

# The relationship between debt levels and total shareholder return of JSE-listed platinum companies

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## Remarks

The reader is reminded of the following:

- This mini-dissertation is presented in article format and in accordance with the policies of the North-West University's Faculty of Economic and Management Sciences' WorkWell Research Unit and consists of one research article.
- The article was submitted to the South African Business Review (refer to Annexure 1). The article was formatted according to the journal's author guidelines (refer Annexure 2).

## **ABSTRACT**

**TITLE:** The relationship between debt levels and total shareholder return of JSE-listed platinum companies

**KEYWORDS:** Debt levels, gearing, leverage, share prices, shareholder return, risk, platinum industry, market capitalisation

Investors make investment decisions based on their risk appetite. Furthermore, when such investors consider shares as part of their investment portfolio, these investors will consider the risk profile of the company it is interested in. By taking on a certain level of risk, shareholders expect to be commensurately compensated. Shareholders of companies with relatively higher debt levels in their capital structure and therefore higher financial risk, require a relatively higher return on their investment in order to compensate for such additional risk taken. Shareholders expect return in the form of dividend pay-outs, and capital growth in the share price. A positive correlation is therefore expected between the debt levels of a company and the total return to their shareholders, i.e. the sum of the dividend pay-outs and the capital growth in the share price, also referred to as total shareholder return (TSR).

The focus of this study is on the platinum industry in South Africa, as this industry is vital to the South African economy in terms of job creation and earner of foreign exchange as South Africa dominates the world production of platinum. The purpose of this study is to investigate whether there is a correlation between the debt levels and the total shareholder return (TSR) of platinum companies listed on the JSE Ltd.

Quantitative research techniques were used to address the research problem, making use of secondary data and rank correlation-based research. Firstly, the debt-to-equity ratio for each company was calculated based on book values. Secondly, the TSR of each company was calculated considering the dividends received and capital growth in share price. The correlation between the TSR and the debt-to-equity ratio was determined using Spearman's rank correlation coefficient.

The results were inconclusive, i.e. no, negative and positive relationships where the relationship is for the first 12 years not significant and for the last two years significant.

Therefore the final conclusion is that this study is inconclusive to support or to reject the conceptual scope of the study in that risk is concomitant to return, i.e. returns compensate for risks, therefore higher debt levels require higher total shareholder returns (and *vice versa*).

This study contributes to the literature on capital structure decisions from a South African platinum company perspective. The core audience will be the management of South African platinum companies considering changes in their capital structure as well as investors considering investing into a listed platinum company.

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## **CHAPTER 1**

### **1 INTRODUCTION**

#### **1.1 BACKGROUND**

Investors make investment decisions based on their risk appetite. Furthermore, when such investors consider shares as part of their investment portfolio, these investors will consider the risk profile of the company it is interested in. Risk appetite, i.e. the willingness of investors to bear risk, depends on both the degree to which investors dislike such uncertainty and the level of that uncertainty (Gai & Vause, 2005).

By taking on a certain level of risk, shareholders expect to be commensurately compensated. Based on the capital asset pricing model (CAPM), as developed by Sharpe and Lintner, financial risk in a company is created by introducing debt into the company's capital structure, as the company has a legal obligation to i) pay interest on the outstanding debt, and ii) repay the capital (Firer, Westerfield, Jordan & Ross, 2004). The CAPM is a model used to describe the relationship between risk and expected return. Shareholders of companies with higher debt levels (also known as leverage or gearing) in their capital structure require a higher return on their investment in order to be compensated for the additional risk taken (Firer *et al.*, 2004).

Shareholders expect return in the following two forms (Oladipupo & Okafor, 2013):

- i) dividend pay-outs, and
- ii) capital growth in the share price.

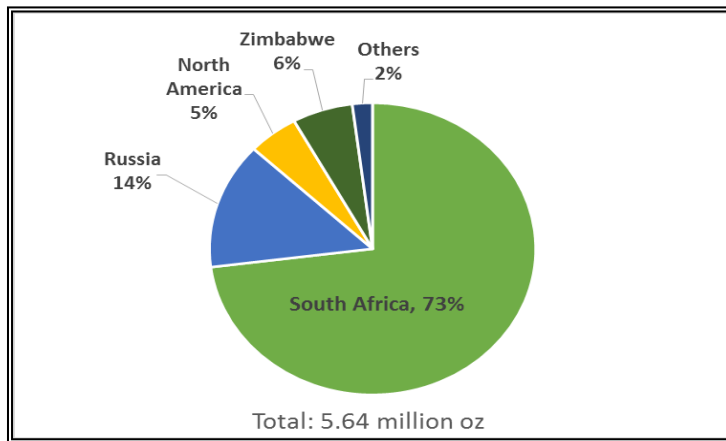
Theoretically, a positive correlation would therefore be expected to exist between the debt levels of a company and the total return to their shareholders, i.e. the sum of the dividend pay-outs and the capital growth in the share price.

##### **1.1.1 Platinum industry in South Africa**

The platinum industry in South Africa is vital to the South African economy in terms of job creation and earning foreign exchange. South Africa dominates the world production of platinum and has more than 80% of the world's platinum reserves

(Jones, 1999). As indicated in Graph 1, South Africa supplied 73% of the world's platinum in 2012.

**Graph 1: Platinum supply by region in 2012**



(Source: Matthey, n.d.)

This industry has recently been plagued with unrest. On 16 August 2012, police shot and killed 34 people, almost all of them striking mine workers, while trying to disperse and disarm them. Recently, after the longest strike in South African history, an agreement was finally reached between the platinum companies and the trade unions in June 2014 (Maylie, 2014).

Terence Goodlace, chief executive officer of Impala Platinum described the damage as follows (Jamasmie, 2014):

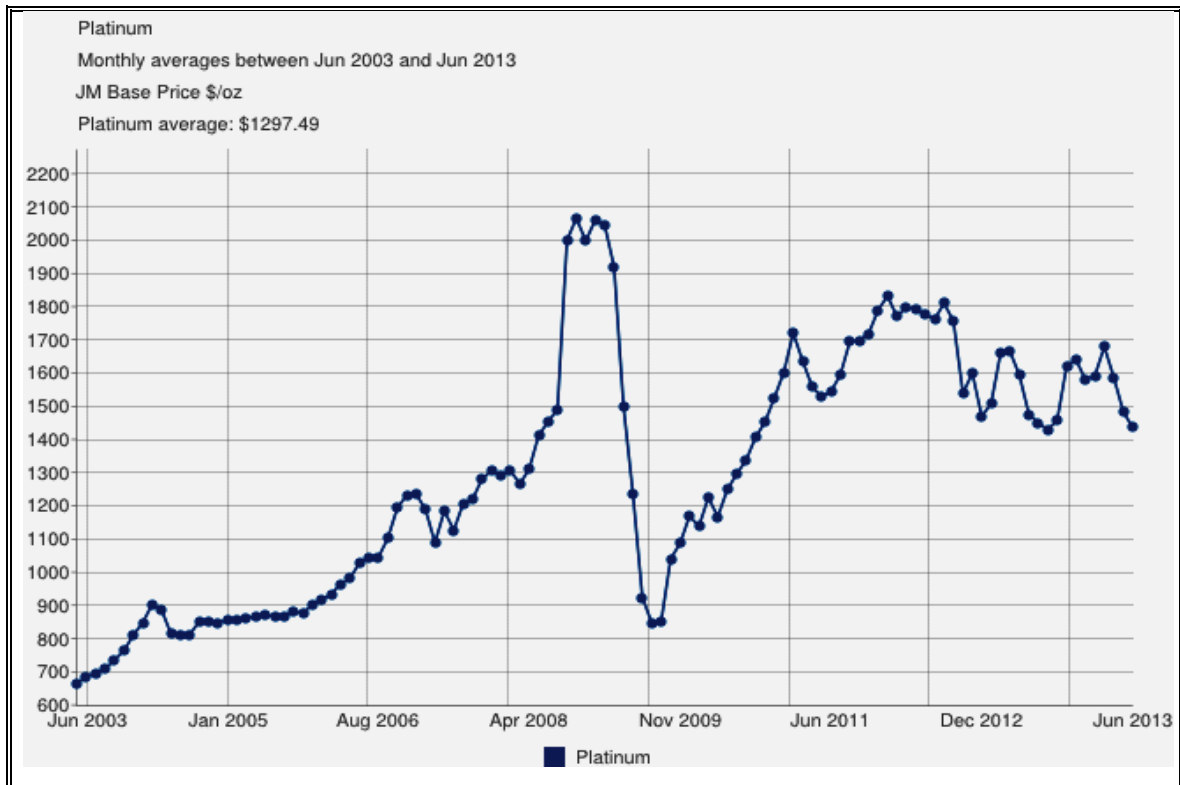
*“Implats has lost about 246 000 ounces of production of the metal since the strike started, equivalent to revenue of 5.4 billion rand, while employees forfeited 1.4 billion rand in wages.”*

The effect of these incidents on this study should be minimal as this study will focus on listed companies in the same industry (platinum industry); most industry-specific influences should therefore be eliminated. This study will investigate the relationship between financial risk and return in the platinum industry in South Africa.

Platinum companies listed on the JSE Limited can be considered a higher risk investment for the following reasons:

- The volatility of international platinum prices. As indicated in Graph 2 below, platinum prices are very volatile and this volatility increases the risk for investors.

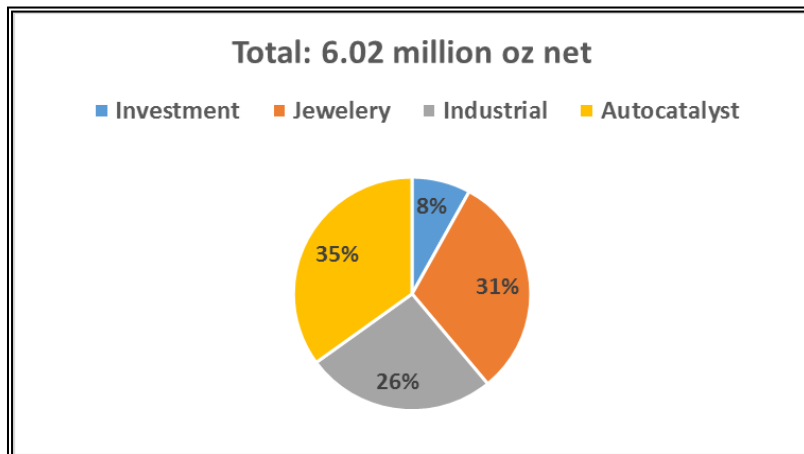
**Graph 2: Platinum prices between June 2003 and June 2013**



(Source: Matthey, n.d.)

- Numerous variables outside the direct influence of corporate management, such as i) the volatility of foreign exchange rates (Arize, Osang & Slottje, 2000), ii) trade unions influencing labour forces (Schultz & Mwabu, 1997), and iii) demand for the product. When considering the demand for the product, on the one hand, platinum is used in the vehicle production industry, while, on the other hand, it is also a luxury jewellery item (refer to Graph 3).

**Graph 3: Platinum demand by application in 2012**



(Source: Matthey, n.d.)

### **1.1.2 Literature review**

A number of research studies relevant to the topic have been conducted. Campbell (1996) stated that aggregate share market risk is the main factor determining excess share and bond returns, but that the price of share market risk does not equal the coefficient of relative risk aversion.

There exists a positive relationship between company performance and capital structure, as pointed out in the following studies performed across various industries. Abu-Rub (2012) found that a positive relationship exists between the capital structure and the firm's performance when considering a sample of 28 companies listed on the Palestinian Stock Exchange over the period of 2006 to 2010. Sari and Hutagaol (2011) also found that there is a positive relationship between the debt-to-equity ratio and share return; however, this result was statistically insignificant. They also found a similar result in comparing the degree of operating leverage and share return when considering food and beverage companies listed on the Indonesian Stock Exchange from 2003 to 2008.

A study performed by Azhagaiah and Gavoury (2011) focused on the IT industry in India. The study proved that there had been a strong one-on-one relationship between the capital structure variables and profitability. The return-on-assets ratio (ROA) and return on capital employed (ROCE) and the capital structure had a significant influence

on the profitability; and increases in the use of debt funding in capital structure tends to minimise the net profit of the IT firms listed on the Bombay Stock Exchange in India.

Afrasiabi and Ahmadiania (2011) performed research on the financing effect on the capital structure of companies listed on the Tehran Stock Exchange. They found that companies that are financed via issuance of shares have less risk and higher return. Therefore, this group of companies had a better performance against systematic risk and more value creation for its shareholders.

Factors influencing the capital structure of a company were researched in the following papers: Zaheer, Saeed and Mir (2011) found that the capital structure debt-equity mix relies heavily on the assets that a firm possesses along with the growth in business being important to a certain extent. A study by Liu and Ning (2009) considered listed companies in the electric power industry in China. They found that the size of the company, non-debt tax shields and asset structure were not significantly correlated with the capital structure, and the fluidity of the assets was negatively correlated with the capital structure.

Furthermore, size and profitability variables were found to be significant in a study performed on companies in Malaysia when trying to identify the factors that influence the debt proportions of the capital structures (Sarma, Lellapalli & Lellapalli, 2010).

Share prices play an important role in determining a firm's financing choice. Firms that experience large share price increases are more likely to issue equity and retire debt than are firms that experience share price declines (Hovakimian, Opler & Titman, 2001).

Finally, Ping and Caixia (2011) concluded that a company's capital structure decision has positive, negative and uncertain effects on its own total market value, which may be adjusted by the controllable leverage decision-making. However, they also stated that the extent of capital structure decision on a listed company's total market value should be explored more deeply.

It can therefore be concluded that this topic is very relevant throughout the world and, furthermore, that not many studies have been performed within the South African

context. A study on the platinum industry in South Africa specifically is very relevant due to the importance of this industry to the South African economy.

### **1.1.3 Motivation of topic actuality**

As highlighted above, the platinum industry is important to the South African economy. Furthermore, investors do require a return to compensate for, *inter alia*, financial risk. This study will address whether there is a positive relationship between debt levels and total shareholder return in the platinum industry in South Africa.

The core audience of this study include shareholders considering investments in platinum companies as well as platinum companies considering an appropriate capital structure.

## **1.2 PROBLEM STATEMENT**

Shareholders require a higher return on an investment with a higher risk profile (Lopez & Nieto, 2009). Companies often make use of debt in their capital structure to fund operations and investments. However, this debt creates financial risk.

When considering all the above, the problem statement can therefore be formulated as follows: Is there a correlation between debt levels and total shareholder return (TSR) when considering platinum companies listed on the Johannesburg Stock Exchange Limited (JSE)?

## **1.3 RESEARCH OBJECTIVES**

The main objective of this study is to investigate whether there is a correlation between the debt levels and the total shareholder return (TSR) of platinum companies listed on the JSE. The secondary objectives include:

- Conceptualising capital structure and total shareholder return from the literature;
- Contextualising the platinum industry in South Africa, and
- Establishing the capital structure associated with the highest performing platinum company.

## **1.4 RESEARCH DESIGN/METHOD**

In order to achieve the above-mentioned objectives, both a literature review and empirical study will be conducted.

### **1.4.1 Literature review**

The literature review will include studying published academic literature, both international and national, performed on the various factors influencing this topic.

The literature review aims to achieve the following:

- To identify the various factors influencing capital structure;
- To find an appropriate definition of gearing/debt to equity ratio to use as part of the study; and
- To understand total shareholder return (TSR) and all the elements that make up TSR.

### **1.4.2 Empirical research**

The study field will comprise all the companies listed on the Platinum and Precious Metals sector on the JSE.

Quantitative research techniques will be used to analyse the audited financial statements for each company. The debt to equity ratio for each company will be calculated based on book values. The TSR of each company will be calculated considering the dividends received and capital growth in share price. The rank correlation between the TSR and the company's debt ratio will be determined per annum. Thereafter, the results will be interpreted.

## **1.5 DELINEATIONS AND LIMITATIONS OF THIS STUDY**

This study will focus on JSE-listed platinum companies. Other external factors that might have influenced the TSR other than the debt levels in the capital structure fall outside the scope of this study.

By focusing the study on listed companies in the same industry (platinum industry), most industry-specific influences should be eliminated.

## **1.6 THE STRUCTURE OF THE MINI-DISSERTATION**

The mini-dissertation will be presented as follows: Chapter 2 will provide detailed information on the research methodology followed to achieve the set research objectives. This will include detail on the research paradigm, research design and data collection methods. Chapter 3 will conceptualise, from the literature, capital structure and how debt in a company's capital structure influences a shareholder's required return. The next chapter will set out the results of the empirical analysis performed relating to the correlation between debt levels and TSR. This will be presented as an academic article. Finally, the conclusions and recommendations from the findings of the study will be presented in Chapter 5.

Chapter 2 will now discuss the research methodology.

## **CHAPTER 2**

### **2 RESEARCH METHODOLOGY**

#### **2.1 INTRODUCTION**

Before a researcher can embark on a research study, a clear understanding of the research methodology and design is required. These concepts mainly refer to the researchers' plan of action in order to conduct and complete the study (Creswell, 2003). The research design, research methodology and research paradigm will be discussed, followed by a description of the types of research. Next, the data collection methods used in the study will be presented and discussed.

The main objective of this research study, as set out in Chapter 1 (refer page 6), is to determine whether there is a relationship between the debt levels and total shareholder return of JSE-listed platinum companies. The research approach to be followed will be chosen to address this research objective.

Neville (2007) refers to *research* as a process of enquiry and investigation. Furthermore, it is systematic, methodical and ethical and can assist in solving practical problems and increase knowledge. Research can also be defined as a scientific and systematic search for pertinent information on a specific topic (Kothari, 2009). However, in order to assist in solving problems or increase knowledge, one has to plan and find the best ways to collect and organise data.

Firstly, a distinction should be drawn between the concepts of research design and research methodology.

#### **2.2 RESEARCH DESIGN AND RESEARCH METHODOLOGY**

There are numerous ways to design a study in order to arrive at well-argued, reliable conclusions (Hofstee, 2006). According to Hofstee (2006), the research design is a discussion about the overall approach used in order to address your research problem. Researchers consider two guiding factors when deciding how to design the research study: (a) the circumstances of their study, and (b) the research questions they intend to study and why (McGregor & Murnane, 2010). The design also indicates the techniques and methods that will be used to collect and analyse the data. Similarly,

the research design should indicate the various approaches to be used in solving the research problem, sources and information related to the problem (Rajasekar, Philominathan & Chinnathambi, 2013).

The word 'methodology' comprises two nouns: method and *ology*, which means a branch of knowledge. Therefore, methodology is a branch of knowledge that deals with the general principles of the generation of new knowledge (McGregor & Murnane, 2010). According to Creswell (2003), in order to select an appropriate research methodology, several considerations are required: firstly, the research problem might indicate a specific research methodology to be used in the study; secondly, the researcher's own experiences, training and worldview; and thirdly, the audience to whom the research is to be reported.

According to Rajasekar *et al.* (2013), the research methodology is a systematic way to solve a problem. It is the science of studying how research is to be carried out. Research methodology is essentially the procedures by which researchers go about their work of describing, explaining and predicting phenomena. It can also be defined as the study of methods by which knowledge is gained.

It can therefore be concluded that the research design can be defined as the overall approach in order to answer the research question and meet the objectives, while the research methodology includes the detailed plan and relevant measuring techniques used in the process of answering the proposed research question.

### **2.3 RESEARCH PARADIGM**

A paradigm is a set of assumptions, concepts, values and practices that constitute a way of viewing reality (McGregor & Murnane, 2010). In any particular field, research is performed in accordance with a set of rules, concepts and procedures termed a paradigm, which is well accepted by the scientists working in that field (Rajasekar *et al.*, 2013). According to Denzin and Lincoln (2005), a paradigm is a basic set of beliefs that guide action.

Researchers therefore often approach their research problem or topic from a frame of reference based upon assumptions that are taken for granted. These assumptions

may remain not only unquestioned, but also beyond conscious awareness (Morgan, 1980).

Major research approaches to management or organisational research are often described as quantitative and qualitative. These will be discussed in more detail next.

## 2.4 QUALITATIVE AND QUANTITATIVE RESEARCH

The major research approaches to management or organisational research are i) qualitative, ii) quantitative, and iii) mixed methods, which is a combination of the first two approaches. The quantitative approach is typically selected by researchers to respond to research questions requiring numerical data, while the qualitative approach is followed for research questions requiring textual data and the mixed methods approach for research questions requiring a combination of both numerical and textual data (Williams, 2007). The main differences between the two main approaches, quantitative and qualitative, are summarised in Table 2.1.

**Table 2.1: Quantitative and qualitative paradigm assumptions**

<b>Research paradigm</b>	<b>Nature of reality</b>	<b>Relationship of researcher</b>	<b>Process of research</b>	<b>Purpose</b>
Quantitative	Objective, apart from researcher	Researcher is independent from what is being researched	<ul style="list-style-type: none"> <li>• Deductive process</li> <li>• Cause and effect</li> <li>• Context free</li> </ul>	<ul style="list-style-type: none"> <li>• To explain and predict</li> </ul>
Qualitative	Reality is subjective and multiple, as seen by participants in the study	Researcher interacts with that being researched	<ul style="list-style-type: none"> <li>• Inductive process</li> <li>• Mutual simultaneously shaping factors</li> <li>• Emerging design</li> <li>• Context bound</li> </ul>	<ul style="list-style-type: none"> <li>• To understand and interpret</li> <li>• To critique and identify</li> </ul>

(Summer, 2003)

This study will make use of quantitative research techniques.

## 2.5 MEASURING INSTRUMENTS

In order to meet the research objectives set in Chapter 1 (refer to page 6) of determining whether a relationship exists between the debt levels and total shareholder return (TSR) of the platinum companies listed on the JSE, rank correlation-based research will be conducted.

### Hypothesis

The conceptual scope of the study is that risk is concomitant to return, i.e. returns compensate for risks, therefore higher risks require higher returns (and *vice versa*). The hypothesis of the study is developed against this backdrop, where the debt-to-equity ratio represents risk opposed to return, measured by TSR. The following null- and alternative hypotheses are stated:

- $H_0$ : There is no monotone relationship between the debt-to-equity ratio and TSR of platinum companies.
- $H_1$ : There is a monotone relationship between the debt-to-equity ratio and TSR of platinum companies.

To estimate the relationship between risk and return, Spearman's rank correlation coefficient was applied to determine whether there is a monotone dependence between the debt-to-equity ratio and the TSR of the organisation. Rank-order correlation is a non-parametric approach for determining the strength between the two variables. This non-parametric approach is preferred when data seem not to be normally distributed, because the correlation statistics are not affected by the type of mathematical relationship between variables, unlike Pearson's correlation coefficient that requires the relationship to be linear. Therefore the Spearman rank correlation coefficient is a more general measure of any kind of monotonic relationship between two variables. Since this measure is based on ranks it is not as sensitive for outliers (Gauthier, 2001; Millard & Neerchal, 2001).

The Spearman rank correlation coefficient was selected to measure the relationship between risk and return using annual data from 2000 to 2013, because only limited data were available. Regression analysis with a single dependent variable requires a

sample of ten observations (Sekaran, 2006; Peng, Lee & Ingersoll, 2002). The number of organisations included in this study varies between five and 12. Therefore, it was uncertain whether the data was normally distributed. As a result of the limited number of organisations included in the population, a two-sided hypothesis test at a 5% and a 10% level of significance respectively, is performed. This means there is strong sample evidence ( $p < 0.05$ ) and there is only weak sample evidence ( $0.05 < p > 0.1$ ) to reject  $H_0$  in favour of  $H_1$  (Wegner, 2007).

In order to perform rank correlation-based research, a population needs to be established and specific data needs to be collected.

### **2.5.1 Population**

The study field comprised all companies listed under the Platinum and Precious Metals sector on the JSE Ltd. There are a total of 13 companies listed under the Platinum and Precious Metals sector on the JSE Ltd as at 30 April 2014. Platfields Limited was excluded from the analysis as the company only listed on the JSE Ltd in December 2010; therefore, sufficient data points are not available to qualify for the correlation statistics. A total of 12 companies were therefore analysed.

### **2.5.2 Data collection methods**

Quantitative research techniques were used to collect the required data, which included an analysis of each company's audited financial statements and gathering each company's share price history. The *debt ratio* for each company was calculated based on book values. As audited financial information and share prices are only available once a company has listed on the JSE, the number of years used to analyse each company were different.

The *TSR* of each company was calculated considering the *dividends received* and *capital growth* in share price. The electronic databases of McGregor BFA and Datastream were used to assist in gathering the required information.

Each measure and technique will now be discussed.

### *Total shareholder return (TSR)*

TSR refers to the total return of a share to an investor, which includes capital gains and dividends earned. The TSR data is available by referring to R100 invested when the company listed on the JSE Ltd and then calculating the value of the investment at any point thereafter given the share price and the dividends declared. The TSR data was extracted at daily intervals. To establish an average value at year-end, a 30-day average considering the 30 variables before year-end was calculated.

### *Debt-to-equity ratio*

The annual debt-to-equity ratio variables based on book values were extracted from the McGregor BFA database for each of the 12 companies in the population. The change in the debt-to-equity ratio was calculated annually.

The debt-to-equity ratio is only available on year-end date. Each mining company has its own year-end date and therefore the analysis took place at different dates, as can be seen in Table 2.2 below. Refer to page 19 for further explanation on how the debt-to-equity ratio was calculated.

**Table 2.2: Population and year-end dates**

<b>Company</b>	<b>Year-end date</b>	<b>Years analysed</b>
Anglo American Platinum	31 December	2000-2013
Aquarius Platinum	30 June	2005-2013
Atlatsa Resources Corporation	31 December	2006-2012
Bauba Platinum	30 June	2000-2013
Eastern Platinum	31 December	2008-2013
Impala Platinum	30 June	2000-2013
Jubilee Platinum	30 June	2007-2013
Lonmin	30 September	2000-2013
Northam Platinum	30 June	2000-2013
Royal Bafokeng Platinum	31 December	2010-2013
Sable Metals and Minerals	28 February	2006-2013
Wesiswe Platinum	31 December	2006-2013

## 2.6 RELIABILITY AND VALIDITY

According to Hatch and Farhady (1982), reliability is the extent to which a test procedure reveals a consistent result when administered under similar conditions. The term 'reliability' is a concept used to test or evaluate quantitative research.

Joppe (2000) provides the following explanation of what validity in quantitative research is:

*Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Researchers generally determine validity by asking a series of questions, and will often look for the answers in the research of others.*

There are three basic types of validity, according to Linn (1980):

- *Content validity:* Refers to the extent that the measuring technique accurately covers the topic of research.
- *Criterion-related validity:* Refers to how successfully the specific measuring technique can be used for empirical testing. The criterion must be both objective and relevant.
- *Construct validity:* Refers to how successfully correlations can be predicted.

Attention was paid to reliability and validity while conducting the research to ensure maximum reliability. Data was gathered from reliable sources and all the analyses were conducted in exactly the same way for each company in the population. This ensured that the same outcome was experienced for each company. Therefore, the data collection and analysis can be seen as valid and reliable.

## 2.7 SUMMARY

The objective of this chapter was to provide detailed information on the research methodology followed to achieve the set research objectives. This chapter also included detail on the research paradigm, research design and data collection methods used to analyse the data collected.

Next, Chapter 3 will conceptualise from the literature capital structure and how debt in a company's capital structure influences a shareholder's required return.

## **CHAPTER 3**

### **3 CAPITAL STRUCTURE AND DEBT**

#### **3.1 INTRODUCTION**

The aim of this chapter is to address the first secondary objective, as set in Chapter 1 (refer page 6), of the conceptualisation of capital structure and total shareholder return from the literature.

Although the topic of capital structure has been explored by various researchers (Modigliani & Miller, 1958; Donaldson, 1961; Myers, 1984; Weichenrieder & Klautke, 2008), the topic remains a controversial one. Most studies have been aiming to answer questions about the factors influencing the choice of a capital structure and the influence of such factors. The results have been either inconclusive or contradicting. One such study was conducted by Myers (1984) in which he questioned in what way companies decided on their capital structure. He could not find an answer and this question therefore remains a difficult one.

The chapter will start by presenting the history of capital structure theory, followed by a brief description of each of the modern capital structure theories. Section 3 discusses the choice between capital versus debt in the capital structure. The next section will then consider the influence of capital structure on profitability. Furthermore, an appropriate definition of the gearing/debt ratio to use as part of this study will be examined. Finally, we will consider literature that will conceptualise total shareholder return and all the elements that make up TSR.

#### **3.2 THE HISTORY OF CAPITAL STRUCTURE THEORY**

The modern theory of capital structure started with a paper published by Modigliani and Miller in 1958 titled *The Cost of Capital, Corporation Finance and the Theory of Investment*. The Modigliani-Miller theorem states that, in an efficient market, in the absence of taxes, bankruptcy costs and asymmetric information, a company's value is unaffected by the way it is financed. Otherwise stated, regardless of whether the company's capital comprises equities or debt, or a combination thereof, or what the dividend policy is, the company's value would remain the same (Modigliani & Miller,

1958; Weichenrieder & Klautke, 2008). The theorem is also known as the capital structure irrelevance principle. This ground-breaking research opened the door for various other researchers to further explore this specific topic.

One such researcher, Donaldson (1961), conducted research and found that management strongly favoured generating new funds internally. This is even to the exclusion of external funds with the exception of the occasional increase in fund requirements. However, most managers did not even consider cutting dividend payments in order to raise funds.

Furthermore, a significant amount of research has also focused on capital structure being determined by agency costs specifically, i.e. costs due to conflict of interest. Jensen and Meckling (1976) identified two types of conflict while building on the earlier work of Fama and Miller (1972). The types of conflict, however, fall outside the scope of this study. Jensen and Meckling (1976) argued that an optimal capital structure could be obtained by simply trading off the agency costs of debt against the benefit of having debt in the capital structure.

Myers (1984) studied two contrasting capital structure frameworks:

1. Static trade-off framework: A company is viewed as setting a target debt ratio and gradually moving towards it. This is similar to the manner in which a company would adjust dividends to move towards a target pay-out ratio.
2. Pecking order framework: A company will prefer internal to external financing and debt to equity if it issues securities. The company furthermore has no well-defined target debt ratio. This is similar to the work done by Donaldson (1961).

According to Titman and Wessels (1988), many theories suggest that companies select capital structures depending on factors that determine the various costs and benefits associated with debt and equity financing. These attributes include the i) size of a company, ii) collateral value of assets, iii) growth, iv) profitability, and v) tax shields. When considering size, for example, they found that debt financing might be large for small companies but, on the other hand, small for large companies. When considering the cost of issuing debt and equity securities, they found that small companies pay much more than large companies do to issue new equity. Large companies, however,

usually had retained earnings saved up over time and preferred to use those funds to finance new projects (Titman & Wessels, 1988).

Harris and Raviv (1991) surveyed capital structure theories based on agency costs, asymmetric information, product/input market interactions and corporate control considerations. These theories represent all possible determinants of a company's capital structure.

Abor (2008) encouraged equity finance in the initial phases of a company's existence, which would give the company a sound base in order to expand by way of debt financing. The findings of this study concur with the findings of Myers (1984) and Donaldson (1961) that found that when considering the static trade-off theory, companies prefer raising capital; firstly, from retained earnings, and secondly, from debt, and thirdly, from issuing new equity. Previous years' profitability of a company, and therefore the amount of retained earnings available, would then play an important role in determining the capital structure.

As evident from the above discussion, there are various capital structure theories, including the Miller and Modigliani theory, the trade-off theory and the pecking order theory (Van Rooyen, 2014). These theories are today referred to as the modern capital structure theories and can be summarised as follows:

Miller and Modigliani proposed that an entity's capital structure has no effect on the value of such a business. The trade-off theory, on the other hand, suggests that management will strive to achieve the optimal capital structure by finding a trade-off between the tax advantages of debt and the costs of financial distress and agency costs of debt. Finally, the pecking order theory suggests that an optimal capital structure does not exist, but that management will rather make decisions about the entity's capital structure on the basis of their preference for certain types of finance (Van Rooyen, 2014).

### **3.3 DEBT VERSUS EQUITY IN CAPITAL STRUCTURE**

There are various benefits of having debt in a company's capital structure, but also some obvious risks. Debt financing is an effective way of lowering tax costs but, on

the other hand, higher levels of debt in the capital structure can also result in a higher probability of bankruptcy. Higher levels of debt may decrease the value of a company, making it unattractive as an investment (Zaheer *et al.*, 2011). While Modigliani and Miller (1958, 1963) demonstrated that, in a frictionless world, financial leverage is unrelated to company value, they also noted that in a world with tax-deductible interest payments, company value and capital structure are positively correlated.

This view was supported by Van Horne (2002), who explained that the advantage of debt in a world of corporate taxes is that interest payments are deductible as an expense. In contrast to this, dividends or retained earnings are not tax deductible (Ojo, 2012).

Another factor that plays an important role in a company's decision between issuing debt or equity is the timing of the fund's requirement. Baker and Wurgler (2002) developed a timing measure based on the concept that companies tend to raise funds with debt when their share price is low, while raising equity when their share price is high. Therefore, companies are expected to have lower (higher) debt ratios if they raise capital when their share prices are high (low). Hovakimian, Opler and Titman (2001) similarly found that share prices play an important role in determining a company's financing choice. Companies that experience large share price increases are more likely to issue equity and retire debt than are companies that experience share price declines.

### **3.4 DEFINING GEARING/LEVERAGE**

Gearing, also known as leverage, has become synonymous with risk. Financial leverage is a measure of how much debt a company uses to finance its assets. It can therefore be concluded that as debt increases, financial leverage increases (Rehman, 2013). An increase in leverage may furthermore also increase the probability of default because as the company's financial obligations increase, the financial risk is also increased (Cai & Zhang, 2010).

Gearing/leverage is defined in a number of ways. A summary of the various definitions, as defined by author, date and title of paper, is provided in Table 3.1. These definitions are required in order to identify the definition to be used in this study.

**Table 3.1: Gearing/leverage definition summary**

Author(s) and date of research	Title of paper	Definition
Alkhatib, K. (2012)	The determinants of leverage of listed companies	Leverage = Total liabilities to equity
Iqbal, A., Hameed, I. & Ramzan, N. (2012)	The impact of debt capacity on firm's growth	Total Debt/book value of assets
Bhandari, L.C. (1988)	Debt/equity ratio and expected common share returns: Empirical evidence	Debt/equity ratio = (book value of total assets – book value of common equity) / market value of common equity
De Jong, A. & Verwijmeren, P. (2010)	To have a target debt ratio or not: What difference does it make?	Book leverage: Total debt to total assets
Hatfield, G.B., Cheng, L.T.W. & Davidson, W.N. (1994)	The determinants of optimal capital structure: The effect of company and industry debt ratios on market value	The leverage ratio used was total debt-to-market value of equity.
Kzistami, M. (2011)	Does leverage have a strong impact on profitability: A case study on IT sector	Using the terms of a strict definition, financial leverage represents the total debt reported to the equity of a firm, reflecting the capacity of the financial managers to attract external financial resources in order to improve the efficiency of the equity.
Lasman, D.A. & Weil, R.L. (1978)	Adjusting the Debt-Equity Ratio	Debt-equity ratio is debt divided by equity  There are various definitions of this ratio. The numerator can include all liabilities, all but current liabilities or only long-term interest bearing debt.
Mulford, C.W. (1985)	The importance of a market value measurement of debt in leverage ratios: Replication and extensions	Debt divided by equity  Two debt-to-equity ratios were used as measures of financial leverage: Market values and book values.

Author(s) and date of research	Title of paper	Definition
Ojo, A.S. (2012)	The effect of financial leverage on corporate performance of some selected companies in Nigeria	The leverage (LEV) was measured by the debt-equity ratio of the companies
Rehman, S.S.F.U. (2013)	Relationship between financial leverage and financial performance: Empirical evidence of listed sugar companies of Pakistan	Financial leverage is measured using the debt-to-equity ratio. Debt-to-equity ratio is measured by dividing total liabilities to shareholders' equity. Both market values and book values were considered.
Yuan, Y. & Motohashi, K. (2010)	Impact of the debt ratio on company investment: A case study of listed companies in China	Total debt ratio (total liabilities/total assets or bank loans/total assets) using market values.

Research conducted by Harris and Raviv (1991) on leverage ratios noted that it is generally accepted that companies in a given industry will have similar leverage ratios as opposed to leverage ratios across industries. They furthermore found that, over and above specific industries having a common leverage ratio, these ratios are over time relatively stable.

### 3.5 UNDERSTANDING TOTAL SHAREHOLDER RETURN

As mentioned in the introduction to this chapter (page 17), the aim of this chapter is to address the secondary objective of the conceptualisation of capital structure and risk and return from the literature. The aforementioned sections focused on capital structure and debt levels, while this section will focus on conceptualising total shareholder return (TSR). A relationship exists between the risks taken by shareholders when investing in a company and their expected return for taking on such risks. The amount of risk an investor is willing to accept depends largely on the investor's risk appetite, i.e. the willingness of an investor to bear risk (Gai & Vause, 2005).

According to Dimson, Marsh and Staunton (2000), risk and return are summarised as follows: The single most important contemporary issue in finance is the equity risk

premium. This drives future equity returns, and is the key determinant of the cost of capital. The risk premium is the expected reward for bearing the risk of investing in equities, rather than in low-risk investments such as bills or bonds (Dimson *et al.*, 2000).

The main objective of financial management is to create shareholder wealth or value (Azhagaiah & Priya, 2008). This was reiterated by Anca and Petre (2012), who stated that the concept of shareholder value creation reflects the fundamental principal of successful financial management: to maximise the market value of investors' wealth.

According to Favaro and Rotz (2001), TSR as a measure of business performance is the best indicator of corporate success. TSR is calculated as the change in a company's share price for a given period, plus its free cashflow over the same period, as a percentage of the share price at the beginning of the period. However, TSR as a measure of corporate performance on its own in any given year carries minimal meaning. If it is measured over the long term, it can be regarded as the best indicator of success. This is because it reflects how well a company has created long-term value in highly competitive markets.

Adamson, Goings and Kapinos (n.d.) published a guide on the calculation of TSR. The following formula is suggested in the calculation of TSR:

### **Formula 3.1: Total shareholder return**

$$\text{Total shareholder return} = \frac{\text{change in share price} + \text{dividends paid}}{\text{beginning share price}}$$

Where 'dividends paid' equals the total of all dividends paid on one (1) share during the performance cycle.

Dividends play a pivotal role in the estimation of TSR. As shareholder wealth is created by not only capital growth in the share price, but also dividend earnings over the same period, it should be included in the calculation of TSR. According to Adamson *et al.* (n.d.), companies calculate TSR using the ex-dividend share price. It was also noted that, theoretically, the appropriate calculation of TSR should assume that dividends are reinvested at the ex-dividend rate.

Abrams, Cohan and Suzman (2006) define TSR simply as the return on a company's share, assuming reinvestment of dividends. It is therefore clear that TSR can be defined as the total return of a share to an investor, consisting of both capital gains and dividends.

### **3.6 SUMMARY**

The objective of this chapter was to address the secondary objective as set in Chapter 1 (page 6) of the conceptualisation of capital structure and total shareholder return from the literature. Capital structure theory has a lengthy history, starting in 1958 with Modigliani and Miller (1958). This was followed by the development of other capital structure theories; some of which are in recent times referred to as modern capital structure theories. As debt and equity are both capital structure components, the decision for a company to finance using debt versus equity or a combination of both, was discussed next.

As a company introduces debt into its capital structure, financial risk is created. Gearing, also known as financial leverage, can, however, be defined in various ways. For purposes of this study, the definition of gearing has to be conceptualised and therefore a summary of the many definitions as provided by various authors was tabulated. The chapter concluded with a conceptualisation of total shareholder return.

The primary focus of the next chapter will be on the empirical analysis of the JSE-listed platinum companies. This chapter is presented in the form of an academic article and sets out the results of the research performed regarding the relationship between debt levels and TSR by making use of the content and methodology as set out in Chapters 1 and 2.

## CHAPTER 4

### 4 RESEARCH ARTICLE

Title: The relationship between debt levels and total shareholder return of JSE-listed platinum companies

The reader is requested to take note of the following:

- The article has been submitted to the following DHET indexed, peer-reviewed academic journal as follows:

Von Abo, S. & Middelberg, S.L. The relationship between debt levels and total shareholder return of JSE-listed platinum companies. Southern Africa Business Review (ISSN: 1998-8125)

- The article as submitted is included in “Annexure 1: Article as submitted” on page 58. The article was written in line with the journal’s submission guidelines, which are included in “Annexure 2: Journal submission guidelines” on page 77.
- The article was researched and written by the first author as the candidate and primary author, while the second author fulfilled a reviewer function thereto as the research project’s study leader.

## **Abstract**

The platinum industry in South Africa is vital to the South African economy in terms of job creation and earner of foreign exchange. Investors considering platinum companies as an investment would study the risk profile of such a company. Shareholder of companies with high debt levels compared to equity, will require a relatively higher return to compensate for additional risk taken. The purpose of this study is to investigate empirically whether there is a positive correlation between the debt levels and the total shareholder return (TSR) of platinum companies listed on the JSE Limited. The study field comprised annual analyses for 12 companies listed under the Platinum and Precious Metals sector on the JSE Ltd for the 14-year period 2000 to 2013. The results of the study were inconclusive, because a statistically significant positive correlation between changes in debt levels and changes in TSR could only be found in two of these years. The core audience of the study will be the management of South African platinum companies considering changes in their capital structure, as well as investors considering investing in a listed platinum company. The contribution of the study is therefore to add to the body of literature on capital structure decisions from a South African platinum mine context.

**Keywords:** South Africa, debt levels, share prices, shareholder return, platinum industry, risk

## 4.1 INTRODUCTION

The platinum industry in South Africa is vital to the South African economy in terms of job creation and earner of foreign exchange. South Africa dominates the world production of platinum and has more than 80% of the world's platinum reserves (Jones, 1999; Matthey, n.d.). Platinum companies listed on the South African stock exchange, the JSE Limited (JSE), can be considered a higher risk investment for the following reasons: i) the volatility of international platinum prices (Matthey, n.d.), ii) numerous variables outside the direct influence of corporate management, such as the volatility of foreign exchange rates (Arize, Osang & Slottje, 2000), iii) trade unions influencing labour forces (Bhorat, Naidoo & Yu, 2014), and, iv) demand for the product (Yang, 2009).

In recent years, this industry has, however, been plagued with unrest. After a period of turmoil at the end of 2012, the labour unrest flared again in February 2014. The longest strike in the South African history of nearly five months was ended after a wage agreement was finally reached between the South African platinum companies and labour unions in June 2014 (Maylie, 2014). The impact of the strike on the platinum industry was severe, as per Terence Goodlace, the chief executive officer of Impala Platinum (Antonioli, 2014). As the South African platinum industry is such a key role player in South Africa, the focus of this study will fall on this sector.

Investors make investment decisions based on their risk appetite. Furthermore, when such investors consider shares as part of their investment portfolio, these investors will consider the risk profile of the company it is interested in. Risk appetite, i.e. the willingness of investors to bear risk, depends on both the degree to which investors dislike such uncertainty and the level of that uncertainty (Gai & Vause, 2005).

By taking on a certain level of risk, shareholders expect to be commensurately compensated. Shareholders of companies with relatively higher debt levels in their capital structure, and therefore higher financial risk, require a relatively higher return on their investment in order to compensate for such additional risk taken. Shareholders expect return in the form of dividend pay-outs and capital growth in the share price. A positive correlation is therefore expected between the debt levels of a company and

the total return to their shareholders, i.e. the sum of the dividend pay-outs and the capital growth in the share price, also referred to as total shareholder return (TSR).

The main objective of this study is therefore to investigate whether there is a correlation between the debt levels and the TSR of platinum companies listed on the JSE. In order to meet this objective, the paper will be structured as follows: section 2 will discuss the theoretical perspectives, while the third section will discuss the research data and methodology followed. Section 4 will present the research results and findings, while concluding remarks will be presented in section 5. The paper will conclude with limitations of the study and areas for further research will be identified.

## **4.2 THEORETICAL PERSPECTIVES**

The theoretical perspectives, *inter alia*, will consider previous research conducted in order to identify the knowledge gap. The history of capital structure theories will be discussed, followed by literature on debt versus equity in the capital structure. Gearing, also referred to as leverage, definitions will be considered, and this section will conclude with TSR. These discussions will provide the theoretical framework from which the empirical study will be conducted.

### **4.2.1 Previous research conducted and knowledge gap**

The objective of this section of the literature review is to summarise previous research conducted in order to identify a knowledge gap. A number of studies performed across various industries have found that a positive relationship exists between company performance and capital structure. Abu-Rub (2012) found that a positive relationship exists between the capital structure measures (including short-term debt, long-term debt and total debt to total assets, and total debt to total equity) and the firm's performance when considering a sample of 28 companies listed on the Palestinian Stock Exchange over the period 2006 to 2010. Sari and Hutagaol's (2011) findings from a study conducted on food and beverage companies listed on the Indonesian Stock Exchange from 2003 to 2008, agreed with the findings of Abu-Rub (2012). They found that a positive relationship does exist between the debt-to-equity ratio and share return; however, this result was statistically insignificant. Pathirawasam and

Wickremasinghe (2012) found that the debt ratio was negatively related to the financial performance of the listed companies in Sri Lanka.

A study performed by Azhagaiah and Gavoury (2011) focused on the IT industry in India. The study found that an increase in the use of debt in the capital structure tends to minimise the net profit of the IT firms listed in the Bombay Stock Exchange in India. Afrasiabi and Ahmadinia (2011) performed research on the financing effect on the capital structure of companies listed on the Tehran Stock Exchange. It was found that companies that are financed via the issuance of shares have less risk and higher returns. This group of companies therefore had a better performance against systematic risk and more value creation for its shareholders.

Research conducted on the factors influencing the capital structure of a company includes the following: Zaheer, Saeed and Mir (2011) found that the capital structure debt-equity mix relies heavily on the assets that a firm has, combined with the growth in business to a certain extent. A study by Liu and Ning (2009) considered listed companies in the electric power industry in China. It was found that the size of the company, non-debt tax shields and asset structure were not significantly correlated with the capital structure, and the flexibility of the assets was negatively correlated with the capital structure. Size and profitability variables were found to be significant in a study performed on companies in Malaysia when trying to identify the factors that influence the debt proportions of the capital structures (Sarma, Lellapalli & Lellapalli, 2010). Hovakimian, Opler and Titman (2001) found that share prices play an important role in determining a company's choice of finance. Companies that experience large share price increases are more likely to issue equity rather than debt than are companies that experience share price declines (Hovakimian *et al.*, 2001). Finally, Ping and Caixia (2011) concluded that a company's capital structure decision has positive, negative and uncertain effects on its own total market value, which may be affected by controllable leverage decision-making. However, it was also recommended that the extent of the capital structure decision on a listed company's total market value should be explored more deeply.

Other studies on the topic of capital structure have been conducted by various other researchers, including Modigliani and Miller (1958), Donaldson (1961), Myers (1984), and Weichenrieder and Klautke (2008). These studies aimed to address the factors

that determine a company's choice of capital structure; however, the results have been either inconclusive or contradicting.

Lastly, a South African study similar to the topic of this study was conducted by Brümmer and Wolmarans (1995) approximately two decades ago. The authors investigated whether a positive relationship exists between the debt-to-equity ratio and the expected return of a share, if beta and firm size are simultaneously tested as variables. They found that the theory that hypothesises that a high risk is compensated by a high return is not valid for their sample.

It is evident that the topic of capital structure decisions and the relationship between capital structure variables and company performance has been well researched; however, the following gaps in the literature urged that this similar study should be conducted, since there is firstly only a single study performed on JSE-listed companies, secondly this JSE-listed company study could not support the risk-return theory, and thirdly, no previous study has been done on this unique group of companies, namely platinum extractors. The contribution of the study is therefore to add to the body of literature on capital structure decisions from a South African platinum mine context.

#### **4.2.2 The history of capital structure theories**

The modern theory of capital structure started with research published by Modigliani and Miller (1958). The Modigliani-Miller theorem states that in an efficient market, in the absence of taxes, bankruptcy costs and asymmetric information, a company's value is unaffected by the way it is financed. Otherwise stated, regardless of whether the company's capital comprises equities or debt, or a combination thereof, or what the dividend policy is, the company's value would remain the same (Modigliani & Miller, 1958; Weichenrieder & Klautke, 2008). The theorem is also known as the capital structure irrelevance principle. This ground-breaking research opened the door for various other researchers to further explore this specific topic.

One such researcher, Donaldson (1961), found that management strongly favoured generating new funds internally even to the exclusion of external funds. However, most managers did not even consider cutting dividend payments in order to raise funds.

Furthermore, a significant amount of research has also focused on capital structure being determined by agency costs, specifically costs due to conflict of interest. Jensen and Meckling (1976) identified two types of conflict while building on the earlier work of Fama and Miller (1972). The types of conflict, however, fall outside the scope of this study. Jensen and Meckling (1976) argued that an optimal capital structure could be obtained by simply trading off the agency costs of debt against the benefit of having debt in the capital structure.

Myers (1984) studied two contrasting capital structure frameworks, namely the i) static trade-off framework, and ii) the pecking order framework. The first framework is based on the premise that a company is viewed as setting a target debt ratio and gradually moving towards it. This is similar to the manner in which a company would adjust dividends to move towards a target pay-out ratio. The pecking order framework, on the other hand, states that a company will prefer internal to external financing and debt to equity if it issues securities. The company furthermore has no well-defined target debt ratio. This is similar to the work done by Donaldson (1961).

Abor (2008) encouraged equity finance in the initial phases of a company's existence, which would give the company a sound base in order to expand by way of debt financing. The findings of this study concur with the findings by Myers (1984) and Donaldson (1961), who found, when considering the static trade-off theory, that companies prefer raising capital first from retained earnings, secondly from debt, and thirdly from issuing new equity. Previous years' profitability of a company, and therefore the amount of retained earnings available, would then play an important role in determining the capital structure.

As evident in the above discussion, there are various capital structure theories, including the Miller and Modigliani theory, the trade-off theory and the pecking order theory (Van Rooyen, 2014). These theories are today referred to as the modern capital structure theories and can be summarised as follows:

Miller and Modigliani proposed that an entity's capital structure has no effect on the value of such a business. The trade-off theory, on the other hand, suggests that management will strive to achieve the optimal capital structure by finding a trade-off between the tax advantages of debt and the costs of financial distress and agency

costs of debt. Finally, the pecking order theory suggests that an optimal capital structure does not exist, but that management will rather make decisions about the entity's capital structure on the basis of their preference for certain types of finance (Van Rooyen, 2014).

### **4.2.3 Debt versus equity in capital structure**

There are various benefits of having debt as part of the capital structure, but also some obvious risks. Debt financing is an effective way to lower tax costs, but higher levels of debt in the capital structure can certainly result in a higher probability of bankruptcy. That, in turn, will decrease the value of the company, making it unattractive as an investment (Zaheer *et al.*, 2011). While Modigliani and Miller (1958, 1963) demonstrated that, in a frictionless world, financial leverage is unrelated to company value, they also noted that, in a world with tax-deductible interest payments, company value and capital structure are positively related. This view was supported by Van Horne (2002). In contrast to the tax deductibility of interest, dividends or retained earnings are not tax deductible (Ojo, 2012).

The timing of the funds requirement also plays an important role in whether a company decides to issue equity or debt. Baker and Wurgler (2002) developed a timing measure based on the idea that companies tend to raise funds with debt when their share price is low and with equity when their stock price is high. Therefore, companies are expected to have lower (higher) debt ratios if they happen to raise capital when their share prices are high (low). Hovakimian *et al.* (2001) similarly found that share prices play an important role in determining a company's financing choice. Companies that experience large share price increases are more likely to issue equity and retire debt than are companies that experience share price declines.

### **4.2.4 Gearing/leverage**

Gearing, also known as leverage, has become synonymous with risk. Financial leverage is a measure of the level of debt a company uses to finance its assets. As debt increases, financial leverage increases (Rehman, 2013). An increase in leverage may also increase the probability of default as the company's financial obligations increase, thereby ultimately increasing risk (Cai & Zhang, 2010).

Gearing/leverage is defined in a number of ways. A summary of some definitions, as defined by author, date and title of paper, is provided in Table 4.1. These definitions are required in order to identify the definition of gearing to be used in this study.

**Table 4.1: Gearing/leverage definition summary**

<b>Author(s) and date of research</b>	<b>Title of paper</b>	<b>Definition</b>
Bhandari (1988)	Debt/equity ratio and expected common share returns: Empirical evidence	Debt/equity ratio = (Book value of total assets – book value of equity) / market value of equity
Brümmer & Wolmarans (1995)	The relationship of debt to shareholders' equity and the relationship to the required rate of return on ordinary shares	(Book value of total assets – book value of equity) / Market value of equity
Kzistami (2011)	Does leverage have a strong impact on profitability: A case study on IT sector	Financial leverage represents the total debt reported to the equity of a company.
Alkhatib (2012)	The determinants of leverage of listed companies	Leverage = Total liabilities to equity
Iqbal, Hameed, & Ramzan (2012)	The impact of debt capacity on firm's growth	Total debt/book value of assets
Ojo (2012)	The effect of financial leverage on corporate performance of some selected companies in Nigeria	The leverage (LEV), measured by the debt-equity ratio of the companies
Rehman (2013)	Relationship between financial leverage and financial performance: Empirical evidence of listed sugar companies of Pakistan	Financial leverage is measured using the debt-to-equity ratio. Debt-to-equity ratio is measured by dividing total liabilities to shareholders' equity. Both market values and book values were considered.

Taking into account the various studies mentioned and all possible definitions of leverage and the debt-equity ratio, it is clear that most studies make use of the debt-equity ratio based on book values. Some studies also made use of a debt-asset ratio;

however, for the purposes of this study, the debt-equity ratio will be calculated based on book values.

#### 4.2.5 Understanding total shareholder return

The aforementioned sections focused on capital structure and debt levels, while this section will focus on conceptualising TSR. A relationship exists between the risks taken by shareholders when investing in a company and their expected return for taking on such risks.

According to Dimson, Marsh and Staunton (2000), risk and return are summarised as follows: The single most important contemporary issue in finance is the equity risk premium. This drives future equity returns, and is the key determinant of the cost of capital. The risk premium is the expected reward for bearing the risk of investing in equities, rather than in low-risk investments such as bills or bonds.

The main objective of financial management is to create shareholder wealth or value. This was reiterated by Anca and Petre (2012), who stated that the concept of shareholder value creation reflects the fundamental principal of successful financial management, i.e. to maximise the market value of investors' wealth.

According to Favaro and Rotz (2011), TSR as a measure of business performance is the best indicator of corporate success. TSR is calculated as the change in a company's share price for a given period plus its free cashflow over the same period, as a percentage of the beginning share price. However, TSR as a measure of corporate performance on its own in any given year carries minimal meaning. If it is measured over the long term, it can be regarded as the best indicator of success. This is because it reflects how well a company has created long-term value in highly competitive markets.

The following formula is suggested for the calculation of TSR (Adamson, Goings & Kapinos, n.d.):

$\text{Total shareholder return} = \frac{\text{Change in share price} + \text{dividends paid}}{\text{Beginning share price}}$
Where "dividends paid" equal the total of all dividends paid on one (1) share during the performance cycle.

It is therefore clear that TSR is defined as the total return of a share to an investor consisting of both capital gains and dividends.

### **4.3 RESEARCH DATA AND METHODOLOGY**

This study will follow analytical techniques from a quantitative research paradigm and all the data will be collected from secondary sources. In order to meet the research objectives of determining whether a relationship exists between the debt levels and TSR of the platinum companies listed on the JSE, correlation-based research will be conducted as part of the empirical study. Spearman's rank correlation coefficient will be considered.

In order to perform correlation-based research, a population has to be determined, and consequently, specific data of the population has to be collected.

#### **4.3.1 Population and data collection methods**

The study field comprised all companies listed on the platinum and precious metal sector of the JSE as at 30 April 2014. There were 13 companies listed on this sector on this date. One of the listed companies, namely Platfields Limited, was excluded from the analysis as the company only listed on the JSE during December 2010. A total of 12 companies were therefore analysed.

In order to determine the debt levels of each company, the *debt/equity ratio* (DE ratio) for each company was calculated based on book values. When considering the share price information, the number of years used to analyse each company varied as audited financial information and share prices are only available once a company lists on the JSE. The *TSR* of each company was calculated using the *dividends received* and *capital growth* for each share. The electronic databases McGregor BFA and Datastream were used to assist in gathering the required information.

Furthermore, TSR refers to the total return of a share to an investor, which includes capital gains and dividends earned. The TSR data is available as an index calculated by referring to R100 invested when the company listed on the JSE and then calculating the value of the investment at any point thereafter using the share price and the

dividends declared. The TSR data was extracted at daily intervals. To establish an average value at year end, a 30-day average before year end was calculated.

The change from one year to the next was then calculated and compared to the change in the DE ratio. The annual DE ratio variables based on book values were extracted from the McGregor BFA database for each of the 12 companies in the population. The change in the DE ratio was calculated annually.

As the DE ratio is only available on a company's financial year-end date as provided by the company's annual financial statements, the analysis was performed at various dates, as is evident from Table 4.2 below.

**Table 4.2: Population and year-end dates**

<b>Company</b>	<b>Year-end date</b>	<b>Years analysed</b>
Anglo American Platinum	31 December	2000-2013
Aquarius Platinum	30 June	2005-2013
Atlatsa Resources Corporation	31 December	2006-2012
Bauba Platinum	30 June	2000-2013
Eastern Platinum	31 December	2008-2013
Impala Platinum	30 June	2000-2013
Jubilee Platinum	30 June	2007-2013
Lonmin	30 September	2000-2013
Northam Platinum	30 June	2000-2013
Royal Bafokeng Platinum	31 December	2010-2013
Sable Metals and Minerals	28 February	2006-2013
Wesiswe Platinum	31 December	2006-2013

## **Hypotheses**

The conceptual scope of the study is that risk is concomitant to return, i.e. returns compensate for risks, and therefore higher risks require higher returns (and *vice versa*). The hypotheses of the study are developed against this backdrop, where the DE ratio represents risk opposed to return, measured by TSR. The following null- and alternative hypotheses are stated:

- $H_0$ : There is no monotone relationship between the debt-to-equity ratio and TSR of platinum companies.

- $H_1$ : There is a monotone relationship between the debt-to-equity ratio and TSR of platinum companies.

To estimate the relationship between risk and return, Spearman's rank correlation coefficient was applied to determine whether there is a monotone dependence between the DE ratio and the TSR of the organisation. Rank-order correlation is a non-parametric approach to determine the strength between the two variables. This non-parametric approach is preferred when data seems not to be normally distributed, because the correlation statistics are not affected by the type of mathematical relationship between variables, unlike Pearson's correlation coefficient that requires the relationship to be linear. Therefore, the Spearman's rank correlation coefficient is a more general measure of any kind of monotonic relationship between two variables. Since this measure is based on ranks, it is not as sensitive to outliers (Gauthier, 2001; Millard & Neerchal, 2001).

The Spearman rank correlation coefficient was selected to measure the relationship between the debt levels, i.e. risk and TSR, using annual data from 2000 to 2013, because only limited data was available. Regression analysis with a single dependent variable requires a sample of ten observations (Sekaran, 2006; Peng, Lee & Ingersoll, 2002). The number of companies included in this study varies between five and 12. Therefore, it was uncertain whether the data was normally distributed. As a result of the limited number of organisations included in the population, a two-sided hypothesis test at a 5% and a 10% level of significance, respectively, is performed. This means there is strong sample evidence ( $p < 0.05$ ) and there is only weak sample evidence ( $0.05 < p > 0.1$ ), respectively, to reject  $H_0$  in favour of  $H_1$  (Wegner, 2007).

#### **4.4 RESEARCH RESULTS AND FINDINGS**

A two-sided hypothesis test was performed to prove that there is no rank correlation between the equity-to-debt ratio and TSR, ( $p = 0$ ). Then (Wegner, 2007),

$$H_0: p = 0$$

$$H_1: p \neq 0.$$

Testing the null-hypothesis regarding the relationship between the DE ratio and TSR, the Spearman rank correlation coefficient (R) is indicated in Table 4.3.

**Table 4.3: Spearman’s rank correlation coefficient between DE ratio and TSR**

Year	Correlation coefficient (R)	Significance (p)	N
2000	0	1	5
2001	-0.1	0.873	5
2002	-0.3	0.624	5
2003	0.7	0.188	5
2004	-0.4	0.505	5
2005	-0.371	0.468	6
2006	-0.55	0.125	9
2007	-0.212	0.556	10
2008	0.327	0.326	11
2009	0.255	0.450	11
2010	0.266	0.404	12
2011	0.322	0.308	12
2012	0.594**	0.042	12
2013	0.573*	0.066	11

\*\* Significant at 5% (two-sided).

\*Significant at 10% (two-sided).

Note that there was no correlation in 2000, a negative correlation in 2001, 2002, 2004 to 2006, and a positive correlation in 2003 and 2007 to 2013. The relationship was significant only for 2012 and 2013. Regarding 2012,  $H_0$  was rejected in favour of  $H_1$ , since there was strong sample evidence that a relationship existed between risk and return. It can therefore be concluded that a strong positive relationship in 2012 exists between the DE ratio and TSR. Regarding 2013, there was only weak sample evidence to reject  $H_0$  in favour of  $H_1$ , implying  $H_0$  is probably true.

#### 4.5 CONCLUDING REMARKS

The purpose of this study was to determine whether there is a positive correlation between debt levels and total shareholder return (TSR) when considering platinum

companies listed on the JSE. When considering the rank-order correlation coefficient, we can also conclude that the study reveals mixed results, i.e. no negative and positive relationships where the relationship for the first 12 years is not significant and for the last two years significant. Therefore, the final conclusion is that this study is inconclusive to support or reject the conceptual scope of the study in that risk is concomitant to return, i.e. returns compensate for risks, and therefore higher debt levels require higher total shareholder returns (and *vice versa*).

The practical implication of the research is that investors considering investment in listed platinum companies will have to consider more than merely the capital structure of the company in order to make an informed decision about the investment. The financial performance of platinum companies resulting in TSR to shareholders is highly dependent on variables such as the international platinum prices and foreign exchange rates. These variables cannot be influenced by the management of platinum companies.

Furthermore, the management of platinum companies listed on the JSE will also have to consider various factors when considering an optimum capital structure including their ability to raise affordable equity and debt in the uncertain period the platinum industry is currently experiencing. As the results for this study were inconclusive, specifically within a South African platinum company context, such companies will have to carefully consider the effect that changes in capital structure will have on the total return to their shareholders. This is because the maximisation of shareholder wealth remains a priority for listed companies.

#### **4.5.1 Limitations of the study and future research**

A limitation to the study is that the results of the study cannot be generalised, as the focus was on South African platinum companies. However, further research can attempt to address this limitation by replicating and expanding the study to other sectors of the JSE. This will enable cross-sector comparisons and identify possible best practices in making capital structure decisions. From the results, it is also clear that further research could be considered by investigating the influence of variables outside the control of management on the relationship between debt levels and total shareholder return.

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## **CHAPTER 5**

### **5 CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

The aim of this chapter is to revisit the research objectives set in Chapter 1 (page 6) by summarising and concluding the findings based on these objectives. The researcher will present each objective followed by a summary and conclusion of the related findings. A comprehensive summary of the research will be provided followed by the limitations of the research. Finally, the areas for possible future research will be presented.

The main objective of the study was to determine whether there is a correlation between the debt levels and total shareholder return (TSR) of platinum companies listed on the JSE.

The secondary objectives included:

- Conceptualising capital structure and total shareholder return from the literature; and
- Contextualising the platinum industry in South Africa, and
- Establishing the capital structure associated with the highest performing platinum company.

These secondary objectives will now be discussed.

##### **5.1.1 Conceptualising capital structure and total shareholder return from the literature**

This objective was mainly addressed in Chapter 3, page 17. Modigliani and Miller (1958) performed ground-breaking research when they initially developed the Modigliani-Miller theorem, also known as the capital structure irrelevance principle. This opened the door for various other researchers to further explore this specific topic. Later, Myers (1984) studied two contrasting capital structure frameworks, namely the i) static trade-off framework, and ii) pecking order framework.

Miller and Modigliani proposed that an entity's capital structure has no effect on the value of such a business. The trade-off theory, on the other hand, suggests that management will strive to achieve the optimal capital structure by finding a trade-off between the tax advantages of debt and the costs of financial distress and agency costs of debt. Finally, the pecking order theory suggests that an optimal capital structure does not exist, but that management will rather make decisions about the entity's capital structure on the basis of their preference for certain types of finance (Van Rooyen, 2014).

Literature that conceptualised total shareholder return and all the elements that make up TSR were also considered. The main objective of financial management is to create shareholder wealth or value (Azhagaiah & Priya, 2008). TSR is calculated as the change in a company's share price for a given period plus its free cashflow over the same period, as a percentage of the beginning share price.

### **5.1.2 Contextualising the platinum industry in South Africa**

South Africa is known globally for its mining industry. The platinum industry has grown, from the first discovery of the metal in 1923, to South Africa being the largest producer of platinum in the world, supplying 73% of the world's platinum in 2012 (Hochreiter *et al.*, 1985; Jones, 1999; Matthey, n.d.). The platinum industry in South Africa is vital to the South African economy in terms of job creation and earning foreign exchange.

### **5.1.3 Establishing the capital structure associated with the highest performing platinum company**

The final secondary objective of establishing the capital structure associated with the highest performing platinum company was achieved, but the results were inconclusive. Further research needs to be conducted in order to determine the capital structure of each individual company as well as the overall company performance. As this study focused on the changes in the debt levels and how that correlated with the changes in TSR, the highest performing platinum company could not be identified.

## **5.2 RESEARCH SUMMARY AND RECOMMENDATIONS**

The purpose of this study was to determine whether there is a correlation between debt levels and total shareholder return (TSR) when considering platinum companies listed on the JSE. When considering the rank correlation coefficient, we can also conclude that the study reveals mixed results, i.e. no negative and positive relationships where the relationship for the first 12 years is not significant and for the last two years significant. Therefore, the final conclusion is that this study is inconclusive to support or reject the conceptual scope of the study in that risk is concomitant to return, i.e. returns compensate for risks, and therefore higher risks require higher returns (and *vice versa*).

Shareholders considering investment in listed platinum companies will have to consider other factors than merely the capital structure of the company in order to make an informed decision about the investment.

Platinum companies listed on the JSE, on the other hand, will also need to consider various factors when considering an optimum capital structure. As the results for this study were inconclusive, platinum companies will need to carefully consider the effect that the change in capital structure will have on the total return to their shareholders, as the maximisation of shareholder wealth is a top priority for listed companies.

## **5.3 RESEARCH LIMITATIONS**

This study focused only on JSE-listed platinum companies. Other external factors that might have influenced the TSR other than the debt levels in the capital structure fell outside the scope of this study. The findings of this study can therefore not be generalised to include other industries or companies. By focusing the study on listed companies in the same industry (platinum industry), most industry-specific influences would have been eliminated.

## **5.4 FUTURE RESEARCH OPPORTUNITIES**

Considering the above scope and limitations, further research can attempt to replicate a similar study in other sectors of the JSE, from which cross-sector comparisons and best practices may be extrapolated. From the results, it is also clear that further

research could be considered investigating the relationship between firm size and total return to shareholders.

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## **ANNEXURE 1: ARTICLE AS SUBMITTED**

### **The relationship between debt levels and total shareholder return of JSE-listed platinum companies**

#### **Abstract**

The platinum industry in South Africa is vital to the South African economy in terms of job creation and earner of foreign exchange. Investors considering platinum companies as an investment would study the risk profile of such a company. Shareholder of companies with high debt levels compared to equity, will require a relatively higher return to compensate for additional risk taken. The purpose of this study is to investigate empirically whether there is a positive correlation between the debt levels and the total shareholder return (TSR) of platinum companies listed on the JSE Limited. The study field comprised annual analyses for 12 companies listed under the Platinum and Precious Metals sector on the JSE Ltd for the 14-year period 2000 to 2013. The results of the study were inconclusive, because a statistically significant positive correlation between changes in debt levels and changes in TSR could only be found in two of these years. The core audience of the study will be the management of South African platinum companies considering changes in their capital structure, as well as investors considering investing in a listed platinum company. The contribution of the study is therefore to add to the body of literature on capital structure decisions from a South African platinum mine context.

**Keywords:** South Africa, debt levels, share prices, shareholder return, platinum industry, risk

## 1.1 INTRODUCTION

The platinum industry in South Africa is vital to the South African economy in terms of job creation and earner of foreign exchange. South Africa dominates the world production of platinum and has more than 80% of the world's platinum reserves (Jones, 1999). Platinum companies listed on the South African stock exchange, the JSE Limited (JSE), can be considered a higher risk investment for the following reasons: i) the volatility of international platinum prices (Matthey, n.d.), ii) numerous variables outside the direct influence of corporate management, such as the volatility of foreign exchange rates (Arize *et al.*, 2000), iii) trade unions influencing labour forces (Bhorat, Naidoo & Yu, 2014), and, iv) demand for the product (Yang, 2009).

In recent years, this industry has, however, been plagued with unrest. After a period of turmoil at the end of 2012, the labour unrest flared again in February 2014. The longest strike in the South African history of nearly five months was ended after a wage agreement was finally reached between the South African platinum companies and labour unions in June 2014 (Maylie, 2014). The impact of the strike on the platinum industry was severe, as per Terence Goodlace, the chief executive officer of Impala Platinum (Antonioli, 2014). As the South African platinum industry is such a key role player in South Africa, the focus of this study will fall on this sector.

Investors make investment decisions based on their risk appetite. Furthermore, when such investors consider shares as part of their investment portfolio, these investors will consider the risk profile of the company it is interested in. Risk appetite, i.e. the willingness of investors to bear risk, depends on both the degree to which investors dislike such uncertainty and the level of that uncertainty (Gai & Vause, 2005).

By taking on a certain level of risk, shareholders expect to be commensurately compensated. Shareholders of companies with relatively higher debt levels in their capital structure, and therefore higher financial risk, require a relatively higher return on their investment in order to compensate for such additional risk taken. Shareholders expect return in the form of dividend pay-outs and capital growth in the share price. A positive correlation is therefore expected between the debt levels of a company and the total return to their shareholders, i.e. the sum of

the dividend pay-outs and the capital growth in the share price, also referred to as total shareholder return (TSR).

The main objective of this study is therefore to investigate whether there is a correlation between the debt levels and the TSR of platinum companies listed on the JSE. In order to meet this objective, the paper will be structured as follows: section 2 will discuss the theoretical perspectives, while the third section will discuss the research data and methodology followed. Section 4 will present the research results and findings, while concluding remarks will be presented in section 5. The paper will conclude with limitations of the study and areas for further research will be identified.

## **1.2 THEORETICAL PERSPECTIVES**

The theoretical perspectives, *inter alia*, will consider previous research conducted in order to identify the knowledge gap. The history of capital structure theories will be discussed, followed by literature on debt versus equity in the capital structure. Gearing, also referred to as leverage, definitions will be considered, and this section will conclude with TSR. These discussions will provide the theoretical framework from which the empirical study will be conducted.

### **1.2.1 Previous research conducted and knowledge gap**

The objective of this section of the literature review is to summarise previous research conducted in order to identify a knowledge gap. A number of studies performed across various industries have found that a positive relationship exists between company performance and capital structure. Abu-Rub (2012) found that a positive relationship exists between the capital structure measures (including short-term debt, long-term debt and total debt to total assets, and total debt to total equity) and the firm's performance when considering a sample of 28 companies listed on the Palestinian Stock Exchange over the period 2006 to 2010. Sari and Hutagaol's (2011) findings from a study conducted on food and beverage companies listed on the Indonesian Stock Exchange from 2003 to 2008, agreed with the findings of Abu-Rub (2012). They found that a positive relationship does exist between the debt-to-equity ratio and share return; however, this result was statistically insignificant. Pathirawasam and Wickremasinghe (2012) found that the debt ratio was negatively related to the financial performance of the listed companies in Sri Lanka.

A study performed by Azhagaiah and Gavoury (2011) focused on the IT industry in India. The study found that an increase in the use of debt in the capital structure tends to minimise the net profit of the IT firms listed in the Bombay Stock Exchange in India. Afrasiabi and Ahmadiania (2011) performed research on the financing effect on the capital structure of companies listed on the Tehran Stock Exchange. It was found that companies that are financed via the issuance of shares have less risk and higher returns. This group of companies therefore had a better performance against systematic risk and more value creation for its shareholders.

Research conducted on the factors influencing the capital structure of a company includes the following: Zaheer, Saeed and Mir (2011) found that the capital structure debt-equity mix relies heavily on the assets that a firm has, combined with the growth in business to a certain extent. A study by Liu and Ning (2009) considered listed companies in the electric power industry in China. It was found that the size of the company, non-debt tax shields and asset structure were not significantly correlated with the capital structure, and the flexibility of the assets was negatively correlated with the capital structure. Size and profitability variables were found to be significant in a study performed on companies in Malaysia when trying to identify the factors that influence the debt proportions of the capital structures (Sarma, Lellapalli & Lellapalli, 2010). Hovakimian, Opler and Titman (2001) found that share prices play an important role in determining a company's choice of finance. Companies that experience large share price increases are more likely to issue equity rather than debt than are companies that experience share price declines (Hovakimian *et al.*, 2001). Finally, Ping and Caixia (2011) concluded that a company's capital structure decision has positive, negative and uncertain effects on its own total market value, which may be affected by controllable leverage decision-making. However, it was also recommended that the extent of the capital structure decision on a listed company's total market value should be explored more deeply.

Other studies on the topic of capital structure have been conducted by various other researchers, including Modigliani and Miller (1958), Donaldson (1961), Myers (1984), and Weichenrieder and Klautke (2008). These studies aimed to address the factors that determine a company's choice of capital structure; however, the results have been either inconclusive or contradicting.

Lastly, a South African study similar to the topic of this study was conducted by Brümmer and Wolmarans (1995) approximately two decades ago. The authors investigated whether a positive

relationship exists between the debt-to-equity ratio and the expected return of a share, if beta and firm size are simultaneously tested as variables. They found that the theory that hypothesises that a high risk is compensated by a high return is not valid for their sample.

It is evident that the topic of capital structure decisions and the relationship between capital structure variables and company performance has been well researched; however, the following gaps in the literature urged that this similar study should be conducted, since there is firstly only a single study performed on JSE-listed companies, secondly this JSE-listed company study could not support the risk-return theory, and thirdly, no previous study has been done on this unique group of companies, namely platinum extractors. The contribution of the study is therefore to add to the body of literature on capital structure decisions from a South African platinum mine context.

### **1.2.2 The history of capital structure theories**

The modern theory of capital structure started with research published by Modigliani and Miller (1958). The Modigliani-Miller theorem states that in an efficient market, in the absence of taxes, bankruptcy costs and asymmetric information, a company's value is unaffected by the way it is financed. Otherwise stated, regardless of whether the company's capital comprises equities or debt, or a combination thereof, or what the dividend policy is, the company's value would remain the same (Modigliani & Miller, 1958; Weichenrieder & Klautke, 2008). The theorem is also known as the capital structure irrelevance principle. This ground-breaking research opened the door for various other researchers to further explore this specific topic.

One such researcher, Donaldson (1961), found that management strongly favoured generating new funds internally even to the exclusion of external funds. However, most managers did not even consider cutting dividend payments in order to raise funds. Furthermore, a significant amount of research has also focused on capital structure being determined by agency costs, specifically costs due to conflict of interest. Jensen and Meckling (1976) identified two types of conflict while building on the earlier work of Fama and Miller (1972). The types of conflict, however, fall outside the scope of this study. Jensen and Meckling (1976) argued that an optimal capital structure could be obtained by simply trading off the agency costs of debt against the benefit of having debt in the capital structure.

Myers (1984) studied two contrasting capital structure frameworks, namely the i) static trade-off framework, and ii) the pecking order framework. The first framework is based on the premise that a company is viewed as setting a target debt ratio and gradually moving towards it. This is similar to the manner in which a company would adjust dividends to move towards a target pay-out ratio. The pecking order framework, on the other hand, states that a company will prefer internal to external financing and debt to equity if it issues securities. The company furthermore has no well-defined target debt ratio. This is similar to the work done by Donaldson (1961).

Abor (2008) encouraged equity finance in the initial phases of a company's existence, which would give the company a sound base in order to expand by way of debt financing. The findings of this study concur with the findings by Myers (1984) and Donaldson (1961), who found, when considering the static trade-off theory, that companies prefer raising capital first from retained earnings, secondly from debt, and thirdly from issuing new equity. Previous years' profitability of a company, and therefore the amount of retained earnings available, would then play an important role in determining the capital structure.

As evident in the above discussion, there are various capital structure theories, including the Miller and Modigliani theory, the trade-off theory and the pecking order theory (Van Rooyen, 2014). These theories are today referred to as the modern capital structure theories and can be summarised as follows:

Miller and Modigliani proposed that an entity's capital structure has no effect on the value of such a business. The trade-off theory, on the other hand, suggests that management will strive to achieve the optimal capital structure by finding a trade-off between the tax advantages of debt and the costs of financial distress and agency costs of debt. Finally, the pecking order theory suggests that an optimal capital structure does not exist, but that management will rather make decisions about the entity's capital structure on the basis of their preference for certain types of finance (Van Rooyen, 2014).

### **1.2.3 Debt versus equity in capital structure**

There are various benefits of having debt as part of the capital structure, but also some obvious risks. Debt financing is an effective way to lower tax costs, but higher levels of debt in the

capital structure can certainly result in a higher probability of bankruptcy. That, in turn, will decrease the value of the company, making it unattractive as an investment (Zaheer *et al.*, 2011). While Modigliani and Miller (1958, 1963) demonstrated that, in a frictionless world, financial leverage is unrelated to company value, they also noted that, in a world with tax-deductible interest payments, company value and capital structure are positively related. This view was supported by Van Horne (2002). In contrast to the tax deductibility of interest, dividends or retained earnings are not tax deductible (Ojo, 2012).

The timing of the funds requirement also plays an important role in whether a company decides to issue equity or debt. Baker and Wurgler (2002) developed a timing measure based on the idea that companies tend to raise funds with debt when their share price is low and with equity when their stock price is high. Therefore, companies are expected to have lower (higher) debt ratios if they happen to raise capital when their share prices are high (low). Hovakimian *et al.* (2001) similarly found that share prices play an important role in determining a company's financing choice. Companies that experience large share price increases are more likely to issue equity and retire debt than are companies that experience share price declines.

#### **1.2.4 Gearing/leverage**

Gearing, also known as leverage, has become synonymous with risk. Financial leverage is a measure of the level of debt a company uses to finance its assets. As debt increases, financial leverage increases (Rehman, 2013). An increase in leverage may also increase the probability of default as the company's financial obligations increase, thereby ultimately increasing risk (Cai & Zhang, 2010).

Gearing/leverage is defined in a number of ways. A summary of some definitions, as defined by author, date and title of paper, is provided in Table 1. These definitions are required in order to identify the definition of gearing to be used in this study.

**Table 1: Gearing/leverage definition summary**

<b>Author(s) and date of research</b>	<b>Title of paper</b>	<b>Definition</b>
Bhandari (1988)	Debt/equity ratio and expected common share returns: Empirical evidence	Debt/equity ratio = (Book value of total assets – book value of equity) / market value of equity
Brümmer & Wolmarans (1995)	The relationship of debt to shareholders' equity and the relationship to the required rate of return on ordinary shares	(Book value of total assets – book value of equity) / Market value of equity
Kzistami (2011)	Does leverage have a strong impact on profitability: A case study on IT sector	Financial leverage represents the total debt reported to the equity of a company.
Alkhatib (2012)	The determinants of leverage of listed companies	Leverage = Total liabilities to equity
Iqbal, Hameed, & Ramzan (2012)	The impact of debt capacity on firm's growth	Total debt/book value of assets
Ojo (2012)	The effect of financial leverage on corporate performance of some selected companies in Nigeria	The leverage (LEV), measured by the debt-equity ratio of the companies
Rehman (2013)	Relationship between financial leverage and financial performance: Empirical evidence of listed sugar companies of Pakistan	Financial leverage is measured using the debt-to-equity ratio. Debt-to-equity ratio is measured by dividing total liabilities to shareholders' equity. Both market values and book values were considered.

Taking into account the various studies mentioned and all possible definitions of leverage and the debt-equity ratio, it is clear that most studies make use of the debt-equity ratio based on book values. Some studies also made use of a debt-asset ratio; however, for the purposes of this study, the debt-equity ratio will be calculated based on book values.

### 1.2.5 Understanding total shareholder return

The aforementioned sections focused on capital structure and debt levels, while this section will focus on conceptualising TSR. A relationship exists between the risks taken by shareholders when investing in a company and their expected return for taking on such risks.

According to Dimson, Marsh and Staunton (2000), risk and return are summarised as follows: The single most important contemporary issue in finance is the equity risk premium. This drives future equity returns, and is the key determinant of the cost of capital. The risk premium is the expected reward for bearing the risk of investing in equities, rather than in low-risk investments such as bills or bonds.

The main objective of financial management is to create shareholder wealth or value. This was reiterated by Anca and Petre (2012), who stated that the concept of shareholder value creation reflects the fundamental principal of successful financial management, i.e. to maximise the market value of investors' wealth.

According to Favaro and Rotz (2011), TSR as a measure of business performance is the best indicator of corporate success. TSR is calculated as the change in a company's share price for a given period plus its free cashflow over the same period, as a percentage of the beginning share price. However, TSR as a measure of corporate performance on its own in any given year carries minimal meaning. If it is measured over the long term, it can be regarded as the best indicator of success. This is because it reflects how well a company has created long-term value in highly competitive markets.

The following formula is suggested for the calculation of TSR (Adamson, Goings & Kapinos, n.d.):

$\text{Total shareholder return} = \frac{(\text{Change in share price} + \text{dividends paid})}{\text{Beginning share price}}$ <p>Where "dividends paid" equal the total of all dividends paid on one (1) share during the performance cycle.</p>
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It is therefore clear that TSR is defined as the total return of a share to an investor consisting of both capital gains and dividends.

### **1.3 RESEARCH DATA AND METHODOLOGY**

This study will follow analytical techniques from a quantitative research paradigm and all the data will be collected from secondary sources. In order to meet the research objectives of determining whether a relationship exists between the debt levels and TSR of the platinum companies listed on the JSE, correlation-based research will be conducted as part of the empirical study. Spearman's rank correlation coefficient will be considered.

In order to perform correlation-based research, a population has to be determined, and consequently, specific data of the population has to be collected.

#### **1.3.1 Population and data collection methods**

The study field comprised all companies listed on the platinum and precious metal sector of the JSE as at 30 April 2014. There were 13 companies listed on this sector on this date. One of the listed companies, namely Platfields Limited, was excluded from the analysis as the company only listed on the JSE during December 2010. A total of 12 companies were therefore analysed.

In order to determine the debt levels of each company, the *debt/equity ratio* (DE ratio) for each company was calculated based on book values. When considering the share price information, the number of years used to analyse each company varied as audited financial information and share prices are only available once a company lists on the JSE. The *TSR* of each company was calculated using the *dividends received* and *capital growth* for each share. The electronic databases McGregor BFA and Datastream were used to assist in gathering the required information.

Furthermore, *TSR* refers to the total return of a share to an investor, which includes capital gains and dividends earned. The *TSR* data is available as an index calculated by referring to R100 invested when the company listed on the JSE and then calculating the value of the investment at any point thereafter using the share price and the dividends declared. The *TSR*

data was extracted at daily intervals. To establish an average value at year end, a 30-day average before year end was calculated.

The change from one year to the next was then calculated and compared to the change in the DE ratio. The annual DE ratio variables based on book values were extracted from the McGregor BFA database for each of the 12 companies in the population. The change in the DE ratio was calculated annually.

As the DE ratio is only available on a company's financial year-end date as provided by the company's annual financial statements, the analysis was performed at various dates, as is evident from Table 2 below.

**Table 2: Population and year-end dates**

Company	Year-end date	Years analysed
Anglo American Platinum	31 December	2000-2013
Aquarius Platinum	30 June	2005-2013
Atlatsa Resources Corporation	31 December	2006-2012
Bauba Platinum	30 June	2000-2013
Eastern Platinum	31 December	2008-2013
Impala Platinum	30 June	2000-2013
Jubilee Platinum	30 June	2007-2013
Lonmin	30 September	2000-2013
Northam Platinum	30 June	2000-2013
Royal Bafokeng Platinum	31 December	2010-2013
Sable Metals and Minerals	28 February	2006-2013
Wesiswe Platinum	31 December	2006-2013

## Hypotheses

The conceptual scope of the study is that risk is concomitant to return, i.e. returns compensate for risks, and therefore higher risks require higher returns (and *vice versa*). The hypotheses of the study are developed against this backdrop, where the DE ratio represents risk opposed to return, measured by TSR. The following null- and alternative hypotheses are stated:

- $H_0$ : There is no monotone relationship between the debt-to-equity ratio and TSR of platinum companies.

- $H_1$ : There is a monotone relationship between the debt-to-equity ratio and TSR of platinum companies.

To estimate the relationship between risk and return, Spearman's rank correlation coefficient was applied to determine whether there is a monotone dependence between the DE ratio and the TSR of the organisation. Rank-order correlation is a non-parametric approach to determine the strength between the two variables. This non-parametric approach is preferred when data seems not to be normally distributed, because the correlation statistics are not affected by the type of mathematical relationship between variables, unlike Pearson's correlation coefficient that requires the relationship to be linear. Therefore, the Spearman's rank correlation coefficient is a more general measure of any kind of monotonic relationship between two variables. Since this measure is based on ranks, it is not as sensitive to outliers (Gauthier, 2001; Millard & Neerchal, 2001).

The Spearman rank correlation coefficient was selected to measure the relationship between the debt levels, i.e. risk and TSR, using annual data from 2000 to 2013, because only limited data was available. Regression analysis with a single dependent variable requires a sample of ten observations (Sekaran, 2006; Peng, Lee & Ingersoll, 2002). The number of companies included in this study varies between five and 12. Therefore, it was uncertain whether the data was normally distributed. As a result of the limited number of organisations included in the population, a two-sided hypothesis test at a 5% and a 10% level of significance, respectively, is performed. This means there is strong sample evidence ( $p < 0.05$ ) and there is only weak sample evidence ( $0.05 < p > 0.1$ ), respectively, to reject  $H_0$  in favour of  $H_1$  (Wegner, 2007).

#### **1.4 RESEARCH RESULTS AND FINDINGS**

A two-sided hypothesis test was performed to prove that there is no rank correlation between the equity-to-debt ratio and TSR, ( $p = 0$ ). Then (Wegner, 2007),

$$H_0: p = 0$$

$$H_1: p \neq 0.$$

Testing the null-hypothesis regarding the relationship between the DE ratio and TSR, the Spearman rank correlation coefficient (R) is indicated in Table 3.

**Table 3: Spearman's rank correlation coefficient between the DE ratio and TSR**

Year	Correlation coefficient (R)	Significance (p)	N
2000	0	1	5
2001	-0.1	0.873	5
2002	-0.3	0.624	5
2003	0.7	0.188	5
2004	-0.4	0.505	5
2005	-0.371	0.468	6
2006	-0.55	0.125	9
2007	-0.212	0.556	10
2008	0.327	0.326	11
2009	0.255	0.450	11
2010	0.266	0.404	12
2011	0.322	0.308	12
2012	0.594**	0.042	12
2013	0.573*	0.066	11

\*\* Significant at 5% (two-sided).

\*Significant at 10% (two-sided).

Note that there was no correlation in 2000, a negative correlation in 2001, 2002, 2004 to 2006, and a positive correlation in 2003 and 2007 to 2013. The relationship was significant only for 2012 and 2013. Regarding 2012,  $H_0$  was rejected in favour of  $H_1$ , since there was strong sample evidence that a relationship existed between risk and return. It can therefore be concluded that a strong positive relationship in 2012 exists between the DE ratio and TSR. Regarding 2013, there was only weak sample evidence to reject  $H_0$  in favour of  $H_1$ , implying  $H_0$  is probably true.

## **1.5 CONCLUDING REMARKS**

The purpose of this study was to determine whether there is a positive correlation between debt levels and total shareholder return (TSR) when considering platinum companies listed on the JSE. When considering the rank-order correlation coefficient, we can also conclude that the study reveals mixed results, i.e. no negative and positive relationships where the relationship for the first 12 years is not significant and for the last two years significant. Therefore, the final conclusion is that this study is inconclusive to support or reject the conceptual scope of the study in that risk is concomitant to return, i.e. returns compensate for risks, and therefore higher debt levels require higher total shareholder returns (and *vice versa*).

The practical implication of the research is that investors considering investment in listed platinum companies will have to consider more than merely the capital structure of the company in order to make an informed decision about the investment. The financial performance of platinum companies resulting in TSR to shareholders is highly dependent on variables such as the international platinum prices and foreign exchange rates. These variables cannot be influenced by the management of platinum companies.

Furthermore, the management of platinum companies listed on the JSE will also have to consider various factors when considering an optimum capital structure including their ability to raise affordable equity and debt in the uncertain period the platinum industry is currently experiencing. As the results for this study were inconclusive, specifically within a South African platinum company context, such companies will have to carefully consider the effect that changes in capital structure will have on the total return to their shareholders. This is because the maximisation of shareholder wealth remains a priority for listed companies.

### **1.5.1 Limitations of the study and future research**

A limitation to the study is that the results of the study cannot be generalised, as the focus was on South African platinum companies. However, further research can attempt to address this limitation by replicating and expanding the study to other sectors of the JSE. This will enable cross-sector comparisons and identify possible best practices in making capital structure decisions. From the results, it is also clear that further research could be considered by

investigating the influence of variables outside the control of management on the relationship between debt levels and total shareholder return.

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## **ANNEXURE 2: JOURNAL SUBMISSION GUIDELINES**

SA Business Review

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### **Nature of contributions**

The *Southern African Business Review* serves as a vehicle for the publication and dissemination of research in the fields of the economic and management sciences. Research contributions should conform to high standards of scholarly research inquiry. The following should at least be addressed: purpose/objective of the article, sound conceptualisation/theoretical foundation, statement of the research problem or hypothesis, research methodology (where applicable), analysis/discussion of research findings (where applicable) and conclusion.

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2. All tables, illustrations and figures should be incorporated in the body of the manuscript. The editor reserves the right to refuse publication of any submission for which the artwork is not of an acceptable standard.
3. Since the Southern African Business Review follows a policy of blind peer review, the first page of the text proper should carry the title of the article, but not the name(s) of the author(s).
4. A separate page should carry the title of the article, its author(s) and relevant biographical information, including full name, academic title, current position and institution (where appropriate). Postal and e-mail addresses should also be provided.
5. The article should be preceded by a single paragraph abstract of the article, not exceeding 200 words. The abstract should not form part of the text. A list of as many key words as possible should be submitted per article for cataloguing purposes.
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3. If approved subject to revision, the manuscript will be returned to the author(s) who will make the necessary alternations/corrections. The final copy of the manuscript will then be returned to the editors. This copy should be submitted in MS Word by e-mail.
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7 November 2014

Dear Mr / Ms

Re: Language editing of master's dissertation: The relationship between debt levels and total shareholder return of JSE-listed platinum companies

I hereby declare that I language edited the above-mentioned master's dissertation by Ms Sandra von Abo (student number: 24051349 – 2012) during October 2014.

Please feel free to contact me should you have any enquiries.

Kind regards

Cecile van Zyl

Language practitioner

BA (PU for CHE); BA honours (PU for CHE); MA (NWU)