



**THE IMPACT OF INTEGRATED REPORTING ON COST OF CAPITAL  
AND ANALYSTS' FORECASTS: A STUDY OF JOHANNESBURG STOCK  
EXCHANGE (JSE) LISTED MINING FIRMS**

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## **DECLARATION**

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## **ABSTRACT**

Integrated reporting has gained traction in the reporting space and research literature since December 2013, when the International Integrated Reporting Council issued an integrated reporting framework. However, there is a lack of evidence on the benefits associated with integrated reporting. This study examined its effect on the cost of equity capital, and analysts' forecast errors. Empirical studies on voluntary disclosures and integrated reporting suggest a negative relationship between high quality disclosures and the cost of equity. The study employed a panel regression analysis to investigate the association between integrated reporting scores, the cost of equity capital and analysts' forecast errors. The sample comprised mining firms listed on the Johannesburg Stock Exchange from 2013 to 2018. The results highlight an insignificant inverse relationship between integrated reporting and the cost of equity capital, and analysts' forecast errors. Although not significant, they suggest that improvements in the quality of integrated reporting could contribute to reducing the cost of equity capital and improving financial analysts' estimates by providing relevant information. The results shed some light on the financial benefits associated with the adoption of integrated reporting. Essentially, there is some evidence that the capital market rewards firms who produce integrated reports aligned with the International Integrated Reporting Framework.

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# **CHAPTER 1: INTRODUCTION**

## **1.1 Introduction**

This chapter presents the background to the study, the problem statement, and the study's objectives and research questions. It also highlights the study's significance and its limitations.

Integrated reporting (IR) gained traction during the past decade, and its advent has been hailed by its proponents as the most significant recent development in the corporate reporting space. However, some critics perceive of it as simply another box ticking exercise, due to its bias towards providers of financial capital (Flower, 2015). Among the early adopters, South Africa was the trailblazer in executing IR (Zhou et al., 2017). The International Integrated Reporting Council (IIRC (2013: p 7) defines IR as “concise communication about how an organization’s strategy, governance, performance, and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term”. The Council adds that IR is the foundation for significant change in the manner in which firms are administered and report to their stakeholders. Although IR is supposed to benefit all stakeholders (business partners, local communities, customers, suppliers, legislators, regulators and employees), its primary aim is to explain to investors how the firm creates value over time (IIRC, 2013). Given that it is a relatively new concept, it has attracted considerable research interest, particularly with regard to the evidence-based benefits ascribed to compliance with the IR framework. This study investigated the effect of IR on the cost of equity capital and analysts’ estimates.

## **1.2 Background**

The world has recently experienced enormous challenges, among the most significant of which are the decline in natural resources and climate change. Firms utilize these resources and, in the process, impact the environment. It is thus imperative that they become conscious of the impact of their operations on the environment and finite resources and take steps to promote sustainability. Furthermore, they need to report on the both the effects of their activities and their efforts to address them. It is against this background that the IIRC formulated an international <IR> reporting framework to assist firms in addressing sustainability. The caliber of users of financial statements has changed drastically over the past two decades; of particular note is the zest for knowledge and the speed at which information travels, worldwide. Such technological advancements come with both pros and cons.



Firms produce goods and services with the primary aim of maximizing shareholders' wealth (Ogilvie, 2009). This is achieved through the realization of profits and expansion by means of profitable investments. Sustainable profits and continued existence are key for modern-day firms. However, today's investors and other stakeholders are not only concerned with financial performance, but require information pertaining to other qualitative metrics. Comprehensive, integrated communication is thus critical for the sustainability of contemporary firms.

In their quest to maximize shareholders' wealth, firms utilize human capital, natural resources, social capital, and manufactured capital (IIRC, 2013). They need to harmonize their interaction with these capitals in order to achieve sustained prosperity. The major challenge is the limited availability of capitals, particularly natural resources which are used by all stakeholders in the economy (EY, 2014a). Moreover, there is enormous pressure on companies to reflect on how they utilize natural resources. In some instances, firms are required to adopt rehabilitation strategies. In addition to natural resources, infrastructure, and other resources such as human capital, firms require financial capital in order to accomplish their primary aim of wealth maximization. In the context of wealth creation, it is evident that the most important stakeholders in a firm are the providers of financial resources that generally aim to receive a good return on their investments. In deciding whether or not to provide capital and continue to support a business, providers of financial capital demand relevant information for decision making. Such information should include past performance, the latest changes and developments in the economy, and future prospects.

The conventional channels whereby companies provide information to investors and other stakeholders, are annual financial statements and interim reports (Pham, 2012, IIRC, 2013). The question is, do these provide the relevant information required by investors? This study addresses this question from an equity capital market point of view. According to the IFRS (2018), information is said to be relevant if it influences users' decisions on the allocation of resources. Furthermore, it should facilitate prediction. This study thus assessed the relevance of IR by investigating its effect on the cost of equity capital and analysts' estimates.

There has been a profound paradigm shift in corporate reporting over the years (Schiager & Haukvik, 2012, KPMG, 2015). In terms of the International Accounting Standards Board's conceptual framework, the objective of financial reporting is to provide information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in

making decisions about providing resources to the entity (SAICA, 2010:(n.p)) as they are the primary stakeholders in a company (Busco et al., 2013, IASB, 2018). These stakeholders require relevant information in order to make appropriate decisions. Firms therefore have a responsibility to provide such information and to this end, they produce interim and annual financial statements and complementary reports.

Relevance is one of the essential attributes of useful information. Information is relevant when it is capable of influencing the decisions of primary users (investors, lenders, and creditors). In order to do so, it must have predictive or confirmatory powers (IFRS, 2018). This implies that, relevant information reflects on past performance and provides insight into the future outlook. The major criticism of traditional reporting is that, the information provided by financial statements is historical (Cohen et al., 2012), whereas users of corporate reports also require information that provides a future perspective on the firm. Users of corporate reports' calls for the provision of more relevant information resulted in the advent of non-financial reporting (Roberts et al., 2005). In a nutshell, entities should embrace holistic reporting (EY, 2014a). Forward-looking reporting provides information that facilitates decision making about the allocation of resources, particularly financial capital in the form of debt and equity capital (IIRC, 2013). Corporate reports should thus include, inter alia, management of the business, its prospects, and the firm's social responsibility and environmental policies.

Comprehensive reports that provide information on both past and future performance would facilitate investors' decisions on the allocation of capital. Such information should comprise a comprehensive list of metrics pertaining to sustainability accounting. As was evident in the wake of the 2008 global economic crisis, traditional reporting is less relevant in an uncertain economic environment (EY, 2014a). In the past, annual reports focused on the performance of a firm's internal resources and the profits attributable to investors. Less or no emphasis was placed on resources owned by society, natural resources and the external environment and very little information was made available to the public on how the firm affected or was affected by external resources. According to the IIRC (2012), an annual report should explain how the company created or intends to create value. Some capitals, such as natural capital, do not belong to the firm (IIRC (2012) and firms should thus use these resources in a responsible manner. Stated differently, a firm should always endeavor to create value for itself as well as improve the value of other external resources (IIRC, 2013). It is not desirable for a firm to maximize profits at the expense of natural resources, society, employees and customers.

However, as noted by (Perego et al., 2016), it is not uncommon for a firm to experience a mismatch between internal value creation and external value creation in the short term. Nevertheless, the ideal is overall value creation for all stakeholders in the long run. While it is accepted that the use of capitals comes with costs, the value of using resources which manifest in outcomes should exceed the costs if the firm is to promote sustainability (IIRC, 2013).

Corporate reporting is generally described as any form of communication directed to external users of financial information. Corporate reporting includes annual financial statements, notes to the financial statements, interim reports, sustainability reports, and corporate social responsibility disclosures (IASB, 2018). According to IASB (2018) the general purpose of financial reporting is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity.

There is a distinction between mandatory and discretionary reports. The reporting of mandatory disclosures is regulated by bodies such as IFRS, JSE and Companies Act. These governing bodies ensure standardization and uniformity in reporting, whereas discretionary reports tend to be more flexible (Gouws & Cronje, 2008). The conventional reports consist of statement of comprehensive income, statement of changes in equity, statement of cash flows, statement of financial position, comparative information, and notes to the financial statements (IASB, 2018, Abeysekera, 2013) (PWC, 2013). These are traditional statements that dominate the corporate reporting space. South African companies listed on Johannesburg Stock Exchange are required to prepare and publish financial statements using the International Financial Reporting Standards (JSE, 2015). Although users of financial statements include government, employees, suppliers and other social communities, it is evident that the primary audience are investors. The importance of providers of financial capital was also reiterated in <IR> framework (IIRC, 2013). Generally, firms prepare and publish annual reports to communicate to investors about performance and how the entity plans to maximize wealth. Accordingly, in order to make informed decisions about the allocation of capital, investors rely on company annual reports. In a quest to maximize investors' wealth, firms generally develop financial strategies that encourage investment and growth. Growth and investment opportunities require cash resources. Therefore, finance managers need to establish, assess, and select the most cost-effective source of funds. Investors are the providers of funds and rightfully so, they demand relevant information from the reporting entity. An information

becomes relevant if it is capable of influencing decision making of investors (IASB, 2018). According to Cheng et al. (2014a) firms which manage to produce annual reports that reduce agency costs and information asymmetry have better access to finance. This is largely due to investors' willingness to finance investment projects perceived to have growth potential at minimal risk. Evidently, in some instances there is an information and intention gap between those charged with governance and shareholders. The information gap creates uncertainty and to a certain extent, mistrust. Essentially the firm's annual report should provide relevant financial information that relates to financial performance of the past, present and future. A study by Lawrence (2013) found that individual shareholding increase as result of improved financial disclosures. This suggest that investors do require and make use of clear and concise financial reports. The clarity, relevance and conciseness of disclosures reduce information disadvantage at individual investor level.

To the extent that firms' earnings are properly disclosed in financial statements and disclosed in a transparent manner, there will be less uncertainty about investors' equity (Lawrence, 2013). Both parties (investor and firm) benefit here. From investor's perspective it becomes easier to invest and project their future earnings, while on the firm's side, less perceived risk means less cost of capital. Firms require financial capital for expansion and to seize investment opportunities. Investors supply financial capital only if there is hope of increase in their year invested funds. It is therefore imperative that a reporting firm provide relevant and transparent annual reports that will facilitate decision making of investors.

According to JSE listing requirements JSE (2015), firms are required to publish interim results within three months at mid-year and final reports at the end of the year. Included financial results are statement of comprehensive income, statement of cash flow statement, statement of changes in equity, statement of financial position, profit/loss statement, dividend announcements and commentary report. According to the Companies Act No. 71, South African companies are required to publish annual financial reports within six months after the end of its financial year. A study of the importance of non-financial performance, by Milost (2013), suggested that traditional financial reporting neither provide a true reflection of past performance, nor does it provide relevant information for decision making. The findings were attributed to the use of estimates in determining amounts. The accounting system should provide information about events of business and future outlook. The figures presented in

financial reports may not alone provide relevant and useful information required by investors for decision making. Similarly, a study by Flower (2015) found that traditional financial reporting ignore social and environmental issues. It is imperative that a firm disclose how its business model and activities impacted on society and environment. Stakeholders need reporting that will address both past and future performances (Bernardi & Stark, 2018). The conventional reports have over the years been criticized for not providing adequate information needs of a variety of stakeholders. Effectively these studies suggest that conventional reporting is struggling to cope with changes in reporting requirements, such as the need to reflect on how the firm is impacting on social and external environment. Some of the notable changes in reporting landscape is the need for firms to focus long term sustainability, while on the other end investors demand more transparent information that will enable them make better decision making (Adams, 2015). According to Stewart (2015), investors and all other stakeholders demand corporate reports that integrate financial, social and environmental aspects. The problem with conventional reporting is it tends to only use financial performance as a yardstick for firm's growth (Burke & Clark, 2016). Traditional reporting seems to be preoccupied with financial results, whereas the current reporting landscape demands for a holistic communication about value creation.

It is evident from the above literature that traditional reporting does not meet information requirements of investors and rest of stakeholders. The ever-changing business landscape and information needs of investors, makes it inevitable for firms to shift their reporting paradigm in order to address such developments. Against this backdrop many firms embrace voluntary disclosures which include corporate social responsibility, sustainability and many other standalone reports. Over the years, users of corporate reports have demanded additional reports that reflect on sustainability and how the firm is cooperating with environmental requirements. Some firms heeded the call and started producing complementary reports while others produced environmental reports as an addendum to their annual financial statements. The major challenge is that complementary reports tend to be disjointed, and are not properly linked to financial information. This creates the impression that such reports are not important, but are merely produced as a public relations exercise. They are not comparable with the firm's previous reports or with other firms in the same industry. For example, some companies only produce corporate social responsibility (CSR) reports as an addendum (Zhou et al., 2017) Moreover, no links are drawn between these reports and the firm's business strategy on sustainability and management of risks. An ideal framework for reporting would be one that

facilitates investors' assessment of the firm's ability to create sustained value in the long run (EY, 2014b, Baron, 2014). This would break silo thinking and enhance the connectivity of segments in annual reports, which has always been elusive. It is against this background that the concept of IR was conceived.

### **1.3 Problem statement**

Despite the excitement surrounding IR, there is a lack of evidence on the advantages of adopting the IR Framework (Abhayawansa et al., 2019), particularly the benefits accruing to reporting firms. This can be attributed to the fact that IR is a relatively new phenomenon. Should cost benefit analysis of IR reveal a positive relationship between the quality of integrated reports and investor preference, this would incentivize firms to inculcate a culture of IR (Kannenberg & Schreck, 2019). The current study examined the association between an integrated report's score, which is estimated in terms of content elements (independent variable), and the cost of capital as well as analysts' estimate errors (dependent variables). It thus sought to determine whether IR impacts on the cost of equity capital and analysts' forecast errors and if firms that produce reports with a higher IR score, have a financial edge over those that produce reports with lower scores.

South Africa offers a rich research context in the area of IR because the Johannesburg Stock Exchange (JSE) was the first stock exchange in the world to make IR mandatory under the code on corporate governance (JSE, 2015, Zhou et al., 2017, Idowu & Baldo, 2019). It is on this basis that this study focused on JSE listed mining firms. Although there are related studies on companies listed on the JSE, most sampled all economic sectors, which may have affected direct comparisons. In order to enhance comparisons and also due to limited resources, this study focused on one sector. The mining sector makes a significant contribution to South Africa's Gross Domestic Product, and plays a major role in job creation. Contrary to the perception that IR is biased towards financial capital investors, integrated reports should target all stakeholders in an entity (Cheng & Saltzman, 2010). Other stakeholders such as local communities within which the firm operates, government, employees, suppliers and regulatory bodies influence the continued existence or non-existence of a firm. While providers of financial capital may be the most important stakeholders in so far as liquidity is concerned, the reporting firm has to consider the interests of other stakeholders. Integrated reporting would promote transparency regarding the firm's impact on the ecological, social and capital market

environments. As suggested by Steyn (2014), IR should ultimately serve as mechanism by which the firm effectively communicates with society at large.

## **1.4 Research objectives and questions**

Financial capital features prominently in the IR framework (IIRC, 2013). Therefore, the main aim of the study was to investigate the effect of IR on financial capital. Its objectives were:

### **1.4.1 Research Objectives**

- To determine the effect of integrated reporting on the cost of equity capital among JSE listed mining firms.
- To determine the effect of integrated reporting on analysts' forecast errors among JSE listed mining firms.

### **1.4.2 Research Questions**

- Does compliance with the integrated reporting framework affect the cost of equity capital for JSE listed mining firms?
- Does compliance with the integrated reporting framework affect analysts' forecast errors for JSE listed mining firms?

## **1.5 Significance of the study**

While previous studies investigated the relationship between conventional financial disclosures and the cost of equity capital (Fonseka et al., 2019), there is a paucity of research on the association between contemporary voluntary disclosures and the cost of equity capital and analysts' estimates. Furthermore, only a few studies have investigated empirical evidence on the benefits that accrue to the reporting firm as a result of complying with the International Integrated Reporting Framework (Zhou et al., 2017, Vitolla et al., 2019a). This study aimed to contribute to the sparse literature on the effect of IR on a firm's cost of equity and analysts' estimates. It is important to gain empirical insights into the association between IR and the cost of equity capital because firms play a major role in job creation, provision of goods and services, and social upliftment, and contribute to government revenue through taxation (Akisik & Gal, 2011). Moreover, given the high unemployment rate in South Africa, it is important to identify the factors that affect firms' liquidity. In order for firms to seize investment opportunities, they require financial capital which is provided by investors that ultimately

require returns on their capital. Thus, financial capital comes with costs for firms and reducing such costs is one of the ways to increase profitability. The cost of equity capital is no exception.

If, as suggested by Mangena et al. (2016), Giner Reverte (2006), the premium on equity capital is a function of risk, it is reasonable to predict that a reduction in risk will result in a reduced cost of equity capital. Opportunity costs arise in the allocation of equity capital to firms as investors could have invested their financial resources elsewhere. In a nutshell, if there is higher perceived risk, investors are likely to require a higher return. The main objective of IR is to furnish concise information on how the entity creates value over time (Nylund, 2017). If this is achieved, one would expect improvement in investors' assessment of the firm's outlook, which should lead to less risk.

### **1.6 Limitations of the study**

The limitations of the study include the lack of a secondary database for IR quality rankings. Linked to this is the issue of subjectivity in developing a rating scale. Although some organisations conduct surveys on firms' degree of compliance in producing integrated reports and bestow awards on those that perform well, different bodies use different rating methods. The rating scales are hence not comparable. Subjectivity in the allocation of scores can be expected due to the fact that quality is a relative phenomenon. This study was no exception as the researcher manually constructed an assessment tool to test for the compliance level of integrated reports based on content elements. However, the assessment tool was developed based on the IIRC content elements to minimise the degree of subjectivity. While it would have been ideal to assess all firms listed on the JSE, manually rating each one would have been time-consuming. The study was thus confined to listed mining companies. Moreover, the assessment tool was limited to content elements of IR. Ideally, all aspects of IR, including the reporting principles, could have been incorporated.

A further limitation was that some of the mining firms did not make their integrated reports available on their websites, limiting the number of observations. Had there been a readily available database of IR rankings, the study would have covered a larger population that could have resulted in significant statistical results and more conclusive empirical evidence. Although the IIRC content elements were used to construct scores, this method is prone to the researcher's subjectivity. It is also noted that similar studies involved comparisons of



constructed IR scores assigned by research assistants, which were agreed for uniform coding. Due to limited resources, this was not the case in this research. Finally, while most of the data pertaining to the dependent and control variables was obtained from the Bloomberg database, there were a few instances where the Bloomberg terminal did not return requested values. This shortcoming was mitigated by the extensive observational time span (a six-year period). A much longer period would have been ideal but, due to the relative newness of IR, this was not possible.

### **1.7 Outline of the dissertation**

The remainder of this dissertation is constructed as follows:

Chapter two presents the theoretical framework that underpinned this study as well as a review of the literature based on the study's research objectives and questions. Chapter three outlines the research methodology employed, discusses the dependent and independent variables, and provides models specification. Chapter four analyzes the data and presents the results, while chapter five presents an overall conclusion based on the study's objectives and research questions, and offers recommendations as well as suggestions for future research.

### **1.8 Chapter summary**

This chapter presented the background to the study. It highlighted the problem statement, the research objectives and questions, and the study's significance and limitations. The following chapter discusses extant theories related to disclosures and their effects, and critically reviews the empirical literature on the effects of voluntary disclosures and IR on the cost of equity capital and analysts' estimates.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents the theoretical framework that underpinned this study and a review of the relevant empirical literature. It discusses the theories employed and their relevance to IR, the cost of equity and analysts' forecast errors. Previous research on the impact of voluntary disclosures on the capital market is reviewed, as well as empirical studies on IR's effect on this market.

The alignment of firms' integrated reports to the International <IR> Framework is an interesting topic in corporate reporting, since IR is principles-based, whereas some of the standards, such as the United States' Generally Accepted Accounting Principles (GAAP), are rules-based. The principles-based approach implies a degree of flexibility, whereas conventional corporate reporting is known for its strong emphasis on compliance with rules. In order to identify a sound framework to investigate the research problem, a researcher needs to review previous research (Sekaran & Bougie, 2003). To this end, this chapter reviews relevant studies on corporate reporting, particularly the effect of voluntary disclosures and integrated reports on the capital market.

Integrated reporting aims to provide users of corporate reports with transparent information which will help them to assess the firm's prospects. On the face of it, IR should benefit both the firm and providers of capital. In theory, providers of capital, especially investors will have access to more relevant information about the company prospects, while on the other side of the coin, the firm's reputation should be enhanced by the improved transparency that is ascribed to integrated reports. Integrated reporting should thus result in a win-win situation (for the reporting firm and other stakeholders) situation. According to Zhou et al. (2017), one of the expected benefits to the firm, is the reduced premium on equity capital.

A typical investor can be expected to be happy with the maximization of their shareholder's wealth, following the firm's adoption of IR. However, the question that remains is, what is in it for the firm that prepares an integrated report? This question is relevant when one considers that IR comes with additional costs (preparation time, information gathering, paper, space and other factors). As noted previously, South Africa became a trendsetter when the JSE made IR mandatory for all listed companies in terms of its code on corporate governance. Although

implementation was based on the principle of apply or explain, the code on corporate governance provides a benchmark for the implementation of IR. However, there has recently been a paradigm shift in countries that have adopted IR and there is now some discretion in relation to this principle. Moreover, the IR framework is known for its non-rigid stance with regard to application. Therefore, this study distinguishes between high quality integrated reports and low-quality ones. The level of quality refers to the scores achieved by firms on the basis of the content elements of the IR framework.

There is a lack of evidence on the benefits of IR in relation to the cost of equity capital. Zhou et al. (2017), Yancheva (2018) suggest that there is an inverse relationship between the cost of equity capital and the quality of non-financial disclosures. This implies that, as the firm provides relevant information, investors will demand lower risk premiums due to less uncertainty.

## **2.2 Theoretical Framework**

In order to facilitate understanding of the variables employed in this study, it is important to identify the theoretical framework that forms the basis for this research. The variables in this context refer to the phenomena that a study focuses on in order to establish relationships or trends. According to (Ryan et al., 2002), variables are the properties or events used in a measurement system. Theories provide the basis upon which reporting and disclosures are developed (Urquiza et al., 2010). This chapter presents a general understanding and perspectives of related theories in corporate reporting in order to enhance comprehension of the empirical research results.

Although IR is viewed from a mandatory perspective in this study, a great deal of discretion is apparent in its application, since the IR framework is not rules-based, but principles-based. Furthermore, the notion of ‘apply or explain’ suggests varying degrees in the level of IR scores for different entities. Thus, the theories behind voluntary disclosures are very relevant. Widely researched theories in this regard include the voluntary disclosure theory, stakeholder theory, agency theory, legitimacy theory, signaling theory, and capital need theory. The following paragraphs provide a brief overview of these theories.

### ***2.2.1 Voluntary Disclosure Theory***

Voluntary disclosures enhance analysts' understanding of the firm's prospects by providing additional information (Beyer et al., 2010). Disclosures should thus contain information demanded by investors. The term voluntary in this context implies a firm's discretion as opposed to obligation, to prepare and provide additional pertinent reports. Voluntary disclosure refers to additional information provided by companies in order to meet the information needs of users and facilitate their decision making (Meek et al., 1995, Giovannoni & Fabietti, 2013). Voluntary disclosures aim to mitigate asymmetry between managers and investors by providing information pertaining to the long term sustainability of the company. Grossman (1981), Schiller Lundh (2013) suggest that firms should voluntarily publish as much information as possible in order to avoid assumptions by investors that information is withheld due to a negative outlook.

### ***2.2.2 Stakeholder theory***

Ansoff (1965) is credited with developing the stakeholder theory; however, some trace its origins to the 1940s (Fernando & Lawrence, 2014) even though it only gained currency in the 1980s.

The theory regards a firm as part and parcel of society at large. Stakeholders are parties that influence accomplishment of a firm's objectives as well as those that are affected by such objectives (Donaldson & Preston, 1995, Freeman, 2005). In an era of constant economic change and technological developments, it is imperative that accounting theory adjusts to the needs of stakeholders. The stakeholders in this case include employees, customers, creditors, suppliers, governmental bodies and other public interest groups (Roberts, 1992, Rahmawati et al., 2019). While the firm's operations affect stakeholders, the firm is also affected by stakeholders.

The stakeholder theory posits that those charged with governance of the entity have a mandate to meet the expectations of stakeholders (Gelmini et al., 2015). In doing so, management has to undertake activities that are deemed important by stakeholders (Smith, 2008). Thus, companies should always consider stakeholders before embarking on any action or deciding not to act (Deegan, 2002a). Given that the various groups that are interested in the operations of the company have different expectations, the stakeholder theory suggests that the firm

should have a different contract with each group as opposed to a standard one that addresses the whole society. Each stakeholder group has the power to impose demands on the company and their relative power determines how much of a firm's attention and focus is required to address their demands. In this regard, stakeholders are differentiated into primary and secondary groups (Clarkson, 1995). The primary group refers to stakeholders that play an integral role in the firm's survival and without whom it cannot operate. In turn, the secondary group is comprised of stakeholders who are not key to the firm's survival, but influence its operations. In summary, the stakeholder theory aims to address the relationship between the entity and its stakeholders.

All the stakeholders have needs and concerns that need to be addressed by the reporting entity. Furthermore, their needs sometimes clash, creating a dilemma for the firm. For example, investors might be excited about a new machine that will improve the firm's turnover, while the opposite would true be from the perspective of the broader society if the introduction of the machine resulted in job losses. The stakeholder theory thus suggests that the reporting entity needs to strike the balance in meeting stakeholders' expectations. Although there is generally only one comprehensive integrated report, the <IR> framework endeavors to be as inclusive as possible by covering the information needs of all stakeholders.

### ***2.2.3 Agency Theory***

The agency theory acknowledges that there is an agency problem between principals (shareholders) and agents (executives) (Shapiro, 2005) and seeks to mitigate this problem and its associated costs. There is a contractual relationship between the shareholders and managers of a firm, in which managers (agents) are accountable to shareholders (principals) (Shapiro, 2005). The shareholders are the owners of the company, and they appoint executives to run the business on their behalf. The agency theory is concerned with resolving problems that can exist in the agency relationship due to misaligned goals or different levels of risk aversion. The most common agency relationship in finance occurs between shareholders (principals) and company executives (agents) (Mutunga & Owino, 2017). Information and intention gaps result in conflict (Shapiro, 2005) and information asymmetry thus needs to be addressed. One of the objectives of this study was to examine the impact of IR on analysts' forecast errors. The agency theory is relevant since financial analysts play a critical role in reducing agency problems between principals and agents (Boubakri & Bouslimi, 2016, Flores et al., 2019).

For example, management might decide not to pay dividends in order to maximize shareholders' wealth by reinvesting their funds in profitable investments. The long-term plan in this case is to increase the company's market value which will, in turn, improve shareholders' financial position. However, if shareholders are not aware of the reasons for management's decision, a typical shareholder is likely to react negatively to such a move and dispose of their shareholding. In other instances, there is no information/intention gap; rather, the difference lies in the appetite for risk (Ogilvie, 2009). Managers may have a larger appetite for risk than shareholders. According to Macey (2019), the agency problem assumes three forms, namely, (i) the owner and manager are two different parties, (ii) a clash of interests among shareholders (owners of the firm), and (iii) conflict between a company and other parties such as employees, trade unions, suppliers, and the government. The nature of companies dictates that there should be separation between owners (shareholders) and managers (directors) of the firm. This is largely due to the fact that there are numerous shareholders and it is practically impossible for all of them to make daily decisions pertaining to the operations of the firm. Managers are therefore stewards of the company who have an obligation to make strategic decisions in the best interest of shareholders (Healy & Palepu, 2001). Shareholders have different interests and opinions and also represent different class interests. The elite may act without considering the interests of ordinary or lower-class shareholders. The agency problem also arises between the firm and other stakeholders, especially employees as the former is often accused of exploiting the latter. Managers may be accused of enriching themselves through unjustified remuneration packages and performance bonuses at the expense of employees.

Agency costs include the cost of equity capital rising above the market rate, since without adequate information on managers' intentions, shareholders are likely to increase their premium to compensate for unknown factors. Similarly, the cost of equity capital may increase if management is perceived to be abusing their power by making decisions that are not in the interests of shareholders. Jensen Meckling (1976) add that agency costs include the appointment of external auditors, financial analysts, lawyers and specialists. Agency costs are borne by shareholders.

The agency theory and agency costs are relevant to this study since IR aims to enhance communication among firm executives, shareholders, employees, suppliers, financiers, government and society at large. Moreover, IR focuses on the providers of financial capital

(EY, 2014b). Agency costs such as the excess cost of equity capital may be reduced if the purpose of IR is achieved. The same is true for analysts' forecast errors. If analysts are able to access sufficient relevant information about the firm and managers' strategic decisions, there could be fewer earnings surprises.

#### ***2.2.4 Legitimacy theory***

The legitimacy theory is derived from the concept of organisational legitimacy, which is described by Dowling Pfeffer (1975) and Deegan (2002b) as a condition or status which exists when an entity's value system is congruent with that of the larger social system of which it is part. When an actual or potential mismatch exists between the two value systems, the entity's existence is threatened. The legitimacy theory suggests that firms continually seek to ensure that they operate within the parameters and norms of their societies. Firms voluntarily report on activities if management perceives these issues to be relevant and important to the communities in which they operate (Deegan, 2002a, Bhimani et al., 2016). The legitimacy theory is thus concerned with the firm's license for its existence as there is a social contract between the firm and society (Deegan, 2002a, Aluchna & Idowu, 2017). For example, if the community expects the firm to employ a certain number of local residents and it does not meet these expectations, it runs the risk of losing the right to operate. Thus, the social contract can be influenced by certain groups and it can be expressed or implied. Sanctions imposed by society include reduced demand for the company's products, sanctions by suppliers, government intervention and industrial action. In extreme cases, local communities can revolt against the firm. It is thus critical that firms engage with communities and all stakeholders on a regular basis in order to adjust to changing expectations. Critics of the legitimacy theory suggest that, disclosures merely represent lip service on the part of firms in order to convince society that they still have a legitimate right to operate. However, proponents of the theory hold that additional disclosure enables a firm to proactively tell its story. The legitimacy theory was appropriate for this study as IR is an inclusive process that includes reporting on how the firm has impacted on society, how it intends rehabilitating the natural resources at its disposal, and how it intends to create value for others. The IR framework thus provides structured guidelines to ensure that the annual report covers contentious issues that can affect a firm's existence.

### ***2.2.5 Signalling Theory***

The signalling theory posits that a firm provides signals to the market, particularly current and potential investors. The motive is to paint a picture of a firm that cares about and is cognisant of the needs of investors. By implication, this requires that the firm goes beyond expectations in providing reports. The signalling theory relates closely to the agency theory because both aim to mitigate information asymmetries between managers and investors. Over and above mandatory reports, firms disclose information in a quest to position themselves as a better investment option than other firms (Cotter et al., 2011). Integrated reporting includes reporting on the risks and opportunities facing the firm, and how it intends to capitalize on opportunities and mitigate risks (IIRC, 2013). A report that reflects how the company creates or intends to create value for itself and others, is in theory, a signaling report. A high-quality integrated report sends signals to investors about the firm's strategic moves towards maximization of shareholders' wealth. That would augur well for the firm in the long run as such signals may reduce the cost of equity capital. Information asymmetry is often blamed for an increase in the cost of capital.

### ***2.2.6 Capital Need Theory***

Given that firms generally require external capital in order to seize investment opportunities, the capital need theory posits that discretionary disclosures assist firms in acquiring the required finance (Choi, 1973). This theory posits that as firms compete in the capital market, they tend to increase their voluntary disclosures in order to convince potential investors that they are worth investing. Accordingly, firms produce CSR reports because of competition for financial capital (Shehata, 2014). There are some similarities between the capital need theory and the signaling theory as both aim to appease the market. The thinking behind the capital need theory is the belief that the risk premium is included in the cost of equity capital. Since the risk premium is directly related to uncertainty, it stands to reason that by providing more voluntary disclosures, the firm would reduce risk to a certain extent.

## **2.3 Empirical Literature**

### ***2.3.1 The impact of voluntary disclosures on the cost of equity capital and analysts' forecast errors***

Beyer et al. (2010) and Zhou et al. (2017) assert that quality voluntary disclosures improve a firm's information landscape and thus enhance analysts' assessment of its outlook as they are able to arrive at a more accurate prediction of its earnings. Dhaliwal et al. (2012) observe that



voluntary disclosures improve the integrity of the firm's reporting environment by providing transparent reporting in the form of substantive disclosures, which facilitates analysts' assessment of its future prospects. This could result in tangible benefits for the firm, such as reduction in the cost of equity capital. This proposition is supported by the capital need theory which states that voluntary disclosures enable firms to compete for financial resources in the capital market (Healy & Palepu, 2001).

The voluntary disclosure theory suggests that firms with good news have an incentive to disclose information, whereas the opposite is true for those with bad news (Fonseka et al., 2019). However, (Berrone & Gomez-Mejia, 2009) note that some companies manipulate disclosures, particularly where rewards are offered for environmental disclosures. This could be self-defeating if investors become aware of such manipulation as they might not value future voluntary disclosures (Berrone & Gomez-Mejia, 2009). Nevertheless, most studies suggest that companies with improved voluntary reporting scores are likely to attract cheaper equity capital. Investors attach less risk to investing in firms that communicate how they have improved their employee, social, and environmental policies. It would appear that investors are willing to absorb some premium due to lower perceived risk. Kim Pinnuck (2014) found that a low cost of capital was associated with improved disclosure levels as investors are able to predict the firm's future growth. Another point of view suggests that a high level of disclosures reduces the estimation risk by facilitating future cash flow predictions (Barth et al., 2017). If there is less estimation risk, investors are likely to use a low discount rate to estimate their future earnings.

Dhaliwal et al. (2012) investigated the association between the quality of non-financial disclosures and analysts' estimates. Corporate social responsibility was used as a proxy to assess the level of non-financial disclosures. Firms from 31 countries were included in the observations and the study found that non-financial disclosures were associated with a decrease in analysts' forecast errors. Thus, analysts use CSR reports to predict a company's future performance. The study also found that non-financial disclosures were more relevant in jurisdictions where the business culture is centered around stakeholders. Hence, these jurisdictions experience better forecast accuracy. This empirical literature supports the stakeholder theory. Plumlee et al. (2015) investigated the relationship between environmental disclosures and firm valuation for US firms. Environmental disclosures were measured against the Global Reporting Initiative (GRI) index, and the results showed a direct relationship

between the level of environmental disclosures and firm valuation. The cost of equity capital and cash flows were used as metrics to measure firm valuation. The implied cost of equity capital was calculated using the target price method. In line with the voluntary disclosure theory, the study found an inverse relationship between the quality of environmental disclosures and the cost of equity capital. Lev et al. (2010) suggested that high-level voluntary disclosure not only assists analysts with relevant information to make predictions, but can also enhance a firm's sales performance. A firm may have been driven by the stakeholder theory and subsequently improve or begin voluntary disclosures. However, if sales increase after publishing voluntary disclosures, by implication, positive signals would have been received by the market; hence, the signaling theory is also at play.

Lemma et al. (2019) assessed the quality of carbon disclosures by firms listed on the JSE. They found that firms with a risk of high carbon emissions issued better quality carbon disclosures due to their desire to mitigate adverse reactions in response to not making such information available. In line with the signaling theory, firms that issued high quality carbon disclosures reaped rewards in the form of a reduced cost of equity capital. It can thus be concluded that firms operating in a carbon intensive space face greater risks and that voluntary carbon disclosures reduce information asymmetry and promote their market position (Healy & Palepu, 2001, Lemma et al., 2019). In contrast, Guidry Patten (2012), Peters Romi (2014) argue that voluntary carbon disclosures come with proprietary costs. They note that disclosing negative information could ultimately increase the cost of equity capital. Nevertheless, Fonseca et al. (2019) argue that environmental disclosures reduce information asymmetry and the agency problem. This is particularly relevant in countries that consume a lot of energy and in the process emit carbon dioxide (Chang et al., 2017). Chang et al. (2017) investigated the effect of environmental disclosures on the cost of equity capital in China's energy sector and found that a negative relationship existed between the level of environmental disclosures and the cost of equity capital.

However, Hail (2002) observes that empirical research on voluntary disclosures is affected by subjectivity in deciding on levels of disclosures. Different researchers may arrive at different scores when assessing a firm's disclosure. Moreover, numerous factors come into play in estimating the cost of capital. Even if disclosure levels are not subject to bias, market conditions might be unstable, exacerbating uncertainty. Nevertheless, (Hail, 2002) study on Swiss firms found a significant negative relationship between the cost of equity and the level

of disclosures. Reverte (2009) investigated whether listed Spanish firms with high CSR disclosure ratings enjoyed a lower cost of capital. After controlling for risk factors such as market beta, size of the firm, and market to book ratio, the study found a significant negative association between CSR reporting quality and the cost of equity capital. Dhaliwal et al. (2011) and Suto and Takehara's (2018) studies on the impact of CSR reporting on the cost of capital also pointed to the advantages of non-financial disclosures. However, these studies focused on firms that experienced significant increases in the cost of capital in the previous financial year. Increasing their reporting on CSR activities reduced the cost of capital. Furthermore, firms that produced high quality CSR reports attracted analyst coverage and committed investors. These findings are in line with the signaling theory.

Dhaliwal et al. (2011), Sletten (2012) investigated whether or not a decline in share prices induced firms to disclose management forecasts. The findings suggest that when share prices fall, the cost of equity capital increases, causing executives to disclose more information in order to minimize market shock. This is also in line with the signaling theory. Thus, improving or initiating voluntary disclosures may be regarded as a method to pacify investors and stakeholders that are experiencing uncertainty and its associated risks. A possible indirect benefit of such reports is consciousness of social and environmental expectations. If a firm is seen as socially and environmentally compliant, it may avoid the sanctions associated with non-compliance. Healy Palepu (2001) argue that demand for financial reporting and disclosures arises from information asymmetry and agency conflicts between managers and outside investors. In general, a higher level of financial disclosure reduces perceived risk and thus the required rate of return.

El Ghouli et al. (2011) found that high quality CSR disclosures are associated with a reduced cost of equity capital. The researchers established the existence of an inverse relationship between the level of CSR disclosures and the cost of equity capital, which suggests that as firms provide more relevant disclosures, investors are willing to settle for a lower rate of return. These findings concur with the voluntary disclosure theory that posits that relevant disclosures help to reduce information asymmetry. Both the legitimacy and stakeholder theories are applicable to CSR disclosures. These studies shed some light on the application of the theories by providing empirical insight into how consciousness of societal imperatives and stakeholder-oriented disclosures can provide tangible financial benefits to the reporting firm. The value creation suggested by the IR framework implies that investors are more interested in the value

which the firm creates for itself (IIRC, 2013). A reduced cost of equity capital is one of the ways in which the firm can increase its value. Empirical evidence of this nature suggests that firms should consider adopting IR. While the legitimacy and stakeholder theories are applicable, it is evident that IR primarily targets the providers of financial capital (IIRC, 2013, Flower, 2015).

Contrary to studies that support the voluntary disclosure theory, Mulyati (2017) found that voluntary disclosures did not have an impact on the cost of equity among manufacturing firms listed on Indonesia's stock exchange. The study controlled for the firms' beta and size and the regression results pointed to an insignificant positive effect of voluntary disclosures on the cost of equity capital. This can be attributed to the irrelevance of the information included in voluntary disclosures. Mulyati (2017) argues that voluntary disclosures do not meet investors' need for information on the risks of securities. However, Boubakri Mishra (2017) suggest that information overload negatively affects investors' assessment of a firm's outlook. The researchers examined the magnitude of disclosures and their effect on the cost of equity capital, and concluded that information overload manifested in an increase in the cost of equity capital.

Eriandani et al. (2019) research on firms listed on Indonesia's stock exchange found that environmental risk disclosures have a positive effect on the cost of equity capital. Again, this is contrary to the voluntary disclosure theory. Environmental disclosures are critical as the firm has to show how its operations affect the environment. One of the imperatives of IR is to reflect value creation for the entity as well as for others (IIRC, 2013). However, Lioui Sharma (2012) suggest that IR's effect on the cost of equity depends on the level of unfavorable information included in voluntary disclosures. The riskier the picture painted in voluntary disclosures, the higher the rate of return investors will demand. Similarly, Dirman (2019) investigated the impact of CSR disclosures on the cost of equity capital, and found a positive association between the two variables.

This review of the literature on the impact of voluntary disclosures on the cost of equity capital and analysts' estimates points to mixed results. However, the majority of previous studies suggest a negative relationship between the quality of voluntary disclosures and the cost of equity capital and analysts' estimates errors. Agency costs, information asymmetry, and risk are some of the factors linked to the cost of equity capital. The impact of these factors can be reduced by applying the agency theory, stakeholder theory and signaling theory. Directly

opposite results (an increase in the cost of equity capital) were attributed to proprietary costs, information overload, and irrelevant disclosures.

Although voluntary disclosures may provide relevant information, their weakness lies in the fact that they tend to be voluminous. For example, a report on sustainability can comprise 200 or more pages (Cheng et al., 2014b). Furthermore, standalone reports lack connectivity with aspects of the main report which makes it difficult to comprehend them. Investors and other stakeholders need reports that are inclusive and connected in order to maximize the usefulness of the information at their disposal (Cheng et al., 2014b). Despite the good intentions and proposed solutions presented by voluntary disclosures, there is a need for an improved, more inclusive reporting framework. This would provide a foundation for a holistic report that reflects on how the firm affects capitals whilst engaging in the process of creating value. In a quest to address the shortcomings of voluntary disclosures, the IIRC proposed a framework that promotes connectivity of information to facilitate assessment of a firm's future outlook (Cheng et al., 2014b). This would connect all information in a manner that communicates value creation from the perspective of the external environment due to the firm's business strategy (IIRC, 2013). Makiwane (2012) notes that IR builds on the guiding principles of the Management Commentary Practice Statement, which was issued in 2010 by the International Standards Board. Integrated reporting provides companies with a mechanism to report their financial and non-financial performance in a single document (Eccles & Armbruster, 2011). They are thus able to produce reports that combine issues relating to the environment, society, skills, governance, risks and opportunities, financial results, and sustainability.

The following section reviews the empirical research on IR.

### ***2.3.2 Integrated Reporting and its impact on the cost of equity capital***

Zhou et al. (2017) suggest that, due to the discretionary nature of the IR framework the voluntary disclosure theory is relevant to IR. There is a paucity of research on the relationship between integrated reports and organizational benefits due to the relative newness of this phenomenon. Most studies in this field utilize voluntary disclosure theory as the basis for their research. Zhou et al. (2017) investigated the impact of integrated reports' level of compliance with the IR framework on the implied cost of capital and analysts' estimates dispersion for all firms listed on JSE. The researchers developed a scorecard to assess the level of alignment with the framework. The study found a significant negative relationship between integrated

reports' level of alignment with the framework and the implied cost of capital and analysts' estimates errors. Bernardi Stark (2018) investigated the effects of the introduction of integrated reports on the quality of Environmental, Social and Governance (ESG) disclosures. The study found that, adoption of integrated reports improved ESG disclosure scores and this was associated with a reduction in analysts' forecast errors. This suggests that IR brought about connectivity between financial and non-financial information.

According to BlackSun (2014), organizations that distribute integrated reports build a more grounded relationship and understanding with investors. If voluntary corporate disclosures yield economic benefits, it is expected that firms will perform even better after adopting IR as integrated reports are guided by a structured framework with much emphasis on connectivity. Integrated reports are superior to voluntary disclosures because they show connectivity between all sections of the annual report. One of the likely benefits of a good relationship with investors, will be a reduction in perceived risk. In turn, this has the potential to reduce the cost of capital.

Integrated reporting can be viewed as an innovative way to reduce the cost of equity capital (Vitolla et al., 2019a). Vitolla et al. (2019) investigated the impact of IR on the cost of equity capital for 116 firms from different countries that had adopted the IR model. The results showed a significant inverse relationship between the quality of IR and the cost of equity capital. The decline in the cost of equity capital was ascribed to reduced information asymmetry due to improved transparency. Again, this points to the agency problem discussed earlier which can be mitigated by improved information transparency. Integrated reporting improves transparency by providing an indication of risks and opportunities, as well as how the firm intends to create value over time. Similar to Baiman Verrecchia (1996) study that found that disclosures are capable of affecting the cost of equity, IR can help a firm to minimize forecasting risks and monitoring costs. However, Richardson Welker (2001) produced conflicting results regarding the relationship between disclosures and the cost of equity. The researchers examined the effect of social disclosures on the cost of equity capital among a sample of Canadian firms. The study establishment the existence of a significant positive association between the cost of equity capital and social disclosures. These mixed findings are interesting as social capital is among the reporting spheres of IR.

While advocates of IR claim that it results in improved company value, Baboukardos Rimmel (2016) investigation of the difference in firms' value prior to and post the adoption of the King III Report pointed to a decline in net asset value due to the adoption of IR. This was attributed to the fact that risks and liabilities are now disclosed in integrated reports. Such undesirable outcomes can also be linked to proprietary costs. One can thus deduce that it is possible for the cost of equity capital to increase as a result of adopting IR, depending on the nature of the new information and how the markets react to it.

It is posited that IR is capable of reducing the cost of processing information, especially for firms with complex operational environments (Lee & Yeo, 2016). Included in this category are firms with a significant proportion of intangible assets, and large companies with a number of segments. In this regard, IR mitigates data asymmetry between the board and speculators. This is congruent with the agency theory which seeks to address the information gap between principals and agents (Shapiro, 2005). Lee Yeo (2016) also found that the firms that benefited the most from IR were the ones with a greater need for external financing. The capital need theory also comes into play here as it posits that as firms compete for financial resources in the capital market, they tend to issue more disclosures (Choi, 1973). In the final analysis, it was found that the performance of firms involved in the securities exchange and those operating in the financial sector that produced superior integrated reports outstripped those with lower quality reports. Thus, although preparing integrated reports comes with extra costs, its benefits outweigh the costs. Proponents of IR such as Lee Yeo (2016), Zhou et al. (2017), Barth et al. (2017), Maroun (2019) attribute such benefits to improved presentation of the organizational strategy and the manner in which the business adapts to changes within and outside the organization, its holistic focus on both financial and non-financial information, better explanation of risks and opportunities and how the firm mitigates risks and takes advantage of opportunities to create value, and the emphasis on connectivity of information.

However, critics of voluntary disclosures point to the negative effects on firm valuation due to proprietary disclosure costs (Verrecchia, 1990, Arya et al., 2010). Competitors may profit from proprietary disclosures since IR includes disclosure of a firm's strategy and business model. Barth et al. (2017) examined the relationship between integrated reports and firm valuation among firms listed on the JSE. The EY excellence rankings scores were used to differentiate between high quality and low standard integrated reports. A direct relationship was found

between high quality integrated reports and liquidity. Contrary to other studies, no association was found between integrated reports and the cost of equity capital.

Previous studies suggest a theoretical link between the extent to which disclosures affect non-diversifiable risk, and the premium on equity capital (Beyer et al., 2010). Similarly, Lambert et al. (2007) suggest that the assessed level of risk associated with future cash flows can be influenced by accounting information. As an improved and concise disclosure mechanism, IR is expected to help firms to reduce information asymmetry and estimation risk. More relevant information will reduce the risk premium. Serafeim (2015) argues that data asymmetry between an organization's executives and external financial specialists creates uncertainty. The bigger the potential information gap between management and investors, the more probable it is that investors will require a higher rate of return to compensate for the bigger risk. The impact of information asymmetry is greater for long term investors as their returns depend on future cash flows and sustainability accounting. Since IR takes cognizance of the long-term outlook, it makes provision for information about long term growth prospects. This is crucial for investors who wish to plant seeds (financial capital) with the aim of obtaining a bountiful harvest (returns). According to Serafeim (2015), firms that provide more information on social, environmental and governance issues tend to outperform (in financial capital terms) those that do not produce or produce fewer ESG reports. This suggests that firms with superior ESG activities have easier access to investors' financial capital. Furthermore, it is posited that organizations that reveal more ESG data enjoy a lower cost of capital and improved access to funds (Serafeim, 2015). Previous research also shows that disclosures can limit the non-diversifiable hazard, which would result in a decrease in the cost of capital. When a firm produces transparent disclosures, investors tend to show greater support and willingness to invest which will improve its liquidity.

Analysts have significant influence in determining the cost of capital and they consider both financial and non-financial information in evaluating a company's income. Provision of more complete data would thus reduce estimation errors (Dhaliwal et al., 2011). Moreover, analysts are likely to adopt a favorable view of organizations that provide more information (Serafeim, 2015). Therefore, the more relevant the disclosures (both financial and non-financial), the better the analysts' estimates (Zhou et al., 2017). While it has been noted that analysts tend to have less understanding of such disclosures, especially where they relate to complex transactions, managers should not take this as a sign that they need not provide relevant



disclosures, especially well-structured reports such as integrated reports. Integrated reports that achieve high IR scores, are expected to provide analysts with relevant information that helps them to evaluate a firm's long term prospects (Zhou et al., 2017). The more relevant the information available to analysts, the greater the likelihood of a reduced premium on equity capital. The literature suggests that reduced information asymmetry between the firm and investors can contribute to a reduction in the cost of equity capital (Healy & Palepu, 1993, Verrecchia, 1983, Lambert et al., 2007). Although the voluntary disclosure theory suggests a negative relationship between high quality disclosures; and the cost of equity capital and analysts' forecast errors, as noted by Verrecchia (1983), Botosan (1997), Verbeeten et al. (2016), this theory is widely criticized due to the disjointed nature of discretionary reports. Integrated reports aim to solve this problem by placing more emphasis on connectivity.

At the heart of integrated report is a phenomenon called integrated thinking. Successful integrated reports would not be achieved without endorsing a culture of integrated thinking. However, the business model is the vehicle used by management to arrive at the sustained value creation over time (EY, 2014b). In order for a firm to realise strategic plans it requires a business model that will charter the route to follow to arrive at desired destination. In terms of the IIRC Framework, an entity can sustain value if it can manage the range of capitals as efficiently as possible (EY, 2014b). The capitals in question are: Financial, Manufactured, Human, Intellectual, Social, and Natural (IIRC, 2013). Most firms interact with these capitals as inputs and through their business activities, firms convert capitals into outputs.

The integrated Reporting Committee of South Africa IRCSA (2010) provide guidance on technical matters relating to integrated reporting and integrated thinking in South Africa. While the IIRC provides guidance on materiality in integrated reporting, South African companies should also observe principles of King IV Report on Corporate Governance for South Africa 2016 (IRCSA, 2010). Integrated thinking forces those charged with governance to look at interconnectedness of all facets of internal and external environments. For an example, a firm aims to maximize shareholders wealth by improving net profits. Such strategy may result in an increased financial capital, however what if that is achieved at the expense of employees? While improving financial resources in this regard may be desirable, it also a noble practice to pay equitable wages and salaries. It can be deduced from the <IR> framework (IIRC, 2013) that in order for companies to release sustainable value creation, they have to approach all resources at their disposal with an the aim of enhancing value. Admittedly, this

may at times not be possible in the short run due to the tradeoffs in some capitals. A typical example is a mining firm using land for exploration as its capital. While the local communities may be worse off by losing the right to land, the same community may be better off in the long run if the mining firm employs the local community. A concise communication about how firm's strategy, governance, performance and outlook lead to value creation is ideal, but the question is how that could be achieved. To answer that, the IIRC developed a framework which consists of guiding principles and content elements that would provide guidance for firms in compiling integrated reports (IIRC, 2013). In order to strike a balance between flexibility and prescription, the <IR> framework adopts a principles base approach (IIRC, 2013). In this regard the framework recognizes diversity of individual circumstances of firms, but strive to ensure that there is sufficient degree of comparability. Accordingly, the framework does not provide specific key performance indicators, however it is suggested that judgement pertaining to firm's circumstances, be exercised when preparing integrated report.

Quality Integrated reports that are aligned to the prescribed <IR> principles are expected to provide analysts with more relevant information which would be helpful in evaluation of firm's long term prospects (Zhou et al., 2017). The more quality information available to analysts, the greater the likelihood of reduced cost of equity capital. Studies suggest that the cost of equity capital can be decreased by minimizing information asymmetry between firm and investors. According to Healy Palepu (1993), Verrecchia (1983), Lambert et al. (2007), the following are some of the key contributions of integrated reporting:

- Integrated reports that identify risks and opportunities within the firm. A report that show plans to manage risks and capitalize on opportunities, provide some form of assurance to the investors about the firm's sustainability.
- Integrated reports bring together all value drivers into one document that helps in getting a bigger picture with less effort. Investors have to do only minimum search which saves them costs. One of the principles of integrated report is connectivity. Thus, a quality integrated report will assist analysts and investors make a better sense of every aspect of corporate reports.
- Uncertainty is reduced to a reasonable level. Uncertainty contributes a lot in high required rate of return. Integrated report is about the story of a firm which is portrayed

in the best possible transparent manner. The more relevant and transparent information available to investors, the less uncertainty there will be.

## **2.4 Summary**

While IR is becoming more popular in the corporate reporting space, some countries have not yet adopted it, although voluntary disclosures are widely embraced. This chapter presented the theoretical framework that underpinned this study and reviewed the literature on IR in order to lay the foundation for the study.

The following chapter unpacks the research methodology employed to conduct this study.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The previous chapter presented the theoretical framework that underpinned this study and a review of the relevant literature. This chapter focuses on the methodology employed to conduct the research. It recaps the research objectives, and discusses the study design, model specification, the research approach, population and sampling, units of analysis, data collection methods, the research model, hypothesis development, and the data analysis and presentation process. Most of the studies reviewed in chapter two suggest an inverse association between the cost of equity capital and high-quality discretionary disclosures (Hail, 2002, Dhaliwal et al., 2011, Cohen et al., 2012, Zhou et al., 2017). However, some found no link between the cost of equity and the extent of disclosures (Arya et al., 2010, Barth et al., 2017). This study contributes to existing knowledge by investigating if there is any relationship between the total scores of integrated reports, and the cost of equity capital as well as analysts' forecast errors. The secondary data (integrated reports) for this study was collected from firms' annual reports published on their respective websites, while the other metrics (firm size, market to book ratio, leverage, beta, and cost of equity capital) were obtained from the Bloomberg database terminal. The dependent and independent variables were arranged in a panel data format, from 2013 to 2018. The year 2013 is a good starting point because the international IR framework (IIRC (2013) was issued in December 2013.

### **3.2 Research design**

In order to arrive at research findings that are a true reflection of reality, and achieve the intended goals, the researcher needs to be guided by an outline that assists in planning and implementation of the study (Burns & Grove, 2005). Since the main objective of the study was to determine the effect of integrated reports on the equity capital market, an explanatory (causal) research design was adopted. The quantitative method was employed while Stata 15 statistical software was used for data analysis. The quantitative method was selected over a qualitative approach because the main research question required acceptance or rejection of the presence of a relationship between the independent variable and dependent variables. Qualitative methods are superior when it comes to providing accurate analysis (Sun, 2017). The impact of IR was measured quantitatively using metrics that are readily available from the Bloomberg database. Therefore, a quantitative approach was deemed a more suitable choice for the purpose of the study. In order to achieve the research objectives, the relationships between the independent variable (integrated report score), and dependent variables (the cost

of equity capital and analysts' forecast errors) were observed. According to Smith (2017), the main research question determines the choice of research method. Observation of quantitative data provides an opportunity to model relationships between variables. Such studies adopt regression-type methods to analyze the magnitude of change in the dependent variables as a result of change in the independent variable. This study adopted regression analysis to investigate the association between the cost of equity capital, analysts' forecast errors, and the alignment /quality of integrated reports within the <IR> framework.

### 3.3 Model Specification

Similar to related studies by Dhaliwal et al. (2011), Zhou et al. (2017), panel data regression models were adapted to assess the relationship between the variables (independent and dependent). In order to customize the model to the South African mining industry, sustainability reports in accordance with the GRI were incorporated. Most South African mining firms produce sustainability reports in accordance with the GRI framework. Since the study observed the same group of firms over a period of time, panel linear regression was a suitable model to answer the research questions. The multivariate equations were regressed to achieve the study's objectives. The treatment securities group covered 22 JSE listed mining firms over a period of six years (2013 to 2018). The model was guided by the following objectives that were set out in chapter one:

**Objective 1: To determine the effect of integrated reporting on the cost of equity capital among JSE listed mining firms.** The following regression was estimated to test objective 1:

$$COE_{it} = \beta_0 + \beta_1 IRSCORE_{it} + \beta_2 GRI_{i,t} + \beta_3 SIZE_{it} + \beta_4 BETA_{it} + \beta_5 LEV_{it} + \beta_6 MB_{it} + \varepsilon_{it} \dots\dots\dots (1)$$

The above variables are briefly discussed in sections 3.4.1 to 3.4.5.

**Objective 2: To determine the effect of integrated reporting on analysts' forecast errors among JSE listed mining firms.** The following regression was estimated to test objective 2:

$$FCERROR_{it} = \beta_0 + \beta_1 IRSCORE_{it} + \beta_2 GRI_{i,t} + \beta_3 SIZE_{it} + \beta_4 BETA_{it} + \beta_5 LEV_{it} + \beta_6 MB_{it} + \varepsilon_{it} \dots\dots\dots (2)$$

Where:

COE = Cost of equity capital

IR\_SCORE = Total score assigned to integrated reports

SIZE = Natural logarithm of firm's total assets

BETA = Market beta at the end of the month after financial year-end

LEV = Debt to assets at the end of the financial year

MB = Market to book ratio at the end of the year

FCERROR = Difference between actual earnings and estimated earnings

GRI – Sustainability report

A brief discussion of the above variables is provided below in sections 3.4.1 to 3.4.2.

The raw data was captured and prepared in an excel spreadsheet. A panel regression analysis was then performed using the Stata 15 statistical software package.

### **3.4 Justification of Variables**

Adapted from related studies such as (Dhaliwal et al., 2011, Dhaliwal et al., 2012, Zhou et al., 2017, Vitolla et al., 2019b), the following variables were included in the regression analyses in order to test the impact of IR on the cost of equity capital, as well as analysts' estimates errors:

- Cost of equity capital – dependent variable
- Analysts' forecast errors – dependent variable
- Integrated reporting score – independent variable

There were two regression models. The first tested the impact of IR on the cost of equity capital, while the second tested the impact of IR on analysts' forecast errors. The following paragraphs provide a brief description of each variable.

#### **3.4.1 Cost of equity capital (COE)**

The cost of equity capital generally refers to the implied market discount rate that yields the current value of the share price, when applied to the expected future cash returns (Reverte, 2012). The cost of equity capital is impacted by the level of disclosure and risk (Botosan, 2006). It was the first dependent variable used in this study to measure the impact of IR. The data for the cost of equity capital was obtained from Bloomberg and it spanned a six-year period, from 2013 to 2018. As highlighted by Zhou et al. (2017), the appropriate measure of the cost of equity capital is a debatable topic. Dhaliwal et al. (2011) employed three different measures

of cost equity that were averaged to arrive at the appropriate cost of equity capital. Zhou et al. (2017) used the PEG model to calculate the cost of equity capital, while Khelif et al. (2019) adopted the CAPM approach to calculate the cost of equity capital to investigate the effect of voluntary disclosures. The cost of equity capital values for this study were derived from the CAPM model. The choice of this model was strongly influenced by the dominance of its application in Bloomberg database searches. Moreover, a survey of European finance experts conducted by Bancel Mittoo (2014), found that 80% of the experts used CAPM to calculate the cost of equity capital. Moyo Mache (2018) comparison of results from CAPM and alternative methods such as constant growth dividend, residual income, and earnings growth showed that the estimates of the alternative models were close to those of CAPM. After filtering for firms that did not provide integrated reports on their websites and other missing data pertaining to the variables that constitute the models, there were 105 observations. According to Ogilvie (2009), the CAPM is computed as follows:

$$COE = R_f + \beta (R_m - R_f) \dots\dots\dots(3)$$

Where

COE = the cost of equity capital

$R_f$  = risk free rate of interest

B = beta factor of individual security

$R_m$  = return on market portfolio

### **3.4.2 Analysts' forecast errors (FCERROR)**

As stated in Zhou et al. (2017), analysts' forecast errors refer to the difference between the average estimates made by analysts over a period of 12 months, and actual earnings. Basically, a comparison is made between analysts' forecast earnings per share (EPS) at the beginning, and actual earnings per share at the end of the 12-month period. Bissessur Veenman (2016) define analysts' forecast errors as earnings surprises. In this regard, analysts' errors refer to the percentage difference between actual earnings and the predictions made by analysts. Bissessur Veenman (2016) add that firms seek to achieve a zero percentage difference or just above zero. This represents less information asymmetry. The Bloomberg database provides a formula for calculating the earnings surprise percentage. As such, the best earnings surprise percentages were obtained from Bloomberg. According to Core et al. (2006), it is normal for investors to use analysts' mean estimates when predicting the market outlook. (Bissessur &

Veenman, 2016) note that, analysts' forecast errors can be measured by observing small earnings surprises. Earnings surprises refer to the difference between actual earnings and estimated earnings. The forecast error data for each selected security was obtained from the Bloomberg database. The functioning of capital markets is strongly influenced by financial analysts' estimates and they need relevant information in order to provide stock and revenue estimates of firms. Managers and investors use financial analysts' estimates to assess their performance and investment decisions, respectively. Forecast error, also referred to as an earnings surprise can be defined as the annual difference between earnings per share and consensus estimates. Bissessur Veenman (2016) define consensus estimates as the average of individual financial analysts' forecasts over a period of 12 months (Lang & Lundholm, 1996, Hope, 2003, Maaloul et al., 2016). Therefore, analysts' forecast errors are measured as follows:

$$FCERROR = \frac{Actual\ EPS - Estimated\ EPS}{Actual\ EPS} \dots\dots\dots(4)$$

Where:

FCERROR = Analysts' forecast errors

EPS = Earnings per share

### **3.4.3 Integrated Reports (IR\_SCORE)**

Similar to related studies by Dube (2017), Zhou et al. (2017), this study focused on IR as the independent variable of interest. Pistoni et al. (2018) suggest that the quality of integrated reports is assessed by including contents elements, assurance and reliability. This study used the content elements of the IR framework to assess the quality of integrated reports and assign a score (IIRC, 2012). The GRI represents a dummy variable which is shown as 1 if the firm created a sustainability report as per the GRI, otherwise 0 if the firm didn't issue GRI reports. Most firms in the mining segment issue sustainability reports as per the GRI. In line with the GRI rules, organizations need to present data on monetary, environmental and social issues alongside conventional financial statements. The idea is to encourage appraisal of companies' reports by investors and different partners. Although there are different voluntary disclosure frameworks in the corporate reporting landscape, IR is a relatively new phenomenon; hence the selection of IR\_SCORE as an independent variable. Similar to Dhaliwal et al. (2011) study on voluntary disclosures, a negative coefficient was expected between the IR score and the



dependent variables. The rationale for this expectation lies in the general notion that there is a negative association between relevant information and investors' perceived risk.

#### **3.4.4 Control Variables**

The previous literature has shown that certain variables are correlated to the cost of equity capital (Khlif et al., 2019). It is on this basis that the study incorporated control variables in the regression models. Adapted from previous studies by Dhaliwal et al. (2011), Zhou et al. (2017), and (Vitolla et al., 2019b), the following control factors were included in the regression models:

- Firm Size (SIZE) – The company size is measured as a natural logarithm of the total assets, since total assets is widely used as a proxy for firm size. Botosan Plumlee (2005) pointed to the existence of an inverse correlation between the size of the firm and the cost of equity capital.
- Market beta (BETA) at the end of financial year. Beta measures the security risk in relation to the overall market risk (Sharpe, 1964). The beta is included in the model because of its positive impact on the cost of equity capital in a CAPM model (Khlif et al., 2019).
- Market to book value (MB) - market capitalization to book value at the end of the financial year. The market to book value is generally inversely associated with the cost of equity capital (Fama & French, 1993).
- Leverage (LEV) – total debt (interest bearing long term) divided by total assets. Financial leverage is included in the model in order to consider the effect of the firm's financial structure.

#### **3.5 Data Types and Sources**

The units of analysis employed are the annual average cost of equity capital (COE) and analysts' forecast errors (FCERROR). The units were measured against the IR scores which were manually calculated by means of a score card. The cost of equity and analysts' forecast errors for each selected security were derived from excel formulas which are available on the Bloomberg database.

### **3.6 Estimation Procedure**

#### ***3.6.1 Data Preparation and sampling***

The data for the regression models was prepared in three phases. Firstly, the annual IR scores for each company were documented in a spreadsheet. The annual integrated reports were obtained from the companies' websites and were evaluated on the basis of the IR framework (content elements section). Secondly, the annual cost of equity capital, and analysts' forecast errors data was obtained from the Bloomberg database. The data in respect of the control variables was also obtained from the Bloomberg terminal. All data pertaining to the first two phases was then captured in an excel spreadsheet. The third and final step before statistical analysis was importing the excel spreadsheet data into the Stata 15 program.

Quantitative research aims to collect data by applying valid and reliable measures from a sample that is a representative of the respondents (Ntukabumwe, 2009). According to Sekeran (2003), a population refers to the whole group of things, people, or events that are of interest to the researcher's investigation. Similarly, it refers to the total collection of components which the researcher wishes to investigate (Cooper & Schindler, 2001). The population for this study was firms listed on the JSE. In order to streamline the research for improved correlations, the study was limited to mining firms listed on the JSE. In line with the King III code of governance, IR was introduced in South Africa in 2009 (EY, 2014a). Since then, the JSE has made IR mandatory for all listed companies. It is on this basis that this study used JSE listed firms to examine the effect of IR scores on the cost of equity capital and analysts' forecast errors. It is however, noted that the IR is not a rules-based, but a principles-based framework, as its implementation was on the apply or explain basis. Based on the survey conducted by BlackSun (2014), the framework provides relevant guidance on how to prepare integrated reports and inculcate a culture of integrated thinking.

The secondary information was acquired from the organizational sites of the mining firms listed on the JSE and the Bloomberg database for 2013 to 2018. The year 2013 was selected as the starting point because the <IR> Framework was released in that year. The mining sector was selected due to its dominance in South Africa's political, social and economic landscape (MineralsSA, 2018). In 2017, this sector employed 464 667 people and contributed R312 billion to GDP (MineralsSA, 2018). The listed mining firms, are therefore a reasonable representation of the South African economy. Unlike the few previous studies on the cost of equity capital and integrated reports which covered JSE listed firms in all sectors, this study

sought to enhance comparison and the validity of the findings by focusing on a specific sector. The listed mining companies were sourced from the JSE database which is readily available on the JSE website (JSE, 2015). Most companies' annual integrated reports are also available on their websites. Therefore, the annual integrated reports were obtained online. The annual average cost of equity capital was computed for the period 2013 to 2018. The analysts' forecasts errors were sourced from the Bloomberg database for the period 2013 to 2018 and were compared with the actual earnings per share (EPS). The assessment of the association between the quality of integrated reports and analysts' forecast errors aimed to validate the assertion that value-relevant information reduces uncertainty of information. While the average cost of equity capital was computed from the Bloomberg database, there was a challenge with regard to integrated reports since there was no existing database for integrated reports rankings. Similar to the coding system used in study by Zhou et al. (2017), a scorecard was developed based on the content elements of the IR framework.

Table 13 in the appendices section, provides a summary of the basis of the scorecard used to evaluate the selected firms. Whereas the coding system used in Zhou et al. (2017) included all content elements with a corresponding 31 components, this study selected the seven content elements which comprised dimensions with a possible 38 scoring points (IIRC, 2013). The selected dimensions and their respective scores were: (a) Organizational overview and external environment (5), (b) Governance (5), (c) Business model (10), (d) Risks and opportunities (3), (e) Strategy and resource allocation (5), (f) Performance (5), and (g) Outlook (5). Ultimately, the total minimum and maximum scores were zero and 38, respectively. Therefore, the company integrated reports rankings were manually computed using a spreadsheet on a scale from zero to 38 points. Zero means the firm did not produce integrated reports that comply with the framework, whereas 38 meant that the firm complied with all the requirements of the IR framework.

### ***3.6.2 Sampling method***

As stated by Saunders Lewis (2012 p: 132), "a sample is a subgroup of the whole population". Similarly, Sekeran (2003) notes that sampling is the process of selecting a sufficient number of components from the population. The key attributes of a sample are that it is selected from a population and that the selected components should be relevant to the population. For the purposes of this study, the population was all companies listed on the JSE between 2013 and 2018. The JSE database consisted of approximately 400 listed firms throughout the selected

period. However, due to time constraints with regard to establishing IR rating scores, a representative sample was selected from the population. The JSE database comprises various sectors of the South African economy. The mining sector was selected due to its significant contribution to the country's GDP. Moreover, this is a sensitive industry with regard to social, environmental and ethical issues (Frick, 2002).

While probability sampling is characterized by random selection of items, non-probability sampling is based on convenient selection (Cooper & Schindler, 2001). Since the researcher intended to focus on the mining sector, a purposive sampling method was adopted (Saunders & Lewis, 2012). All the firms listed on the JSE were obtained from the database and thereafter categorized, and the mining sector was selected. Fifty-eight mining companies were listed on the JSE, but a few did not produce integrated reports according to the <IR> framework. It was established that most of these firms had a primary listing other than the JSE. Accordingly, they were excluded from the sample as they had no effect on the investigation. While the dependent variables were obtained from the Bloomberg database, there was no readily available relevant panel data in respect of integrated reports. Although entities such as EY and the CIS bestow IR excellence awards, these rankings did not provide the required secondary data for this research because they tend to be inclusive of all sectors and publish only the top achievers. The integrated reports for each mining firm listed on the JSE for the period 2013 to 2018 were thus downloaded from the firms' websites. Most firms produced integrated reports throughout the sample period including their historical data. A spreadsheet tool was created to assess each company's IR on a scale of a minimum of 0 and a maximum of 38 points.

The listed mining companies represented a reasonable sample for the purpose of this study as they outperformed the JSE All Share Index (PWC, 2018). The South African mining industry includes gold, diamonds, platinum, coal, chrome, vanadium, and titanium mining companies, all of which were investigated for this study. Despite a decline in productivity, the gold sector remains a major player in the South African economy (MineralsCouncilSA, 2013). According to the Minerals Council, it employed more than 100 189 workers in 2018 (MineralsSA, 2018). In total, 58 mining firms were listed on JSE (see table 14 in appendices section). However, in some instances the data required for the panel regression model was not available either from the companies' websites or the Bloomberg database. Thus, in the final analysis, there were 105 and 58 observations for the cost of equity capital and analysts' forecast errors panel

regressions, respectively. Table 15 in the appendices section, shows the final sample of mining firms that were included in the observations.

### ***3.6.3 Diagnostics Tests***

Prior to analyzing the regression results, the model was tested for statistical significance in order to reject the null hypothesis and accept an alternative hypothesis, or accept the null hypothesis if the model was not statistically significant. A Breusch-Pagan test was performed using the Stata 15 program to test for heteroskedasticity. The intention was to either accept or reject the null hypothesis that suggested homoscedastic residuals (Torres-Reyna, 2007b). The results of Breusch-Pagan test are presented in the following chapter. If necessary, a robust regression analysis would be incorporated to solve heteroskedasticity. Since the study used a multilinear regression analysis method, a multicollinearity test was performed in order to check if the independent variables were not perfectly multicollinear. If the VIF factor for all independent predictors was less than 10, as suggested by (Myers & Myers, 1990), this would imply no multicollinearity. Stata 15 detects such perfect multicollinearity and drops the relevant variables if necessary. The normality tests were run through Stata 15 statistical software to ensure that the residuals of variables had minimum variance. Finally, a Durbin-Watson test was run to test for serial correlation. In order to arrive at an appropriate regression model, the study incorporated a Hausman test. The Hausman test assists in selecting the the appropriate model between fixed effect and random effect models (Hausman & Taylor, 1981a). Whereas the fixed effect model hold constant the time invariant factors that could influence the assessment of the association between the dependant and independent variables, the random effect model intentionally includes the time invariant factors (Torres-Reyna, 2007b). The choice between fixed effect and random effect models is relevant to the study since dependant variables (cost of equity capital and analysts' forecast error) could be influenced by time invariant factors such as quality of management, labour retention and customer loyalty. The detailed diagnostics tests results are presented in chapter four.

## **3. 7 Summary**

This chapter presented the research methodology employed to conduct this study. The research objectives were restated and the research design, population, and sampling were discussed. The dependant and independent variables were introduced and the reasons for their inclusion were briefly explained. With reference to the literature reviewed, the hypothesis was

developed. This was followed by the estimation of the regression models. A brief overview was provided of data analysis and presentation, including the diagnostics tests as a precursor to the following chapter which analyzes the data.

## CHAPTER 4: DATA PRESENTATION AND ANALYSIS

### 4.1 Introduction

The previous chapter discussed the research methodology employed to conduct the study. This chapter presents the analysis of the raw data that was collected from the mining firms' websites and the Bloomberg database. It begins with a presentation of the results from diagnostics tests with the proposed corrective measures, where applicable. Secondly, we present the Hausman test results which guided the choice between the fixed effects and random effects regression models. Thirdly, the descriptive and correlation summaries are briefly explained. The fourth and final step is the presentation of the regression results.

### 4.2 Diagnostics Tests Results

This section summarizes the diagnostics tests that were performed prior to the final regression analyses.

#### 4.2.1 Multicollinearity test

In order to check for the possibility of high correlation between the predictors (independent variables), multicollinearity tests were performed for the cost of equity capital regression analysis, and analysts' forecast errors regression analysis. The table below presents the results of the multicollinearity tests.

TABLE 1: Multicollinearity Test

| Cost of Equity            |      |          |
|---------------------------|------|----------|
| VARIABLE                  | VIF  | 1/VIF    |
| SIZE                      | 2.37 | 0.421582 |
| IR_SCORE                  | 2.22 | 0.449726 |
| GRI                       | 1.75 | 0.572312 |
| LEV                       | 1.39 | 0.717335 |
| MB                        | 1.08 | 0.923492 |
| BETA                      | 1.06 | 0.947240 |
| Mean VIF                  | 1.65 |          |
| Analysts' Forecast Errors |      |          |
| VARIABLE                  | VIF  | 1/VIF    |
| SIZE                      | 1.50 | 0.667729 |
| IR_SCORE                  | 1.42 | 0.706002 |
| GRI                       | 1.41 | 0.707627 |
| LEV                       | 1.37 | 0.731612 |
| MB                        | 1.21 | 0.825527 |
| BETA                      | 1.04 | 0.960835 |
| Mean VIF                  | 1.32 |          |

The first section of table 1 provides the summary results from the Stat vif command, while the second shows the results of the multicollinearity test, where the VIF factor for all independent

variables is less than 10 (Myers & Myers, 1990). The VIF factor is 1.65. Thus, there is no multicollinearity between the independent variables. The same test was performed for the analysts' forecast errors regression analysis model. Similar to the cost of equity regression model, the results suggest that there is no multicollinearity as the VIF value is 1.32 which is less than 10.

#### 4.2.2 Heteroskedasticity Tests

Guru (2019) suggests that the presence of heteroskedasticity makes the regression model unreliable owing to its biasness. Heteroskedasticity tests are performed as a precautionary measure with the aim of making corrections where necessary. This study adopted the Breusch-Pagan test to detect heteroskedasticity. The null hypothesis for this test is homoscedasticity, which implies no heteroskedasticity, whereas the alternative hypothesis suggests heteroskedasticity. Table 2 below presents a summary of the results.

TABLE 2: Heteroskedasticity Test Results

| Command | Breusch-Pagan/Cook-Weisberg test for heteroskedasticity | Chi2(1) | Prob>chi2 | <0.05 reject | Heteroskedasticity |
|---------|---|---------|-----------|--------------|--------------------|
| Hetest  | Cost of Equity  | 1.44    | 0.232     | No           | No                 |
| Hetest  | FC Error (Analysts' forecast errors)                    | 9.11    | 0.0025    | Yes          | Yes                |

Table 2 shows that the p-value for the first regression (cost of equity) is 0.232. Since the p-value is greater than 0.05, the null hypothesis which states that there is constant variance, is supported. This implies the presence of constant variance. Contrary to the first regression, the results in respect of the analysts' forecast errors regression analysis shows a p-value of 0.0025. This represents significance at 0.05, which implies the presence of heteroskedasticity. As suggested by Acock (2008) and Guru (2019), in order to correct for heteroskedasticity, the robust regression analysis is performed by performing the vce (robust) command in Stata 15.



### 4.2.3 Normality Tests

The normality test detects the residuals of variables with the aim of ensuring that the variables have minimum variance. The null hypothesis for normality suggests that the data is normally distributed, and the opposite is true with the alternative hypothesis. Again, in line with Guru (2019) guidelines, the significance level baseline is set at 0.05. Skewness refers to the assessment of the direction of skew, while the Kurtosis is the representation of dimensions between the height and central peak of the bell curve (Guru, 2019).

TABLE 3: Skewness/Kurtosis test for Normality

| Command      | Dependent Variable                 | Obs | Pr (Skewness) | Pr (Kurtosis) | Prob>chi2 (2) | <0.05 reject | Normality |
|--------------|------------------------------------|-----|---------------|---------------|---------------|--------------|-----------|
| Sktest resid | Cost of Equity                     | 105 | 0.0000        | 0.0059        | 0.0001        | Yes          | No        |
| Sktest resid | FC Error (Analysts forecast error) | 58  | 0.0031        | 0.0000        | 0.0000        | Yes          | No        |

Table 3 shows the Skewness Kurtosis test results. There were 105 observations in the first regression, while the second consisted of 58 observations. In terms of the first dependent variable, there is zero probability of normally distributed skewness. Since 0.000 is less than 0.05, the skewness is not normally distributed. The p-value is also smaller than 0.05, as its value = 0.0059. Lastly, the chi-square is also significant at 0.0001 which is less than 0.05. Thus, the null hypothesis can be rejected, and it can be concluded that the residuals do not show normal distribution. In terms of the second dependent variable (analysts' forecast errors), the patterns are similar to the results of cost of equity. The p-values for Skewness, Pr(Kurtosis, and chi-square are 0.0031, 0.000, and 0.0000, respectively. Therefore, the null hypothesis is rejected as the results do not show normal distribution.

TABLE 4: Shapiro Wilk Test for Normality

| Command | Shapiro Wilk W Test                      | Obs | Prob>z | <0.05 reject | Normality |
|---------|--|-----|--------|--------------|-----------|
| Swilk   | Cost of Equity                           | 105 | 0.0004 | Yes          | No        |
| Swilk   | FC Error<br>(Analysts<br>forecast error) | 58  | 0.0000 | Yes          | No        |

Table 4 provides a summary of the normality test results of the Shapiro Wilk test. The null hypothesis suggests that the dataset of the model is normally distributed (Guru, 2019). The results of Shapiro-Francia W test show that the p-values for all variables are less than 0.05, which is significant. Therefore, the null hypothesis is rejected for both the cost of equity and analysts' forecast errors models, which means that the data is not normally distributed. In terms of normality tests, it can be concluded that there is no normality. In order to minimize the effect of non-normality, robust regression analysis is performed.

#### 4.2.4 Serial Correlation Tests

The null hypothesis suggests that there is no serial correlation, whereas the opposite is true with the alternative hypothesis at 5% and below significance level.

TABLE 5: Serial Correlation Test Results

| Stat Command  | Breusch Godfrey test                     | Z     | Prob>z | <0.05 reject | Serial Correlation |
|---------------|--|-------|--------|--------------|--------------------|
| Runtest resid | Cost of Equity                           | -1.47 | 0.14   | No           | No                 |
| Runtest resid | FC Error<br>(Analysts<br>forecast error) | -3.18 | 0.000  | Yes          | Yes                |

The results in table 5 indicate that there is no serial correlation in the first regression (cost of equity capital) since the p-value is 0.14. The p-value is insignificant and therefore the null hypothesis is not rejected. However, the second regression (analysts' forecast errors) has serial correlation as the p-value is less than 0.05. Thus, the null hypothesis is rejected. The

autocorrelation was corrected in Stata by using the Durbin-Watson statistic command. Below is a summary of correction for serial correlation.

| Stat Command   | Durbin-Watson statistic (original) | Durbin-Watson statistic (transformed) | Serial Correlation |
|--|------------------------------------|---------------------------------------|--------------------|
| prais FCERROR<br>IR_SCORE LEV<br>BETA SIZE MB GRI,<br>corc | 0.847535                           | 0.970485                              | No                 |

### 4.3 Presentation and Analysis of Results

This section presents the descriptive statistics, and the correlation and regression analyses. The raw data which was organized in a spreadsheet.

#### 4.3.1 Descriptive Statistics

The descriptive analyses of the variables for the first and second regression models are shown in tables 6 and 7 respectively. The tables provide the statistical description of the collected data, and depict statistical information on the independent, dependent and control variables.

TABLE 6: Descriptive Statistics: COE

| Variable | Obs | Mean   | Std Dev | Min      | Max    |
|----------|-----|--------|---------|----------|--------|
| COE      | 105 | 0.110  | 0.161   | 0.079    | 0.156  |
| IR_SCORE | 105 | 23     | 9.54    | 6        | 37     |
| LEV      | 105 | 1.94   | 0.92    | 0.99     | 8.65   |
| BETA     | 105 | -6.927 | 21.347  | -116.862 | 19.428 |
| SIZE     | 105 | 8.099  | 2.513   | -.0131   | 12.93  |
| MB       | 105 | 1.081  | 1.767   | 0.107    | 17.142 |
| GRI      | 105 | 0.542  | 0.500   | 0        | 1      |

Notes:

COE: Cost of equity

IR\_SCORE: Integrated reporting level

BETA: risk measurement of the firm's stock in comparison with the market

MB: Financial year end market value of the equity divided by the year end book value of equity

SIZE: Natural log of financial year end market value of equity

GRI: Dummy variable of the Global Reporting Initiative

Table 6 provides a descriptive summary of the statistical data pertaining to the cost of equity panel data analysis. There were 105 observations throughout the period. The mean IR\_SCORE is 23 out of a potential total score of 38. Contrary to the mean scores obtained in previous studies (Zhou et al. (2017), which were in the region of 6, this reflects that, on average, companies fared relatively well in IR in terms of the framework. The improvement in IR can be attributed to increased momentum as most firms fully embraced the integrated international <IR> framework between 2015 and 2018. The average cost of equity capital over the period (2013-2018) is 0.11. This is slightly lower than that found in a study by Zhou et al. (2017), which was 0.13. However, it is consistent with the 0.113 found by (Vitolla et al., 2019b). Lemma et al. (2019) reported a slightly lower average cost of equity capital of 0.09 for the top 100 JSE listed firms between 2010 and 2015. As expected for the mining sector, most companies also produced GRI reports, since the mean value is 0.54.

*TABLE 7: Descriptive Statistics - FCERROR*

| Variable | Obs | Mean   | Std Dev | Min       | Max     |
|----------|-----|--------|---------|-----------|---------|
| FCERROR  | 58  | 1.217  | 11.807  | -55.80361 | 50.046  |
| IR_SCORE | 58  | 27     | 8       | 6         | 37      |
| LEV      | 58  | 1.930  | 0.594   | 1.095     | 3.730   |
| BETA     | 58  | -9.454 | 25.858  | -116.862  | 15.46   |
| SIZE     | 58  | 9.140  | 1.928   | 2.061     | 12.939  |
| MB       | 58  | 1.269  | 2.2098  | 0.951     | 17.1425 |
| GRI      | 58  | 0.689  | 0.466   | 0         | 1       |

Notes:

FCERROR: Analysts' forecast error

IR\_SCORE: Integrated reporting level

BETA: risk measurement of the firm's stock in comparison with the market

MB: Financial year end market value of the equity divided by the year end book value of equity

SIZE: Natural log of financial year end market value of equity

GRI: Dummy variable of the Global Reporting Initiative

Table 7 provides the summary statistics of the analysts' forecast error analysis. Due to the unavailability of data, the total number of observations was reduced to 58. The mean analysts' forecast error (FCERROR) is 1.2 which reflects that the analysts' estimates are close to actual earnings. In the absence of earnings management, the results support the notion that IR improves the availability of the relevant information required by analysts in order to predict firms' earnings (Zhou et al., 2017). Similar to the results for cost of equity, the majority of firms also produced GRI reports as the mean value is 0.69.

#### 4.3.2 Correlation

In order to investigate correlation between the variables, a statistical correlation procedure was performed and is presented in tables 8 and 9. Correlation refers to the strength of the relationship between variables (Acock, 2008). The proximity of observations is measured on the basis of the regression line. The magnitude of the relationship between the dependent variables and independent variables was tested by means of pairwise correlation coefficients of the dependent and independent variables. In line with Acock (2008), the significance of correlation in the following tables is denoted as 1% and 5%. According to Acock (2008: p158), the relationship is weak where  $r = .1$ . The opposite is true where  $r = .5$ .

TABLE 8: Correlation: COE & Independent Variables

|          | COE               | IR_SCORE          | LEV                | BETA              | SIZE    | MB     | GRI |
|----------|-------------------|-------------------|--------------------|-------------------|---------|--------|-----|
| COE      | 1.0000            |                   |                    |                   |         |        |     |
| IR_SCORE | 0.1553<br>0.1138  | 1.0000            |                    |                   |         |        |     |
| LEV      | 0.1288<br>0.1904  | 0.0271<br>0.7835  | 1.0000             |                   |         |        |     |
| BETA     | -0.1447<br>0.1408 | -0.1470<br>0.1346 | 0.0749<br>0.4477   | 1.0000            |         |        |     |
| SIZE     | 0.3771*<br>0.0001 | 0.6784*<br>0.0000 | -0.2259*<br>0.0205 | -0.1736<br>0.0766 | 1.0000  |        |     |
| MB       | -0.0549           | -0.0727           | -0.1009            | 0.0377            | -0.1852 | 1.0000 |     |

|            |                  |                   |                   |                  |                   |                   |        |
|------------|------------------|-------------------|-------------------|------------------|-------------------|-------------------|--------|
|            | 0.5783           | 0.4613            | 0.3057            | 0.7027           | 0.0585            |                   |        |
| <b>GRI</b> | 0.1522<br>0.1213 | 0.5414*<br>0.0000 | 0.3059*<br>0.0015 | 0.0339<br>0.7311 | 0.4229*<br>0.0000 | -0.0418<br>0.6720 | 1.0000 |

\*Significance level at 5%

\*\*Significance level at 1%

Table 8 shows the results of pairwise correlation coefficient between COE and the independent variables (IR\_SCORE, LEV, BETA, SIZE, MB, & GRI). The Pearson correlation between the cost of equity and the IR score is very insignificant as  $r = 0.15$ ,  $p > 0.05$ . This is in contrast to the correlation results in Zhou et al. (2017) study on the relationship between IR and the cost of equity capital. However, there is significant correlation between the cost of equity capital and the SIZE of the firm, although the results show a positive relationship, since  $r = 0.37$ ,  $p < 0.05$ . The remainder of the control variables do not have significant correlation with the cost of equity capital.

*TABLE 9 Correlation: FCERROR & Independent Variables*

|                 |  | <b>FCERROR</b>     | <b>IR_SCORE</b>   | <b>LEV</b>        | <b>BETA</b>       | <b>SIZE</b>        | <b>MB</b>         | <b>GRI</b> |
|-----------------|--|--------------------|-------------------|-------------------|-------------------|--------------------|-------------------|------------|
| <b>FCERROR</b>  |  | 1.0000             |                   |                   |                   |                    |                   |            |
| <b>IR_SCORE</b> |  | -0.2944*<br>0.0249 | 1.0000            |                   |                   |                    |                   |            |
| <b>LEV</b>      |  | -0.1209<br>0.3659  | 0.2736*<br>0.0377 | 1.0000            |                   |                    |                   |            |
| <b>BETA</b>     |  | 0.0543<br>0.6854   | -0.1337<br>0.3170 | 0.0594<br>0.6577  | 1.0000            |                    |                   |            |
| <b>SIZE</b>     |  | -0.0374<br>0.7805  | 0.4178*<br>0.0011 | -0.0786<br>0.5574 | -0.1524<br>0.2533 | 1.0000             |                   |            |
| <b>MB</b>       |  | -0.0104<br>0.9382  | -0.1962<br>0.1399 | -0.0830<br>0.5356 | 0.0453<br>0.7357  | -0.3998*<br>0.0019 | 1.0000            |            |
| <b>GRI</b>      |  | -0.2680*<br>0.0420 | 0.3070*<br>0.0191 | 0.4742*<br>0.0002 | 0.0459<br>0.7322  | 0.1125<br>0.4006   | -0.1309<br>0.3275 | 1.00000    |

\*Significance level at 5%

\*\*Significance level at 1%

Similar to Dhaliwal et al. (2012), Zhou et al. (2017) findings, the analysts' forecast error (FCERROR) dependent variable in table 9 has a negative correlation (-0.29) with IR\_SCORE and it is significant (p-value = 0.0249). The same is true with regard to the correlation with GRI, given the values of -0.2680 and 0.0420, for r and p, respectively. The remainder of the control variables (LEV, BETA, SIZE, and MB) have insignificant correlation with analysts' forecast error (FCERROR).

#### ***4.3.3 Fixed Effect vs. Random Effect***

The Stata 15 software provides options that can be used to select the appropriate regression model. Regression tests on panel data were performed on both fixed effect and random effect models, with the intention of selecting the appropriate model. According to Torres-Reyna (2007b), the fixed effect model controls for the time-invariant factors that could influence the assessment of the relationship between the dependent and independent variables. It detects the exclusive time influence in which the independent variables and dependent variables change over time. The fixed effect regression analysis model holds random variables constant. It thus removes the impact of factors such as the quality of a firm's management, labor retention, customer loyalty, etc. In the context of the study, these factors could influence the cost of equity capital and the quality of IR.

In contrast to the fixed effect model, the random effect model deliberately includes the time invariant factors with the suggestion that they would influence the dependent variable (Torres-Reyna, 2007b). The random variables are unpredictable; hence, the random effect regression analysis. The random effect model incorporates time invariant factors as explanatory variables, which allows for generalization beyond the model. According to (Torres-Reyna, 2007b), if there are indications that there may be other factors that could influence the outcome of the dependent variable, it is advisable to opt for the random effects regression model. Thus, the inclusion of time invariant variables such as the quality of the labor force, goes a long way in explaining the outcome. (Torres-Reyna, 2007b) further highlights the challenge of the unavailability of some of these random variables. However, the main principle of random effect is to recognize the possibility that other random factors might influence the dependent variable in question.

#### 4.3.4 Hausman Test

After performing the diagnostic tests, the fixed effects and random effects models were run in order to arrive at an informed decision in selecting the appropriate model. The Hausman test provides guidance on the choice between fixed effects and random effects regression models (Hausman & Taylor, 1981b). As outlined by Guru (2019), it can be performed in STATA and the overall guidance suggests that the random effect model is appropriate where the p-value is above 5%, whereas the fixed effect model is appropriate where the p-value is 5% and below. According to Torres-Reyna (2007b), the null hypothesis suggests that random effect is the better model. However, it is necessary to run a Hausman test in order to choose between the null hypothesis and alternative hypothesis. The Hausman test results are summarized in the table below.

TABLE 10: Hausman Test Results

| Command                    | Hausman Test                              | Chi2(1) | Prob value | <0.05<br>reject | Random<br>Effect/Fixed<br>Effect |
|----------------------------|---|---------|------------|-----------------|----------------------------------|
| Hausman<br>fixed<br>random | Cost of Equity                            | 1.44    | 0.2490     | No              | Random                           |
| Hausman<br>fixed<br>random | FC Error<br>(Analysts'<br>forecast error) | 9.11    | 0.0024     | Yes             | Fixed                            |

Similar to Torres-Reyna (2007a), Acock (2008), Guru (2019), this study used 5% (0.05) as the threshold to measure the significance of the p-value. Accordingly, p-values are significant at the level of 0.05 and below, and this means that the null hypothesis should be rejected. Any p-value that measures above 0.05 is insignificant and this means that the null hypothesis should be accepted. Based on the Stata results depicted in table 10, the random effect model was selected as an appropriate model for the first regression. The results for the cost of equity regression model show  $\text{Prob} > \chi^2 = 0.2197$ , which is greater than 0.05. In this instance, the null hypothesis cannot be rejected, and as such the random effect model is selected to test for the effect of the independent variables on the cost of equity capital. However, the Hausman test results for the second model (analysts' forecast error) favors the fixed effect model since



the p-value is significant at 0.0024, which is less than 0.05. Therefore, the null hypothesis is rejected in this instance.

#### 4.3.5 Regression Analysis

In order to fulfil the study's objectives and answer the research questions, panel regressions were used to test for the effect of the independent variables (IR\_SCORE, SIZE, LEV, MB, BETA) on the dependent variables (Cost of Equity and Analysts' forecast error). The tables below present random effects GLS regression and fixed effect results, respectively.

TABLE 11: Regression Results - COE

| Random effects GLS regression (2013 – 2018): xtreg COSTOFEQUITY IR_SCORE LEV SIZE MB LTG BETA GRI, re vce(robust) |             |         |                     |
|---|-------------|---------|---------------------|
| Independent Variables   | Coefficient | P value | Significant at 0.05 |
| IR_SCORE  | -.0002265   | 0.319   | No                  |
| LEV   | .0055097    | 0.019*  | Yes                 |
| BETA  | -0.000468   | 0.496   | No                  |
| SIZE  | .0037939    | 0.000** | Yes                 |
| MB  | -.0007247   | 0.257   | No                  |
| GRI   | -.0039638   | 0.403   | No                  |
| Constant  | 0.747306    | 0.000** | Yes                 |
| R Square value  | 0.239       |         |                     |
| N   | 105         |         |                     |

\*Significance level at 5%

\*\*Significance level at 1%

Table 11 shows the results of random effects GLS regression which were processed through the use of Stata 15 statistical software. Similar to previous studies (Zhou et al. (2017), Vitolla et al. (2019a), there is a negative coefficient between the cost of equity and the IR score (IR\_SCORE). The results suggest that there is an inverse relationship between the two variables, which can be interpreted to mean that as the firm improves IR, the cost of equity tends to decrease. As indicated in chapter two, some of the costs of equity can be attributed to the agency problem. In this context, the integrated report is linked to reduced risks relating to agency costs. However, the relationship between the cost of equity and IR\_SCORE is insignificant as the p-value is 0.319, which is greater than 0.05. Unlike other similar studies, in this instance IR has an insignificant effect on the cost of equity capital. The only variables that have a significant effect on the cost of equity capital, although positive, are LEV and SIZE

since their p-values are 0.019, and 0,000, respectively. Consistent with Fama French (1995), there is negative relationship between the cost of equity capital and market to book market value (MB). According to Mazzotta Veltri (2014), Vitolla et al. (2019a), providers of financial capital tend to overstate shares that are expected to grow. Overall, the predictors (independent variables) only account for 0.2396 of the outcomes (dependent variable – cost of equity capital). This means that the model’s ability to explain the dependent variable (cost of equity capital) is approximately 24%. The remaining 76% (100-24) is made up of variables other than those in the model. The results are statistically lower than other related studies. In a study by Vitolla et al. (2019a), the regression model accounted for 39.8% of the cost of equity capital. However, in another related study by Eriandani et al. (2019), regression model to relationship between voluntary carbon disclosures and cost of equity capital yielded only 2.5%.

*TABLE 12: Regression Results - FCERROR*

| Fixed effects regression (2013 – 2018): <b>xtreg FCERROR IR_SCORE LEV SIZE MB LTG BETA VAREAN GRI, fe vce(robust)</b> |                    |                |                            |
|---|--------------------|----------------|----------------------------|
| <b>Independent Variables</b>  | <b>Coefficient</b> | <b>P-value</b> | <b>Significant at 0.05</b> |
| IR_SCORE  | -0.6889578         | 0.118          | No                         |
| LEV   | -3.546304          | 0.384          | No                         |
| BETA  | -0.583901          | 0.414          | No                         |
| SIZE  | -14.87673          | 0.043*         | Yes                        |
| MB  | -2.658467          | 0.341          | No                         |
| GRI   | -1.603382          | 0.862          | No                         |
| Constant  | 166.6974           | 0.030*         | Yes                        |
| R Square value  | 0.0121             |                |                            |
| Rho   | 0.9494             |                |                            |
| N   | 58                 |                |                            |

\*Significance level at 5%

\*\*Significance level at 1%

Table 12 presents the fixed effect regression analysis of the relationship between analysts’ forecast error and the independent variables. Similar to the study on the effect of voluntary disclosures on analysts’ forecast errors by Dhaliwal et al. (2012), there is an inverse relationship between the IR score and forecast errors, since the coefficient is -0.689. However, the effect of IR on the outcome is statistically insignificant as  $p = 0.118$ . This provides less evidence to support the relationship between the quality of IR and analysts’ estimates. The

SIZE of the firm has a statistically significant effect on the analysts' estimates, as  $p = 0.043$ . A similar study by Zhou et al. (2017) also showed that the size of the firm significantly impacts analysts' estimates. The remainder of the independent variables show an insignificant effect on analysts' forecast errors. The overall r-square is 0.0121.

#### **4.4 Summary**

This chapter discussed the diagnostics test results and identified corrective measures where applicable. This was followed by the presentation of the summary descriptive results and correlation. The final section analysed and discussed the data from the perspective of the research objectives and questions. The results were compared with those from previous related research.

The following chapter summarizes the results and draws conclusions. It also offers recommendations arising from the findings and suggestions for further research.

## **CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

Having discussed and analyzed the results in chapter four, this chapter presents answers to the research questions that were posed in the first chapter. It presents a summary of the study, conclusions, recommendations, and suggestions for further research.

### **5.2 Summary of the Study**

This study investigated the effect of IR on the cost of equity capital and analysts' forecast errors. It conducted a critical analysis of IR and its impact on the equity capital market. The theories underpinning disclosures were reviewed and the theoretical framework included the voluntary disclosure theory, agency theory, legitimacy theory, signaling theory, and capital need theory. Due to the sparse literature on IR, much of the literature reviewed was based on voluntary disclosure theory. In order to accomplish the research objectives, the study adopted a panel regression-type method to analyze the relationship between integrated reports' level of compliance with the framework, and the cost of equity capital and analysts' estimates. The secondary data that was collected covered a six-year period from 2013 to 2018.

#### ***5.2.1 Objective 1: To determine the effect of integrated reporting on the cost of equity capital among JSE listed mining firms***

The degree of compliance with the IR framework was measured using a scorecard. In terms of the first objective, the results show that there is a negative relationship between the cost of equity capital and the IR score. This suggests that the higher the IR score, the lower the cost of equity capital will be. However, the study found an insignificant relationship since the p-value is 0.319 ( $p\text{-value} > 0.05$ ), at 0.05 significance level. This is contrary to the research results of Vitolla et al. (2019b) who found a significant negative relationship between a high IR score and the cost of equity capital. Although not significant, this result supports the expectations of the voluntary disclosure theory (Beyer et al., 2010). It is in accordance with the proposal that investors may settle for a lower rate of return if there is less perceived hazard because of the decrease in data asymmetry. However, it is noted that some studies on the connection between the cost of equity capital and voluntary disclosures showed a significant inverse association. Zhou et al. (2017) obtained a significant statistical result between the integrated report score and the cost of equity capital.

### ***5.2.2 Objective 2: To determine the effect of integrated reporting on analysts' forecast errors among JSE listed mining firms***

The IR scores were measured by a scorecard based on the content elements of the IR framework. In order to measure the integrated reports' degree of compliance with the <IR> Framework, a panel regression was developed to fulfil the second objective. The results on the effect of IR on analysts' forecast errors show an inverse relationship that is statistically insignificant. The p-value is 0.118 (p-value >0.05). The fact that integrated reports' degree of compliance with the framework is inversely related to analysts' forecast errors suggests that IR assists analysts in their prediction of a firm's outlook. However, due to the insignificance of the results, few inferences can be drawn.

### **5.3 Conclusions**

This study investigated the association between IR and the cost of equity capital as well as analysts' forecast errors. The research was motivated by on-going debate on whether or not IR offers any benefits to the reporting entity. The main objectives were to investigate the effect of IR on the cost of equity capital and analysts' estimates. In this regard, the study examined whether compliance with the IR framework affected the cost of equity capital among JSE listed mining firms. This was based on the premise that shareholders may reward firms that issue integrated reports in conformity with the framework. Furthermore, the role played by financial analysts in the capital market was examined in relation to the adoption and implementation of integrated reports that comply with the international framework. Two regression analyses were performed to answer the research questions. Based on the results presented in chapter four, the following conclusions can be drawn:

- ✓ Regarding the first question, it can be concluded that IR's level of compliance with the international framework does affect the cost of equity capital. However, the results showed an insignificant negative relationship between integrated reports and the cost of equity capital. The p-value of 0.319 is greater than 0.05.
- ✓ In terms of the second question, we conclude that integrated reports' level of alignment with the international framework does affect financial analysts' estimates, although the results are statistically insignificant. The p-value is 0.118. Nonetheless, the results point to the inverse direction between the quality of IR and analysts' forecast errors.

- ✓ Overall, although the results were not significant, they point in the direction of the voluntary disclosure theory which suggests that firms that produce relevant disclosures are rewarded by the capital market.

The overall results of the models provide some evidence to support the effect of IR on the cost of equity capital and analysts' estimate. However, due to the insignificant statistical nature of the results, few or no inferences can be drawn.

#### **5.4 Recommendations**

The study's results suggest that reporting firms could reap some benefits if their integrated reports are aligned with the integrated framework. Based on this conclusion, the following recommendations are made:

- Managers should take advantage of IR and make the most of the platform to concisely present opportunities.
- The IR framework makes provision for the reporting firm to communicate with investors on how the firm is going to mitigate risks. Managers should capitalize on this provision by ensuring that they disclose as many risk management mechanisms as possible in order to minimize uncertainty.
- In order to maximize the benefits of IR and the usefulness of integrated reports, such reports should not be presented separately, but should form part of the main annual report and should be linked to the financial section.
- An audit framework to which external auditors can refer would enhance the credibility of integrated reports. Currently, external stakeholders place more reliance on audit reports; however, there is not much clarity of what constitutes an integrated report that would meet audit requirements. A standard on integrated reports would enhance the credibility of IR and enhance its relevance in the capital market.

#### **5.5 Suggestions for further research**

Although the study's results show some evidence of the effect of IR on the cost of equity capital and analysts' estimates, it was noted that the association between predictors and outcome was not significant. Future studies could cover a larger sample in order to produce more compelling evidence. Moreover, given the tremendous increase in the number of jurisdictions that have made IR mandatory, it would be interesting to investigate whether its purported benefits are prevalent in other settings. Incorporating questionnaires and interviews with accountants,

executives, investors and some shareholders to corroborate the evidence would also provide a different perspective on the benefits of IR.

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## APPENDICES

*TABLE 13: Content Elements of Integrated Reporting*

| THE CODING FRAMEWORK                                       |  |
|--|--|
| Dimensions   | Components   |
| <b>1. Organisational overview and external environment</b> | 1.1 Mission and Vision                                       |
|  | 1.2 Culture, ethics and value                                |
|  | 1.3 Activities, markets, competition and market position     |
|  | 1.4 Summary statistics                                       |
|  | 1.5 Significant factors affecting operations                 |
|  |  |
| <b>2. Governance</b>                                       | 2.1 Leadership structure                                     |
|  | 2.2 Processes for decision making                            |
|  | 2.3 Reflection on strategic decisions                        |
|  | 2.4 Reflection on organisation culture, ethics and values    |
|  | 2.5 Strategic plans for innovation                           |
|  |  |
| <b>3. Business Model</b>                                   | 3.1 Description of business model                            |
|  | 3.2 Description of activities, inputs, outputs and outcome   |
|  | 3.3 Graphical presentation of business model                 |
|  | 3.4 Reflection of inputs in relation to capitals             |
|  | 3.5 How the entity differentiates itself in the market place |
|  | 3.6 How the model adapts to changes in economy               |



|  |  |
|--|--|
|  | 3.7 Identification of key products and services  |
|  | 3.8 Reflection on internal and external outcomes                                       |
|  | 3.9 Effects of outcomes on capitals  |
|  | 3.10 Both positive and negative outcomes   |
|  |  |
| <b>4. Risks and Opportunities</b>          | 4.1 Key risks and opportunities specific to the firm                                   |
|  | 4.2 Sources of risk and opportunities  |
|  | 4.3 Plans to mitigate risks and capitalise on opportunities                            |
|  |  |
| <b>5. Strategy and Resource Allocation</b> | 5.1 Reflection on short, medium and long terms objectives                              |
|  | 5.2 Strategies in place to achieve objectives  |
|  | 5.3 Resource allocation plans  |
|  | 5.4 Control measures for the objectives  |
|  | 5.5 Linkage between strategy and resource allocation plans, and other content elements |
|  |  |
| <b>6. Performance</b>                      | 6.1 Quantitative indicators with respect to targets and risks and opportunities        |
|  | 6.2 Positive and negative effects on capitals  |
|  | 6.3 State of stakeholder relationship  |
|  | 6.4 Link between past, current and future performance                                  |
|  | 6.5 Financial analysis of effects on capitals  |
|  |  |
| <b>7. Outlook</b>                          | 7.1 Expectations about the external environment  |
|  | 7.2 The impact of changes on the firm  |
|  | 7.3 Measures in place to respond to changes  |
|  | 7.4 Implications of external environment on financial performance                      |
|  | 7.5 The availability of capitals the firm uses   |

Source: Adapted (IIRC, 2013)

*TABLE 14: JSE Listed Mining Firms*

| <b>Name of company</b>               |                                     |
|--------------------------------------|-------------------------------------|
| African Eagle Resources Plc          | Harmony Gold Mining Company Limited |
| African Rainbow Minerals Limited     | Hulamin Limited                     |
| Andulela Investment Holdings Limited | Impala Platinum Holdings Limited    |
| Anglo American Platinum Limited      | Jubilee Platinum PLC                |
| Anglo American Plc                   | Kibo Mining PLC                     |
| AngloGold Ashanti Limited            | Kore Potash PLC                     |
| Arcelormittal South Africa Limited   | Kumba Iron Ore Limited              |
| Assore Limited                       | Lonmin PLC                          |



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| Atlatsa Resources Corporation       | Master Drilling Group Ltd             |
| Bauba Platinum Limited              | McMining Limited                      |
| BHP Billion Plc                     | Merafe Resources Limited              |
| BSI Steel Limited                   | Middle East Diamond Resources Limited |
| Buffalo Coal Corporation            | Orion Minerals NL                     |
| Central Rand Gold Limited           | Pan African Resources PLC             |
| Chrometco Limited                   | Petmin Limited                        |
| Delrand Resources Limited           | Randgold & Exploration Company Ltd    |
| Diamond Corp Plc                    | Rockwell Diamonds Incorporated        |
| DRDGOLD Limited                     | Royal Bafokeng Platinum Limited       |
| Eastern Platinum Limited            | Sentula Mining Limited                |
| Evraz Highveld Steel & Vanadium     | Sibanye Gold Limited                  |
| Ferrum Crescent Limited             | South African Coal Mining Holding Ltd |
| Firestone Energy Limited            | South32 Limited                       |
| Giyani Gold Corporation             | Tawana Resources NL                   |
| Glencore Plc                        | Tharisa PLC                           |
| Gold Fields Limited                 | The Waterberg Coal Company Limited    |
| Great Basin Gold Limited            | Trans Hex Group Limited               |
| Harmony Gold Mining Company Limited | Wesizwe Platinum Limited              |

TABLE 15: Final Sample – JSE Listed Mining Firms

| Name of company                       |                                       |
|---------------------------------------|---------------------------------------|
| Anglo American Platinum Limited       | Trans Hex Group Limited               |
| Anglo Gold Ashanti Limited            | Unicorn Capital Partners Ltd          |
| Bauba Platinum Limited                | Wesizwe Platinum Limited              |
| Chrometco Limited                     | African Rainbow Minerals Limited      |
| DRDGOLD Limited                       | Andulela Investments Holdings Limited |
| Gold Fields Limited                   | Anglo American Plc                    |
| Harmony Gold Mining Limited           | Arcelomittal South Africa Limited     |
| Impala Platinum Holdings Limited      | Assore Limited                        |
| Middle East Diamond Resources Limited | BSI Steel Limited                     |
| Merafe Resources Limited              |                                       |
| Royal Bafokeng Platinum Limited       |                                       |
| Randgold & Exploration Company Ltd    |                                       |
| Sibanye Gold Limited                  |                                       |

