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Corporate Social Responsibility in the Mining Sector in South Africa – The Impact on Financial Performance

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A research article submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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DECLARATION

I, Thakhani Nemaranzhe, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Thakhani Nemaranzhe

Signed at ……

On the …….. day of …… 20…..

DEDICATION

This work is dedicated to myself, my family and those that have supported me throughout my life.

ACKNOWLEDGEMENTS

I would like to thank the Almighty God for keeping me, guiding me and granting me the wisdom throughout the entire process. It was not as easy, as I had anticipated, but I found hope, strength and courage in God.

I would also like to thank my Supervisor, Ms. Ayanda Magida for guiding me, and also being patient with me. I really appreciate the effort you have put towards this project

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ABSTRACT

Corporate Social Responsibility (CSR) remains a much-debated topic in the business world as more companies are increasingly acknowledging the need for CSR in one way or another. However, the debate on whether CSR benefits a company financial remains. Researcher's effort to analyse the value of CSR on company's financial performance has revealed inconclusive and inconsistent results. In South Africa, CSR in the mining sector is seen as an important tool, to alleviate poverty, address inequity and create a safe environment for the community. This study examines the relationship between CSR and Financial Performance of 21 mining companies listed on the Johannesburg Stock Exchange (JSE). CSR is measured using the JSE Social Responsibility Index (SRI), and Financial Performance as measured using Return on Assets (ROA), Tobin's Q and Market Value Add (MVA). The Arellano and Bond estimator model showed that there is a negative relationship between CSR and ROA, Tobin'q and MVA. Therefore one can conclude that there is no relationship between CSR and financial performance. However, the t-test showed a positive relationship between CSR and ROA. The inconsistency in the results, can therefore render the overall study results as inconclusive

1 Introduction

Corporate Social Responsibility (CSR), also referred to as Corporate Social Investment (CSI), in South Africa remains a much-debated topic around the world, and increasingly, companies are beginning to include CSR projects as part of their corporate structure and strategy (Hamman, 2003; McWilliams & Siegel, 2000; Singh & Singh, 2013). McWilliams, Siegel, and Wright (2006) define CSR as instances where companies go beyond their daily business activities and engage in activities that create development and sustainability of society. CSR considers various stakeholders including the community, environment, employees, and customers (Hamann, Acutt, & Kapelus, 2003). It covers a whole range of issues that lead to sustainable socio-economic development.

Two main theories pertain to CSR, namely the stakeholder theory and the shareholder theory. The shareholder theory introduced by Milton Friedman states that the only social responsibility role that businesses undertake is to increase the profits of its shareholder transparently and within the bounds of the law. He further argues that if an executive takes on any other role that might be termed as “social responsibility” beyond creating value for the shareholders, then the executive is in breach of his/her fiduciary obligations (Friedman, 1970). Contradictory, Edward Freeman introduced the stakeholder theory which states that its stakeholders’ satisfaction measures a company’s success. He defines stakeholders as individuals or groups that are affected or could be affected by the activities of a business (Freeman, 1984). This broader group of stakeholders could include the environment, community, suppliers, customers, and employees.

Increasingly, local and global mining companies have taken critical steps to include environmental control measures, and community and employee development as part of their strategies (Bonini, Brun, & Rosenthal, 2002; Crowther & Aras, 2008). Different authors have noted some drivers for companies to adopt CSR. Research by Bonini et al. (2002) found that many companies are motivated to incorporate CSR as part of their business because they do recognise the benefits of CSR as a way of mitigating certain risks and creating a good reputation for the company. A study by Bala (2013) on companies that have undertaken CSR activities in India

found that more companies are beginning to adopt CSR strategies as a way of benefiting the company and their employees. In contrast, Singh and Singh (2013) argued that companies adopt CSR as a way of controlling social and environmental consequences that can pose a significant threat to the operational performance of a company. This understanding has led more companies to recognise the importance of CSR towards the sustainability of their business (Singh & Singh, 2013). Hilson (2013) argued that in reality, CSR is driven by commercial agenda and legislation rather than voluntarily ethical requirements. This mixed notion on CSR and company performance has raised further interest in the academic and commercial space.

1.1 The Rationale of the Study

In South Africa, the mining industry is one of the oldest industries and has been the backbone of the country's economy (Hamman, 2003; Marais, 2010; PWC, 2017). Even though the mining contribution towards the GDP of the country has decreased over the years, it has continued to contribute significantly to the national economy. In 2015, the industry contributed 6.9% towards the country's GDP and employed approximately 490 000 people (Statistics SA, 2015).

Recently, the South African mining industry has been the centre of major human rights, safety, and socio-economic challenges. In mining, safety has always been a concern, mainly because of the nature of the operation and it is considered as one of the high-risk industries. These risks include injuries of employees, rising costs, climate change, access to infrastructure and energy, regulatory risks, and skills shortages (Zwieg, 2018). In addition to the risks involved, within the South African sector, human rights and socio-economic challenges have plagued the mining industry because of the apartheid legacy that inhibited the fair distribution of mineral wealth and equal employment opportunities (Marais, 2010). Such similar incidents continue to strengthen the voice of government, NGOs, civil society, and communities on the role of the mining sector towards CSR activities (Hamman, 2003).

The mining sector in South Africa has implemented notable CSR activities compared to other industries (Siyobi, 2015). This increase is attributed to the introduction of regulations such as the Mining and Petroleum Development Act (MPRDA) of 2002 that is aimed towards readdressing the apartheid legacy where employees, community and environmental interests were neglected (Hamman, 2003). According to the MPRDA act, mining companies are expected to develop communities in which they operate by building infrastructures such as roads, schools, and health facilities (MPRDA, 2002).

There has been growing research on the CSR activities conducted in the developed nations and their paucity of evidence in the developing countries. South Africa is one of the developing countries that is endowed with approximately 53 mineral resources, including diamond, coal, platinum, gold, chrome, manganese, iron ore, and cobalt (DMR, 2017). The impact that mining activities have on communities surrounding the mines, therefore, is significant. To date, research on CSR in SA has mainly focused on how mining companies implement their CSR activities and the impact that CSR has on communities and employees (Dube & Maroun, 2017; Marais 2010; Siyobi, 2015).

There is a paucity of evidence on the CSR activities in the SA mining sector. It, therefore, is against this background that this study seeks to investigate the value that CSR activities can create for mining companies in South Africa regarding financial performance. The aim and objectives of this study are to assess the relationship between CSR and financial performance using return on assets (ROA), Tobin's Q, and market value add (MVA) as measures of financial performance.

1.2 Problem Statement

Globally, numerous studies led to the development of various frameworks and methods to measure the impact of CSR projects on company performance (Gladys & Chipeta, 2012; McWilliams & Siegel, 2000; Orlitzky, Schmidt, & Rynes 2003; Tsoutsoura, 2004). In South Africa, the Johannesburg Stock Exchange (JSE) Socially Responsible Investment Index (SRII) was introduced in 2004. The SRII measures companies against the environment, society, and economy, referred to

as the triple bottom line (JSE, 2014). The index was later replaced by the FTSE/JSE Responsible Index Series in 2015 (JSE, 2014). The FTSE/JSE assesses all companies listed on the JSE on environmental and climate change issues, socio-economic sustainability, and corporate governance. This index aims to promote transparent and sustainable business practices (JSE, 2014). Similar indices also exist worldwide such as the Dow Jones Sustainability Index series (DJSI), Calvert Social Index (CSI), FTSE4GOOD series, KLD Global Sustainability Index Series (GSI), Sao Paolo Stock Exchange Sustainability 2018, and Corporate Sustainability Index (ISE).

In South Africa, mining companies are under tremendous pressure to adopt CSR activities as a way of readdressing human rights and environmental concerns. Based on this premise, this study seeks to establish the relationship between the CSR activities of mining companies in South Africa and financial performance.

1.3 Research Question

This thesis, therefore, is guided by the following research question: Does CSR affect the financial performance of mining companies listed on the JSE?

1.4 Significance of the Study

In the context South Africa, CSR is seen as one of the instruments that private sector can deploy as a way of uplifting communities. In the mining sector, CSR is highly enforced through legislation, however questions remain whether this initiatives benefit the mining companies or not. This study aims to provide answers to an existing grey area concerning the significance of CSR from a South African mining sector viewpoint. The research's purpose is to understand how CSR affects the financial performance of mining companies

1.5 Study Outline

The remainder of this research report is structured as follows: Chapter 2 presents the literature review. The literature presents previous studies and findings on CSR

in the global, South African, and mining context. This chapter also reviews literature that focuses on the relationship between financial performance and CSR in business. Chapter 3 introduces the research methodology employed in this study. It also presents the type of sampling and data collection techniques, models used, the developed hypothesis, and variables used in the study. Chapter 4 presents the results and findings of the study concerning the research question. Chapter 5 discusses the findings and results of the empirical studies in relation to the objective of the study and the literature review. Finally, Chapter 6 gives the conclusion, limitations, and recommendations for further studies.

2 LITERATURE REVIEW

The literature review focuses on past research done in the area of CSR and its relation to the financial performance of different companies across the globe. This section studies the different dimensions of CSR and how it affects the performance of the company. Furthermore, it examines whether CSR can build a reputation for a company, and how that reputation benefits the company. The relationship between CSR and financial performance has received much attention from scholars and researchers in an attempt to justify the inclusion of CSR in daily business activities. This section concludes by assessing the South African legislative environment, which is a significant driver towards CSR.

2.1 Dimensions of CSR

CSR towards community and environment

CSR brings into realisation efforts by businesses towards creating sustainability in the community and environment in which they operate (Skinner & Mersham, 2008). Debates have ensued on whether environmentally-focused CSR initiatives create value for an organisation. Gorges and Waddocks (1997) pointed out that firms that participate in community-focused CSR activities gain through tax benefits and certain regulatory exclusions that grant them a competitive advantage. In his research, Uttig (2000) argued that companies benefit through CSR by effectively

managing the natural environment that will, in turn, increase production efficiencies resulting in better profit margins.

The CEO of Rio Tinto, David Humphreys, also draws attention to the influence of customers, communities, and employees towards the performance of the mining companies. In his argument, Humphrey's (2000) posited that the failure to recognise and address stakeholders, have negative effects on the performance of the mine. His argument is further supported by a global study done by McKinsey and Company on Valuing CSR. In the study, executives, CFOs, and investors of different companies were surveyed. The survey results suggest that businesses acknowledge that environment and social programmes create value for the shareholder (Bonini et al., 2002). In creating that sustainability, it, however, is vital that businesses maintain profits as expected by the shareholders (Hamman, 2003). Engardio, Capell, Carey, & Hall (2007) also warn firms on investing vast amounts of money on environmental issues and the uncertainty of returns on those investments.

A study by Flammer (2012) showed how a British petroleum company's stock price was affected by an environmental incident involving oil spillage in the Gulf of Mexico. Before the accident, the company recorded a stock price of US$59 per share, which then dropped to US$28.9 per share after the incident in only three months. The adverse effects of the incident forced the company to increase its CSR activities as an attempt to regain its reputation and stakeholder trust (Lyon & Maxwell, 2011). In support of the above, Henriques and Sadorskly (2013) argue that firms responding to environmental concerns and pressures experience a better environmental and financial performance; however, firms who do otherwise experience a loss.

CSR towards employees' perceptions

In most cases, CSR refers to the activities towards the external environment rather than employees within the company. Increasingly, companies are also beginning to recognise their employees as the primary source of a company's success (Arshad, Anees, & Ulah, 2015). In their study, Rupp, Ganapathi, Aguilera, and Williams (2006) focused on employees' perception and behaviour towards their

company's CSR activity or lack thereof. The article posits that CSR creates a positive perception of the employee about the organisation regarding job satisfaction, citizenship behaviour, and job perception (Rupp et al., 2006). Their study suggests that CSR can assist in mitigating negative responses from employees such as labour disputes/unrests and unsatisfactory work performance.

A study also supporting this argument carried out by Shiun (2012) focused on the impact of perceived CSR on employee performance and turnover in Singapore-based organisations. The results suggest that perceived CSR activities cause desirable behaviours in employees. One, therefore, can infer that a company's activity is positively linked to employee performance and retention. Literature research by Bauman and Skitka (2012) that focused on CSR and employees' satisfaction found that CSR gives employees a sense of security, belonging, self-esteem, and meaningfulness in an organisation. These four factors increase an employee's level of satisfaction in an organisation (Bauman & Skitka, 2012). The above studies suggest that employees have positive perceptions towards companies that are actively involved in CSR activities, which, in turn, contributes positively to the performance of that particular firm.

2.2 CSR and Reputation

Good CSR initiatives positively affect a company's reputation, and this has a positive impact on the company (Godfrey, 2005; Kramer & Porter, 2006; Melo & Garrido-Morgado, 2012). The literature on CSR reputation suggests that there is a positive correlation between the company's CSR activities and reputation. Sima and Gheorghe (2007) posited that demonstrating responsibility for the community builds a company's reputation and has immediate positive consequences. In support of the latter, Patten's (2007) investigation on how the market responds towards press releases detailing company's donations during the aftermath of the tsunami that hit South Asia in 2004, revealed a positive relationship between community investment and a firm's value.

Specific to the mining sector, mining companies depend on customers, government, and financial institutions or investors for individual needs such as

capital and operating licenses. Customers, in general, are increasingly starting to consider how the products they buy are produced (Humphreys, 2000). In a business-to-business (B2B) environment, organisations want to be associated with mining companies that are perceived to be doing good in the community and environment in which they operate (Humphreys, 2000). At some point in their operations, mining companies do require some financial leverage to support their business.

Financial institutions are also increasingly considering how companies conduct their businesses and their effect on the local community and the environment (Sima & Gheorghe, 2007). The government also considers mining companies' record of accomplishment, environmental management plans, and community development plans before issuing and reissuing mining licenses or permits (MPRDA, 2002). The above illustrates that CSR initiatives build a good reputation for a company, which can positively affect a company's image and performance. Furthermore, Arshad et al. (2015) acknowledged the importance of stakeholder engagement and demonstration of CSR activities in enhancing a company's reputation, which also leads to improved human capital and financial performance.

2.3 CSR and Financial Performance

The debate relating to the financial value of CSR has triggered numerous studies in this field. The results, however, have been inconclusive, as mentioned earlier. One of the earliest studies into the relationship between financial performance and a company's CSR activities concluded that firms with less or no CSR activities experienced weaker financial performance and carried higher risks than companies that are actively involved in CSR activities (McGuire, Sundgren, & Schneeweis, 1988). Subsequent studies have concluded inconsistent results due to the different approaches, methodologies, and variables that researchers adopted (Simpson & Kohers, 2002; Zhu, 2000). Research suggests that these studies are sensitive to the financial performance measurements used; hence, the inconclusive results (Kitzmueller, 2008; William & Siegel, 2009; Wu, 2006).

Zhu (2000) stated that measuring financial performance is extremely complex, and one needs to consider various variables. Financial performance can be measured using either market-based measures, accounting measures, or mixed measures. Some research suggests that accounting-based measures, which include return on assets (ROA) and Return on Equity (ROE), do not capture the full complexity of a firm's performance and cannot evaluate future profit potential (Konar & Cohen 1999; Singh, Sethuraman, & Lam, 2017).

Market-based measures include Beta risk index and market capitalisation. Researchers now commonly use mixed measures, which include Tobin's Q and Market Value Added (MVA). MVA is defined as the difference of the current firm's market value and the capital contributed by the investors If the MVA is positive, there is value created in the company, and if it is negative, then the value was decreased (Carin et al., 2017). Tobin's Q refers to the number of outstanding shares multiplied by the market value of the share price plus the liabilities and then divided by the book value of the total assets (Carin et al., 2017).

According to McWilliam and Segal (2000), two sets of studies are used to study the relationship between CSR and financial performance. The first set of study applies an event study methodology where the analysis focuses on the short-term financial impact in a period where companies engage in CSR activities. The second set of study focuses on the relationship between CSR and the long-term financial performance of a company. The results of both studies have been inconsistent, with some studies showing relationships and others showing no relationship at all.

There are three schools of thought relating to the relationship between CFP and CSR, which are highlighted below.

- *Positive relationship*

Several researchers have found a positive relationship between CSR and financial performance. The first school of thought found a positive association between CSR and CFP (Fu & Shen, 2015; Govindarajan & Amilan, 2013; Jie & Hasan, 2016; Mutasim & Salah, 2002; Preston & O'Bannon, 1997; Torugsa, 2012; Toutsoura, 2004; Yusoff & Adamu, 2016). A study by Kim and Kim (2014) in the tourism sector

showed a positive correlation between CSR and company's performance. The study was conducted on data collected from 1991 to 2008 using ESG rating. The study concluded that CSR could enhance a company's shareholder value by increasing Tobin's Q (Kim & Kim, 2014).

A study by Wang, Dou, and Jia (2016) revealed a positive relationship between CSR and financial performance. In this study, Wang et al. (2016) employed a meta-analytic framework to establish a relation of CSR to CFP on 42 empirical studies. Friedman's theory and the literature motivate this school of thought on stakeholders' impact on the performance of a company. Stakeholders refer to employees, customers, communities, and the environment.

- *Negative relationship*

This school of thought is based on Milton Friedman's theory that was reflected earlier in this research, which suggests that CSR is not the responsibility of organisations but rather the responsibility of the government. Several authors have established a negative relationship between CSR and financial performance (Babalola, 2012; Cellier & Chollet, 2011; Hirigoyen & PoulainRehm, 2014; Margolis & Walsh, 2003; Singh, 2014). Research by Davis (1973), which sought to study the relationship between CSR and price earnings ratio as a measure of financial performance of British firms, revealed a negative relationship.

Similarly, research by Wright and Ferris (1997) sought to study the impact of companies that divest and shift funds to CSR on market performance found there was a drop in price shares during that time. The study covered 116 South African companies for over ten years. These studies, therefore, imply that CSR activities negatively affect the market value of the company. In the same vein, a study by Moore (2001) on the supermarket industry found a negative relation between CSR and financial performance. Barnea and Rubin (2010) argued that CSR activities could distract individuals from their responsibilities toward realising the interest of the firm and subsequently, decreasing the profits of the company.

- *Neutral relationship*

The third school of thought supports the notion that CSR works as an independent variable to financial performance. Ullman (1985) cited that there is no relationship between CSR and financial performance. The argument is supported by a study conducted by McWilliams and Siegel (2000) to understand the relationship between CSR and financial performance where 6-year data from 524 companies were studied. The study showed a neutral effect of CSR on financial performance when research and development intensity and advertising intensity are included in the regression. The results, however, showed a significant association between research and development, and financial performance.

Similarly, a study by Aras, Aybars, and Fortuna (2010) showed neutral results when analysing companies listed on the Istanbul Stock Exchange 100 index. The study employed a content analysis methodology, revealing a positive relationship between CSR and firm size rather than financial performance. Finally, a study covering the companies in the Istanbul Stock Exchange National 100 Index, which used content analysis alone in the determination of social performance, revealed a positive association only between company size and CSR (Aras et al., 2010).

In conclusion, based on previous literature, Querol-Areolathe (2017), argued that any relationship between CSR and CFP could be because of external factors or underlying reasons. Lee and Park, (2009) and Salzmann, Lonescu-Somers, and Steger (2005) have noticed that CSR differs across different industries in Germany. Chen, Feldmann, and Tang (2015) posited that CSR activities vary between industries due to the nature of the business and different pressures that those industries face. To verify Chen's argument, Zhang (2016) conducted a study on the relationship between CSR and financial performance of companies across five sectors by applying an OLS regression method. The results of his analysis confirmed that the impact of CSR on financial performance does indeed differ between industries.

2.4 CSR Related Regulations Specific to the Mining Industry

The South African government has introduced a range of CSR-related regulations in a bid to promote the participation of the private sectors in addressing the socio-

economic challenges facing the country (Kabir, Mukuddem-Petersen, & Petersen, 2015). Specific to the mining industry, these regulations include the MPRDA Act of 2002, the mine health and safety Act 29 of 1996, and the Broad-Based-Black Economic Empowerment Charter also known as the controversial Mining Charter. The mining charter emanates from the MPRDA, which seeks to promote socio-economic development and growth within the mining industry and the affected communities (Stevens, 2013). A breach in any of the guidelines stipulated in the MPRDA could result in the Minister of Mineral Resources revoking the mining rights of that particular company (MPRDA, 2002).

The mining charter is aimed at transforming the mining industry to be more inclusive of the historically disadvantaged South Africans (HDSA) in an attempt to redress the inherent inequalities resulting from the Apartheid Legacy (Deloitte, 2017). It focuses on the following elements: employment equity, ownership, procurement and enterprise development, beneficiation, human resource development, housing, living conditions, and mine and community development (Deloitte, 2017). According to the Code of Good Standards, which is contained in the MPRDA and further emphasised in the Mining charter, mines are expected to contribute 1% of their Net Profit Before Tax (NPAT) towards mine and community development programmes (Draft Mining Charter, 2018). Appreciating the above, South Africa has good policies for promoting CSR activities; however, monitoring the progress of such activities remains an understudied issue.

In the international space, several instruments have been put in place to further encourage firms to adopt CSR. These instruments are mainly aimed at publicising good practices towards the environment and society, creating standards, and measuring social performance (The Social Capital Group, 2014). In particular focus to the mining sector, the international council for minerals and metals (ICMM) has put in place ten principles to promote sustainable development. Members affiliated to this council are committed to measuring their performance against these principles. These principles refer to the following corporate governance issues: corporate decision making, human rights, risk management strategies, health and

security, environment, biodiversity, integrated material management, community development and independent verification (ICMM, 2012).

Although various studies show inconsistent results, the literature suggests that in the mining sector, in particular, the cost and risk that mining companies hold for not acknowledging their role in creating sustainability in the communities in which they operate are increasingly rising (Humphreys, 2000). This high risk and costs are influenced mainly by the nature of the business and the role of NGOs and government in ensuring that the community and the environment are not exploited in the interest of the investors and mine owners only (Hamman, 2003).

2.5 Summary of Literature review

Different studies have come to different conclusion as to whether CSR has an impact on financial performance of a company. Some literature suggests that CSR has other benefits such as perceived good reputation, retention and attraction of staff, and good community relations which in turn has an indirect positive link to the performance of a company. Critics of CSR, posit that CSR is not in the best interest of the shareholders, and therefore companies should rather focus on creating wealth for their shareholders. With CSR increasingly gaining attention from organisations and governments around the world, many researchers have performed studies in a bid to study the relationship between CSR and financial performance. The results of these previous studies have shown either positive, negative or neutral results depending on the methodology adopted, variables and measurement of those variables. In the South African context, CSR is enforced through legislature, as it is viewed as an important tool to address issues of community and environmental sustainability.

3 METHODOLOGY

Research methodology is described as a plan of action that the researcher adopts to accomplish the outcomes. This research adopts a quantitative methodology.

Quantitative methods are used to collect and analyse statistical and numerical data that are collected through channels such as questionnaires, surveys, or secondary statistical data (Babbie, 2010). The objective of quantitative research is to generalise the collected data across a population aiming to explain a particular phenomenon. It is best suited to investigate, explain, and predict relationships between two or more variables (Leedy and Ormond, 2013).

3.1 Research Design

The purpose of a research design is to assist the researcher to find relevant evidence that will answer the research questions. It specifies the type of evidence that needs to be gathered to attain a convincing answer to the research questions. This research study used a correlative research design. Creswell (2012) defined correlation design as a statistical analysis that seeks to determine a relationship or pattern between two or more variables without the manipulation of the variables. In other words, this kind of study seeks to draw a link or degree of association between the variables. This research adopts a correlation study that seeks to examine the relationship between the financial performance of listed mining companies and CSR over 5 years.

In this light, the study uses panel data regression equations as the primary method for analysis. Panel data regression methodology is opted for because it usually gives the researcher analysis of a large amount of data over a period (Torres-Reyna, 2007). Wooldridge (2002) defined panel data, as data on a set of cross-sectional units followed over time and it can reflect different dynamics over time. Furthermore, panel regression analysis allows for the control of omitted variables and unobserved sources of individual heterogeneity that varies across individuals. In other words, panel regression can account for heterogeneity and, therefore, it gives individual estimates.

The company's CSR is measured using the SRI index as documented on the JSE. A score of 0 is given to companies not listed on the SRI index, and a score of 1 is given to companies listed on the SRI index. In this context, the company's financial performance is measured using accounting-based and mixed measurements as

defined in the literature review. The accounting-based measurements used in this study are Return on Assets (ROA), and the mixed measures include MVA and Tobin's Q. These indicators were obtained from the McGregor BFA database and computed as an annual value for each year considered.

3.2 Theoretical Model

The study built on a theoretical model of company performance-based models by Freemans (1973), McWilliams and Siegal (2000), and Waddocks and Graves (1997), as discussed earlier. In this model, supported with empirical literature on company performance in different industrial sectors across countries, company performance is given as a function of company-specific factors as shown below:

$$Company\ performance\ =\ f\ [\ CSR, company\ control\ factors]$$

In this model, company-specific factors include factors that are within the sphere of influence of the company, which are total assets, total sales, debt to equity ratio, and corporate social responsibility measured based on a company's inclusion on the SRI index. These factors are expected to have a different influence and relationship with companies' financial performance.

3.3 Model Specification for the Regression

The primary objective of this research was to assess the impact of corporate social responsibility (CSR) on company performance (CFP) in the mining sector. Following the theoretical model above by Waddocks and Graves (1997), the correctly specified models are given as:

$$CFP(ROA_{it,}) = \beta_0 + \beta_1 ROA_{it-1} + \beta_2 CSR_{it} + \beta_3 FR_{it} + \beta_4 FS_{it} + \beta_4 FIC_{it} + \varepsilon \text{ (1)}$$

$$CFP(_{,}MVA_{it,}) = \beta_0 + \beta_1 MVA_{it-1} + \beta_2 CSR_{it} + \beta_3 FR_{it} + \beta_4 FS_{it} + \beta_4 FIC_{it} + \varepsilon \text{ (2)}$$

$$CFP(Tobin's\ Q)_{it,} = \beta_0 + \beta_1 Tobin's\ Q_{\ it-1} + \beta_2 CSR_{it} + \beta_3 FR_{it} + \beta_4 FS_{it} + \beta_4 FIC_{it} + \varepsilon \text{ (3)}$$

- Where CFP is measured by Return on Assets (ROA), Market Value Add (MVA) and Tobin's Q
- CSR – Corporate Social Responsibility
- FR – Firm Risk
- FS – Firm Size
- FIC – Firm Industry Contribution
- Ɛ – error term

3.4 Variables

3.4.1 Dependent variables

In this study company financial performance is the dependent variable. Previous research suggests that there are three methods used to measure financial performance namely; market based measures, accounting based or profitability measures and mixed and mixed measures (Konar & Cohen 1999; Singh, Sethuraman, & Lam, 2017). This study measures financial performance using mixed measures which incorporated accounting based and market based measures of financial performance.

Company Financial Performance (CFP)

For this study, company performance was measured by both accounting measures and mixed measures. ROA is chosen because it is easily accessible, and in the interest of stakeholders, it, therefore, is the only measure that was used as financial accounting measures. ROA is calculated as a company's profit divided by total assets of that company (Hackston & Milne, 1996). This measure can demonstrate a company's financial performance and profitability (Belu & Manescu, 2013). In addition to the ROA, Tobin's Q and MVA were used as dependent variables.

Researchers now commonly use mixed measures, which include Tobin's Q and Market Value Added (MVA). This is mainly motivated by the notion that accounting based measures are unable to measure future profitability potential of a company

(Konar & Cohen 2001). Tobins'q is used in this study because it measures the shareholders' value of the firm, and it is more resistant to manipulation like other accounting measures (Gunthorpe, 1997). In this way, the study will be able to assess if the relationship between shareholders assessment of the company based and its involvement towards CSR initiatives. Additional MVA is used because its gives a long term perspective of a company's performance based on the value of the share. This allows one to assess whether certain initiatives or events had an impact on the performance of a company.

Lagged Company Financial Performance – ROA_{it-1}, MVA_{it-1}, Tobin's Q_{it-1}

Company financial performance lagged entails the level of company performance from the previous period. In a panel regression analysis model, the inclusion of the lagged dependent variable as an exogenous variable is done when the dependent variable has memory over itself. The variable is expected to have a positive impact since a company that performed well last year is more likely to perform better the coming year (Belu & Manescu, 2013).

3.4.2 Independent variable – CSR

In this context, CSR is measured as CSP according to its inclusion in the SRI index and was used as a dependent variable. Companies that comply with the criteria and are listed on the SRI index scores a 1, and companies who do not comply and are not listed scores a 0.

3.4.3 Control variables

Several factors such as firm risk, size of firm, and industry were used to control the results for the dependent variables as motivated by previous studies (Ullman, 1985; McWilliams & Siegel, 2000). So, each of these variables were controlled for in this study.

Firm Risk [FR]

Waddocks and Graves (1997) argued the inclusion of risk as an essential control variable on the premise that it influences the attitude towards spending. Furthermore, Orlitzky and Benjamin (2001) found a circular relationship between CSR and financial performance. Their evidence showed that CSR has a negative effect on financial risk, which, in turn, negatively impacts CSR in the next year. Risk refers to risk tolerance of management and is measured by using the debt to total assets ratio (Cai, Jo, & Pan, 2012; Lang, Ofek, & Stulz, 1996; Mahoney & Roberts, 2007; Waddock & Graves, 1997).

Firm Size

Studies show that firm size can affect the involvement of a company on CSR activities. This observation is supported by Perrini et al. (2007) who argued that larger firms are more likely to participate in CSR activities compared to a small-medium sized firm. Total assets and total sales are used as measures of firm size (Hillman & Keim, 2001; Waddock & Graves, 1997).

Firm Industry Contribution

The inclusion of industry as a control variable is based on the premise that the existence of industry-specific regulations, economies of scale, and intensity of competition could influence CSR and financial performance (Campbell, 2007; McWilliams & Siegel, 2000). In the context of this study, all companies are from the same industry factors.

3.5 Data Collection

3.5.1 Sampling

This study adopts a purposive sampling technique. Purposive sampling is a non-probability sampling technique where a researcher purposefully selects participants based on the knowledge, experience, or qualities of the individuals (Etikan, Musa, & Alkassim, 2016).

This study focused on mining companies that are listed on the JSE. The sampling procedure was carried out using a determined-criteria. Since the study also relied heavily on the SRI index that was launched in 2004, the considered period of the study was from 2004 to 2015 inclusive, a total of 11 years. In this period, the number of firms that were listed on the JSE ranged from 38 to 56. Firms that delisted or had no publicly available information for the period were excluded.

The required information of all the variables had to be present on the McGregor BFA database. Companies whose information was not accessible or available for the course of the 11 years on the database were excluded. The lack of information reduced the sample size drastically to 15 companies. For this reason, the number of years was reduced to 5 years to attain a more significant sample of 21 companies.

3.5.2 Data collection instruments/tools

Data collection was done using secondary data collection techniques. As such, the secondary data were collected primarily from the JSE SRI index and the McGregor BFA database. Data from the McGregor BFA database were extracted and downloaded on an excel spreadsheet format. Data from the JSE were downloaded from the website in word format.

3.5.3 Data collection: Procedure

Two kinds of data were collected for these studies. The first set of data was collected from the JSE website and contained the SRI index for the listed mining companies. The second set of data, which refers to the financial data, were collected from the McGregor BFA. To maintain a certain level of consistency, data from annual financial reports were not used for these studies.

3.6 Data Analysis

The focus of the study is to evaluate whether CSR influences the financial performance of South African mining companies listed on the JSE. This section

elaborates on the data analysis technique used in the study. This research used a panel regression model as the primary method, as well as the independent t-test analysis. Before running the regression model, a diagnostic test was performed. Arellano and Bond autocorrelation, Multicollinearity, Heteroscedasticity, Hausman, Panel unit root test and regression estimation was done using the Stata 14 software.

3.6.1 Descriptive Analysis

Descriptive analysis entails the behavior and character of the data that is the mean, standard errors, maximum and minimum values of the data as well as the normality of the data, this helps to understand whether there is a possibility of the data suffering from unit root problem as well as if the data is either normally distributed or not. Since the number of CSR firm was consistent throughout the period of 5 years, data was analysed in a consolidated manner rather than annually.

3.6.2 Diagnostic Test

The following pre-regression tests were done; Arellano and Bond autocorrelation, Multicollinearity, Heteroscedasticity, Hausman, and Panel unit root test. The purpose of this tests was to validate the robustness of the data and results

- ***Autocorrelation test***

Due to the presence of a lagged endogenous variable in the model, it is likely to suffer from the problem of autocorrelation this means that at the level the dynamic panel data has autocorrelation. Autocorrelation is defined as the correlation between two variables belonging to the same variable. The presence of serial correlation results in some of the variables are invalidated, AR (1) is used to check its presence of order 1. The Arellano and Bond method was employed to test for autocorrelation.

Hypotheses H0: Serial correlation among independent variables

Decision rule and conclusion

If the critical p-value is greater than 0.05, then reject the null hypothesis. Therefore, the conclusion is that serial correlation does exists amongst the variables.

If the critical p-value is less than 0.05, then reject the alternative hypothesis. Therefore, the conclusion is that serial correlation does not exists amongst the variables.

- ***Heteroscedasticity Test***

Heteroscedasticity refers to the data that shows different variances of the error terms between the variables. If the error terms are the same across all the entities, then it is considered as homoscedasticity. In this study the Breusch-Pagan heteroscedasticity test was employed to test for the time variance of the data.

Hypothesis H_0: Homoscedasticity

Decision Rule and Conclusion

If the critical p-value is greater than 0.05, then reject the null hypothesis. Therefore the conclusion is that heteroscedasticity does exist.

If the critical p-value is less than 0.05, then reject the alternative hypothesis. Therefore the conclusion is that there is homoscedasticity.

- ***Panel Unit Root Test***

The purpose of the panel root test helps one to avoid spurious results and misleading conclusions that result from using non-stationary data in making inferences (Maddala & Wu 1999). This study uses the same test employed by Levin–Lin–Chu test to test for the stationarity of the data Levin et al. (2002).

In conducting the test, the general equation considered was

$$\Delta y_{it} = \alpha y_{(it-1)} + \sum_{(j=1)}^{p} \beta_{(ij)} \Delta_{(it-1)} + \sigma + \varepsilon_{it} \quad (4)$$

Hypotheses H0: ρ – 1 = 0 (panel contains unit root)

Decision rule

If the Levin Lin Chu statistic's p-value is less than 0.05, then reject the null hypothesis. Therefore the conclusion is that panel variable contains a unit root.

- ***Hausman Test***

The model used must be checked for correctness and detect the presence of random fixed effects by conducting the Hausman (1978) test. In this test the panel GMM estimator was compared to the instrumental estimator.

H_Robust=[(β̃_GMM -β̂_(IV)) [(V) ̂_GMM -β̃_(IV]] [β̃_GMM-β̃] (5)

Hypotheses H_O ∶=plim(θ̂-θ̃)=0 there is a presence of fixed effects in the data

Decision rule

If the critical p-value is less than 0.05, then accept the null hypothesis. Therefore fixed effects model technique is adopted

If the critical p-value is greater than 0.05, then alternative hypothesis is accepted. Therefore, the random effects model is adopted

- ***Testing for Multicollinearity***

Multicollinearity refers to inter-associations amongst independent variables in a model (Gujarati 2008). To assess this associations, one needs to investigate the tolerance and its variance inflation factor (VIF). In simple terms, the VIF sums up the extent of the variances. A high VIF represents high correlation amongst the variables.

〖VIF〗_K=1/(1-R_k^2) (6)

Hyphothesis

H_0: multicollinearity does not exist among variables

Decision Rule

If VIF is higher than 4, then multicollinearity does exists. If VIF is higher than 10, then serious multicollinearity exists. Alternatively, no multicollinearity exists.

3.6.3 Independent T-test

The study employs a T-test analyses to study the relationship between Financial Performance and CSR. A T-test is an inferential statistical method that is used to determine whether there is a significant difference between the means of two groups (Sujarweni, 2007). This type of test assumes the dependent variable fits a normal distribution. There are three types of t-tests, namely; Paired difference t-test, and t-test for an independent variable which has two options, one assuming equal variance and the other assuming unequal variance (Kim, 2005). This study employs the paired difference t-test, which is typically used to analyse the difference between the means of two different groups, which are paired in terms of particular characteristics. In this instance all of the samples fall under one industry, hence the suitability of this kind of a test. For the independent t-tests two hypotheses were formulated;

Hypothesis 1: There is no significant difference in financial performance (measured as ROA, MVA and Tobin's) between CSR firms and Non-CSR firms

Hypothesis 1: There is a significant difference in financial performance (measured as ROA, MVA and Tobin's) between CSR firms and Non-CSR firms

3.6.4 Regression analysis

This research employed the Arellano and Bond Generalized Method of Moments dynamic with fixed effects test for the regression model (Arellano and Bond, 1991). This choice of approach is motivated by the fact that it is more suitable for dynamic panel data with fixed effects. According to Clements et al., (2003), the fixed effect model is able to give consistent estimates of unique effects that are associated with exogenous variables.

3.7 Ethical Issues

Ethical research requirements aim to address the protection of the dignity and information of the subjects of the research. It guides the researcher on what is acceptable and unacceptable when conducting research. Saunders et al. (2009) noted that ethical issues are more concerned with the collective quality of data. Data on this research, however, were collected from the BFA McGregor Database and the JSE website. Both these sources are considered reputable sources. Ethical issues, therefore, are minimal, as the information used in this study is made for public use.

3.8 Validity

In quantitative research, validity and reliability are used to measure the quality of the research through increasing transparency and reduce biases (Singh, 2014). Validity refers to the extent to which a theoretical concept is accurately measured, and how the results of the study can be generalised. This section distinguishes between two types of validity, namely internal validity and external validity.

Internal validity Internal validity refers to the degree to which the results of the study are attributable to the independent variable (Mark and Reichardt, 2001). Part of the analysis focuses on the mean of the results, which tends to bias due to extreme numbers. To increase the internal validity, this study considered certain control variables in addition to the dependent and independent variables, as motivated by the literature review.

External validity addresses the extent to which the results of a study can apply to other populations (Rooney et al., 2016). This report followed a purposive sampling method and only focused on one industry. Companies used in this study, however, were all listed on the JSE for the period of this study; therefore, the same results might apply to other populations listed on the JSE. To this end, this research only focused on mining companies in South Africa and, therefore, it decreases the external validity of the results; therefore, the results have average viability. To

contribute to the viability, the study considered control variables to increase the measurement viability.

3.9 Reliability

Reliability refers to consistency over time. It is measured by the degree to which the test is free from measurement errors and how it produces the same results consistently under the same conditions (Maree & Fraser, 2004; McMillan & Schumacher, 2001). To this end, all measures of financial performance were sourced from one database and were annualised. Furthermore, all measures of CSR were collected from one source. Secondly, the same measurements were used for the entire sample, where one data on the main variables were missing; the entire company information was removed from the data set. Although, the same measures were used, it should be noted that there was no test for reliability of the measurement tools that was conducted in the study. However, on the assumption that the data was consistent throughout the years, the study is considered as reliable.

3.10 Limitations

Limitations could arise mainly because of the relatively small sample size. The research relies on companies within the same industry, which may also give rise to certain limitations; for instance, a holistic or general view might be compromised. One might find that CSR makes more impact in certain industries than in other industries. The data collection mainly relied on what is available on the McGregor Financial Database. A lack of certain essential variables led to the exclusion of specific information and, therefore, this study might have resulted in some biases.

4 PRESENTATION OF RESULTS

This section presents the results and findings of the study to fulfil the purpose of the research. It contains the descriptive analysis and the t-test results using an excel spreadsheet. The regression model was undertaken by applying the Arellano

and Bond Generalised Method of Moments dynamic model to a panel dataset of eleven selected countries.

4.1 Descriptive Statistics

Descriptive analysis shows the statistic overview of the analysed data and is useful in explaining the essential features of the data such as mean, average, median, mode and standard deviation.

4.1.1 Overall descriptive analysis

This section reports the descriptive statistics of the main variables and control variables used in this study. It should be noted that due to the consistency of companies' inclusion on the SRI index over the 5-year period, all data were consolidated and not annualised. The descriptive analysis of the analysed data is presented in Table 1.

Table 1: Descriptive Analysis of the Independent and Control Variables

Variable	Count	Mean	Std. Dev	Minimum	Maximum
MVA	105	6.93	54.57	0.08	560.49
Tobin's Q	105	1.68	4.23	0.07	42.32
ROA	105	-5.86	84.58	-805.43	92.89
Total assets	105	5.93	30.14	-80.07	189.73
Total Sales	105	7.45	53.29	-98.78	401.87
Debt/Equity	105	0.50	2.20	-8.98	14.4

The number of observations recorded amounts to 105 and were consistent throughout the variables. Regarding CSR, only 11 out of 21 companies were listed on the SRI index throughout the 5-year period. In the context of this report, it implies that 52% of the companies included in the samples are active in CSR.

The minimum and maximum values of the ROA are −805, 43 and 92.89, implying that the range is comprehensive. The mean of ROA, which is the average, is recorded as −5.86, implying a negative performance. The negative performance during this period was also confirmed in a study done by Lockwood (2016), which

showed that negative ROAs were recorded from the period 2009 to 2013 in most mines, resulting in a negative average ROA for mining companies in South Africa.

A Tobin's Q value that ranges between 0 and 1 means that the costs of replacing a firm's assets are higher than the value of its stock implying that the cost of replacing a firm's assets is more than the value of the stock (Wolfe & Sauaia 2005). Tobin's Q value of more than 1 means that the firm's stock is more expensive than the costs of replacing its assets, implying that the stock is overvalued (Wolfe & Sauaia 2005). To this end, Table 1 shows the median of the sample as 1.69, with a range of 0.07 and 42.32 as the minimum and maximum value respectively. Indeed, the average of 1.69 implies that on the average stock price of the firms was overvalued.

The mean, minimum and maximum MVA recorded are 6.92, 0.08, and 560.49, respectively. The range of the MVA is notably high with the maximum value of 560.49 as a possible extreme outlier. To avoid skewed/biased results, the outlier was removed, and another analysis was performed that gave the results provided in Table 2.

Table 2: Descriptive Statistics of the MVA Excluding One Data Point

Variable	Count	Mean	Std. Dev	Minimum	Maximum
MVA	104	1.607	1.78	0.08	14.31

In simple terms, MVA measures the difference between the current total market value and the investor's capital contribution. A high MVA implies that more value was created. Table 2 shows the mean, minimum and maximum values as 1.62, 0.08 and 14.31, respectively. This positive MVA implies that value was added; however, it is comparatively low.

4.1.2 Descriptive data of CSR vs non-CSR companies

Table 3 and Table 4, respectively, show descriptive statistics of the two groups of companies. The first group of companies is of those assumed to be active in CSR

activities. The second group of companies are those companies not listed on the SRI index and are assumed not to be active in CSR activities.

Table 3: Summary of Descriptive Statistics of Companies Listed on the JSE SRI Index

Variable	Count	Mean	Std. Dev.	Minimum	Maximum
ROA	55	12.45	20.76	-16.66	92.89
MVA	55	1.77	1.51	0.57	7.68
Tobin's Q	55	1.35	1.09	0.52	5.27

Table 4: Summary of Descriptive Statistics of Companies That Are Not Listed on the JSE SRI Index

Variable	Count	Mean	Std. Dev	Minimum	Maximum
ROA	50	-26.01	117.97	-805.43	32.07
MVA	50	1.41	2.05	0.08	14.31
Tobin's Q	50	2.06	6.05	0.07	42.32

The average ROA for companies listed on the SRI index is significantly higher than that of companies not listed on the index. In particular, the average ROA of companies not listed on the SRI index is negative, implying a poor performance in this regard. The average MVA of companies listed on the SRI index is higher than that of companies not listed on the index. The findings above imply a better performance for the first group of companies concerning MVA. The Q-ratio for both groups is greater than 1, implying that the average stock price of the firms from both groups was overvalued. To this, the ROA variable indicates that there is a positive relationship between financial performance and CSR, using the SRI index as a measure.

4.2 Diagnostic Tests

4.2.1 Unit root test

For this test, the Levin-Lu-Chu test was employed. If the Levin Lin Chu statistic's p-value is less than 0.05, then the null hypothesis is rejected Therefore the conclusion is that panel variable contains a unit root

The results of the unit root test are shown on the table 6 below;

Table 5: Panel Unit Root Results

Variable	Levin Lin Chu statistic	Probability value	Integral order	Decision
FS	-10.29	0.00	I (1)	Stationary
FIC	-27.42	0.00	I (1)	Stationary
FR	-2.59	0.01	I (1)	Stationary

Source Stata 14

The p-values of all the variables are less than 0.05, this implies that null hypothesis is rejected. And therefore, one can conclude that the panel data is stationary, with an ordered one of integration.

4.2.2 Autocorrelation Test

The Arrellano and Bond autocorrelation test was performed to test for serial autocorrelation among the variables. If the critical p-value is less than 0.05, then the null hypothesis is accepted. Therefore, the conclusion is that serial autocorrelation does not exists amongst the variables. Simarly, the hausman and Heteroscedasticity test were also performed. The results are shown in Table 6 below.

Table 6: Arellano and Bond Serial Correlation Results

Test	Probability value	AR (2)	Conclusion

Arellano and bond	0.00	-3.64	Serial autocorrelation does not exist
Hausman		Chi (4)	Conclusion
	0.00	27.06	No random effects
Heteroscedasticity		Chi2(1)	Remarks
	0.00	208.61	There is no heteroscedasticity

Source Stata 14

Arellano and Bond Serial Correlation results show a p-value of 0.0003 which is less than .05. Therefore, we accept the null hyphothesis, and can conclude that there is no serial autocorrelation among the variable. This results give validates the variables used in the study. The findings of the Hausman test suggest that there are no random effects present in the data, therefore this validates that the fixed effects method is best suited for the regression. And lastly, the findings of the heteroscedasticity test imply that the null hypothesis is accepted and therefore it can be concluded that there is no heteroscedasticity in the data.

4.2.3 Multicollinearity Test

The results of the multicollinearity test are shown on the table 8 below;

Table 7: Multicollinearity Test Results

Variable	VIF	$^{1}/_{VIF}$
FS	1.02	0.98
CSR	1.02	0.98
FR	1.01	0.99

FIC	1.02	0.98
Mean	1.02	

Source Stata 14

The VIF values of all the variables in this study are lower the 4. Based on Rogerson (2001) and Kennedy (2008) arguments that state that multicollinearity exists when VIF is greater than 4, therefore one can conclude that there is no multicollinearity in our data.

4.3 T-test Results

This section focuses on the results of the t-test that was performed on the sample data. The purpose of this analysis was to investigate if there was any statistical difference between the mean of mining companies that are listed on the JSE SRI index and those that are not listed on the SRI index of the different financial measurement variables. The test calculated the mean of the entire period of 5 years for each of the two groups.

4.3.1 The relationship between financial performance and ROA

Table 8: T-Test: Two-Sample Assuming Unequal Variances on ROA

	CSR	**Non-CSR**
Mean	12.45	-26.01
Variance	430.97	13916.67
Observations	55	50
Hypothesised Mean Difference	0	
df	52	
t-Stat	2.27	
P(T<=t) one-tail	0.01	
t Critical one-tail	1.67	

P(T<=t) two-tail	0.03	
t Critical two-tail	2.00	

The statistical mean of the two groups as seen in Table 8 , is significantly different, with that of companies listed on the JSE SRI index being positive and one of the non-listed companies being negative. This result implies that companies that are listed on the JSE SRI index perform better than those not listed on the SRI index. The *p*-value is 0.023, which is less than 0.05. This value suggests that there is a statistical difference between the means of the ROAs of CSR firms and non-CSR firms. The null hypothesis, therefore, is rejected, and in this case, the alternative hypothesis, which suggests that CSR firms perform better than non-CSR firms regarding ROA, is accepted.

4.3.2 The relationship between financial performance and MVA

Table 9: T-Test: Two-Sample Assuming Unequal Variances on MVA

	CSR	**Non-CSR**
Mean	1.78	1.41
Variance	2.27	4.21
Observations	55	49
Hypothesised Mean Difference	0	
df	87	
t Stat	1.03	
P(T<=t) one-tail	0.15	
t Critical one-tail	1.66	
P(T<=t) two-tail	0.31	
t Critical two-tail	1.99	

Regarding MVA, the mean variables of both groups of firms are positive (**Table 9**). The result of the *p*-value is 0.30, which is higher than 0.05. The null hypothesis, which suggests that there is no statistical difference between the mean of the MVA of CSR firms and non-CSR firms, therefore, is accepted.

4.3.3 The relationship between financial performance and Tobin's Q

Table 10: T-Test: Two-Sample Assuming Unequal Variances on Tobin's Q

	CSR	**No CSR**
Mean	1.36	2.06
Variance	1.06	36.61
Observations	55	50
Hypothesised Mean Difference	0	
df	52	
t Stat	-0.81	
P(T<=t) one-tail	0.21	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.42	
t Critical two-tail	2.01	

The statistical mean of the two groups as seen in Table 12 is different; however, positive for CSR and non-CSR firms. The *p*-value is shown as 0.42, which is higher than 0.05. This value suggests that there is a statistical no difference between the means of the Q-ratios of CSR firms and non-CSR firms; therefore, the null hypothesis is accepted.

4.4 Estimation and Presentation of Regression Results

The results of the Arellano and Bond PGMM estimation are given below;

Table 11: Regression Results ROA,MVA,Tobin's q - Arellano and Bond PGMM estimation results

		Lagged CFP	FS	FR	FIC	CSR
ROA	Coefficient	3.29	0.94	0.88	-0.99	-78.43
	P- value	0.00	0.03	0.85	0.00	0.24
MVA	Coefficient	-1.96	0.33	-0.63	14.06	-12.64
	P-value	0.06	0.23	0.77	0.00	0.75
Tobin's Q	Coefficient	5.81	-0.03	-0.01	0.46	-0.27
	P-value	0.00	0.05	0.48	0.01	0.92

Source Stata 14

The estimated regression equation (ROA) is as follows:

$$ROA_{it} = 3.29214ROA_{it-1} + 0.9378341FS_{it} + 0.8791896FR_{it} - 0.9872712FIC_{it} - 78.43404CSR_{it} \quad (7)$$

According to the estimated regression equation above, CSR and industry contribution show a negative association to ROA. However, the remainder of the variables show a positive association with ROA.

The estimated regression equation for MVA analysis is as follows:

$$MVA_{it} = -1.9601MVA_{it-1} + 0.3345FS_{it} - 0.6282FR_{it} + 14.0575FIC_{it} - 12.6363CSR_{it} \quad (8)$$

The above equation suggests that only firm size and industry contribution has a positive impact on the MVA. However, our main variable which is CSR shows that there is a negative relationship between CSR and MVA.

The estimated regression equation for the tobins'q analysis is as follows:

$$Tobin'sQ_{it} = 5.813Tobins'Q_{it-1} - 0.0315FS_{it} - 0.0089FR_{it} + 0.4608FIC_{it} - 0.2709CSR_{it} \quad (9)$$

According to the Tobin's q estimated regression equation, only the lagged tobin's q and industry contribution have an impact on Tobin's q. However, firm size, firm risk and CSR show a negative association with Tobin's q.

5 DISCUSSIONS

This chapter presents robust discussions of the findings of this research to the literature review and previous studies.

5.1 T-test Analysis

Table 12: Summary of the T-test Findings

Variable	CSR	Non-CSR	Summary of findings
ROA	12.45	-26.01	Significant difference
MVA	1.78	1.43	No difference
TOBIN' S Q	1.36	2.06	No difference

5.1.1 CSR and ROA

Our study show that there is a significant difference between firms that are listed on the SRI index, and those that are not listed. According the results, CSR companies have positive ROA, and those that are non-CSR companies have a negative ROA. Several other authors have reached the same conclusion, suggesting that firms involved in CSR have higher ROAs than companies not active in corporate social activities, implying a positive relationship between the two variables (Lin & Amin, 2016; Garriga & Mele, 2004). This relationship results from several factors, including reputation because companies can build a reputable

brand and a good relationship with different stakeholders (Cheng, Ioannou, & Serafeim 2014). In this respect, one can conclude that companies with good relations with their employees and community members mitigate the risk of work stoppages that might harm the performance of a mine.

The same view is shared by Pan,Sha,Zhang & Ke, (2014) where they concluded that shareholder responsibility has a significant positive effect on ROA of firms in China. Another factor influencing the positive relationship between CSR and ROA, is the environmental factor, as supported by Berman, Wicks, Kota, and Jones (1999), and Simionescu and Dumitrescu (2018). They argue that considering the environment through the use of cost-effective recyclable materials and other resource-saving programs can lead to effective production and reduction of costs.

5.1.2 CSR and MVA

The results of this study suggests that there is no significant difference between MVA of CSR firms and non-CSR firms, implying that CSR has no impact on the MVA. Similarly, Dewi, Sudarma, Djumahir, and Ganis (2014) concluded there is no connection between CSR and MVA. They based their argument on the notion that MVA is influenced by other aspects relating to return on equity (ROE) and, therefore, it is somewhat affected by the yield of shareholder's capital and not CSR (Dewi et al., 2014; Kadar & Rikumahu, 2017). Other studies, however, have come to a different conclusion. Carina et al. (2017) found a positive relationship between CSR and MVA in the long term. It is important to note that studies on CSR and financial performance that use MVA as a measure of financial performance are limited. The inconsistency is contributed to the different methods employed in different studies.

5.1.3 CSR and Tobin's Q

Tobin's Q reflects a firm's ability to make good decisions regarding investment, assets, and funding management. This study showed an insignificant relation between Tobin's Q and CSR. This finding and that of MVA is corroborated by Orlitzky et al.'s (2003) findings. They argued that market measures correlate less

with CSR than accounting-based measures (ROA). Karlsson, Hagberg, and Johanssons (2015) quantitative research, which applied longitudinal regression methodology to study the relationship between CSR and company financial performance of firms listed on the Stockholm OMX exchange, also come to the same findings as this study.

These findings are similar to those of Sopian and Mulya (2016), where they concluded the CSR does not affect Tobin's Q. This finding can be attributed to the notion that investors are more interested in the good financial performance of the company rather than the CSR disclosures. Secondly, investors buy their shares daily and, therefore, their decision is made based on the short-term performance of a firm. To this end, CSR is considered a long-term strategy; hence, it has less impact on the investor's decision to buy shares.

5.2 Regression Analysis

The estimated results indicate that out of five variables, three variables are statistically significant in explaining the company's financial performance. These variables include lagged company financial performance, firm size, and firm industrial contribution, while firm risk and corporate social responsibility participation do not statistically influence company financial performance in the case of mining companies listed on the JSE. In the context of this research, CSR is the critical variable since the objectives were to investigate if CSR had an impact on company financial performance.

Regarding ROA, the findings have highlighted that there is a neutral and negative association between the two variables as indicated by the insignificance of the variable and the negative coefficient of CSR (−78.43404). This finding, however, contradicts the results of the t-test, which shows a positive relationship.

Several studies have found a negative association between CSR and ROA, and stated that the reason might be that CSR activities can distract individuals from their responsibilities towards realising the interest of the firm, and subsequently, decreasing the profits of the company (Barnea and Rubin, 2010; Wright & Ferris,

1997). In support of the neutral relationship are the findings of Ullman (1985), and McWilliams and Siegel (2000).

In the case of mining companies, it is a rare scenario for a company's financial performance to be influenced by corporate social responsibility. This is due to the nature of the goods that are produced by the mining sector, which is gold, coal, diamonds, and platinum. The public can not directly consume these products; hence, its participation in CSR does not contribute to its financial performance. In the mining sector, therefore, a company participates in CSR to give back to the community and comply with legislative requirements because mining degrades the community and is an environmental hazard to society.

5.2.1 Lagged company financial performance

Lagged company financial performance as measured by ROA_{it-1} entails the company's previous financial performance, and the results indicate that it is statistically significant in explaining the company's current financial performance. The variable is significant at a 1% level of significance, signifying that a company's previous financial performance strongly influences the current financial performance. There is a positive association between ROA_t and ROA_{t-1}, indicating that if a company experienced an increase in financial performance last year, this year it will experience an increase in financial performance, meaning a 1% increase in the previous year's financial performance has a 3.29214% increase in the current year's financial performance. A study by Belu and Manescu (2013) found the same findings and concluded that a company that performs well last year is more likely to perform better the coming year.

5.2.2 Firm size

The variable is statistically significant and has a positive effect on company performance, as expected. The findings are in tandem with those of Hillman and Keim, (2001), and Graves and Waddock (1997) who concluded that the larger the firm, the more likely it is to experience favourable and better financial performance. Their argument is based on the premise that larger firms have a high probability of

enjoying economies of scale such as managerial economies of scale, a high degree of bargaining power, and access to sophisticated technology. A percentage increase in firm size results in a 0.9378341 percentage increase in financial performance, meaning that if a company experience growth, it is more likely to experience positive financial performance in the case of mining companies.

5.2.3 Firm industrial contribution

Firm industrial contribution as measured by total firm sales negatively affects company financial performance, as indicated by the negative coefficient of −0.9872712. This means that a 1% increase in total sales will result in a −0.9872712% decline in company performance. The findings contradict the expected results of a positive relationship between firm industrial contribution and company financial performance as measured by total firm sales. The variable is statistically significant in explaining company financial performance as highlighted by Campbell (2006). The inverse relationship between the variables might be because, in the bid to beat the competition, companies might end up reducing their prices. The other reason might be that of taxes; the higher their income, the more the tax burden becomes; hence, a decline in company financial performance.

5.2.4 MVA as a dependent variable

Based on the market value approach of measuring company performance, only firm risk has an impact on the MVA, and this is contradicting when using the accounting approach as a measure of company financial performance. Despite the insignificance of the variable under ROA, both approaches confirm that the variable has a positive association with company performance. This is directly opposite to the findings of the t-test, which concluded that there is no link between CSR and MVA. Furthermore, the logged MVA shows a negative relationship with the MVA as a measure of financial performance.

5.2.5 Tobin's Q as a dependent variable

The results support the Tobin' Q approach that firm risk is a statistically significant variable in explaining the variations in company performance and it has a positive impact on company performance. Moreover, based on this approach, lagged Tobin's Q has a positive influence on company performance, and the relationship is positive. This finding is also consistent with Cavaco and Crifo (2013), confirming that financial performance is persistent and depends on the previous year's performance.

5.2.6 Conclusion

The estimated regressions shows that there is a negative relationship between ROA and CSR. Therefore one can conclude that CSR does not impact financial performance. However, the findings from T-test show a positive relationship between CSR and financial performance. Overall, the results of this study are considered as inconclusive, based on the premise that all measures of financial performance being, ROA, MVA and Tobin's q show different results with the different tests.

Researchers' efforts to analyse the value of CSR on companies' financial performance have revealed inconclusive and inconsistent results. The inconsistency is mainly attributed to the different and various models, methodologies and variables that authors use to measure financial performance (McWilliams & Siegel, 2000; Tsoutsoura, 2004). On the other end, Peng and Yang (2014) attributed this inconsistency to the different CSR indices used as a measure of corporate social performance (CSP). They argue that this might have caused the inconsistency based on the premise that environmental policies, business practices, and governance vary from country to country.

For instance, a study by McWilliams and Seigal (2000) based on the Domini 400 Social Index and KLD ratings revealed a neutral impact between CSR and financial performance. On the other end, Oh and Park (2015) examined Korean companies listed on the KEJI index, which is considered one of the best indices of measuring

CSR. Their studies revealed a positive relationship between CSR and financial performance of the 295 companies listed on the KEJI index. Because of this inconsistency, some companies are still reluctant towards adopting CSR activities.

6 CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to investigate the relationship between financial performance and CSR in the mining sector. A number of related studies were conducted; however, the results have been inconsistent. The inconsistency is attributed to several factors mainly related to the adopted methodology, measurements of CSR, and measurements of financial performance. These factors vary from one study to another.

In this study, financial performance is measured using ROA, MVA, and Tobin's Q. Two main tests were conducted, namely the t-test and the Arellano and Bond PGGM regression. The t-test analysis showed a positive relationship between CSR active companies and ROA and showed no relationship between CSR and Tobin' Q and MVA. Arellano and Bond PGMM first difference regression results, however, showed that there was a neutral relationship between corporate social responsibility and company financial performance since it was not statistically significant. The inconsistency in the results suggests that the findings of such studies are dependent on the type of methodology and financial performance used. The South African mining sector is actively involved in CSR and suggests that financial performance is influenced by other factors rather than CSR.

It, therefore, is recommended that future research focuses on investigating the benefits of CSR in the mining sector rather than only focusing on financial performance. In that way, the study can motivate and justify the inclusion of CSR in the daily objectives of a company.

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