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Effects of credit rating changes on corporate capital structure in South Africa

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Orientation: The changes in credit ratings for corporates have a great impact on corporate funding decisions, costs and capital structures.

Research purpose: The study aimed to identify the relationship between credit ratings and capital structures in emerging economies such as South Africa.

Motivation for study: Investors, financial managers, regulatory authorities and financial analysts focus on the credit quality of companies as measured by credit ratings in making financing and investing choices. The credit rating is a significant communication tool, and businesses consider it crucial when deciding on capital structure. An ideal capital structure of a company is one that reduces its relative cost of capital by striking a balance between the capital structure proportions to enhance value.

Research approach, design and method: A systematic and quantitative approach using semi-annual data from 2011 to 2020 sourced from EquityRT and the JSE.

Main findings: Credit ratings have a positive and material impact on the capital structure decisions of South Africa's top 40 companies. Thus, a higher debt-to-asset ratio is encouraged when the credit score improves, and a downgrade is more likely to be followed by a capital reduction behaviour.

Practical/managerial implications: Investors, managers and regulators can use the findings of this study for financial decision-making purposes, anticipating changes in future corporate capital structures and monitoring funding opportunities as well as balancing debt to equity in the capital construction of an organisation.

Contribution/value-add: The evidence generated by the study presented that credit rating changes influence capital structure.

Keywords: capital structure; credit ratings; rating outlook; total debt to total assets; investment grade; speculative grade.

Introduction

Capital structure composition is a crucial decision that financial managers must pay close attention to (Ogden, Jen & O'Connor 2003). The ideal capital structure for optimising shareholder wealth has been the subject of research and debate among academics of finance starting with Modigliani and Miller in 1958 (Hossain 2021). However, there is no consensus despite the plethora of divergent theoretical propositions over the past 60 years (Dasilas & Papasyriopoulos 2015). According to Sajjad and Zakaria (2018), an ideal capital structure of a company is one that reduces its relative cost of capital by obtaining a balance between the capital structure ratio propositions to enhance company value. Lately, the role credit rating agencies (CRA) play regarding how businesses raise their capital has increased. This credit rating role has become of interest in modern finance especially in emerging market economies where research is scant (Sajjad & Zacharia 2018).

The focus of this investigation is based on the notion that credit ratings are considered a source of information that influences finance and investment decisions. The credit rating of a company is a significant communication tool, and many businesses consider it crucial while deciding on capital structure (Drobetz & Heller 2014; El-Masry 2016; Michelsen & Klein 2011). It should then follow that when such focus is placed on credit ratings, it would inevitably impact the debt proportions and capital structures of organisations, considering that debt sources typically attract the lowest cost of capital because of its financial leverage feature (Sajjad & Zacharia 2018). Credit ratings are

critical because, to investors, they serve as indicators of the credit quality of a company, therefore, affecting the company's cost of financing its non-current assets or projects (Kisgen & Strahan 2010). Another belief is that when a company's credit rating is reduced, its borrowing rates rise, thus emphasising the key role of credit ratings in shaping corporate capital structure (Sajjad & Zacharia 2018).

Furthermore, governments pursue sovereign credit ratings to enter international capital markets for themselves and domestic private issuers (Cantor & Packer 1996). Sovereign credit ratings are crucial for emerging economies such as South Africa because they allow government and private sector debt issuers to access global financial markets. With that in mind, it is notable that over the last decade, the South African economic environment has been altered dramatically to the point where the sovereign credit rating was recently reduced to sub-investment grade by the main rating agencies. The ramifications of being issued with a sovereign sub-investment grade are extensive. The borrowing costs of a South African company will now typically increase to compensate for the additional credit default risk as communicated through the sub-investment rating (Ntsalaze, Boako & Alagidede 2017). Meanwhile, the global financial markets have become increasingly complicated over time, demanding professional opinions in the frame of credit ratings to augment company financing, investment decisions and risk management (Khatami, Marchica & Mura 2016).

Credit ratings are considered by Naeem (2012) to be based on the fundamental premise that they represent more than merely a yield of business funding strategies. Essentially, credit ratings will continue to play a crucial role in capital structure decisions moving into the future considering the ever-increasing integration of capital markets around the world. However, despite the continued reliance on CRAs by market participants, academic research consistently underestimates the impact of credit ratings on capital structure decisions (Al-Hindawi 2020). It is well known that prior research studies on the association between credit ratings and capital structure mixture have mainly concentrated on data from the USA, European and, most recently, Asian markets (Sajjad & Zakaria 2018). Considering that credit ratings are necessary for African enterprises to gain access to global capital markets, it is imperative to research the impact of credit ratings on capital structures in emerging markets such as South Africa and identify their effects in this region of the world. Therefore, the aim of this research is to determine the impact of credit rating changes on the capital structures of South African listed firms. This expansion of empirical work on the interaction of credit ratings and capital structures of an emerging economy like South Africa could assist companies in other emerging economies in determining their capital structures.

Literature review

The importance of the financing decision is seated in the notion that capital structure impacts the value of a company and plays a critical role in shareholder's wealth maximisation (Sajjad & Zacharia 2018). The debate concerning the influence that capital structure has on the value of the firm started with Modigliani and Miller in 1958. The authors initially stated that under perfect capital market conditions, there is no direct connection between company value and related capital structure (Modigliani & Miller 1958). The authors showed that the value of a company is not dependent on the composition of its capital. However, the primary defect in their first formulation is the absence of a tax-shield benefit. In a later study, Modigliani and Miller (1963) added a tax shield benefit to their formulation. One of the most disconcerting findings in this revised version was that the value of a leveraged firm was assumed to be equal to that of an unleveraged firm, plus the advantages of the tax shield (Aktan et al. 2019). As a result, the issue of the function of bankruptcy has arised, as it has been understood to suggest that debt-intensive businesses are more valued than their counterparts. Interest payments are deducted from taxable income (Modigliani & Miller 1963); hence, the composition of company capital structure matters for its value (Fama & French 2002). Since then, academics have kept looking into how organisations fund their ventures.

The emergence of the two prominent theories: the trade-off theory (Kraus & Litzenberger 1973) and pecking order theory (Myers & Majluf 1984) provided more clarification on how organisations make decisions about their capital structures (Myers 1984). According to the notion of trade-offs, debt financing has both costs and benefits that impact the selection of capital structure. Although borrowing money provides tax advantages, a company that takes on more debt runs the danger of not being able to pay it back. Thus, a value-maximising corporation would aim for a balance between debt and tax benefits of interest shield with the various expenses associated with bankruptcy and financial difficulties (Myers 1984). Debt finance, according to the trade-off hypothesis, offers both advantages and disadvantages. Despite the tax benefits of debt that accrue to a company, growing debt levels raise the risk of its inability to generate adequate revenue to pay debt commitments from the debt issued. It then follows that a value-maximising business would pursue a gearing level that strikes a balance between interest tax benefits and the other expenses associated with bankruptcy and financial difficulty (Myers 1984).

Capital structure decisions are made in a distinct approach, according to the pecking order idea. Donaldson (1961) discovered that financial managers preferred to use funds generated internally, unless it was entirely unavoidable to use external funding, which was one of the first investigations to employ the pecking order hypothesis. It was only in 1984 that the pecking order was refined by Myers and Majluf. The authors believe that businesses acquire external capital only when internal finances are insufficient to meet their funding requirements. More specifically, Myers and Majluf (1984) discovered that businesses first employ internal resources, then debt, and lastly, equity, as a last resort to finance their

projects. As a result, companies prefer the use of borrowed funds to equity for a variety of reasons, two of which are: the higher cost of equity attributable to information asymmetries, as well as the assumption that equity bears the biggest risk of all capital sources, thus prompting a higher required rate of return. After dividends and viable investment opportunities are considered, according to the pecking order hypothesis, a change in debt levels occurs (Shyam-Sunder & Myers 1999). Therefore, leverage ratios are not driven by an ideal capital structure, but rather by the requirement for external financing.

Given the likelihood of the effect of credit ratings on the cost of debt, the impact of credit ratings on capital structure could be explained by one of the two capital structure theories mentioned here. In the case of a downgrade of credit ratings, the inclusion of more debt can be motivated by the tax-shield debt provides, which supports the trade-off theory. Or a downgrade will inhibit further debt financing because of it being more expensive. This in turn will make internal financing more attractive, which will support the pecking order theory.

Determining the credit quality of companies by means of credit ratings has become increasingly important in deciding an ideal mixture of equity and debt compositions in a company's funding structure. Credit ratings are considered by 57.1% of Chief Financial Officer (CFOs) as the second most important factor impacting debt strategy (Graham & Harvey 2001). In addition, the credit rating–capital structure hypothesis (CR-CS), proposed by Kisgen (2006), contends that managers' capital structure decisions are heavily influenced by credit ratings, because of the distinct costs and advantages attached to different rating levels (Naeem 2012). Kisgen (2006) found that credit ratings had a significant impact on capital structure decisions in the U.S. market between 1986 and 2001. Companies on the cusp of an upgrade or downgrade in their credit rating, issue less debt relative to net equity as a percentage of their total assets (Kisgen 2006). Debt costs and capital structure, as well as the ability of an organisation to continue trading, are directly influenced by a company's credit rating (Gray, Mirkovic & Ragunathan 2006). With regard to capital structure, Servaes & Tufano (2006) contend that the credit rating is by far the most important factor.

Further evidence for the influence of credit ratings on the financial gearing decisions of companies was revealed in related research undertaken by Michelsen and Klein (2011) during the period 1990–2008. In addition, to test for the CR-CS hypothesis, Drobetz and Heller (2014) used both U.S. and German firms to examine the relationship. The authors discovered that there was evidence of a minimal target rating being pursued by companies from the U.S. sample and financial distress was only of secondary importance. Thus, this finding aids Kisgen's (2006, 2009) basis for the relevance of the CR-CS hypothesis. According to a study by Sajjad and Zakaria (2018), the relationship between credit rating scales and leverage ratios is the most important factor in Asian markets, such as China, Hong Kong, Japan, Singapore, South Korea, Malaysia, Indonesia, Thailand and India. They found this relationship to be characterised as a non-linear inverted U shape. Thus, companies with high or low ratings have relatively low gearing ratios, and those with a rating in the middle tend to have a considerably higher gearing ratio. According to their main findings, corporations in the Asian markets make capital structure decisions based on the costs and benefits of each rating scale.

For many financial market participants, credit ratings appear to be relevant; that is, the consensus is that higher credit ratings equal lower debt costs, and vice versa (Pan et al. 2015). Some financial economics research in this discipline, on the other hand, questions the significance of changes in these ratings. A popular argument is that the rating change may occur in conjunction with, or even more likely, immediately after, an informational release; hence, it may include no informational substance on its own (Boot & Milbourne 2002). Many publicly traded companies believe that only the factors of the firm can achieve optimal capital structure (Sajjad & Zakaria 2018). This notion is also observed by Raqeeb and Zaidi (2012) in Pakistani companies that seem to trivialise the need for being rated by CRAs for the purposes of raising capital on their financial markets. Despite using the same technique as Kisgen (2006), Kemper and Rao (2013) were unable to validate Kisgen's (2006) position that the CR-CS motive is scientifically linked to any of these traits.

Nations with better financial development and legal settings implemented capital structure modifications more swiftly and efficiently than other countries, regardless of whether the corporate ratings were improved or reduced (Huang & Shen 2015). These authors argue that the financial growth of a nation, as well as its legislative frameworks and institutional structures are more critical in determining the optimal capital structure. They also found that a change in credit ratings had an erratic effect on capital structure decisions, which is the most important finding of their study. As a result, following a rating downgrade, companies would modify their capital structure ratio but after a rating upgrade, they would not adjust it significantly.

There has been a growing number of research on the effect of credit ratings on capital structure in the USA, Europe and Asia (Drobetz & Heller 2014; Kisgen 2006; Matthies 2013; Michelsen & Klein 2011; Sajjad & Zakaria 2018; Wojewodzki, Poon & Shen 2018). While Africa requires credit ratings to access foreign markets, not much has been written about African countries. Furthermore, a number of studies in the South African setting have been undertaken on the generic determinants of capital structure, the influence of capital structure on corporate performance in various industries, and the impact of sovereign credit ratings on South African Banks (Chibamba 2018; De Wet & Gossel 2016; Kasozi 2009; Marimuthu 2019; Mokoaleli-Mokoteli 2019; Mokuoane 2016; Munangi & Bongani 2020; Mutize & Gossel 2018; Ntswane 2014; Ntsalaze et al. 2017; Sibindi 2017). There have been no studies that specifically investigated the effect of credit

ratings on a company's capital structure choices for the South African context.

Decisions pertaining to capital structure are critical to the success of the company and are closely monitored by financial managers. The capital structure of a given company should harmonise the proportions of the capital structure ratio, which consequently reduces the relative cost of capital as the firm seeks to enhance its value (Chivandire, Botha & Mouton 2019; Sajjad & Zakaria 2018). Because credit ratings are used by investors to assess the credit quality of a company, it stands to reason that its cost of debt, which is influenced by credit ratings, will have a direct impact on corporate capital structure (Baltagi 2005; Kisgen & Strahan 2010).

Data discussion

This investigation employed semi-annual data for a 10-year period, from 2011 to 2020, with a target population of the top 40 stocks listed on the JSE index. The date range considered was from 31 August 2011 (first 6 months of 2011) to 28 or 29 February 2021 (2020 year-end). The starting period was selected as 2011, since there had been several changes in the South African sovereign credit ratings, which influenced corporate credit ratings immensely (Rusike 2020).

To measure the dependent variable, capital structure, the total book debt to total book assets (TDTA) was utilised as the optimal proxy for capital structure and this is like previous studies (Degryse, De Goeij & Kappert 2012; Dermirguc-Kunt, Martinez-Peria & Tressel 2015; Du Toit et al. 2014; Feld, Heckemeyer & Overesch 2013; Mittoo & Zhang 2008, 1995; Naeem 2012; Palacn-Sánchez, Ramirez-Herrera & Di Pietro 2013; Sajjad & Zakaria 2018; Titman & Wessels 1988).

According to (Standard & Poor's 2017) eventually access the primary source directly, thus the citation in brackets falls off. Credit ratings are calculated using only long-term issuer ratings, with certain broad ratings (e.g., AA[1] to CCC[2]) and notches (+/non/-) that further split the score into subcategories to indicate the respective positions within each category. Included in the data collected are company-specific control variables in the form of the following ratios: profitability (ROA), tangibility (TAG), liquidity (LQDT), size (SIZ) and growth opportunities (GWTH). Industrial dummies are used considering the sample of companies available, such as basic material (BM_{dum}), consumer service (CS_{dum}), and oil and gas (OG_{dum}). Dummy variables were included in the initial least squared dummy variable model in the panel estimation process (Michelsen & Klein 2011; Naeem 2012; Sajjad & Zakaria 2018).

All the credit rating history data were collected from Standard & Poor's terminal, while the dependent and control variables data were collected from EquityRT, and respective published company integrated reports. All this data are secondary in nature. The long-term credit ratings as well as the credit rating outlook (RO) of the issuers are used in this study because they reflect current views of the rating agencies (at the time of rating issuance) on the ongoing ability of the company to service its debt (Naeem 2012). As the explanatory variable, each individual credit rating scale (ICR), as provided by S&P's, will be measured using the coding system described in Appendix 1 and Appendix 2 (Sajjad & Zakaria 2018).

A numerical coding method is developed to test the effects of credit rating scores on the capital structure of a company (Hovakimian et al. 2009). The true credit ratings of the companies are used in the coding procedure, starting with the highest individual score in the sample, which is '16' AA+. The numerical coding is based on the actual rating of the companies. The AAA broad rating categories were excluded from the analysis because there was no company with such a high credit score. A rating below B-score is recognised by code '1' at the end of the numerical codes and it is assigned to non-rated (NR) companies. NR companies are allotted the code '1' and put in the bottom tier, as Naeem (2012) points out. The allotment is hinged on the premise that the companies have poor credit quality and lack the financial muscle to access debt markets, among other criteria. As a result, each actual ICR is assigned a code ranging from 16 to 1, as illustrated in Appendix 1.

Control variables

It is necessary for the investigation to include control factors that are known to influence company capital budgeting decisions for the purposes of generating robust results that are a true representation of the effect of credit ratings on capital structure (Aktan et al. 2019; Naeem 2012). These control variables are chosen because they have theoretical and empirical implications and have been shown to be relevant in explaining the interplay between these two crucial variables (Sajjad & Zakaria 2018). The control variables in the model include firm-specific capital structure determinants and industry dummies.

Internal firm factors that have been considered in previous research (e.g. Kisgen 2006, 2009, 2008; Naeem 2012; Sajjad & Zakaria 2018) include lag of capital structure (LAG TDTA), profitability (ROA), tangibility (TANG), liquidity (LQDT), size (SIZ) and growth opportunities (GRWTH). Three industry dummies are utilised, and these were selected by considering the sample of companies available, such as basic material (BM_{dum}), consumer service (CS_{dum}), and oil and gas (OG_{dum}) (Naeem 2012).

Empirical model specification

This study adopts a panel regression model, which is conducted in EViews 12. In line with other previous empirical investigations that explored the linkage between credit ratings and capital structure, the panel regression model is appropriate (Mittoo & Zhang 2008; Naeem 2012; Sajjad & Zakaria 2018). Panel models are thought to produce better

1.Very strong capacity to meet financial commitments.

2.vulnerable and dependent on good business conditions to continue.

estimates than other models because the explanatory variables are less likely to have multicollinearity (Sajjad & Zakaria 2018). When performing a regression analysis, panel models can account for firm-specific differences by adjusting for differences that are not obvious in cross-section or time-series data alone (Baltagi 2005).

To test the impact of credit rating changes on capital structure decisions empirically, the capital structure is considered as a function of credit ratings. The capital structure of companies is the dependent variable denoted by CS_{it}, which is proxied and measured by TDTA for company *i* in year *t*. As a result, the following is the basic panel data regression model:

$$CS_{it} = \beta_0 + \beta_1 ICR_{it} + \beta_2 RO_{it} + \beta_{it} X_{it} + \in_{it} \quad \text{[Eqn 1]}$$

Where:

CS_{it} = capital structure
β_0 = constant term
ICR_{it} = credit score of a company, with cardinalised values of 16, 15 … 1, where AA+ = 16 to B- = 2 and NR = 1
RO_{it} = Rating Outlook of a company, with cardinalised values of 16, 15…1, where AA+ = 16 to B- = 2 and NR = 1
$\in_{it}$ = disturbances error term
X_{it} = represents control variables: lag of capital structure (LAG_TDTA); profitability (ROA); tangibility (TANG); liquidity (LQDT); size (SIZ) and growth opportunities (GRWTH); industry dummies [basic material (BM_{dum}); consumer service (CS_{dum}); and oil and gas (OG_{dum})].

Incorporating all the variables as presented in the basic equation (1), equation (2) is refined as follows:

$$\begin{aligned} TDTA_{it} = {} & \beta_0 + \beta_1 ICR_{it} + \beta_2 RO_{it} + \beta_3 LAG\_TDTA_{it} + \\ & \beta_4 ROA_{it} + \beta_5 TANG_{it} + \beta_6 LQDT_{it} + \beta_7 SIZ_{it} + \\ & \beta_8 GRWTH_{it} + \beta_9 BM_{dum} + \beta_{10} CS_{dum} + \\ & \beta_{11} OG_{dum} + \in_{it} \end{aligned} \quad \text{[Eqn 2]}$$

The regression coefficients for the actual credit ratings (ICR) and RO are represented by β_1 and β_2, respectively, in Equation (2). The regression coefficient for the control variables; ROA, TAG, LQDT, SIZ, AGE and GRWTH are represented by $\beta_1 - \beta_8$ respectively. The industry-specific dummies (basic material industry BM_{dum}, consumer services industry CS_{dum} and oil and gas industry – OG_{dum}) are then incorporated from $\beta_9 - \beta_{11}$ respectively.

The panel data regression analysis process as described by Brooks (2008) was followed. The process includes three preliminary models to be estimated, namely the pooled regression model, fixed effect model and the random effects model. The fixed effect model assumes that time-invariant characteristics are unique and other individual characteristics are not correlated. Moreover, the fixed effect technique removes the effect of time-invariant effects from the independent variables. The cross-sectional random effects regression model was conducted to indicate the impact of actual ICR, together with potential credit rating change (RO) and other control variables, explaining capital structure function.

To establish the best model to determine the effect of credit ratings on the capital structure of sample companies, two diagnostic tests are applied. These two tests are the redundancy test and the Hausman test (Hausman 1978). The redundancy test determines whether cross-sectional or time series effects are redundant (Du Plessis 2018; Pelcher & Bolton 2021). The Hausman test needs to be applied to the random effects approach to check for endogeneity and verify the selection of the most efficient model.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of Johannesburg, School of Accounting Research Ethics Committee. (No. SAREC20210218/02).

Results

Firstly, consider the results of the redundancy fixed effects test and Hausman test in Table 1. The redundancy fixed effects test shows that the assumption of cross-sectional homogeneity should be rejected at a 99% confidence level, and therefore, a fixed effects model is more optimal than a pooled panel model. Secondly, the null hypothesis of the Hausman test is that the optimal model is the random effects model. Based on the results of this test, the null hypothesis is rejected at a 90% confidence level; therefore, the fixed effects model is optimal for this dataset.

Therefore, this study reports the results obtained by the fixed effects model after dropping insignificant variables in Table 2. The value of the adjusted *R*-squared of 0.924 indicates the applicability of the model (De Wet 2023). Furthermore, the *p*-value of the *F*-stat of 0.000 indicates that the variables collectively contribute to the model at a 99% confidence level. In addition, the significant *p*-value of 0.000 verifies the importance of the inclusion of the selected variables (Du Plessis 2018; Pelcher & Bolton 2021).

In addition, the test results of the Jarque Bera Normality Test and the Panel Cross-section Heteroskedasticity LR Test. The null hypothesis for the normality test is that the residual is normally distributed, and the null hypothesis of the Panel Cross-section Heteroskedasticity LR Test is that the variance of the residual is homoscedastic. In both cases, the null hypothesis is accepted; therefore, these two key assumptions of a panel regression model are upheld. Secondly, the variance inflation factors reported at the bottom of Table 2 are all below 10, indicating that no multicollinearity is present in the model.

TABLE 1: Redundancy test and Hausman test results.

TDTA fixed effects test	Statistic	*d.f.*	Prob.	Reject or accept
Redundancy fixed effects test				
Cross-section Chi-square	26.654	8.000	0.008	Reject
Hausman test				
Period Chi-square	39.291	18.000	0.083	Accept

TDTA, total book debt to total book assets; *d.f.*, difference; Prob., probability.

TABLE 2a: Final model: Fixed effects model after dropping all the insignificant variables.

Variable	Coefficient	*p*
C	0.198	0.003
ICR	0.039	0.012
RO	0.024	0.020
TDTA (-1)	0.804	0.000
ROA	-0.101	0.002
LQDT	-0.021	0.006
GRWTH	-0.009	0.015
TANG	-0.025	0.044

RO, ratings outlook; ROA, profitability; TANG, tangibility; LQDT, liquidity; GRWTH, growth; ICR, credit rating changes; TDTA, total book debt to total book assets.

TABLE 2b: Final model: Fixed effects model after dropping all the insignificant variables.

Variance inflation factor	Centred factor
Size	2.065
ROA	2.048
LQTD	1.205
ICR	1.967
RO	2.272
GRWTH	3.271
TANG	1.268

Note: R-squared = 0.939; Adjusted R-squared = 0.924; F-Stat = 87.914; Prob (F-statistic) = 0.000 (denotes significance at the 95% confidence level); Jarque Bera p-value = 0.126; Panel Cross-section Heteroskedasticity LR Test p-value = 0.214

RO, ratings outlook; ROA, profitability; TANG, tangibility; LQDT, liquidity; GRWTH, growth; ICR, credit rating changes; TDTA, total book debt to total book assets.

Based on the final model in Table 2, the effect of credit ratings on capital structure, as measured by TDTA, can be statistically significantly explained by the following variables: actual credit rating changes.

Actual credit ratings

The capital structures (TDTA) of the nine publicly listed JSE companies are positively and significantly affected by the explanatory variable ICR. A single notch upgrade in ICR will result in an increase in TDTA of 0.0392 when all other variables remain constant. Thus, the observed positive relationship between capital structure and actual credit rating scales confirms that management takes credit ratings into consideration when deciding on their capital structures. Essentially, a positive credit rating change encourages more debt relative to assets. As put forward by Kisgen (2006), the CR-CS hypothesis suggests that a negative credit rating is more likely to have a capital structure ratio reducing effect (Naeem 2012). This finding can be explained by the notion that a credit rating upgrade can enable a firm to access the debt market more easily and enjoy favourable costs, while downgraded firms are associated with high cost of borrowing, constrained access to debt markets and more susceptibility to further downgrade; hence, the coefficient is positive. Overall, this relationship highlights that the benefits of a credit rating change are suggested to be material for capital-decision making by companies on the JSE top 40 index. Speculative-grade enterprises, as Naeem (2012) points out, tend to have high gearing levels. The findings of the study, on the other hand, are at odds with that conclusion.

Rating outlooks

Decisions on the capital structure (TDTA) of nine publicly traded companies among the top 40 JSE companies that met the selection criteria, are significantly influenced by changes in the ratings outlook (RO). The coefficient is also positively related to the capital structure variable, that is, 0.024 (p-value of 0.020). As Naeem (2012) states, a change in credit ratings can have both financial and non-financial consequences for companies, thus affecting their access to money markets, brand equity as well as reputation and relations with suppliers and creditors when navigating capital markets. As such, company decisions in this regard appear to be impacted by the proximity of a change and, in this case in point, downgrades are mostly displayed in the ROs or CreditWatch of sample companies, except for only one event when the RO indicated an upgrade. By reducing their amount of capital structure when faced with a potential downgrade, companies may have a better chance of having their current rating maintained or even upgraded in future.

These findings are consistent with the CR-CS hypothesis, which examines whether the costs and benefits of credit ratings matter to companies. When ratings are on the verge of a rating change, companies will reduce their capital structure. To put it in another way, when companies are facing potential downgrades, they can reduce their debt ratio by issuing additional equity in relationship to current period total assets. This finding, which is also supported by the results of Naeem's (2012) study, goes against the trade-off theory, which implies that companies with a lower risk of bankruptcy tend to have healthier capital structures.

Conclusion

Despite the continuous dependence of market participants on credit ratings, academic research frequently underestimates the material effect of credit ratings on corporate capital structures (Naeem 2012). This study explores whether credit ratings influence South African corporate capital structures. This was achieved by employing a panel regression model. Both the Redundancy and Hausman tests indicated that the fixed effects panel model is the optimal model. The results showed that both an improvement in the actual credit rating as well as the potential outlook have a statistically significant positive impact on the total debt to total asset ratio. Thus, an improvement in the credit rating conditions results in a significant increase in corporate leverage. The findings are consistent with those of Sajjad and Zakaria (2018) and Naeem (2012) in providing evidence that each credit rating scale change (be it potential or actual) shows a material effect on the capital structures of the top 40 JSE-listed companies. In addition to classical approaches to optimal capital structure, credit ratings show considerable explanatory power in identifying the ideal capital structure of a company.

The findings have implications for both the trade-off and pecking order theories. In essence, the research demonstrates that JSE top 40 companies assess the costs and advantages of ratings when analysing capital structure decisions, over and above evaluating other related costs and benefits emanating from debt sources. As such, the generic form of the trade-off approach should therefore contain the costs and benefits of credit ratings, because the CR-CS repercussions explored in this study differ from those of the trade-off theory.

Some implications for the pecking order theory were also found. The findings show the reaction of companies to both the anticipated and actual credit rating changes is positive because credit ratings provide some benefits or impose penalties, respectively, when ratings are upgraded or downgraded. The hierarchy of funding in the pecking order theory may not be observed by companies in response to a change in credit rating. Instead, they may accordingly plump for the issuance of stock or equity rather than debt.

As this study collected data on a semi-annual basis, the positive and significant impact on the capital structure of sample companies that both actual credit rating changes and potential credit ratings have on them may suggest, among other things, a minimum target rating that the sample companies are pursuing. If the JSE top 40 listed companies were to reverse the credit downgrades imposed against their creditworthiness, this would be demonstrated by the issuing of less debt during a 6-month period. In this study, these findings are interpreted in the same way as those of Kisgen (2009), who found that companies aim for a low target rating and will reduce leverage if this grade were compromised. To put it another way, the cost of finance rises dramatically for non-investment-grade credit ratings. The JSE top 40 index credit ratings are taken into consideration or extensively relied upon in the capital structure policy, as the results of this study demonstrate.

Financial institutions were deliberately not part of the study sample, as these organisations have a distinct capital structure according to sectorial laws. In addition, data from several NR and/or quoted, confidential rated issuers or privately rated issuers could not be obtained. Compared with prior studies that conducted research for periods of over 20 years and across regions, this study had a limited sample period as emerging markets only recently started to acknowledge the value of being rated. As such, few companies have been rated for such long periods.

Possible further research can include an analysis that makes use of ROs or Credit Watch as a stand-in for probable rating shifts. Kisgen (2006, 2009), whose contribution has been emphatic on the interaction of these two variables, used PLUS or MINUS to denote potential rating changes (Naeem 2012). Thus, further research could investigate other indicators of potential rating changes for companies whose results are generally incompatible with the CR-CS hypothesis or any other surrogates for that matter. It would be interesting to compare the results of this study with those of other CRA, such as Moody's or Fitch because this study only used S&P's credit ratings. It is possible that companies will respond more quickly to an initial change in rating than to subsequent changes in rating. Studies by Almeida et al. (2017) and Williams et al. (2017) (cited in De Wet 2018) found that some rating agencies prefer to follow S&P's which, thus, leads any rating change. Comparative research may examine how companies respond to changes in their capital structure when ratings are first changed by S&P's and then adjusted again by either Moody's or Fitch. Further studies could also use market values, which could provide an added dimension to the empirical results in this context. Furthermore, more practical knowledge and other institutional decision-making processes may have been gathered through interviews, as these factors could influence capital structure decisions. Given some of the criticism levelled at rating agencies from all walks of life, including politicians in developing countries, it is possible that credit ratings do not accurately reflect the financial worthiness of a company. According to the literature, credit quality can be quantified and achieved using the accounting data given in financial statements of a company. If that assertion is correct, it will be worth exploring whether the credit quality indicators developed using such processes have comparable properties on the capital structures of South African companies and can be used in markets that do not employ credit ratings.

Practical implications

This study contributes to the corpus of knowledge by enhancing empirical research on capital structure and credit rating interactions in emerging economies such as South Africa. When compared with related research in other regions, the study adds fresh depth and sophistication to this field of study. The novelty is that this is the first study of its kind to examine the relationship between credit ratings and capital structure in publicly rated non-financial South African entities. More than 80% of the entire market capitalisation of all JSE public companies is represented by the top 40 JSE-listed companies, which the research also examines. The function of credit ratings in shaping the capital structures of South African listed companies is depicted here.

Financial managers are concerned about credit ratings, and this concern has real economic ramifications for corporate entities in emerging markets, when these managers make capital decisions (Sajjad & Zakaria 2018). Credit rating, according to the study, decreases information asymmetries because of the assessment and monitoring role conducted by independent rating agencies. An increase in foreign direct investment in emerging nations such as Africa should be facilitated by the creation and inclusion of detailed firm-level data in the ratings issued by these CRAs.

Government and financial market regulators should focus on ensuring that rating agencies operate in an impartial and fair manner to guarantee that credit ratings are a true reflection of the financial well-being of an enterprise. Credit ratings are expected to be used by investors as a trustworthy indicator of credit quality for JSE top 40 companies and several other market participants and, as such, it is crucial that such ratings are accurate, relevant and reliable.

Credit ratings may have become a significant factor for companies, because many participants in the modern financial markets depend on these rated companies. One of the key findings is that actual ICR has a positive and material impact on the capital structure decisions of companies in the sample. Overall, the actual credit rating scales and capital structures of the top 40 JSE companies are positively related. Choosing a company capital structure involves weighing the benefits and drawbacks of various credit rating scales (Wojewodzki et al. 2018). This means that a higher debt-to-asset ratio is encouraged when the credit score improves. In contrast, according to the implications of the CR-CS hypothesis, a downgrade is more likely to be followed by a capital reduction behaviour (Kisgen 2009). This can be explained by the trend whereby downgraded entities are compelled to consider the high borrowing costs that are associated with their lower credit ratings, which could lead to tight conditions in their debt securities and imposed access limitations to bond markets. The fear of further downgrades may be greater among downgraded companies than among those whose current actual credit ratings have been consistently constant.

In addition, capital structure decisions of publicly rated companies on the JSE top 40 index are positively influenced by potential changes in credit ratings, as assessed by RO, according to the findings of this study. Organisational decisions are founded on the awareness that credit rating changes may have financial and non-financial ramifications for companies in terms of reputational issues, access to capital markets and supplier–creditor relationships. As a result, the JSE top 40 listed companies appear to be affected mostly by the closeness of rating changes, especially considering that the bulk of them were downgrades on the ROs or CreditWatch of the sample companies throughout the study period. The existing rating of a company may be preserved or even improved in the future by reducing the debt level in corporate capital structure when faced with a potential rating downgrade. In line with the CR-CS hypothesis, companies will show capital structure and debt reduction behaviour when confronted with a near-rating shift long before the benefits and costs of credit ratings become meaningful to firms. By issuing more stock to lower the leverage ratio, companies can avoid being downgraded by the ratings agencies. There is no evidence, however, for holding up the trade-off theory, which contends that companies with relatively lower bankruptcy risks possess higher debt levels in their capital structures.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

C.B. authored the article from his MCom finance dissertation as a student. M.C.d.W. authored the thesis as the supervisor. M.M. authored the thesis as the core-supervisor.

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Data availability

The data that support the findings of this study are available from the corresponding author, C.B., upon reasonable request.

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Appendices starts on the next page →

Appendix 1

TABLE 1-A1: Long-term issuer credit ratings and assigned numerical coding.

'Credit ratings	Individual coding'
'AA+	16
AA	15
AA-	14
A+	13
A	12
A-	11
BBB+	10
BBB	9
BBB-	8
BB+	7
BB	6
BB-	5
B+	4
B	3
B-	2
NR	1

Source: Standard & Poor's (2008b) broad rating category and the researcher's assigned codes

Appendix 2

TABLE 1-A2: Rating outlook and assigned numerical coding.

Rating outlook	Individual coding
AA+	16
AA	15
AA-	14
A+	13
A	12
A-	11
BBB+	10
BBB	9
BBB-	8
BB+	7
BB	6
BB-	5
B+	4
B	3
B-	2
NR	1

Source: Standard & Poor's (2008b) rating category and the researcher's assigned codes