on taking over the Target Company, it would invest a further R200 000 to improve its profitability. It has already calculated that the profits of the Target Company would increase under its management, but now it perceives an additional 10% increase. Of course, we now have to add back a figure for depreciation to the profits, and also allow for tax, if we are to find a net cash-flow figure.

The Acquiring Company expects all its investments to pay back after 4 years. Its cost of capital is 14%. Estimated profits for The Target Company are R324 500 plus another 10% which takes it to R356 950. The depreciation of R300 000 has to be added back, less tax of R170 000 – gives an estimated cash flow for year 1 of R486 950. The Acquiring Company estimates that this figure will increase over 4 years by a **further 8% per annum**.

Year	Net cash-flows	Discount factor (14%)	Discounted cash-flow Present value
0	(200 000)	1	(200 000)
1	486 950	0.8772	427 153
2	525 906	0.7695	404 685
3	567 978	0.6750	383 385
4	613 417	0.5921	363 204
	Net present value		**1 378 427**

So R1 378 427 would be the maximum The Acquiring Company would be prepared to pay under these circumstances. (note: the cash flows ignore the purchase price, so that the maximum price to be paid must be that which would give an NPV of zero at 14%)

However, the Acquiring Company is ignoring the cash flows that would undoubtedly occur after year 4. It would be useful to calculate and add on to the PV of the four years cash flow an end value, indicating the continuing nature of the cash flows. If the Acquiring Company did not stipulate a four-year cut off point (and it may seem unrealistic for it to do so, as the value of the Target company at the end of year 4 wouldn't be zero, like a fully depreciated machine), we could use:

Net cash flow in year 4

Discount rate

That is: R613 417 = R4 381 550

0.14

And then discount this using the year 4 discount factor at 14%, giving R2 594 316 (4 381 550 x 0.5921) to add to the R1 378 427 previously found. The purchase price could then be up to R3 972 743.
This method does assume that net cash flows after year 4 will continue to be high – of course, more uncertainty exists the further into the future we look.

7.4 TYPES OF MERGERS AND ACQUISITIONS

7.4.1 Mergers

A merger is a process whereby the assets of two or more companies are combined into one new company. A new company is usually formed, the acquired companies cease to exist as separate entities and the shareholders of the new company are the shareholders of the original companies.

7.4.2 Acquisition

An acquisition (or takeover) is a transaction in which a company, known as the offeror (or acquirer) gains control of the management and assets of another company, known as the offeree (or target), either directly by becoming the owners of these assets or indirectly by obtaining control of management or by acquiring the majority of the shares.

7.4.3 Proxy content

This occurs when an offeror attempts to gain control of the board of directors by its right to appoint the board as a result of the extent of its shareholding.

7.4.4 Leveraged Buyouts (going private*)*

Sometimes a group of investors takes over a firm by means of a leveraged buyout, or LBO. The LBO group takes over the private firm and its shares no longer trade in the securities market. Usually a considerable proportion of LBO financing is borrowed, hence the term leveraged buyout.

If the investor group is led by the management of the firm, the takeover is called a management buyout, or MBO. In this case, the firm's managers actually buy the firm from the shareholders and continue to run it. They become owner-managers.

7.5 ACQUISITION CLASSIFICATION

The focus now turns to mergers and acquisitions and the thinking behind these transactions. Mergers are often categorised as horizontal, vertical or conglomerate.

7.5.1 Horizontal Merger

This takes place between two firms in the same line of business. The merged firms are normally former competitors. An example is the merger of two soft-drink manufacturers. These horizontal mergers may be blocked if they are thought to be anti-competitive or create too much market power. The Competition Commission of South Africa is a statutory body constituted in terms of the Competition Act, No 89 of 1998, empowered to investigate, control and evaluate restrictive business practices, abuse of dominant positions and mergers (in excess of R560 million in SA) in order to achieve equity and efficiency in the South African economy.

7.5.2 Vertical Merger

This involves companies at different stages of production. The buyer expands back toward the source of raw materials or forward in the direction of the ultimate consumer. Thus, a soft-drink manufacturer might buy a sugar producer (expanding backward) or a fast food chain as an outlet for its product (expanding forward).

7.5.3 Conglomerate Merger

This involves companies in unrelated lines of business. The merger of a machine tool manufacturer with a chain of coffee shops is an example of a conglomerate merger. The key benefit of the conglomerate merger is its ability to reduce risk by merging firms that have different seasonal or cyclic patterns of sales and earnings. Sometimes called the "General Electric of South Africa" because of its diverse operations, Bidvest has businesses in banking, freight and food services and operates in Southern Africa, Europe, Asia and Australia.

The company has a reputation as a cost-cutter and for buying underperforming companies that can benefit from its vast distribution network and customer base.In general, many mergers and acquisitions are motivated by possible gains in efficiency from combining operations. These mergers create **synergies (1 + 1 = 3)**. By this we mean that the two firms are worth more together than apart.

A merger adds value only if synergies, better management, reduced costs, greater profits or other changes make the two firms worth more together than apart *(*Gitman, 2011: 684).

7.6 PURCHASE OF SHARES VERSUS PURCHASES OF ASSETS

The offeror can acquire another company's voting share by purchasing all or part of the shares, in exchange for cash or other securities. It normally starts with a private offer from the management of one firm to another and then taken directly to the shareholders.

This can be accomplished by a take-over offer. A **take-over offer** is a public offer to buy shares. It is made directly to the shareholders of another firm.

If the shareholders choose to accept the offer, then they tender their shares by exchanging them for cash or other securities, depending on the offer. A take-over is frequently contingent on the bidders obtaining some percentage of the total voting shares. If the purchasers do not attain a specific level of control then the offer might be withdrawn or reformulated.

A company can also effectively acquire another company by buying most or all of its assets. If all the assets are sold, the offeree is either dissolved or sold to an entity wishing to inject new trading assets into the company. If all or major part of the assets are to be sold, the directors will require the approval of the shareholders in a general meeting. If only a portion of the assets are acquired, the offeree could then continue to trade using its remaining assets.

Advantages of buying shares in a company include:

- The offeror can deal directly with the shareholders.
- No shareholder meeting has to be held and no vote is required.
- Existing leases need not be transferred, thus no landlord consent is required.
- There is no need to alter the existing employment contract of employees.

Arguments in favour of a purchase of assets include:

- Requires a formal vote of the shareholders.
- If assets are purchased, the company saves on paying stamp duty on shares.
- If the offer or has a low or zero tax rate, it may choose to buy the assets.
- If the buyer borrows in order to purchase the asset, the interest on the loan is normally tax deductible.
- Assets can be replaced at a higher value and the firm benefits from the lower taxes because of the increased depreciation. (Firer et al., 2012:739-741).

7.7 GAINS FROM AN ACQUISITION

To determine the gains from an acquisition, we need to first identify the relevant incremental cash flows, or the source of value. Acquiring another firm only makes sense if there is some concrete reason to believe that the offered firm will be worth more in our hands than it is worth now. There are a number of reasons why this might be so.

7.7.1 Synergy

Suppose Firm X is contemplating acquiring Firm Y. The acquisition will be beneficial if the combined firm has a value that is greater than the sum of values of the separate firms. If we let Vxy stand for the value of the merged firm, then the merger makes sense only if:

Vxy > Vx + Vy when Vx and Vy are the separate values.

The difference between the value of the combined firm and the sum of the value of the firms as separate entities is the incremental net gains from the acquisition, ΔV:

$$\Delta v = Vxy - (Vx + Vy)$$

When ΔV is positive, the acquisition is said to generate synergy.

Synergy could thus be defined as the positive incremental net gains associated with the combination of two firms through a merger or acquisition.

7.7.2 Revenue Enhancement

The combined firms may generate greater revenues than two separate firms. Increase in revenue may come from marketing gains, strategic benefits and market power.

7.7.3 Cost Reduction

A combined firm may operate more efficiently than two separate firms in several different ways, namely:

7.7.3.1 Economics of Scale

This relates to the average cost per unit of producing goods and services. If the per unit cost of production falls as the level of production increases, then an economy of scale exists.

The phrase "spreading overhead" is used in connection with economics of scale. This expression refers to the sharing of central facilities such as corporate headquarters, top management and computer services.

7.7.3.2 Economies of Vertical Integration

Operating economies can be gained from vertical combinations as well as from horizontal combinations. The main purpose of vertical acquisitions is to make the coordination of closely related operating activities easier. Benefits from vertical integration are probably the reason that most forest product firms that cut timber also own sawmills and hauling equipment.

7.7.3.3 Complementary Resources

Some firms acquire others to make better use of existing resources or to provide the missing ingredient for success. Think of a glove manufacturer that could merge with a swimming costume manufacturer to produce more even sales over both the winter and summer seasons, thereby use their production facilities better.

7.7.3.4 Lower Financing Costs

The cost of capital can often be reduced when one firm acquires another. The costs of issuing both debt and equity are subject to economies of scale, which lower transactions costs and results in better coverage of the firm by security analysts.

7.7.4 Lower Taxes

Tax gains often are a powerful incentive for some acquisitions. The possible tax gains from an acquisition include the following

- **Net Operating Losses**

Firms that lose money at an operating level will not pay taxes. Such firms can end up with tax losses they cannot use. A firm with net operating losses may be an attractive merger partner for a firm with significant tax liabilities. Excluding any other effects, the combined firm will have a lower tax bill than the two firms considered separately. This is a good example of how a firm can be more valuable merged than standing alone. There is, however, a qualification to our discussion. The South African Revenue Service (SARS) may disallow an acquisition if the principal purpose of the acquisition is to avoid income tax by acquiring a deduction or credit that would not otherwise be available.

- **Unused Debt Capacity**

Some firms do not use as much debt as they are able to. This makes them potential acquisition candidates. Adding debt can provide important tax savings, and many acquisitions are financed with debt. The acquiring company can deduct interest payments on the newly created debt and reduce taxes.

- **Asset Write-Ups**

We have previously observed that, in an acquisition of assets rather than shares, the assets of the acquired firm can be re-valued. If the value of the assets is increased, depreciation will be higher thus resulting in a larger tax deduction.

- **Reduction in Capital Needs**

All firms must make investments in working capital and fixed assets to sustain an efficient level of operating activity. A merger may reduce the combined investments needed by the two firms.
For example, Firm A may need to expand manufacturing facilities while Firm B has significant excess capacity. It may be much cheaper for Firm A to buy Firm B than to build manufacturing facilities from scratch. In addition, acquiring firms may see ways of more effectively managing existing assets. This can occur with a reduction in working capital by more efficient handling of cash accounts receivable, and inventory. Finally, the acquiring firm may also sell off certain assets that are not needed in the combined firm (Firer et al., 2012:752-754).

7.8 HOSTILE TAKEOVERS

A hostile takeover may be defined as a situation where a takeover offer is strongly resisted by the offeree board – perhaps because it does not approve of the offeror company, or because it does not wish to lose operating autonomy.

Target-firm managers frequently resist takeover attempts. Thus companies wishing to limit their exposure to a potentially hostile takeover can install one or more of the following takeover defences prior to a formal bid being imminent, provided the company's articles of association permit or are amended accordingly and as long as actions are bona fide in the interests of the company.

- Surplus cash could be eliminated by, for example, paying a large dividend or committing to a major new project.
- Material assets could be bought or sold. This is sometimes referred to as the "sale of the crown jewels", or a "scorched earth" strategy.
- The company could use a tactic known as a poison pill to repel would be suitors. The term comes from the world of espionage. Agents are supposed to bite a pill of cyanide rather than permit capture. Presumably, this prevents enemy interrogators from learning important secrets. In the equally colourful world of corporate finance, a poison pill is a financial device, which only comes into force if the company is taken over. For example, shareholders are issued with an option to acquire shares cheaply, the option only being exercisable in the event of a takeover.
- A firm facing an unfriendly merger offer might arrange to be acquired by a different, friendly firm. The firm is thereby said to be rescued by a white knight. Alternatively, the firm may arrange for a friendly entity to acquire a large block of shares. Sometimes white knights or others are granted exceptional terms or otherwise compensated. A pyramid structure could be created to entrench control.
- Formal voting agreements between shareholders could be established.
- Interlocking shareholdings could be reconstructed (for example, by cancellation of certain shares with the approval of 75% of the shareholders)
- Articles of association may require that large majorities (over 50%) are necessary for changes in specified company policies.
- Senior executives can be given extended management contracts.
- Some target firms contract to provide large amounts of compensation to top level management if a takeover occurs. These are called golden parachutes.

- Material contracts with penalty conditions if there is a change in control can be entered into by the company (for example, rent increases, loss of distribution rights).
- The company could issue a debenture, a condition of which is that it must be repaid in full if there is a change in control.
- Selected company assets can be placed outside the direct control of shareholders (for example, disposals could require the consent of the staff pension fund).

Perhaps the best defence of all against potential takeover bids is to make fundamental improvements to the operations of the company, including improving profitability, making better use of resources and upgrading the quality of the company's management (Firer et al., 2012:747-748).

7.9 TECHNIQUES USED IN EVALUATING MERGERS AND ACQUISITIONS

The evaluation a proposed merger revolves around answering the following two questions:

1. Is there an overall economic gain to the merger? In other words, is the merger value-enhancing? Are the two firms worth more together than apart?

2. Do the terms of the merger make my company and its shareholders better off? There is no point in merging if the cost is too high and all the economic gains go to the one company.

Answering these deceptively simple questions is difficult. Some economic gains can be nearly impossible to quantify, and complex merger financing can obscure the true terms of the deal. But the basic principles for evaluating mergers are straight-forward.

7.9.1 Mergers Financed by Cash

We will concentrate on a simple numerical example. Your company Jolly Foods is considering acquisition of a smaller food company Mo Roadhouse.

Jolly Foods is proposing to finance the deal by purchasing all of Mo Roadhouse's outstanding shares for R19 per share. Some financial information on the two companies is given below:

	Jolly Foods R	Mo Roadhouse R	Combined Companies
Operating income	150	20	172 (+2)
Operating costs	118	16	132 (-2)
Earnings	32	4	40 (+4)
Cash	55	2.5	
Other assets' book value	185	17.0	
Total assets	240	19.5	
Price per share	48	16	
Number of shares	10.0	2.5	
Market value	480	40	
EPS	R3.2	R1.6	

Note: Figures in millions except price per share and EPS

The background: Why would Jolly Foods and Mo Roadhouse be worth more together than apart? Suppose the operating costs can be reduced, by combining the companies' marketing, distribution, and administration. Operating income can also be increased in Jolly Foods's region. The third column contains projected revenues, costs and earnings for the two firms operating together: annual operating costs post-merger will be R2 million less than the sum of the separate companies' costs, and revenues will be R2 million more. Therefore the projected earnings increase by R4 million.

We will assume that the increased earnings are the only synergy to be generated by the merger. The economic gain to the merger is the present value of the extra earnings. If the earnings increase is permanent (a level perpetuity), and the cost of capital is 20%,

Economic gain = PV (increased earnings) **= 4 ÷ 0.20 = R20 million**

This additional value is the basic motivation for the merger.

What are the terms of the merger? What are the cost and gains to Jolly Foods and its shareholders?

In this case Mo Roadhouse will be paid in cash. The Cash offer is R19 per share, R3 over the present market price.

Number of shares in Mo Roadhouse	=	2.5 m
Amount Jolly Foods has to pay	=	2.5m x R19
	=	R47,5 m
Value of take-over	=	R480 + (R40m + R20m)
	=	R480m + R60m
	=	R540m
Net Present Value of take-over	=	R60 – R47.5m
	=	R12.5m
Take-over Premium	=	R47.5 – R40
	=	R7.5 m
Jolly Foods post-merger share price	=	R540m – R47.5m
	=	R492.5m
Post-merger price per share	=	R492.5m ÷ R10m
	=	R49.25

Therefore, the merger has **increased Jolly Foods shares by R1.25**.

Self-Check Question 1

Shark Limited makes a surprise cash offer of R2.50 a share to Goldfish Industries.
Goldfish Industries has 5 000 000 shares selling at R2 a share and has an EPS of R2,8.

Shark Limited has 15 million shares with a market value of R45 million and an EPS of R3,7. The total synergistic benefit of the merger amounts to R10 million.

Calculate:

1.1 Calculate the value of the take-over.

1.2 Calculate the Net Present Value.
1.3 Calculate the take-over premium.

1.4 Calculate the market price per share after the take-over.

1.5 Calculate the gain/loss per share.

Note: EPS are by convention stated in cents. In this case they are stated in rands. Therefore, the Rand sign must be inserted.

ANSWER TO SELF-CHECK QUESTION 1

1.1 Market value (MV) of take-over	=	MV of Shark + (MV of Goldfish + Synergy)
	=	R45m + (R10m + R10m)
	=	R45 + R20m
	=	R65m
1.2 Net Present Value of take-over	=	(MV of Goldfish + Synergy) – Cash Paid
	=	R20m – R12.5m
	=	7.5m
1.3 Take-over premium	=	Amount paid – MV of Goldfish
	=	R12.5m – 10m
	=	2.5m
1.4 Post-merger Market Value	=	MV of take-over – Amount Paid
	=	R65m – R12.5m
	=	R52.5m
Therefore, Market Price per share	=	R52.5m ÷ 15 million shares
	=	R3.50
1.5 Gain per share	=	R3.50 – R3.00
	=	R0.50

7.9.2 Mergers Financed by Shares

Evaluating the terms of a merger can be tricky when there is an exchange of shares. The target company's shareholders will retain a stake in the merged firms, so you have to figure out what the firm's shares will be worth after the merger is announced and its benefits appreciated by investors. Notice that we started (refer to 7.9.1) with the total market value of Jolly Foods and Mo Roadhouse post-merger, took account of the merger terms (207 500 & 1 250 000 new shares issued respectfully), and worked out the division of the merger gains/losses between the two companies.

There is a key distinction between cash and share financing mergers. If cash is offered, the cost of the merger is not affected by the size of the merger gains. If share is offered, the cost depends on the gains because the gains show up in the post-merger share price, and these are used for the acquired firm.

Suppose, for example, that A overestimates B's value as a separate entity, perhaps because it has overlooked some hidden liability. Thus A makes too generous an offer. Other things equal, A's shareholders are better off if it is a share rather than a cash offer. With a share offer, the inevitable bad news about B's value will fall partly on B's former shareholders.

7.9.2.1 Mergers Financed by Shares (Using Market Value)

Suppose Jolly Foods wants to conserve its cash for other investments and therefore decides to pay for the Mo Roadhouse acquisition with new Jolly Foods (Jolly F) shares? The deal calls for the exchange ratio to be based on the market value of their respective shares.

$$\text{Therefore, the exchange ratio} = \frac{\text{Market Value of Target Company (Mo Roadhouse)}}{\text{Market Value of the Acquiring Company (Jolly F)}}$$

$$= \frac{\text{R40}}{\text{R480}}$$

$$= \underline{0.083}$$

No. of Shares to be issued to Mo Roadhouse	=	2 500 000 x 0.083
	=	207 500
Total number of shares	=	10 m + 207 500
	=	10 207 500
Combined Market Value: Jolly 10m x R48	=	480 000 000
Mo 2.5m x R16	=	40 000 000
Plus synergy	=	20 000 000
	=	R540 000 000
Post-merger Market Value	=	540 000 000
		10 207 500
	=	R52.90

Benefits according to Market Price:

Benefits to Jolly Foods	=	52.90 – 48.00 = 4.90 per share
Benefits to Mo Roadhouse	=	52.90 (0.083) = R4.39 – R16
	=	(R11.61) per share.

7.9.2.2 Mergers Financed by Shares (Using EPS)

Suppose Jolly Foods wants to conserve its cash for the investments and therefore decides to pay for Mo Roadhouse acquisition with new Jolly Foods shares. The deal calls for the exchange ratio to be based on the earning per share (EPS) of their respective shares. (refer to table 7.9.1)

The exchange ratio = EPS of Target Company (Mo Roadhouse)

EPS of the Acquiring company (Jolly Foods)

= 1.6

3.2

= 0.5

No. of shares to be issued to Mo Roadhouse	=	2 500 000 x 0.5
	=	1 250 000
Total number of shares	=	10 m + 1 250 000
	=	11 250 000
Combined earnings: Jolly 10m x 3.2	=	32 000 000
Mo 2.5m x 1.6	=	4 000 000
Plus synergy	=	20 000 000
	=	56 000 000
Post-merger Eps	=	56 000 000
		11 250 000
	=	R4.98

Benefits to Eps:

Jolly Foods	=	4.98 – 3.2 = R1.78
Mo Roadhouse	=	4.98 (0.5) – 1.6
	=	**89 cents**

7.10 Conclusion

The financial manager is sometimes involved in corporate restructuring activities, which involve the expansion and contraction of the firm's operations or changes in its asset or financial (ownership) structure. Included among corporate restructuring activities are mergers and acquisitions. A variety of motives, such as synergy, increasing managerial skill or technology, and defence against takeover, could drive a firm toward a merger, but the overriding goal should be maximisation of the owner's wealth. Merger transactions are heavily debt-financed leveraged buyouts (LBO's). In other cases, firms attempt to improve value of divesting themselves of certain operating units that are believed to constrain the firm's value, particularly when the break-up value is believed to be greater than the firm's current value. Regardless of whether the firm makes a cash purchase or used market values or EPS to acquire another firm, the analysis should centre on making sure that the risk-adjusted net present value of the transaction is positive.

Caselet (Mini case study)

Study the article below and answer the questions that follow:

Drug firm Adcock stays in SA hands

Johannesburg - Chile's CFR Pharmaceuticals said on Friday it would drop its $1.2bn bid for drugmaker Adcock Ingram **[JSE:AIP]** after being thwarted by Adcock's top shareholder.

"Shareholders are advised that Adcock Ingram and CFR have consulted and are of the common view that there is no prospect that the special resolutions to approve the scheme of arrangement proposed between the company and the holders of Adcock Ingram ordinary shares in relation to the offer from CFR will be approved by the necessary 75% majority," the firms announced in a joint statement.

CFR had offered R12.8bn for South Africa's second-largest drugmaker in a bid that required approval from shareholders with 75% of Adcock.

Adcock shareholder Bidvest Holdings, which has opposed CFR because it wants to take control of the company, recently raised its stake to 34.5%.

Adcock and CFR said there is no prospect the deal could be approved by the required 75%.

An analyst told Reuters last week that CFR Pharmaceuticals can either walk away or go hostile in a bid to take over Adcock after Bidvest raised its stake in the drugmaker.

"The CFR bid is not going to get approval. It has two options: walk away or go hostile," said Alec Abraham at Afrifocus Securities.

"But if CFR goes hostile, it would be difficult for it to bed down the deal and get synergies out when working with a hostile shareholder. So my guess is CFR will walk away."

http://www.fin24.com. Date accessed 07/02/2014.

Required:

1.1 Calculate the total number of shares to be acquired by CFR based on Adcock's market value of R70 per share. **(4)**

1.2 Assume CFR shares are currently trading at $65.60 per share. Determine the exchange ratio based on market values for the proposed acquisition.

(Assume $1 = R10.67) **(4)**

1.3 Recently Bidvest Holdings raised its stake to 34.5% in Adcock. Calculate the number of shares held by Bidvest Holdings in Adcock. **(3)**

1.4 In light of the above article, discuss the potential gains for the offeror from the proposed acquisition. **(7)**

1.5 Evaluate whether Adcock should use the 'poison pill' tactic or the 'white knight' rescue as possible takeover defences against a hostile takeover. **(7)**

Editorial: Greek tragedy is a lesson for us in SA- Financial Mail

Tension is rising, to put it mildly, in the European Union and particularly in Greece as that country walks the precipice on whether to accept the terms of a restructuring of Greek debt offered by its main creditors. At the time of going to press on Tuesday, last-minute negotiations were still under way, with no clarity on whether a new, new deal will be accepted or not, and what that might mean for the proposed referendum on Sunday.

Should the terms be accepted by a majority in a referendum, the creditors will (most likely) continue to provide liquidity to Greek banks. However, Greece's charismatic new prime minister and leader of the left-wing Syriza party, Alexis Tsipras, has urged his countrymen to vote against the proposals, calling them an attempt to "humiliate" Greece. That, too, might change.

Tsipras called the referendum just last weekend, a step his big creditors, the International Monetary Fund, the European Central Bank and the European Commission, tried to persuade him not to take. If at midnight on June 30 Greece has failed to pay the IMF a tranche of payments worth €1,544bn, Greece will have officially defaulted on its debt.

The referendum call has been hailed as democracy in action by some influential opponents of the austerity regime imposed on Athens by its creditors for the past five years. Nobel economics prize winners Joseph Stiglitz and Paul Krugman have both written passionately in favour of Athens in its struggle with the "troika". Krugman urges Greeks to vote "No" on Sunday:

"To understand why I say this, you need to realise that most — not all, but most — of what you've heard about Greek profligacy and irresponsibility is false. Yes, the Greek government was spending beyond its means in the late 2000s. But since then it has repeatedly slashed spending and raised taxes. Government employment has fallen more than 25%, and pensions (which were indeed much too generous) have been cut sharply. If you add up all the austerity measures, they have been more than enough to eliminate the original deficit and turn it into a large surplus. So why didn't this happen? Because the Greek economy collapsed, largely as a result of those very austerity measures, dragging revenues down with it."

The eminent economist and author Lord Meghnad Desai has similarly urged Greece to exit the eurozone, and with its pride intact. By exiting, he argues, Greece regains sovereignty over its finances. It is a good story, though a frightening one at its start.

"Greece's exit," he wrote last week, "when it comes, should be on a note of regaining freedom and protecting the pensions of the most vulnerable. It is better to honour pension obligations owed to your citizens than to honour foreign creditors." Tsipras could not have put it better himself.

The problem, though, is that exiting the eurozone means a new and inevitably devalued currency, a hit to personal savings and inflation. Greece, like SA, is a big importer of life's necessities. An exit promises seven to 10 years of pain. Accepting the creditor terms, critics say, promises 35 years of grinding austerity.

The issue has split Greeks. While Tsipras sells Sunday's vote as a stand against more austerity, conservative and business opponents (along with the creditors) see it as a decision about whether or not Greece remains inside the European Union.

Tsipras was elected earlier this year on an anti-austerity ticket and has spent the past five months trying to honour his election promises. To turn his position into a more broadly anti-EU stand is disingenuous. It is quite possible to be an EU member and to retain your own currency, as the British have. Where the issue does widen beyond matters of money is the by now old question about whether it is possible to have an economic union without a political one.

The answer must surely be, by now, that it is not.

The story of the EU and its currency union begins just after World War 2, and the determination of French and German leaders and intellectuals never to go to war again. The machinery the two countries have built, by now, to ensure this has become a bureaucratic monster and deeply unpopular throughout Europe as countries surrender more and more of their sovereignty to EU headquarters in Brussels.

No-one, but no-one, knows what will happen whatever way the Greeks vote on Sunday — if they are called to vote at all. Greek banks have borrowed heavily from, and lent heavily to, parts of Eastern Europe. And there will be linkages, and contagions, should the country crash out of the euro (or Europe), that cannot be imagined until they physically appear.

The Greeks consider themselves deeply European and want to stay in, but their story is instructive. Perhaps it is the case that austerity works best in austere cultures. The Germans, after WW2 and after reunification, worked themselves out of deep holes.

SA can learn from this. We should not join clubs where we are not equals. We must be very careful with our money so that we never have to ask for help, not from the IMF and not from our new best friend, China. Not from anyone.

We are lucky, here, in a way. We are in many ways conservative people. In the main, our conservatism means we are unlikely to do extremely rash things (despite the odd example to the contrary) with our money and that is our best guarantee that we remain a truly sovereign nation).

Source: ***http://www.financialmail.co.za/opinion/editorial/2015/07/02/editorial-greek-tragedy-is-a- lesson-for-us-in-sa***

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The Global Economic Crisis, The Great Depression of the XXI Century.

By Prof Michel Chossudovsky
Global Research, July 08, 2015

The following text is an excerpt of the Preface of The Global Economic Crisis. The Great Depression of the XXI Century, Montreal, Global Research, 2010.

In all major regions of the world, the economic recession is deep-seated, resulting in mass unemployment, the collapse of state social programs and the impoverishment of millions of people. The economic crisis is accompanied by a worldwide process of militarization, a "war without borders" led by the United States of America and its NATO allies. The conduct of the Pentagon's "long war" is intimately related to the restructuring of the global economy.

We are not dealing with a narrowly defined economic crisis or recession. The global financial architecture sustains strategic and national security objectives. In turn, the U.S.-NATO military agenda serves to endorse a powerful business elite which relentlessly overshadows and undermines the functions of civilian government.

This book takes the reader through the corridors of the Federal Reserve and the Council on Foreign Relations, behind closed doors at the Bank for International Settlements, into the plush corporate boardrooms on Wall Street where far-reaching financial transactions are routinely undertaken from computer terminals linked up to major stock markets, at the touch of a mouse button.

Each of the authors in this collection digs beneath the gilded surface to reveal a complex web of deceit and media distortion which serves to conceal the workings of the global economic system and its devastating impacts on people's lives. Our analysis focuses on the role of powerful economic and political actors in an environment wrought by corruption, financial manipulation and fraud.

Despite the diversity of viewpoints and perspectives presented within this volume, all of the contributors ultimately come to the same conclusion: humanity is at the crossroads of the most serious economic and social crisis in modern history.

The meltdown of financial markets in 2008-2009 was the result of institutionalized fraud and financial manipulation. The "bank bailouts" were implemented on the instructions of Wall Street, leading to the largest transfer of money wealth in recorded history, while simultaneously creating an insurmountable public debt.

With the worldwide deterioration of living standards and plummeting consumer spending, the entire structure of international commodity trade is potentially in jeopardy. The payments system of money transactions is in disarray. Following the collapse of employment, the payment of wages is disrupted, which in turn triggers a downfall in expenditures on necessary consumer goods and services. This dramatic plunge in purchasing power backfires on the productive system, resulting in a string of layoffs, plant closures and bankruptcies. Exacerbated by the freeze on credit, the decline in consumer demand contributes to the demobilization of human and material resources.

This process of economic decline is cumulative. All categories of the labor force are affected. Payments of wages are no longer implemented, credit is disrupted and capital investments are at a standstill. Meanwhile, in Western countries, the "social safety net" inherited from the welfare state, which protects the unemployed during an economic downturn, is also in jeopardy.

The Myth of Economic Recovery

The existence of a "Great Depression" on the scale of the 1930s, while often acknowledged, is overshadowed by an unbending consensus: "The economy is on the road to recovery".

While there is talk of an economic renewal, Wall Street commentators have persistently and intentionally overlooked the fact that the financial meltdown is not simply composed of one bubble – the housing real estate bubble – which has already burst. In fact, the crisis has many bubbles, all of which dwarf the housing bubble burst of 2008.

Although there is no fundamental disagreement among mainstream analysts on the occurrence of an economic recovery, there is heated debate as to when it will occur, whether in the next quarter, or in the third quarter of next year, etc. Already in early 2010, the "recovery" of the U.S. economy had been predicted and confirmed through a carefully worded barrage of media disinformation. Meanwhile, the social plight of increased unemployment in America has been scrupulously camouflaged. Economists view bankruptcy as a microeconomic phenomenon.

The media reports on bankruptcies, while revealing local-level realities affecting one or more factories, fail to provide an overall picture of what is happening at the national and international levels. When all these simultaneous plant closures in towns and cities across the land are added together, a very different picture emerges: entire sectors of a national economy are closing down.

Public opinion continues to be misled as to the causes and consequences of the economic crisis, not to mention the policy solutions. People are led to believe that the economy has a logic of its own which depends on the free interplay of market forces, and that powerful financial actors, who pull the strings in the corporate boardrooms, could not, under any circumstances, have willfully influenced the course of economic events.

The relentless and fraudulent appropriation of wealth is upheld as an integral part of "the American dream", as a means to spreading the benefits of economic growth. As conveyed by Michael Hudson, the myth becomes entrenched that "without wealth at the top, there would be nothing to trickle down." Such flawed logic of the business cycle overshadows an understanding of the structural and historical origins of the global economic crisis.

Financial Fraud

Media disinformation largely serves the interests of a handful of global banks and institutional speculators which use their command over financial and commodity markets to amass vast amounts of money wealth. The corridors of the state are controlled by the corporate establishment including the speculators. Meanwhile, the "bank bailouts", presented to the public as a requisite for economic recovery, have facilitated and legitimized a further process of appropriation of wealth.

Vast amounts of money wealth are acquired through market manipulation. Often referred to as "deregulation", the financial apparatus has developed sophisticated instruments of outright manipulation and deceit. With inside information and foreknowledge, major financial actors, using the instruments of speculative trade, have the ability to fiddle and rig market movements to their advantage, precipitate the collapse of a competitor and wreak havoc in the economies of developing countries. These tools of manipulation have become an integral part of the financial architecture; they are embedded in the system.

The Failure of Mainstream Economics

The economics profession, particularly in the universities, rarely addresses the actual "real world" functioning of markets. Theoretical constructs centered on mathematical models serve to represent an abstract, fictional world in which individuals are equal. There is no theoretical distinction between workers, consumers or corporations, all of which are referred to as "individual traders". No single individual has the power or ability to influence the market, nor can there be any conflict between workers and capitalists within this abstract world.

By failing to examine the interplay of powerful economic actors in the "real life" economy, the processes of market rigging, financial manipulation and fraud are overlooked. The concentration and centralization of economic decision-making, the role of the financial elites, the economic thinks tanks, the corporate boardrooms: none of these issues are examined in the universities' economics programs. The theoretical construct is dysfunctional; it cannot be used to provide an understanding of the economic crisis.

Economic science is an ideological construct which serves to camouflage and justify the New World Order. A set of dogmatic postulates serves to uphold free market capitalism by denying the existence of social inequality and the profit-driven nature of the system is denied. The role of powerful economic actors and how these actors are able to influence the workings of financial and commodity markets is not a matter of concern for the discipline's theoreticians. The powers of market manipulation which serve to appropriate vast amounts of money wealth are rarely addressed. And when they are acknowledged, they are considered to belong to the realm of sociology or political science.

This means that the policy and institutional framework behind this global economic system, which has been shaped in the course of the last thirty years, is rarely analyzed by mainstream economists. It follows that economics as a discipline, with some exceptions, has not provided the analysis required to comprehend the economic crisis. In fact, its main free market postulates deny the existence of a crisis. The focus of neoclassical economics is on equilibrium, disequilibrium and "market correction" or "adjustment" through the market mechanism, as a means to putting the economy back "onto the path of self-sustained growth".

Poverty and Social Inequality

The global political economy is a system that enriches the very few at the expense of the vast majority. The global economic crisis has contributed to widening social inequalities both within and between countries. Under global capitalism, mounting poverty is not the result of a scarcity or a lack of human and material resources. Quite the opposite holds true: the economic depression is marked by a process of disengagement of human resources and physical capital. People's lives are destroyed. The economic crisis is deep-seated.The structures of social inequality have, quite deliberately, been reinforced, leading not only to a generalized process of impoverishment but also to the demise of the middle and upper middle income groups.

Middle class consumerism, on which this unruly model of capitalist development is based, is also threatened. Bankruptcies have hit several of the most vibrant sectors of the consumer economy. The middle classes in the West have, for several decades, been subjected to the erosion of their material wealth. While the middle class exists in theory, it is a class built and sustained by household debt.The wealthy rather than the middle class are rapidly becoming the consuming class, leading to the relentless growth of the luxury goods economy. Moreover, with the drying up of the middle class markets for manufactured goods, a central and decisive shift in the structure of economic growth has occurred. With the demise of the civilian economy, the development of America's war economy, supported by a whopping near-trillion dollar defense budget, has reached new heights. As stock markets tumble and the recession unfolds, the advanced weapons industries, the military and national security contractors and the up-and-coming mercenary companies (among others) have experienced a thriving and booming growth of their various activities.

War and the Economic Crisis

War is inextricably linked to the impoverishment of people at home and around the world. Militarization and the economic crisis are intimately related. The provision of essential goods and services to meet basic human needs has been replaced by a profit-driven "killing machine" in support of America's "Global War on Terror". The poor are made to fight the poor. Yet war enriches the upper class, which controls industry, the military, oil and banking. In a war economy, death is good for business, poverty is good for society, and power is good for politics. Western nations, particularly the United States, spend hundreds of billions of dollars a year to murder innocent people in far-away impoverished nations, while the people at home suffer the disparities of poverty, class, gender and racial divides.

An outright "economic war" resulting in unemployment, poverty and disease is carried out through the free market. People's lives are in a freefall and their purchasing power is destroyed. In a very real sense, the last twenty years of global "free market" economy have resulted, through poverty and social destitution, in the lives of millions of people.

Rather than addressing an impending social catastrophe, Western governments, which serve the interests of the economic elites, have installed a "Big Brother" police state, with a mandate to confront and repress all forms of opposition and social dissent.

The economic and social crisis has by no means reached its climax and entire countries, including Greece and Iceland, are at risk. One need only look at the escalation of the Middle East Central Asian war and the U.S.-NATO threats to China, Russia and Iran to witness how war and the economy are intimately related.

Michel Chossudovsky, Montreal, May 2010

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Table 1: Present value interest factor of R1 per period at i% for n periods, PVIFA(i,n).

Number of Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	25%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8547	0.8475	0.8403	0.8333	0.8000
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.7305	0.7182	0.7062	0.6944	0.6400
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407	0.6244	0.6086	0.5934	0.5787	0.5120
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.5337	0.5158	0.4987	0.4823	0.4096
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4561	0.4371	0.4190	0.4019	0.3277
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104	0.3898	0.3704	0.3521	0.3349	0.2621
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.3332	0.3139	0.2959	0.2791	0.2097
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269	0.3050	0.2848	0.2660	0.2487	0.2326	0.1678
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843	0.2630	0.2434	0.2255	0.2090	0.1938	0.1342
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267	0.2080	0.1911	0.1756	0.1615	0.1074
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1778	0.1619	0.1476	0.1346	0.0859
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685	0.1520	0.1372	0.1240	0.1122	0.0687
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452	0.1299	0.1163	0.1042	0.0935	0.0550
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252	0.1110	0.0985	0.0876	0.0779	0.0440
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229	0.1079	0.0949	0.0835	0.0736	0.0649	0.0352
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930	0.0811	0.0708	0.0618	0.0541	0.0281
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802	0.0693	0.0600	0.0520	0.0451	0.0225
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691	0.0592	0.0508	0.0437	0.0376	0.0180
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596	0.0506	0.0431	0.0367	0.0313	0.0144
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611	0.0514	0.0433	0.0365	0.0308	0.0261	0.0115
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245	0.0197	0.0160	0.0129	0.0105	0.0038
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0116	0.0090	0.0070	0.0054	0.0042	0.0012
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0019	0.0013	0.0010	0.0007	0.0001
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	0.0004	0.0003	0.0002	0.0001	*
60	0.5504	0.3048	0.1697	0.0951	0.0535	0.0303	0.0173	0.0099	0.0057	0.0033	0.0019	0.0011	0.0007	0.0004	0.0002	0.0001	0.0001	*	*	*	*

- The factor is zero to four decimal places

Table 2: Present value interest factor of an (ordinary) annuity of R1 per period at i% for n periods, PVIFA(i,n).

Number of Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8547	0.8475	0.8403	0.8333
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5852	1.5656	1.5465	1.5278
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.2096	2.1743	2.1399	2.1065
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.7432	2.6901	2.6386	2.5887
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743	3.1993	3.1272	3.0576	2.9906
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.5892	3.4976	3.4098	3.3255
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.7122	4.5638	4.4226	4.2883	4.1604	4.0386	3.9224	3.8115	3.7057	3.6046
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389	4.4873	4.3436	4.2072	4.0776	3.9544	3.8372
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6065	4.4506	4.3038	4.1633	4.0310
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188	4.8332	4.6586	4.4941	4.3389	4.1925
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286	4.8364	4.6560	4.4865	4.3271
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971	4.9884	4.7932	4.6105	4.4392
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423	5.1183	4.9095	4.7147	4.5327
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675	5.2293	5.0081	4.8023	4.6106
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5755	5.3242	5.0916	4.8759	4.6755
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542	5.6685	5.4053	5.1624	4.9377	4.7296
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472	5.7487	5.4746	5.2223	4.9897	4.7746
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280	5.8178	5.5339	5.2732	5.0333	4.8122
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775	5.5845	5.3162	5.0700	4.8435
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593	5.9288	5.6278	5.3527	5.1009	4.8696
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641	6.0971	5.7662	5.4669	5.1951	4.9476
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.6938	8.0552	7.4957	7.0027	6.5660	6.1772	5.8294	5.5168	5.2347	4.9789
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.9511	8.2438	7.6344	7.1050	6.6418	6.2335	5.8713	5.5482	5.2582	4.9966
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	9.0417	8.3045	7.6752	7.1327	6.6605	6.2463	5.8801	5.5541	5.2623	4.9995
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	9.0736	8.3240	7.6873	7.1401	6.6651	6.2402	5.8819	5.5553	5.2630	4.9999