

THE RELATIONSHIP BETWEEN DEBT LEVELS AND TOTAL SHAREHOLDER RETURN OF JSE-LISTED PLATINUM COMPANIES

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Abstract

The purpose of this study is to investigate empirically whether there is a positive correlation between debt levels and total shareholder return (TSR) of platinum JSE-listed companies. 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 as 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, and investors considering investment 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. 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 et al., 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 and 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.

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.

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 et al. (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 et al., 2010). Hovakimian et al. (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.

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 and Miller, 1958; Weichenrieder and Klautke, 2008). The theorem is also known as the capital structure irrelevance principle. This groundbreaking 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. 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. 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.

2.3. 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 and 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.

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.

2.4. 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 et al. (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.

Table 1. Gearing/leverage definition summary

<i>Author(s) and date of research</i>	<i>Title of paper</i>	<i>Definition</i>
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 and 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 et al. (2012)	The impact of debt capacity on company'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.

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 et al. n.d.):

$$\text{Total shareholder return} = \frac{\text{Change in share price} + \text{dividends paid}}{\text{Beginning share price}} \quad (1)$$

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.

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.

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
Wesivwe Platinum	31 December	2006-2013

3.2. 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:

H0: There is no monotone relationship between the debt-to-equity ratio and TSR of platinum companies.

H1: 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 and 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 et al., 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. 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

Note: ** 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.

5. CONCLUSIONS

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.

5.1. Limitations of the study and future research

A limitation of 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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