

Information Environment of IFRS Adoption and Cost of Debt Capital: Evidence from South Africa

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Abstract

Purpose: This paper examines the economic consequences of the cost of debt capital of IFRS adoption and information environment of South Africa listed mining and manufacturing firms.

Approach: The study uses 49 firms of firm-year observations of 637 for the period 2001-2014. Both OLS, as well as panel data estimation techniques, are employed as the main data analysis. We theorize that the inherent quality of IFRS adoption effect will reduce the cost of debt capital, as quality macroeconomic factors reduce the cost of debt capital.

Findings: Results showed that IFRS and information asymmetry achieve positive and significant relationships with the cost of debt capital, representing an increase in the cost of debt. Macroeconomic factors have no significant overall effects on the cost of debt capital under IFRS, such factors are crucial for accounting standards outcome.

Originality: Our study is one of the few to examine the effect of IFRS adoption of analyst following, information asymmetry and managerial opportunism in a South African context. Our results are also particularly relevant for policy decisions in light of the increased interest by debt-holders and policymakers, in the relationship between IFRS and raising debt capital option in mining and manufacturing firms in South Africa.

Keywords: Cost of debt capital, Macroeconomic factors, IFRS, Panel data regression, South Africa.

JEL: M41; N67; N17; E44; C33

Introduction

Theoretical and empirical studies demonstrate a universal relation between International Financial Reporting Standards (IFRS) adoption and the cost of debt taken into consideration the macroeconomic factors of the information environment. IFRS implementation is perceived to be of high quality and is depicted as a transparent financial information to positively improve investors' wealth by boasting market liquidity, creating new opportunities for diversification and to reduce the cost of capital. Moreover, IFRS adoption can interplay with economic factors to reduce ex-ante information risk, ex-post monitoring and re-contracting costs faced by lenders on lending decisions such as to encourage

growth (Kim et al., 2011). These benefits of IFRS adoption are not universal but pronounced in countries with strong institutional environments by which their firms have greater incentives to protect outside investors (Ball et al., 2003; Lee et al., 2008; Daske et al., 2013). Few studies document the cost of debt reduction under the IFRS adoption; this is due to less sensitivity to the adverse selection problems. This implies that firms with less fierce information asymmetry, would resort to debt, contractual financing, which financing will in turn increase the cost of debt capital under the IFRS effects on both valuation and contracting roles differently. The study utilizes the panel data regression models to examine the IFRS adoption level on cost of debt capital of information environment, bearing in mind the impact of specific macroeconomic factors (Daske et al., 2008).

Following a similar argument, macroeconomic factors can influence the quality of IFRS adoption, which in turn could reduce the cost of debt capital. Barclay and Smith (1995) assert that quality macroeconomic factors significantly impact the cost of debt capital. Quality macroeconomic environment can induce and mitigate agency conflict that paves way for firms not relying so much on debt against the free cash flow problem (Burgstahler et al., 2006). Hope (2003) and Leuz and Verrecchia (2000) provides evidence on the effect of accounting standards on disclosure practices for macroeconomic environments to have more sensitivity to the cost of debt.

Three sets of theories support the phenomenon of the IFRS adoption and cost of debt capital on considering the macroeconomic factors. First, the theory of agency focuses on separation of ownership and control that recognize a contractual view between shareholders and managers in utilization of shareholders' funds, and sharing of returns (Jensen and Meckling, 1976; Bearle and Means, 1932). Under this context, IFRS adoption heightens information disclosure to owners of the business for improving reporting quality for debt holders cost (Kim et al., 2011). Second, the capital need theory posits that increasing quality reporting of IFRS adoption is the crucial need to raise funds successfully at a lower cost to reduce information asymmetries. This theory underscores mandatory disclosure for attracting more information about firm's risk and future prospects (Choi, 1973; Firth, 1980; Leventis, 2001). Finally, the resource-based theory (Clarkson et al., 2011; Hart, 1995) proposes that not all firms have funds to benefit from IFRS implementations. Firms with greater funds tend to enjoy and realize economies of scale as funds are ploughed back to use as against procurement of debt capital with lower risk premium.

Drawing upon these theories, the study examines how IFRS adoption in the stringency of quality macroeconomic factors within the information environment of firm-specific factors could lead to a reduction of cost of debt capital of South Africa listed mining and manufacturing firms. Our analysis is based on data from 2001 to 2014 that did not adopt IFRS until 2005 when it became mandatory. Aside from the pooled data, we compare characteristics of accounting numbers in the pre-IFRS period (2001-2004) and the post-IFRS adoption periods (early post-adoption: 2006-2009, late post-adoption: 2010-2014). Few control variables are included when constructing our design (e.g., tangibility, liquidity, leverage). We find evidence that information asymmetry is a positive and statistically significant effect on the cost of debt on the both pooled data and the late post-adoption periods. Moreover, the level of liquidity is statistically significant at 1% for the cost of debt. The results as well reveal that macroeconomic factors are not affected by the switch to IFRS, hence there is no impact on the cost of debt. Notwithstanding this result, IFRS adoption has a positive significant relationship to the cost of debt at the pooled data level.

This study contributes to the literature addressing the effect of IFRS adoption and the cost of debts, taking into consideration the macroeconomic factors in the South African context. Moreover, IFRS adoption is considered in an African setting to examine the association between the macroeconomic factors and adoption. In addition our study complements the extant literature from European and Asian contexts that analyze the cost of capital in consequences of IFRS adoption.

The next section discusses prior researches and hypotheses development. Section 3 specifies the data and methodology including test estimations of cost of debt within IFRS adoption. Section 4 presents the discussion of the results and conclusions are presented in section 5.

Literature Review and Hypotheses Development

Literature Review

South African Background

Within the African context, South Africa capital market is most prominent and therefore require all publicly traded companies (with certain exceptions) to present consolidated financial statements in conformity with IFRS for each financial year starting on or after January 1, 2005 as announced by the South African Institute of Chartered Accountants (SAICA) Circular 7/2004. This has been as a result of the transparent information environment of IFRS of South Africa capital market. Although, the national standards of South Africa is closer to IFRS usage, we expect different effects from the prior standards (Ashbaugh and Pincus, 2001; Bae et al., 2008) as an overall commitment to transparency is enhanced compared to national standards (Daske et al., 2008; Leuz and Verrecchia, 2000). Mining and manufacturing industries of South Africa account for over 60 percent of South Africa's exports. However, a fall in Gross Domestic Product (GDP) below 2 percent is partly due to negligible growth in mining and manufacturing. So, is the fall in growth due to higher cost of debt capital under the swift to IFRS or weaken macroeconomic factors within the information environment of firms? Debt capital financing in these two industries is huge, since it is a capital-intensive business, and therefore facilitate better debt contracting, which attracts a higher cost of debt. The study by Moscariello et al. (2014) is conducted on European countries (Italy and U.K) for the period from 2002 to 2008. However, several considerations create the need for the research to be replicated in subsequent periods, especially in South Africa perspective. Such considerations could include: enforcement mechanism, cost of capital, especially debt capital covenant and information environment. IFRS adoption effect on the cost of debt could have different implications for debt-holders.

IFRS Adoption and Cost of Debt

Debt capital providers are confronted with asymmetric information challenges when ascertaining the capability of firms' to pay back the debt that mostly depends on the value of assets and subsequent future cash flows potentials. Theory suggests that accounting information quality with comparable disclosures can reduce information asymmetry and estimation risk (Dye 1990; Verrecchia 2001; Easley and O'Hara 2004; Lambert, Leuz, and Verrecchia 2007). Consistency with theory, earlier empirical studies have concluded that the role of financial statements is to mitigate agency costs in a debt-financing context. IFRS adoption speculates to enable firms to raise external funds with a lower cost of debt by reducing information asymmetry and associated selection costs (Naranjo et al., 2014). Hence, based on that, several studies have been conducted.

Empirical results about equity markets are much more pronounced compared with the debt markets as current market value demands for equity holders are the same. IFRS adoption improves transparency of financial reports and has a power to encourage better debt contracts. This is because in defining debt contract conditions, accounting information is crucial (Holthausen and Leftwich, 1983). In addition, IFRS adoption supports external financing therefore higher leverage ratios are associated with firms with debt financing comparatively. Countries with firms of greater incentives that are transparent and achieve strong legal systems focus on protecting outside shareholders claims (Ball et al., 2003; Daske et al., 2013). Firms with improved accounting quality have the ability to access public debt market in relation to private debt market as public disclosure is lower (Dhaliwal et al., 2011). Debt markets encourage conservatism accounting measurement as it snags risk and identified source of demand for financial reporting.

Using accrual quality proxy for reporting quality, Francis et al. (2005) and Bharath et al. (2008) establish evidence of a negative relationship between cost of debt and information quality. This finding reaffirms Sengupta (1998) result that, under better disclosure quality lenders would request for lower risk premium (Kim et al., 2011) on using the US data.

Florou and Kosi (2015) claim that IFRS adoption improves the quality of the public information associated with public bonds compared with private loans. This result reveals lower

interest rates for public bonds as corroborated by the finding of Ball et al. (2015) that loan contract achieve large changes in interest rates relative to public bond contracts.

Donelson et al. (2015) demonstrate that lenders adhere to borrowers' financial reporting quality when deciding to extend credit. By default, IFRS adoption is embedded with the use of quality accounting information in making decisions. They made use of US banks in making lending decisions to private companies. The survey reveals that lenders rely on much lower interest rates for lending decisions.

In contrast to studies Moscarriello et al. (2014) found that IFRS adoption of some UK firms has no impact on the cost of debt. This result corroborates with Pizzo et al. (2009) finding that IFRS adoption in the UK and Italy firms do not have any effect on the cost of debt. In addition, leverage, returns on asset and interest cover were found to have a negative effect on the cost of debt. Also, the findings of Daske (2014) generally failed to show lower anticipated cost of equity capital for adopters of IAS/IFRS or US-GAP among a set of German firms.

The inverse relationships between the IFRS adoption and cost of debt are mostly and largely associated in countries with strong legal systems and institutions as empirical literature substantiate (Florou and Kosi, 2013; Florou et al., 2013; Wu and Zhong, 2009). In this view, this study focuses on South Africa as opposed to European or Asian continents. More so, we provide the panel regressions effect and finally, it reveals the deep understanding of the relationship between the IFRS adoption and the cost of debt of both listed mining and manufacturing firms of South Africa in order to portray the economic consequences of the adoption.

Hypotheses Development

The main hypothesis for the study revolves around three main thematic information environments in relation to the IFRS adoption with information asymmetry, analysts following, managerial opportunism and finally, the macroeconomic factors and the cost of debt of listed mining and manufacturing firms in South Africa.

The relationships between the IFRS adoption, information asymmetry and cost of debt have a link to firm's financial decision-making. External debt financing is preferred because equity capital has the largest adverse selection cost compared to debt capital (Myers and Majluf, 1984, Fama and French, 2002). IFRS adoption enhances full disclosure of debt financing information after adoption by reducing information asymmetry problems. Quality reporting and better disclosure encourage lenders and underwriter to demand a lower risk premium and lowers cost of debt (Sengupta, 1998), Francis et al., 2005; Bharah, Sunder and Sunder, 2008). Also, Zhang (2008) asserts that the timely recognition of losses in reports benefits lenders at a lower rate of return.

IFRS adoption improves the information environment of financial and credit analysts in terms of quality financial information for meaningful investment decisions. IFRS adoption assures forecast accuracy, especially under strong enforcement regimes (Byard et al., 2011, Tan et al., 2011). An increase in information quality after IFRS adoption improves the quality of disclosure (Glaum et al., 2011) leading to enhanced analysts following, which in turn causes a decrease in usage of debt covenants, as IFRS improves financial transparency.

IFRS adoption limits management's opportunistic discretions but assures the promotion of full disclosure of information for meaningful investment decision-making. Building on the results that adoption of IFRS reduces cost of debt (Li, 2010; Daske et al., 2008), reduced managerial opportunism and leads to increase in disclosure which is expected to reduce estimation risk of shareholders. Countries with strong enforcement reveal a reduction in cost debt while other findings exhibit no difference in cost of debt.

While there has been considerable effort to promote IFRS adoption in the quality information environment, especially to reduce the cost of debt of firms in order to enhance capital flows, there remain many questions to answer as there is lax enforcement mechanism of Africa country's

governance and macroeconomic environment. Notwithstanding, within the African context, South Africa exhibits strong enforcement mechanisms, therefore we could hypothesize that:

Hypothesis I: IFRS adoption's interaction effect with information asymmetry, analysts following, and managerial opportunism are likely to reduce the cost of debt of listed mining and manufacturing firms of South Africa.

Macroeconomic Factors and Cost of Debt

Companies that make use of IFRS in the presentation and consolidation of financial statements benefit by raising capital abroad. Raising capital under IFRS adoption facilitates the reducing of cost of capital under improved information efficiency (Daske et al., 2013; Bova and Pereira, 2012). Transparency and disclosure policies of IFRS reporting at the country level would enhance or increase capital flows as it encourages the integration of domestic markets into world markets, which in turn accelerate economic growth (Hope et al., 2006). Several authors conclude that macroeconomic factors have an effect on IFRS adoption at the country level in such areas as improved market size, increased foreign direct investment inflows, increased their perceived corporate governance and increased capital flows at lower costs (Ramanna and Sletten, 2009; Klibi and Kossentini, 2014, Rogmans and Ebbers, 2013; Bevan and Estrin, 2004; Singh, 1995a,b). We could then hypothesize that:

Hypothesis 2: Quality macroeconomic factors under IFRS adoption are likely to reduce the cost of debt capital of listed mining and manufacturing firms of South Africa.

Methodology and Data Collection

Sample Selection

Our initial sample consisted of 65 firms included in the JSE of the extraction industries, specifically in the mining and manufacturing firms. We obtain the analyst following and information asymmetry financial data from archival databases of INET BFA/IRESS SA, Morningstar and Anupedia. Data for cost of debt is collected from Economic discussion net supplemented with hand-collected data. The macroeconomic factors are from the worldwide governance indicators, global economy, federalreserve.org, and fred.stlouisfed.org. After eliminating observations with missing data, our final sample comprises of 49 firms, representing 75.39% for the period from 2001 to 2014. Our sample represents firms of economically important listed mining and manufacturing firms in South Africa with a recent time period. This makes our study relevant in the South African setting.

The sample firms are those companies that have consistently published annual reports and showed available information in both the pre-adoption and the post-adoption periods. Also, sample firms depict fiscal year-end of 12 months for each sample period and data available both before and after the adoption of IFRS. The sample is divided into two phases, namely; pre-adoption period and post-adoption period. However, the post-adoption period is further divided into an early-period of IFRS adoption and later-period of IFRS adoption to establish the actual period in which IFRS impact on cost of debt capital. The pre-adoption period covers 2001-2004, early-post adoption covers 2006-2009 and late-post IFRS adoption covers 2011-2014 and has both common stock and debt in their capital make-up. A transition period of 2005 is ignored because the firms might have delayed in implementing the adoption (with 4 years interval). The exclusion of 2005 adoption transition year is consistent with Chua et al. (2012) and Zeghal et al. (2012).

We employ each firm as its own control variables as the adoption of IFRS in South Africa is mandatory for all listed reporting entities. There are no any other firms that use alternative accounting standards in the post-adoption period for comparison. Therefore, using the same firms in standardizing the firm-year observations in both pre-adoption and the post-adoption explains it more likely that any change observed in the firm cost of debt may account for the adoption of IFRS. Firm-specific factors are also controlled by using the same requirements.

Variables

Dependent Variable

Data for cost of debt (CODC) is collected from Economic discussion net supplemented with hand-collected data. The dependent variable is a firm's cost of debt capital defined as interest rates. It refers to the total cost paid by firms in raising debt capital. The measure of the cost of debt is the interest rate. Following Pittman and Fortin (2004) and Francis et al. (2005) we calculated interest rate as interest expense divided by the average of short- and long-term debt during the year. We expect IFRS to decrease Information Asymmetry with an associated decrease in the cost of debt capital.

Independent Variables

The study used the following independent variables being IFRS (a dummy variable which was coded as 1 for IFRS period and 0 for non-IFRS period), analyst following (AF), information asymmetry (IA), managerial opportunism (MO), and interacted them with IFRS adoption as the interest variables. Other regressors include macro economic factors such as exchange rate, interest rate, government borrowing and economic growth and integrity. It must be stressed that variables such as political stability, voice and accountability, regulatory quality, the absence of violence, rule of law, third party assurance, control of corruption, and government effectiveness are dropped due to the perceived presence of collinearity. Table 1 depicts comprehensive explanations of data definitions and sources for both dependent and independent variables. All the variables are recognized in natural logarithms form.

Table 1: Type and sources of data, their descriptions and definitions

Variables	Formula/ description	Source
Cost of Debt Capital (Lncodc)	=Total debt/ [1-tax rate]	Economicdiscussion.net
Managerial Opportunism (LnMO)	Earnings management	Modified Jones Model
Information Asymmetry (LnIA)	Bid-Ask spread using high and Low share prices	Corwin and Schultz (2010)
Analyst Following (LnAF)	Numbers (1- 100)	The INET BFA Database
IFRS	Dummy: Pre-adoption coded as 0 and post-adoption coded as 1	
Control variables	1. Leverage= Total debt/total asset (LnLEV) 2. Liquidity= Current asset/ current liability (LnLQ) 3. Tangibility= PPE/ total asset (LnTANG)	Averkamp (2004) Breuer et al. (2012)/ Baker and Martin (2011) Badertscher et al. (2014)
Macroeconomic factors	4. Interest rate (LnIR) 5. Exchange rate (LnER) 6. Gross Domestic Product (LnGDP) for growth 7. Government borrowing (LnGOVB) 8. Integrity (LnINTG)	Fred. Stlouisfed.org Federalreserve.org Data GDP World Development Indicators The Global Economy-South Africa Worldwide Governance indicators

Firm Control Variables

Control variables included are liquidity (LQ), tangibility (TANG) and leverage (LEV). We expect IFRS-adopters firm with improved large volume of liquidity to achieve higher growth opportunities to be more likely to attain a firm-specific commitment with positive improved accounting quality. Tangibility measures the percentage of property, plant and equipment within the total assets. It employs to generate earnings to improve the security of income of the firms, positive improved earnings assure sound application of IFRS in financial reporting. It is undoubtedly true that there is high incentive of leveraged firms to practice into earnings management (Watts and Zimmerman, 1986). Leverage mechanism put pressure on managers to create free cash flows to pay interest and principal of debts, but IFRS adoption enhances and improves better disclosure to give reasonable assurance of

quality accounting information for decision making. Combined effects of accounting quality of control variables account for heterogeneity in characteristics across firms included in the study. The quality of control variables could vary the appearance between the pre-IFRS and post-IFRS periods and thereby influence results drawn from the model estimations employed. We expect liquidity to be positively related with reduced cost of debt, but leverage and tangibility to be negatively related to reduce cost of debt under IFRS adoption.

The Model Estimations

Since the data is a panel form, the study used pooled ordinary least square regression (POLS), the random effects (RE) and the fixed effects (FE) panel data estimation techniques depending on which was the best. This estimation test is appropriate because it recognizes both time-series and cross-sectional observation (Chen, 2008). Therefore, the study used the Breusch and Pagan Lagrangian multiplier test to select between the POLS regression and the RE technique, and hence if the RE is the best, the study further uses the test of over-identifying restrictions (Sargan-Hansen statistic) which is used in the literature according to Schaffer (2009), to choose between the RE and the FE model. Thus, the Hausman test is not used to choose between the RE and the FE due to its inability to take care of STATA regressions that automatically deal with heteroskedasticity by reporting robust standard errors. However, if the POLS is chosen ahead of the RE, the study employs the F-test to choose between the POLS and the FE. Notwithstanding, in comparing the POLS to FE, the FE is run without the robust standard error option in order to display the F-test results and therefore if the test chose the FE model ahead of the POLS, the FE is re-run with the robust standard error option. Therefore, all standard errors in this study are robust which eliminated the challenges of possible heteroskedasticity.

The POLS panel regression estimation (equation 1 for 2001-2014) adopt Kim et al.(2011), Florou and Kosi (2013) and Moscariello et al. (2014) approach where the cost of debt of mining and manufacturing firms in South Africa could be explained by IFRS regime, macroeconomic and firm-specific factors.

$$\begin{aligned} codc_{it} = & \alpha_0 + \alpha_1 tang_{it} + \alpha_2 LQ_{it} + \alpha_3 lev_{it} + \alpha_4 IA_{it} + \alpha_5 AF_{it} + \alpha_6 MO_{it} + \alpha_7 IFRS * IA_{i,t} \\ & + \alpha_8 IFRS * AF_{it} + \alpha_9 IFRS * MO_{i,t} + \alpha_{10} INTG_{it} + \alpha_{11} IR_{it} + \alpha_{12} EX_{it} + \alpha_{13} govb_{it} \\ & + \alpha_{14} BR_{it} + \alpha_{15} IFRS_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

We compute cost of debt by recognizing the firm's interest expense to the average interest-bearing debt outstanding for the period under study (Sengupta, 1998; Sanchez-Ballesta and Garcia-Meca, 2011; Francis et al., 2005). The explanatory variables are as follows. IFRS is a dummy variable denoting adoption to be '1', otherwise '0'. All the meanings of the variables are already defined in Table 1.

The estimation equation 2 is given by the following model as:

$$\begin{aligned} codc_{it} = & \alpha_0 + \alpha_1 tang_{it} + \alpha_2 LQ_{it} + \alpha_3 lev_{it} + \alpha_4 IA_{it} + \alpha_5 AF_{it} + \alpha_6 MO_{it} + \\ & \alpha_7 INTG_{it} + \alpha_8 IR_{it} + \alpha_9 EX_{it} + \alpha_{10} govb_{it} + \alpha_{11} BR_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

This model proposes to recognize the computation of cost of debt in relation to two main adoption periods. They are first, the pre-adoption (2001-2004) and finally the post-adoption effects on the cost of debt in relative terms using element of the information environment, macroeconomic and control variables. The post-adoption period is divided into early-post IFRS adoption period (2006-2009) and the late-post adoption period (2011-2014). To reduce the noise and biases of the variables, we took the natural logarithm of all the variables. This would also assist to achieve homogeneity of the variables. All the meanings of the variables are already defined in Table 1.

Results and Discussion

Descriptive Statistics

This section covers descriptive analysis of the variables used in the study, i.e. the mean, standard deviation, and minimum and maximum values of variables used in the study.

Table 2: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	Observ.
codcoverall	.5363278	.366507	.1112525	4.413377	N= 637
between		.1712516	.2788976	1.342806	n =49
within		3248902	-.6234799	3.969427	T = 13
tangoverall	.4233627	.2217169	-.9939135	1.485497	N = 637
between		.1573793	.1578005	.901558	n = 49
within		.1576624	-1.018307	1.212745	T = 13
LQoverall	1.656138	1.162449	.1543981	19.45693	N = 637
between		.5433952	.4174591	3.79206	n = 49
within		1.03033	-.3953993	18.37016	T = 13
levooverall	.3536813	.2404534	.1112685	1.349616	N = 637
between		.1123075	.2085788	.8583845	n = 49
within		.2131733	-.1899268	1.075835	T = 13
IAoverall	.3356972	.4432782	0	8.5604	N = 637
between		.1599642	.0938	.8744538	n = 49
within		.4139926	-.4980182	8.021643	T = 13
AFOverall	4.954474	3.248047	2	12	N = 637
between		1.210563	2.538462	7.153846	n = 49
within		3.018609	-.1993721	11.87755	T = 13
MOOverall	.0023402	.6518441	-12.78741	6.846503	N = 636
between		.1106116	-.4706663	.2900195	n = 49
within		.6425592	-12.31441	7.31951	T-bar = 12.9796
INTGoverall	3.966154	.4946873	3.3	5	N = 637
between		0	3.966154	3.966154	n = 49
within		.4946873	3.3	5	T = 13
IROverall	7.885777	2.28305	4.94	12.73	N = 637
between		.1112641	7.687692	8.006923	n = 49
within		2.280388	4.878085	12.69885	T = 13
EXOverall	8.230195	1.668219	5.645	24.8112	N = 637
between		.1922378	8.068615	9.279608	n = 49
within		1.657316	5.510033	23.76179	T = 13
govboverall	2.22e+07	7.68e+07	19.25307	2.88e+08	N = 637
between		3.76e-09	2.22e+07	2.22e+07	n = 49
within		7.68e+07	19.25307	2.88e+08	T = 13
BROverall	116.4615	43.25186	55	191	N = 637
between		0	116.4615	116.4615	n = 49
within		43.25186	55	191	T = 13
IFRSoverall	.6923077	.4619012	0	1	N = 637
between		0	.6923077	.6923077	n = 49
within		.4619012	0	1	T = 13

Table 2 displays the descriptive statistics for all variables. The average values of Codc and IFRS scores are 0.536 and 0.692 respectively in our main model. The average firm of the quality macroeconomic factors has values of 116.46 and 8.231 for bankruptcy and exchange rate respectively, liquidity mean value of 1.656 and analysts following mean score of 4.945 within the information environment. These values achieve higher mean scores comparatively.

Table 3: Correlation Analysis(obs=636)

Variable	LnCode	LnTang	LnLQ	LnLev	LnIA	LnAF	LnINTG	LnIR	LnEX	LnGOVB	LnMO
Lncode	1.0000										
LnTang	-0.0098	1.0000									
LnLQ	-0.0284	0.0425	1.0000								
Lnlev	0.0305	0.1660	0.0064	1.0000							
LnIA	0.0150	-0.0238	-0.0159	0.0711	1.0000						
LnAF	0.0710	-0.0241	-0.0344	0.0341	-0.0817	1.0000					
LnINTG	0.0867	0.0050	0.0026	-0.0383	-0.0539	0.0545	1.0000				
LnIR	0.0232	0.0099	-0.0876	-0.0776	-0.0892	0.1374	0.1352	1.0000			
LnEX	-0.0234	0.0308	0.0159	0.0422	0.0738	-0.0816	-0.6653	-0.0025	1.0000		
LnGOVB	-0.0167	-0.0041	0.0279	0.0094	-0.0201	0.0654	0.1186	-0.3045	-0.1648	1.0000	
LnMO	0.0137	-0.0149	-0.1991	0.0180	0.0173	-0.0176	-0.0181	-0.0083	0.1062	0.0198	1.0000

Table 3 shows the correlation matrix analysis between all the variables employed in the study. The result depicts that all the correct values are below the critical limits of 0.80. We could conclude that multicollinearity in the independent variables is not a serious problem in the regression analysis (Hair et al., 1995).

Regression Results

This section tackles analysis and discussion of the fixed effects and random effects models used in attaining the objectives of the study as can be seen in Table 4. Thus, for the 2001-2014 period of panel A, the tests (Breusch and Pagan Lagrangian multiplier test, the test of over-identifying restrictions (Sargan-Hansen statistic) and the F-test) chose the fixed effect model to be the best. Therefore, it can be seen that the impacts of leverage, tangibility, liquidity, analyst following and some other variables on the cost of debt capital are insignificant. The case of leverage (LNlev) conflicts the finding of Choi and Lee (2015) that reveals a negative significant impact on cost of debt capital.

Table 4: Multivariate analysis (dependent variable: cost of debt)

Panel A: 2001-2014 excluding 2005 (FE)		Panel B: 2001-2004 (FE)		Panel C: 2006-2009 (FE)		Panel D: 2011-2014 (RE)	
Independent variables	Lncode	Independent variables	Lncode	Independent variables	Lncode	Independent variables	Lncode
Lntang	0.0206 (0.112)	Lntang	0.120 (0.225)	Lntang	0.226 (0.214)	Lntang	-0.0743 (0.120)
LnLQ	-0.0386 (0.0881)	LnLQ	0.544*** (0.137)	LnLQ	0.0898 (0.202)	LnLQ	-0.0937 (0.0861)
Lnlev	-0.0185 (0.0720)	Lnlev	-0.135 (0.175)	Lnlev	0.0699 (0.177)	Lnlev	0.0439 (0.0854)
LnIA	0.0672* (0.0370)	LnIA	0.0238 (0.0912)	LnIA	-0.0140 (0.0605)	LnIA	0.0790* (0.0449)
LnAF	0.0837 (0.0864)	LnAF	0.176 (0.113)	LnAF	0.0713 (0.110)	LnAF	0.139 (0.109)
LnMO		LnMO		LnMO	-0.0641 (0.0430)	LnMO	0.00880 (0.0538)
IFRSIA	-0.0418 (0.0641)	LnINTG	0.349 (0.531)	LnIR	-0.188 (0.324)	LnINTG	1.662 (1.266)
IFRSAF	-0.0193 (0.0193)	LnIR	-0.344 (0.768)	LnEX	-0.137 (0.961)	LnIR	0.243 (1.740)
IFRSMO	0.110 (0.193)	LnEX	0.852 (0.791)	Lngovb	0.0284 (1.397)	LnEX	0.483 (0.503)
LnINTG	0.182 (0.398)	Lngovb	-0.729 (0.887)	LnBR	0.374 (0.573)	Lngovb	-0.0518 (0.0534)
LnIR	0.144 (0.231)	LnBR	-0.238 (0.572)	_cons	-1.942 (5.118)	LnBR	1.165 (1.618)

Panel A: 2001-2014 excluding 2005 (FE)		Panel B: 2001-2004 (FE)		Panel C: 2006-2009 (FE)		Panel D: 2011-2014 (RE)	
Independent variables	Lncode	Independent variables	Lncode	Independent variables	Lncode	Independent variables	Lncode
LnEX	-0.133 (0.237)	MO	0.0850 (0.189)			_cons	-8.961 (10.68)
Lngovb	-0.00601 (0.006)	_cons	0.596 (2.819)				
LnBR	-0.114 (0.166)						
IFRS	0.288* (0.158)						
MO	-0.0961 (0.191)						
_cons	-0.680 (1.099)						
N	579		155		111		121
R ²	0.031		0.103		0.063		
adj. R ²	0.005		0.034		-0.031		
F	0.920		2.313		0.532		

Standard errors are in parentheses ⁺p < 0.10, *p < 0.1, **p < 0.05, ***p < 0.01. LNTANG represents tangibility in natural logarithm, LNLQ represents natural logarithm of liquidity, LNLEV represents natural logarithm of leverage, LNIA represents natural logarithm of information asymmetry, LNAF represents natural logarithm of analyst following, LNMO represents natural log of managerial opportunism, LNINTG represent natural log of integrity, LNIR represents natural log of interest rate, LNEX represents natural log of exchange rate, LNGOV B represents natural log of government borrowing, and LNBR represents bankruptcy.

Further, IFRS and information asymmetry (LNIA) have respective coefficients of 0.288 and 0.0672 that are both significant at 10%. Thus, 1 percent increases in IFRS and information asymmetry leads to 0.288% and 0.0672% increase in the cost of debt capital respectively. The results suggest that IFRS and information asymmetry have increasing impacts on the cost of debt capital among study firms in South Africa. Thus, we reject the null hypothesis which states that IFRS has no effect on the cost of debt capital. The finding on IFRS is contrary to that of Florou and Kosi (2015) who reveal mandatory IFRS adoption to cause a reduction on cost of public debt and Choi and Lee (2015) who reveals IFRS within on-audit consulting services lead to a reduction on cost of debt (interest rate). But Moscarillo et al. (2014) finding reveals that IFRS has no impact on the cost of debt in the UK. This is consistent with Pizzo et al. (2009) a study, who reveals that mandatory IFRS adoption has no impact on the cost of debt capital of either UK or Italy.

For the pre-IFRS adoption period (2001-2004) the test shows that the FE model is the most appropriate, even though liquidity is the only statistically significant variable in relation to the cost of debt. Liquidity has a 1% statistically significant coefficient of 0.544 and therefore a 1% rise in liquidity is found to lead to a 0.544% rise in the cost of debt capital. It means that liquidity has an increasing impact on the cost of debt capital. Further, among the remaining variables that are statistically insignificant, the insignificance of tangibility conflicts the result of Moscarillo et al. (2014) who reveal tangibility to impact on the cost of corporate debt in Italy and the UK negatively.

For the early-post IFRS adoption period, none of the variables is found to be significant. For the late-post IFRS period of 2011-2014, the test chose the RE to be the best model, and it is found that only information asymmetry is significant with a coefficient of 0.0790 that is significant at 10%. Thus, a 1% increase in information asymmetry leads to a 0.0790% rise in the cost of debt capital. This information asymmetry is found to have an increasing impact on the cost of debt capital in the late-post IFRS adoption period. The adjusted R² for the periods reveals 0.005, 0.034 and -0.031 respectively. The early-post adoption confirms the fixed effect model to be the obvious choice.

Table 4 explains the results of testing our second hypothesis related to quality macroeconomic factors and cost of debt capital under IFRS adoption. Results suggest that there is no significant overall

effect, but reveal both negative and positive relationships with the cost of debt capital. This implies that an increase and decrease in cost of debt is not due to macroeconomic variables, even though these factors play a crucial role for IFRS outcomes (Daske et al., 2008). Perhaps, such impact is associated with weak enforcement regime and lax legal systems and institutions.

Limitations of this Study

First and foremost, the sample selection was limited to only mining and manufacturing firms with a consistent financial statement published data. Consequently, the findings may not be generalizable to the entire population of JSE listed companies. Second, results may also be different if interest variables were measured differently in our model specifications. Thirdly, although a number of important control variables are considered in the current study, some additional control variables, that prior research has shown can impact IFRS adoption decision, were not included.

Conclusion

We examine in this study whether IFRS adoption within the information environment affects cost of debt capital by using sample from South Africa listed-firms over the period 2001-2014. We document that the IFRS adoption is positive and has a significant association with cost of debt, and find that the interaction between analysts following, managerial opportunism, information asymmetry and IFRS adoption have no effect and significant on the cost of debt capital. It is just as we evidence that macroeconomic factors could not explain the cost of debt capital. These evidence are strong and consistent for situations that may exhibit weak law enforcement mechanisms. Our findings suggest that IFRS adoption can enhance the reduced cost of debt capital through in-built higher disclosure quality of IFRS. Under the post-IFRS adoption, the real information came out; the risk became apparent and the cost of debt capital increased. Therefore, authorities should be cautious regarding the policy of adoption of IFRS by mining and manufacturing firms in South Africa. This also means that authorities in other African countries should be cautious in making the adoption of IFRS mandatory. Future research should be extended to incorporate other industries to reveal the true outcome about the topic. Also, there is the need to employ a Heckman-type two-stage regression method to address endogeneity concerns arising from firms' self-selecting adoption of IFRS.

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Conflict of Interest

The authors declare no competing interest.

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Table 1: Selected listed Companies

Listed Manufacturing Companies		Listed Mining companies	
Names	Names	Names	Names
Allied Electronics	Mustek	African Rainbow Ltd	Group Five
Aveng	Metair	Drdgold	Growth Point
African Oxygen Ltd	Argent	Oceana	Sentula
AECI	Assore	AngloGold Ashanti	York timbers
NAMPAK	Astral Food	Anglo American Plc	Netcare
Arcelor Mittal	Astrapak	BHP Billiton Plc	Basil
SABMiller	AVI	Sasol Ltd	Hosken
Impala Platinum Holdings Ltd	Barlo World	Reunert	Iliad
PPC Limited	Bidvest	Harmony Gold Mining	Jasco
Murray & Roberts Holdings Ltd	Sovereign	Tongaat	Merafe
Sappi Ltd	Crookes	Omnia	
Illovo Sugar Ltd	Distell		
Aspen Pharmacare Holdings	Grindrod		
Datatec	Beige		

Source: JSE Website (2018)