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Factors Contributing To A Successful Secondary Corporate Bond Market In South Africa

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FACTORS CONTRIBUTING TO A SUCCESSFUL SECONDARY CORPORATE BOND MARKET IN SOUTH AFRICA

A RESEARCH REPORT PRESENTED TO

THE DEPARTMENT OF ACCOUNTING - FACULTY

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In Partial Fulfilment of

the Requirements for the Degree

Master of Commerce (by Coursework)

by

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ABSTRACT

The report examines factors that contribute to a successful secondary corporate bond market (also known as the debenture market in South Africa). These factors include the ability to trade in securities, and to buy and sell them with ease. A market that facilitates this, is one that is operationally and internally efficient. Both operational and external efficiency are analysed in the report. Operational efficiency implies the ability of investors and traders to move into and out of a market easily. An externally efficient market is one in which investors are able to obtain and analyse all relevant information easily and at a relatively low cost to arrive at a fair price.

The report also examines factors that have contributed to the growth of fixed income securities, as well as structural factors that have inhibited the debenture market in South Africa.

The impact of risk is also assessed to the extent that it affects the valuation process. This assessment is inter-linked with the analysis of external efficiency, and consideration is given as to how difficulties in the quantification of risk affect this.

Factors such as bond quality and rating systems which assist in the quantification of risk are reviewed. The impact of aspects such as coupon, maturity and the investment role and value of bonds is also examined.

DECLARATION

I declare that this research report is my own, unaided work, except where acknowledged. It is being submitted in partial fulfillment of the Degree of Master of Commerce (by Coursework) at the University of the Witwatersrand, Johannesburg. It has not previously been submitted for any degree or examination at any other University.

(Paul Howard Brock)

20 day of May 1988.

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CHAPTER 1

INTRODUCTION

In many foreign countries, markets in corporate bonds are well developed. The most developed of these is that of the United States which has a large and successful corporate bond market, both in terms of volumes of trading and in terms of the large number of bond issues which are listed. At the end of 1978 there were 2 985 bond issues listed on the New York Stock Exchange with a par value of $509 billion and a market value of $465 billion (Reilly, F. - 1981 - pg.139). This has grown significantly and by the end of 1984 the market value of corporate bonds listed on the New York Stock Exchange was in excess of $1 trillion dollars, with approximately 3750 issues listed (Fabozzi, F.J., Sauvian H.C., Wilson, R.S. and Ritchie, J.C. - 1987 - pg.261). Trade in these issues is significant and in 1978, on an average day, in excess of 1000 issues traded with volumes in excess of $30 million (Reilly, F. - 1981 - pg.139). These statistics indicate that the U.S. markets are successful and well traded. In addition, a substantial number of issues are traded in the Over the Counter market for which statistics are not available. The large number of issues suggests that the primary market is also well developed and that suitable issues can in most circumstances raise appreciable amounts of finance. For the above reasons this report will focus largely on the structure and characteristics of the United States corporate bond markets.

Markets in all kinds of Fixed Income Securities have grown significantly over the past twenty years. The factors contributing to this are discussed in Chapter 2. It is however significant to note that the

major factors contributing to this growth include the rise in interest rates due to high inflation and less stable interest rate patterns which have as a result offered investors and traders more attractive returns. By taking advantage of market movements and by actively participating in these markets traders may make greatly increased returns. These trading activities have boosted volumes and made securities more marketable as a result of the greater flow of scrip.

The nature of securities has also changed over this period. Instruments have become more sophisticated and tailored to the issuers needs. The majority of tailored income securities bear varying interest rates based on specific points in a period of time. These securities are however not that common and are therefore not discussed in the report. Variable interest securities are another type of security issued in most markets, their returns fluctuating with specific variables. These instruments are not well traded due to difficulties discussed in later sections of the report.

In South Africa the major growth in the fixed income securities market has been in the public sector, where scrip issued by the government and public authorities has increased substantially. In addition, trading activity has substantially increased, partly as a result of the removal of structural factors and the increased sophistication of the participants. Higher and more volatile interest rates have also contributed to this market's growth.

While there has been considerable growth in the public sector or gilt market in South Africa the corporate bond market or debenture market (as

it is known) has not grown significantly. This market sector trades together with equities on the JSE and just over 130 issues are listed, with 69 different issuers. These issues are thinly traded, and few individual transactions occur. In 1987 the total value of activity was just over R100 million representing about 1% of the total par value of securities in issue (see Appendix I). These securities unlike those of the government and public authorities, are not prescribed investments. Institutional investors such as pension funds and life insurance companies are therefore not required to hold them. The impact of these restrictions on the corporate and government sectors is discussed in a later section of the report, where the impact of these differences on the tradeability of corporate bonds is reviewed.

In South Africa there is no rating system for Corporate Bonds Sophisticated systems of rating exist in the United States and several other countries which provide investors and analysts with useful information that assists in the assessment of an issue's risk. As later chapters indicate, risk is an important factor in the determination of bond yields and as a result, credit risk will have an affect on these yields. Information on these yields may therefore assist investors in the valuation process. The importance of this for the success of a market in corporate bonds is examined in a later chapter.

The prescribed asset requirements and the non-existence of a credit rating system are only a few of the factors considered in assessing the restrictions that inhibit trade in the corporate bond market. Additional factors, including those analysed in Chapter 4, assess the criteria necessary for a successful market. In that section, operational efficiency and external efficiency are considered. The

research will analyse the nature of operational and internal efficiency and examine the factors absent in the South African debenture market that may result in operational and internal inefficiencies. These factors include lack of trade and inadequate marketability of securities. The factors causing lack of trade and inadequate marketability include those restricting participation in the market. Factors that inhibit the internal efficiency of the markets, are also considered. These include information that assists in the fair pricing of securities and the lack of information which may inhibit the pricing process. The absence of a credit rating system is considered in relation to this. In Chapter 3 of the report it is suggested that a credit rating system does not supply new original information, although such a service does analyse the information in a way that would otherwise be difficult and costly. This argument is further developed in Chapter 4 and is applied in analysing the factors contributing to a successful market.

The report finally examines other factors that could inhibit the success of the debenture market in South Africa. These factors include market size, legal restrictions and lack of sophisticated participants. These factors may not, in themselves, inhibit this markets success but may be contributing factors. The removal of these and other restrictions, together with the implementation of strategies that could assist in improving the markets efficiency resulting in a more successful bond market is assessed.

The impact of the factors identified above will be analysed in the report as to their possible effects, and in the concluding chapter of the report the combined effects of all these factors will be discussed.

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Fabozzi, F.J., Sauvion, H.C., Wilson, R.S. "Corporate Bonds" in (eds) Fabozzi, F.J. and Ritchie Jr., J.C. and Pollack, I.M. "The Handbook of Fixed Income Securities" Second Edition, Dow-Jones - Irwin, 1987.

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CHAPTER 2

THE INVESTMENT RATE OF BONDS AND BOND MARKETS

This chapter investigates several basic aspects of fixed income securities that are developed upon in the later chapters of the report. These aspects include a brief history of fixed income securities, analysing the factors that have contributed to the growth of these markets throughout the world. This growth, as discussed in a later section, is largely a result of the impressive returns offered by fixed income securities. These aspects are developed on in Chapter 4, where the factors contributing to the success of corporate bond markets and in particular those in South Africa, is considered.

The nature of fixed income securities is also discussed in this section of the report, where the instruments are separated into several broad categories. The most significant of these distinctions is between long and short dated securities, as these trade in separate markets. Another important distinction is that between the corporate or private sector and public sector. Corporate bonds in the private sector are not rated. The absence of rating services is an aspect that distinguishes the South African market from overseas markets such as the United States. The significance of rating services is dealt with in Chapter 3, but is introduced and explained in this chapter. In reviewing the nature of these rating services the meaning of particular ratings is considered and the manner of their rating is analysed.

In Chapter 3 and 4, factors such as risk and marketability are considered, to the extent that they affect bond values. However, these

chapters do not consider the impact of bond terms and structure. This chapter therefore considers these aspects of the bond pricing process which factors include coupon rates and maturity. The size of the coupon and period to maturity will affect the sensitivity of bond prices to changes in interest rates. The exact impact is discussed in a later section of this chapter.

2.1 The Investment Value and Role of Bonds

Bonds form part of a very broad category of financial security, namely fixed income securities. Fixed income securities, by definition, offer investors a fixed amount of income, based on the coupon rate offered. In this pure form, these instruments are debt of the company. However, there are several variations on these instruments. One of the most common and widely used in South Africa is the convertible bond or debenture. These instruments are attractive as they offer investors a combination of fixed income and an opportunity to share in the future growth of the company. They are in fact more like an equity as they ultimately offer more than fixed income. As convertible debentures trade like equities they form part of the equity market as opposed to the fixed income securities market and are therefore outside the ambit of this paper.

As indicated above, fixed income securities offer investors a specific amount of income for holding the security through the interest payment dates. In addition they may provide investors with capital gains as a result of changes in their value. The coupon of these instruments is fixed and as a result changes in the market level of interest rates will result in changes in the value. For example, a decline in interest

rates would result in a yield above that of the market. This would cause the security price to rise in order to reflect the market yield. The reverse would be true in a situation where interest rates in the market fall (see Table 2.1). This table ignores factors such as maturity and coupon levels, which effects are explained in a later part of the chapter.

TABLE 2.1 THE INVERSE RELATIONSHIP OF INTEREST RATES

E.G. A fixed income security with an issue price of R100 and a coupon of R15 p.a.

1. Market Interest Rates of 15% = Yield on Security R15
   Therefore Market Value = R100
   as 15/100 = 15%
2. Market Interest Rates decline to 10% = Yield in Security R15
   Therefore Market Value = R150
   as 15/150 = 10%
3. Market Interest Rates rise to 20% = Yield in Security R15
   Therefore Market Value = R75
   as 15/75 = 20%

Therefore these fixed income securities which may offer investors a very stable return, having lower risk profiles than equities can through aggressive trading strategies provide higher returns. Trading in these securities together with the employment of sound hedging strategies (not discussed in this paper) can result in attractive capital gains where yields and consequently prices fluctuate. These strategies, while

generating substantially higher returns to investors, will also expose them to greater risk as capital losses could occur.

2.2 The History and Growth of Bonds

The appeal of fixed income securities has increased substantially in the U.S. since the late 1960's. This is largely a result of the rise in interest rates with these rates fluctuating widely, providing investors with attractive capital gains opportunities (Joehnk, M.D. - 1983 - pg.3).

In Chapter 4 it is noted that the growth of the S.A. gilt and semi-gilt market since the middle of the 1970's is, in part, attributable to these factors. This, together with the prescribed asset requirements laid down for South African institutions has contributed to this growth. These requirements, which are discussed in greater depth in later chapters, stipulate that specific categorised investments must be held by institutions. In South Africa these include gilts and semi-gilt stocks and differ from the U.S.A. where institutions must hold investments of specific qualities.

The effect of interest rates on returns on fixed income securities versus equities is highlighted by the research of several U.S. studies. Fisher and Lorie, in their study of equity returns over the period 1926-65, found these returns to average 9,3% p.a. (Fisher and Lorie - July 1968). The returns are far in excess of those generated by bonds, as shown by the study of Hickman, who showed an annual return on bonds of about 5,6% between 1900 and 1943 (Hickman - 1958). These returns are high in comparison with the 3,5% suggested by Fisher and Weil as the

average bond return between 1926 and 1968 (Fisher and Wei' - October 1971). This contrasts sharply with the findings of researchers since 1968. Ibbotson and Sinquefield suggest that between 1969 and 1980 the comparative annual returns on fixed income securities have been superior to equities (Ibbotson and Sinquefield - 1981). This change in performance has suggested that fixed income securities are now far more attractive than before. Aggressive portfolio management, together with higher interest rates and the use of hedging strategies has enabled investors to earn more attractive returns, than they could through simple buy and hold strategies.

The bond market in the U.S. and more recently in South Africa has grown as a result of the above factors. However, there are several other important factors that should be considered, which are as necessary to assist in a market's growth. Market size is one of these important factors that is dealt with in Chapter 5. The rating of instruments and the ability to quantify risk, as well as the informational and operational efficiency of the market, is also important. These aspects, which also contribute to the market's success, are discussed in depth in Chapters 3 and 4, while the quality rating systems are discussed in a later section of this chapter.

However, before discussing the quality rating systems employed in markets such as the United States, it is necessary to examine the various categories and types of fixed income securities available.

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However, before discussing the quality rating systems employed in markets such as the United States, it is necessary to examine the various categories and types of fixed income securities available.

2.3 Categories and Types of Fixed Income Securities

Fixed income securities can be divided into two broad categories namely, money market and capital market instruments. The money market is a short-term market and instruments with maturities of less than one year (usually) trade in this market. The distinction is not necessarily this clear and as discussed in Chapter 4, securities with up to three years to maturity may in some circumstances trade in this market. This distinction between the money and capital markets often arises in South Africa as a result of liquid asset requirements for banks and other financial institutions. These liquid assets are specified by the South African Reserve Bank which categorises certain short dated securities and long dated securities nearing maturity as liquid assets for the purpose of these requirements. While corporate bonds or debentures that near maturity may trade in the money market, those of longer maturities will trade in the capital market. The vast majority of debentures, at a particular point in time, have maturities of longer than one year and the report will therefore not deal with the problems of trading debentures in the money market.

The short-term securities that are more generally traded include negotiable certificates of deposit, bankers acceptances and treasury bills. These instruments are issued and purchased by banks in order to obtain short-term funds for themselves and their borrowers, as well as to invest excess liquid funds held by them for short periods of time. The money market in South Africa is fairly active but is substantially smaller and narrower than the capital market. The capital market comprises both the equity and bond markets, with the public debt component referred to as the gilt market, comprising the largest

component. (This is discussed in more detail in Chapter 4).

In South Africa the bond market is not as well structured as the U.S. markets. In Chapter 4 of the report, it is shown that the South African market is dominated by public authorities who trade in the gilts market while the corporate sector is much smaller and is very poorly traded. Due to this sectors "insignificance", trade takes place on the same floor as equities in contrast to gilts which are traded separately.

In the United States, bond markets are more structured and can be broken into five distinct categories. These markets are not dominated by the government although the government is a large player in these markets. In 1978 the largest borrower in this market was the private sector. Corporations sector raised over $68 billion in this year with the government raising over $38 billion in borrowings (Fabozzi,F.J. and Groppelli, A.A. - 1981 - pg.6). In contrast in South Africa the borrowings are dominated by the government. (This will be more evident in the discussion in Chapter 4).

The United States bond market's five distinct categories include the governmental sector which includes the U.S. treasury and municipal sectors. The non-government sector is the corporate sector which includes industrials, public utilities, rail and transportation and financial issues. These individual issues themselves range in quality which is the focus of discussion in the following section.

2.4 The Quality of Bonds

This section deals with the rating of bonds according to their risk of

default. The quality rating that an issue is given is an indication of the issue's exposure to default risk, or the probability of the company to meet its obligations in terms of issue conditions. Bonds in South Africa are not rated in terms of such a system, although the issues of public authorities are categorised according to the issuers apparent quality (see Table 4.1 in Chapter 4).

The U.S. is the leader in the rating of bonds and has a well-developed system for rating these instruments. In the United States there are two major investor services that rate bonds. These services are Moody's rating services and Standard and Poor's rating services. The way in which these services rate bonds and the basis of ratings afforded are discussed in the next section of the Chapter. These are important as their significance is developed in the remaining chapters of this report.

Although the chapter and report focuses only on the U.S. rating services, these services exist in other countries. In Japan, rating services include Mikuni's rating service and in Canada Dominion rating services (Euromoney Corporate Finance Supplement - March 1987).

The key factors that determine bond quality are based on the findings of research by Lawrence Fisher. Fisher identified earnings variability of the firm, the length of time the company was solvent, its debt/equity ratio and the marketability of the issue as key factors (Fisher, L. - June 1959). These factors identified by Fisher are those applied in the ratings of bonds and are discussed below. However, before examining the basis upon which companies are rated it is necessary to review the

various rating categories.

2.5 Bond Ratings

This section focuses on the ratings of Moody's and Standard and Poor's investor services. These quality ratings range from the low risk bonds issued by stable financially sound companies, to high risk, poorly rated, bonds issued by companies that are financially risky.

The quality ratings together with a description of each is shown in the table below.

TABLE 2.2 - QUALITY RATINGS BY INVESTMENT AGENCIES

S & P	MOODY'S	DESCRIPTION
INVESTMENT QUALITY		
AAA	Aaa	These are the highest rated bonds. Capacity to pay interest and repay capital is strong.
AA	Aa	These bonds are high grade obligations. They only differ from AAA (Aaa) to a small degree.
A	A	These bonds are upper medium grade. They have a strong capacity to pay principal and interest, although they are somewhat more susceptible to adverse effects of changes in circumstances and economic conditions.
BBB	Baa	These bonds are regarded as having adequate capacity to pay interest and repay principal. Adverse economic conditions are likely to lead to weakened capacity to make these payments. This is the borderline between sound obligations and those where the speculative element predominates.
SPECULATIVE QUALITY		
BB	Ba	These bonds are regarded as lower medium grade and have only minor investment characteristics. Charges are earned by a fair margin but in poor economic periods deficit operations are possible.

B	B	These bonds are speculative. Payment of interest cannot be assured under difficult conditions.
CCC-CC	Caa-Ca	These bonds are outright speculations, with the payment of interest questionable in poor trade.
C	C	This is reserved for income bonds, no interest is paid.
DDD-D	None	These bonds are in default and interest is in arrears.

Source : Standard & Poor's Bond Guide - 1982
Stern, Stewart & Putnam & Macklis Ltd - Corporate Finance Guide - June 1979

The table indicates how bonds are rated and will be used in discussions of bond quality and yields in this and later chapters. The rating given to a bond issue is a reflection of its quality and will affect its yield, as the rating is an indication of the level of default risk to which an issue is exposed. For example AAA (Aaa) bonds have the lowest exposure to default risk and would therefore have the lowest premium above government bonds, while bonds with ratings of BBB (Baa) would carry higher exposure to default risk and therefore trade at a higher yield above the risk free rate.

In order to understand how bond quality is determined, it is necessary to examine the factors that are used to establish these bond ratings.

2.6 The Determination of Bond Ratings

In reviewing the factors considered in the bond rating process it is important to understand the underlying concepts, as this will provide a better understanding of the risks that a rating reflects, as ratings no longer indicate only the ability to pay interest and repay capital. Thus while bond analysis was previously only concerned with the risk of not receiving interest and capital repayments there is now another

dimension to its analysis. This second dimension focuses on the risk of changes in quality as a result of changes in credit risk. Where a deviation in credit risk occurs and bonds are down-rated, this would result in an increase in the yield and a fall in bond prices (Howe, J.T. - 1983 - pg.345).

The need for this second dimension of credit analysis arises as a result of an increasing number of investors who actively trade in securities for the purpose of making profits through yield changes. Credit analysis was previously only concerned with default and non-payment of interest and capital. This study then focused on straight ratio analysis. The need for a broader form of analysis arose which dealt with ratios and profitability trends such as return on equity, operating margins and asset turnover, previously associated only with equities (Howe, J.T. - 1983 - pg.345).

The factors to be considered in bond analysis should therefore include the following. Pre-tax interest coverage, leverage, cash flow, net assets, age and condition of plant and working capital, which represent the traditional components of ratio analysis. The second dimension of analysis should focus on return on equity and its components as well as other non-financial aspects. These ratios and their significance are discussed below individually.

The first ratios analysed compare the level of earnings with interest charges. This fixed charge coverage ratio is calculated by dividing pre-tax income plus interest by the total interest charge. Where the ratio is less than one the company would need to borrow or dispose of

assets to meet obligations.

The second ratio analysed is the leverage ratio, which can be defined as the long-term debt to the total capital of the company. These should also however take short-term debt into account as this must also be refinanced. Bond analysts should therefore take cognisance of this and in addition to any other off-balance sheet obligations such as leases.

Cash flow as a percentage of total debt is a further ratio that analysts should calculate. This ratio focuses on the total cash flow from operations, to the total debt, in assessing the company's ability to repay debt.

A further significant ratio that should be analysed is the net assets (or equity) of the company to the total debt. Consideration in this analysis is given to market values of net assets. For example, assets with book values that are in excess of market or liquidation values should be adjusted downwards as this will provide a more meaningful indication of the company's ability to meet debt obligations.

Working capital is the final important variable that should be considered in this process. Working capital which is the current assets less current liabilities is considered the primary test of a company's financial flexibility. This provides an indication of the company's ability to weather an economic downturn, as these components can usually be liquidated easily to provide the necessary liquidity in the event of such a downturn (Cohen, Zinbarg & Zeikel - 1987 - pg. 416 and Howe, J.T. - 1983 - pg.349-353).

The factors identified above are the basic ratios that provide analysts and ultimately investors with an indication of the company's ability to meet interest and capital repayments and is the traditional component of rating analysis.

The second category of analysis includes analysis of the components of return on equity which are used to analyse corporate performance and the company's ability to maintain its existing quality rating. In examining these components the analyst should examine them for a period of at least five years in order to assess the progression of each variable. These should be analysed through the business cycle and in relation to the industry (Howe, J.T. - 1983 - pg.354).

The four basic components of return on equity include the pre-tax margins, asset turnover, leverage and tax rate. The manner in which these ratios interact to provide the return on equity is shown in Table 2.3 (Cohen, J.B., Zinbarg, E.D. and Zeikel, 1987, pg.395).

TABLE 2.3 BREAKDOWN OF RETURN ON EQUITY

$$\frac{\text{Pre-tax income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \times 1 - \text{Tax Rate}$$

or

Operating margin x Asset Turnover x Leverage x Tax Effect.

Analysis of these components against industry standards and through economic recession may highlight difficulties that a company may

experience. These could lead to a deviation in its credit risk and a down-rating of its bonds in the future as poor operating margins may, for example, result in reduced fixed charge coverage ratios and an apparent difficulty in meeting fixed obligations such as interest.

Non-financial factors should also be considered in this analysis. These should include any security or protection bondholders are afforded, as well as factors such as foreign exposure, market share and the company's size, which may not be reflected in the ratio analysis performed, but may have an effect on future performance and the ability to meet obligations.

In conclusion, the rating of bonds is therefore based on a number of broad categories of ratio. In certain industries ratios other than the above may be applicable and may be used. However, the application and analysis of these ratios is subjective and judgemental, and numerous qualitative factors also need to be taken into consideration.

A rating service will assist in the valuation process by attempting to quantify these judgemental factors and will greatly contribute to this process. This is discussed in more detail in Chapter 3.

2.7 The Impact of Bond Terms and Structure on Pricing

In Chapter 3 the report deals with the major determinants of bond prices. These determinants are the various components of risk, which together with interest rate levels dominate the valuation process. Before dealing with these factors and the way in which they influence bond prices it is necessary to examine the terms and structure of a

particular issue. The most important of these factors are the coupon rate and the maturity date of the particular issue.

2.7.1 Coupon Rates

The size of the coupon will affect the movement of bond prices as a result of changes in interest rates. An issue with a low coupon rate would be more sensitive to changes in market interest rates, as compared with an issue with a high coupon rate. This is fairly logical as the impact of an interest rate movement of 1% on a bond with a 5% coupon would be more significant, than a 1% movement in the yield of a bond with a 10% coupon. For example, a bond with a maturity of twenty years, a coupon of 10%, trading at a yield of 9%, will experience a move in price from R109,20 to R132,03 if the yield were to drop by 2%. This represents a 20,91% movement in the securities yield. If the coupon were 5% and the bond was trading on a 9% yield with a maturity of twenty years, the bond price would be R63,20. If the yield was to fall by 2% this would cause the price to increase to R78,64. This would represent a 24,43% movement in the bond's price (Fabozzi, F.J. - 1983 - pg.83). This would indicate that bonds with low coupons are more sensitive to changes in bond yields than those with higher coupons.

Maturity

The time to maturity of a particular issue will also have an impact on the bond prices. Assuming all other factors remain constant, bond price volatility will increase, the longer the term to maturity. Therefore where interest rates are expected to increase, the yields on long-term bonds would decrease by a greater percentage as compared to short-term bond. This is logical, as the longer the term to maturity, the more

significant would be the impact on the yield to maturity of a change in market interest rates. This is illustrated with a bond of R100 with a 9% coupon selling at par. If the years to maturity are 5, then a percentage decline in yield of 2% would result in a rise in the bond price to R108,32. Similarly, if the years to maturity were 10, the price would increase to R114,21. These represent an 8,32% and 14,21% increase respectively. In the event of a rise in interest rates the reverse would be true with the bond with 10 years to maturity having the most significant price decline (Fabozzi - 1983 - pg.86). It is therefore advisable for investors to hold stocks with long maturities in times of declining interest rates and stocks with short periods to maturity in periods of rising interest rates.

2.8 Conclusion

This chapter has introduced the role of bonds, and their attraction as instruments for investment. The attraction has grown substantially over the last twenty years, largely as a result of higher and more volatile interest rates. These rates, together with sophisticated hedging strategies, have enabled investors to generate more significant returns.

The change in the methods of investment from a buy and hold strategy to a one of more active trading has also resulted in a change in the bond rating systems. Previously, these systems focused only on the ability of the company to meet obligations of interest payments and capital repayments. This has however changed and a second dimension is now introduced. This dimension looks at the probability of the companies bonds being down-rated. The down-rating of a bond issue would result in its trading on a higher yield, as a higher level of credit risk would be

attributed to the issue. This aspect is of significance to traders concerned with generating a return both from the bond's interest income and capital gains.

The chapter finally focused on the factors impacting bond prices, that are structurally inherent in all bonds. These include maturity and coupon rates, both of which are important to understanding bond price movements. The length of a bond's period to maturity affects the sensitivity of yields. The longer the period to maturity the more sensitive are bond prices. Similarly, bonds with lower coupons are more sensitive to yield changes as compared with higher coupon bonds. This is of significance to traders who may depend on their perception of future interest rate movements in selecting particular securities to take advantage of these effects.

Various other factors need to be considered by investors in selecting a bond portfolio. However, the most important factor is the ability to trade their securities at fair prices in the market. The following chapters therefore focus on the various aspects that may impact and inhibit trade. In Chapter 3 the research will focus on yields and the impact of changes in risk on these. The importance of a credit rating system and its effect on the bond valuation process is also considered, as well as factors that inhibit or facilitate the operational efficiency of the market. These factors are considered in Chapter 4. In Chapter 5 of the report, analysis of structural factors such as the prescribed asset requirements and market size are discussed.

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CHAPTER 3

THE IMPORTANCE OF RISK IN THE VALUATION OF CORPORATE BONDS

This chapter discusses the importance of risk in the determination of bond values. Analysis of research indicates that the ability to quantify risk is important in the valuation process and difficulties experienced in valuing bonds could make them unattractive, thereby inhibiting the functioning of the corporate bond market.

The chapter therefore focuses on the components of risk that affect bonds and places particular emphasis on the components that affect corporate bonds. In the analysis of risk we will show that it is broken into categories of systematic and unsystematic risk. Each of these categories can then be further broken down into several sub-categories.

Systematic risk and unsystematic risk are analysed into their risk sub-categories. The manner in which these risk categories affect the value of bonds is also discussed and distinguished. For example, unsystematic risks such as default risk (or risk of failure to meet commitments) and marketability risk cause changes in bond spreads and are therefore important in the valuation of specific bond issues at any given time. These risks and their impact on bond values are therefore analysed to assess their importance in the valuation process.

Default risk is identified as a key risk in the valuation process, and bond premiums vary significantly as a result of variations in the level of this risk. This risk is, however, difficult to quantify without a suitable measure or rating system. The chapter shows how quality

ratings will greatly assist in this process. These quality ratings were reviewed in the previous chapter and this chapter develops on the research of the previous chapter.

In this chapter we will find that credit ratings in the United States have a significant impact on the values of bonds and are accurate indicators of the credit or default risk to which bonds are exposed. It is suggested that a market without this information will be inhibited by this lack, which will make the valuation process more difficult. The importance of this information in the creation of a successful market is discussed in Chapter 4.

3.1 Capital Market Theory

The basic premise underlying capital market theory is that in most circumstances a positive relationship exists between risk and return (see Fig 3.1). Therefore (as explained by Fisher) the price of bonds will vary inversely with risk, while yields on bonds vary directly with risk (Saldofsky and Miller - 1969).

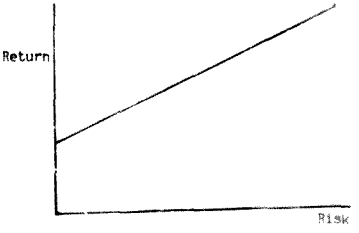


Fig 3.1

Source: An introduction to Fixed Income Securities
Michael D. Joehnk 1983 - pg.11.

Risk is therefore important in understanding the yields on capital market instruments, with increases in risk resulting in increases in yields. Understanding the various risk components is important in explaining the yields on particular instruments, as certain risks have a more significant effect on particular categories of securities, as comared with others. For example interest rate risk has a greater impact on government bond yields than on corporate bond yields, while default risk affects low-grade corporate bonds more significantly.

3.2 Risk Categorisation

Sharpe divides risk into two major categories - systematic and unsystematic risk (Sharpe, Investments - 2nd edition). Systematic risk is the risk affecting all securities, while unsystematic risk is that risk specific to a particular security. Both systematic and unsystematic risk can be further sub-divided into other risk components (Fischer and Jordan - 1987 - pg.116).

Before examining the various components of risk it is important to understand its concept. Fischer and Jordan define risk as the possibility that returns that are realised will be less than those expected. The failure to realise expected returns can be a result of external influences which are not controlled by the firm and internal factors which are more controllable by the firm. These external factors are broad in their effect and are the systematic sources of risk, while those that are controllable are narrower and peculiar to the particular industry and firm. These latter forces are referred to as risks of an unsystematic nature (Fischer and Jordan - 1987 - pg.120).

Systematic risk is therefore the risk that impacts all securities to various degrees, regardless of their specific nature and features. This would include all fixed income securities such as government bonds (Gilts), corporate bonds, preference shares as well as ordinary shares. Sources of this risk component are economic, political and sociological factors. For example global recession is an economic risk which will result in decline in prices of all securities, and thereby cause investors to show returns below those anticipated.

Sources of unsystematic risk (that unique to a particular firm or an industry) include the capability of management, consumer preferences (and changes in them) and labour strikes. These risks are generally independent of those which impact security markets in general.

As discussed previously the extent to which systematic and unsystematic risk affects a particular firm causes the value of its securities to vary. The magnitude of each component as part of the total risk is, in essence, a function of the company's nature and characteristics. For example, producers of durable goods are sensitive to fluctuations in the economy and therefore economic risk. These companies therefore have a greater component of systematic risk, as opposed to a non-durable food producer or utility such as an electrical company which will be more sensitive to unsystematic factors (Fischer and Jordan - 1987 - pg.121). This is logical, as a producer of durable goods, such as a furniture producer, will show better returns during an economic upturn. Factors such as management competence are less important. A food producer is, however, more stable and will be less sensitive to economic cycles and as a result management competence and labour force stability will be

more important.

Before examining how the various risk types affect particular classes of bond and particular issues, it is necessary to review their various components.

3.2.1 Systematic Risk

Systematic risk can be broken down into three basic components. These include interest rate risk, purchasing power risk and market risk (Cohen, Zinbarg and Zeikel - 1987 - pg.9).

(a) Interest Rate Risk

Interest rate risk is probably the most important of all as it impacts all securities, with the possible exception of the highly speculative issues ("junk" issues) whose value is virtually totally dominated by unsystematic factors.

Interest rate risk can be defined as the variability in bond returns as a result of changes in the general level of interest rates (Joehnk, M.D. - 1983 - pg.12). This refers to fluctuations in the value of these fixed income securities as a result of changes in the level of interest rates. Interest rate movements are a very powerful force affecting the value of bonds and it is important to understand the causes of interest rate risk. In very simple terms, interest rate movements are caused by changes in demand and supply. These come about largely as a result of the actions of the Central bank (Reserve Bank in South Africa) who use interest rates as a tool in their monetary policy objectives. The role of monetary policy is to smooth money supply growth, so as to assist in

the growth of the economy, while maintaining inflation at acceptable levels. In addition, the policies adopted are also used to ensure a smooth day to day operation of the financial markets (The South African Reserve Bank - 1986 - pg.39).

The policies used by the S.A. Reserve Bank and many other major central banks are market orientated policies and therefore often have significant impact on interest rates. The mechanisms applied include accommodation, where the Reserve Bank accommodates the discount houses and banks when they experience the need for cash balances. These procedures include the rediscounting of land bank bills and other similar instruments, providing advances secured over government and semi-government stocks and through the purchase of these institution's securities, thereby providing them with the necessary funds. These accommodation procedures are intended to smooth the day to day operations of the financial markets and to carry out monetary policies. The impact of accommodation procedures on money supply and interest rates necessitates their linkage with open market operations as these operations, which involve the buying and selling of government securities, are also aimed at regulating money supply and interest rate patterns (The South African Reserve Bank - 1986 - pg.40).

In order to assess the level of interest rates at any particular time, it is important to understand the central bank's monetary policy as these policies will provide an indication of future interest rate movements.

A change in interest rates filters through from the public debt market

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A change in interest rates filters through from the public debt market

into other sectors of the market. These changes would initially be reflected in higher yields on long and short-term government securities such as Government bonds (RSA stock or gilts in South Africa) and Treasury Bonds (SA-Treasury bills). For example, a rise in rates on government bonds would make them more attractive. Funds would therefore flow into this sector of the market, to take advantage of the attractive yields. This would cause prices of corporate bonds to drop, as a result of funds being drawn out of their market and push up these yields making them more attractive. Similarly a flow of funds out of equity markets would be experienced, forcing prices down and yields up.

(b) Purchasing Power Risk

Closely linked to interest rate risk is purchasing power risk (i.e. inflation). This is linked to the purchasing power of amounts to be received, and is essentially the impact of inflation on the value and returns of an investment. Inflation will, over a period of time, impact yields, as the demand for investments at the current yield will decline, as the future purchasing power of that investment and its returns declines, in real terms, with increased inflationary expectations. In these circumstances, the prices of bonds would fall and the returns consequently improve, before investors would again be attracted to the investment. To the extent that inflation is expected it is already discounted in security prices. However the risk to which markets are exposed is the risk of changes in inflationary expectations or unexpected inflation. For example, were investors to readjust their expectations upwards, anticipating higher than previously expected inflation, yields would rise and security prices drop.

(c) Market Risk

Market risk is the final component of systematic risk, and is the risk of changes in future returns as a result of changes in investor expectations. These changes in expectations are brought about by factors defined in two broad categories. These include factors of either a tangible nature such as real economic forces and those of an intangible nature more closely related to market psychology (Fischer and Jordan - 1987 - pg.118).

The real forces which could cause a drop in security prices include interest rates, inflation and commodity prices (e.g. gold price) among others. Market risk is inter-linked with the other systematic risk factors discussed previously.

The intangible component of market risk is more closely related to investor reaction, and is often a consequence of changes in real economic forces. This occurrence is often apparent in a so-called over-reaction of market to changes in information. Such an over-reaction will see a large drop in security prices in apparent excess of the change in fundamentals that have initially caused prices to drop (as seen in World Stock Markets in 1987). This intangible component often appears unexplained, and is usually attributed to a panic over-reaction. This intangible component could be explained by the strength of information discounted in security prices. The weaker the information applied in the valuation of securities the more sensitive are these securities to changes in it and other real economic forces. Therefore, in periods of strong upward movements in security prices, information pushing prices higher and higher becomes weaker and

more brittle. Changes in real forces which cause prices to tumble have a magnifying effect on perceptions and therefore on security prices.

In essence purchasing power risk and interest rate risk are sub-categories of market risk, with changes in these forces having an impact on markets as a whole. Market risk is, however, attributed an additional intangible dimension - this dimension being the magnification of changes in real forces as a result of market levels being based on "brittle" information.

3.2.2 Unsystematic Risk

Unsystematic risk can be split into several categories. These categories include default risk, marketability risk and issue specific risks (Joehnk, M.D. - 1983 - pg.12). Unsystematic risk differs from systematic risk in the manner in which it is impounded in security prices. Systematic risks impact the variability of returns and changes in security prices, while unsystematic risks impact a security's price and do not alter the variability of returns. This is because the unsystematic risks such as default risk and marketability risk are attributable to factors inherent in the particular issue. As a result, these factors are discounted in the valuation process and cause bonds to trade at levels above the riskless rate. This margin is referred to as a premium or spread. The extent of any premium is fixed at a point in time and will only vary as a result of factors that increase or decrease the particular unsystematic risk. For example, the spread as a result of default risk will widen or narrow with the state of the economy, an economic upturn narrowing the spread and a downturn widening it.

(a) Marketability Risk

Marketability risk relates to the lack of tradeability of a particular security. Marketability was defined in the previous chapter and relates to the ability to buy and sell a particular security or class of security without causing a significant change in its returns. Where the particular security trades in a thin market and is therefore difficult to buy and sell, a greater level of marketability risk exists as individual transactions may have a significant impact on security prices (Darst - 1975 - pg.42). The effect of this would result in thinly traded bonds trading on a higher yield than well traded bonds. (This is discussed in more detail in the section of Chapter 4 dealing with operational efficiency).

(b) Issue Specific Risks

Specific factors relating to a particular issue may also impact the value of a security. By definition these risks are of an unsystematic nature and include reinvestment, call risk and price risk.

Reinvestment risk is the risk of returns on capital and interest that is reinvested at rates below those currently being earned. For example where an investment is made in a bond yielding 9%, it would be hoped that the investor would be able to reinvest the income at a rate of at least 9%. Reinvestment risk pertains to the variability of returns resulting in a lower reinvestment rate. This differs from interest rate risk as it relates to the reinvestment of income generated on these fixed income securities, and capital only on maturity. Therefore securities are not all affected to the same exent. Short-dated securities and those nearing maturity are more sensitive to reinvestment

risk, as both principal and interest would have to be reinvested in the near future. Securities with a high coupon, or high yielding bonds are also more exposed to reinvestment risk, as they yield greater proportions of income that must be invested at lower returns. Reinvestment returns are substantial and may (depending on the coupon and maturity) represent as much as half the total return on investment (Joehnk, M.D. - 1983 - pg.13). Level of reinvestment risks may therefore vary significantly between specific securities.

A call option may be provided in the issue terms of a particular bond issue. This option would provide the company issuing the bonds with the opportunity to redeem these bonds. The nature of the redemption may vary, from circumstances where the issuer has the right to recall all the bonds at any particular time, to those circumstances where the issuer may recall varying portions at certain points over a period of time. The investor is exposed to risk as the issuer may recall the bonds when market interest rates fall below the rate which is earned on the coupon. In these circumstances the issuer would find it cheaper to offer new debt at a more attractive rate of interest. Thus the investor holding an issue with a call option would be exposed to a greater risk than one holding an issue without, as a fall in rates and the consequent exercise of a call would result in a loss of interest with the investor being forced to reinvest at lower rates. Consequently the yield on a redeemable bond would be higher to compensate for this call risk.

A further category of issue specific risk is price risk. Price risk will vary in its level depending on the maturity dates of the issue and on the anticipated trend in interest rates. All issues of fixed income

securities are exposed to price risk because price risk is linked to movements in interest rates, the price varying with fluctuations in market rates. The level of variability is, however, affected by maturity. Bond prices will fluctuate more due to interest rate movements in the case of long dated stocks (as discussed in Chapter 2) as risk of loss is greatest in the case of long dated securities when interest rates are rising (Joehnk, M.D. - 1983 - pg.13). Long dated securities therefore enjoy a premium due to the greater downside loss when interest rates rise, in spite of the greater upside potential in the case of falling interest rates.

(c) Default Risk

The most significant and important unsystematic risk, is default risk. This risk component affects yields substantially and also impacts the price behaviour of the issue. Default risk is the risk of the issuer being unable to make interest payments and capital repayments. This risk is essentially that of a business failure and as a result is referred to as the issuers business risk.

(i) Business Risk

Business risk can be broken down into two components - financial risk and business operating risk. Business operating risk can be split into two basic components - internal business risk which is largely associated with the efficiency of the firm and external business risk which results from factors imposed externally that are outside the firms' control (Fischer and Jordan - 1987 - pg.12). The impact of both internal and external factors will result in changes in the business's profitability. As a result, the greater the chance of changes in the

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