The relationship between corporate sustainability disclosure and firm financial performance in Johannesburg Stock Exchange (JSE) listed mining companies

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Abstract: Whether corporate sustainability disclosure affects profitability remains indistinct to many firms. This paper examines the relationship between corporate social and disclosure and return on investment. The sample of this study consisted of ten Johannesburg Stock Exchange listed mining companies and the data was extracted from sustainability reports for a period of 5 years from 2010 to 2014. In this regard, data collection was undertaken by adoption of content analysis approach. A multi-regression analysis was used to analyze the relationship between environmental disclosure and return on investment. The same statistical mechanism was employed to determine the association involving social disclosure and return on investment. Results show that there is a negative relationship between environmental disclosure and return on investment. On the other hand, the research reveals that there is also a positive association between social disclosure and return on investment. This implies that an increase in corporate reporting of environmental and/or social issues results in heightened financial performance (through increase in return on investment). This study recommends the adoption of corporate social disclosure as it will encourage firms to be socially responsible while generating financial benefits. Further studies can be conducted about the change from voluntary corporate social disclosure to mandatory disclosure.

Keywords: Corporate social disclosure; environmental disclosure; social disclosure; financial performance

1. Introduction

In recent years, there has been a stable rise in the volume of corporate sustainability disclosures by companies [1]. As a consequence, business entities as members of the community are expected to solve or address social as well environmental matters in such a way that aims to add value societies [2]. Thus, corporate sustainability disclosures are aimed to improve financial performance, draw the best employees and to inspire leaders [3]. Corporate sustainability disclosure (CSD) is the reporting tool to account for sustainability investment in the host of business community[4]. Despite the increase for corporate responsibility, most of the impact of a firm’s
operation on the environment is still voluntarily disclosed [5]. Also, levels of
corporate sustainability disclosures are still very low [6][7]. This has resulted in
inadequate disclosure of social and environmental responsibility issues due to
unavailability of data by disclosing corporations and because there is no demand for
the social and environmental data this is due that costs exceed benefits [8].

Moreover, whilst corporate sustainability disclosure is perceived as a voluntary
practice; it has financial implications brought by firm social and environmental
investments [9]). For instance, inability to report on social and environmental issues
has costs also such as penalties, fines, tight regulations, bad publicity and shrinkage
corporate sustainability disclosure does not require expensive resources which
capably lowers corporate profitability. In addition, Iqbal, Ahmad, Hamad, Bashir,
and Sattar, [12] argue that firms should be responsible towards caring for the society
and to go beyond the shareholder’s wealth creation.

However, some managers do not believe that corporate social disclosure is vital to
ensuring the survival of their companies in a stiff competitive economic situation as
well as informing the society which has the privilege to be informed about social
and environmental impacts [8]. On the other hand, some managers are aware of the
gains derived from disclosing social and environmental practices but they are
limited from reporting such information at acceptable level due to cost-benefit issues
[13][8][10].

However, Ahmad, Ahmed and D’netto, [14] claim that many successful corporations
have been criticized for causing social problems such as environmental pollution,
inequality, injustice and poverty. Such scenarios are existent since corporations have
focused on maximizing shareholder’s value without regard for sustainability [15].
Gunawan, Djajadikerta and Smith [[16] investigate the extent of corporate
sustainability disclosure in Indonesia. They found that the amount of disclosure was
limited because managers are unaware about the benefits of corporate sustainability
disclosure. It has been postulated that reporting sustainability investment information is important for companies to project a positive image, gain public credibility and competitive advantage [9] hence increasing firm financial performance. However, Iqbal et al. [12] state that corporate sustainability disclosure adds expenses to the business which reduces the level of firm financial performance. Similarly, Pettern, [17] argued that the reporting of social and environmental impacts has costs and threats hence competitors and regulators may use such against the interests of the firm resulting in the decrease of margins.

However, corporate social disclosures in many countries, is voluntary and there are no definite rules or regulations concerning form and content of disclosure [14]. Therefore, a number of issues have been expressed about corporate social reporting because the published data may be unreliable, companies are being selective about the information to be disclosed and sustainability reports are not comparable from year to year or with other entities[18].

Moreover, environmental impacts caused by burning of fossils fuels, cutting down of trees, transport, industrialization and farming leads to the emission of greenhouse gases into the atmosphere[19]. Carbon monoxide, methane, ozone, water vapor and nitrous oxide are gases that causes global warming. These emissions may have a significant impact on the corporate world and ordinary activities of the firms [20]. The impact can be through government regulation such as carbon tax which will increase costs thereby reducing profitability [21].Therefore, this has led to the increase in corporate sustainability disclosure in order reduce the increase of global warming in the atmosphere[19].

At corporate level, social issues such as HIV/AIDS have a significant negative impact on profitability. Companies that are socially responsible towards reducing social problems (HIV/AIDS) is costly[22]. This means that shortages of skilled human resource and human resource costs are often as a result of HIV/AIDS which has a negative impact on firm financial performance [23][24]. Moreover, in South Africa
owners/managers/governing boards are not aware of the impact of HIV/AIDS on profitability due to the increase in employee benefits such as medical care expenses, sick leave-loss of productive time, drugs and funeral benefits [25]. In light of these excessive expenditures, it is clear that the investors and shareholders would expect the managers to voluntarily disclose HIV/AIDS information in the Sustainability Report.

Contemporary, the main objective of the business is no longer a tradition practice of creating shareholders’ value in the long run. However, modern practices, managers are incorporating corporate sustainability initiatives into their strategies to meet all stakeholders’ needs and ethical principles. Therefore, this will create a sustainable value for all stakeholders that have interest in any company. As there

From above literature, outline corporate perspectives which are capably detrimental to corporate performance if sustainability disclosure has not been implemented or vice versa. In this study, we examine the relationship between corporate sustainability disclosure and firm financial performance in South Africa among selected JSE listed mining companies. We delimited our study to South African mining companies as they are mandated to report on sustainability issues as per JSE Responsible Investment Index. Furthermore, mining companies in South Africa are facing pressure from different stakeholders to report on activities they are undertaking to mitigate environmental degradation, safety programme and contribution to the society in which they operate [26]. With evidence of corporate sustainability issues in South Africa like, global warming, Marikana massacre, third highest HIV/AIDS prevalence rate in the world, therefore, there is a need to examine the relationship between corporate sustainability disclosure and firm financial performance. This paper is divided into four parts: theoretical framework, materials and methods, then results, discussion and the conclusion.
2. Theoretical framework: Stakeholder Theory

Stakeholder theory also stipulates that the society consists of different stakeholders with the imbalanced power to affect the operating activities of the business [6]. Essentially, Kaur and Lodhia [27] suggest an intricate connection among corporations with emphasis on managing stakeholders’ interests. Therefore, the theory describes the association of stakeholder with the information they obtain [28]. Hence, there are three types of stakeholder theories, descriptive, instrumental and normative [29].

Types of Stakeholder theories

There are three types of stakeholder theories, descriptive, instrumental and normative [29]. Descriptive stakeholder theory is widely used in CSD [30]. As such, in this study, it is applicable as it allows the researcher to identify key stakeholders who have a relationship with the firm. This implies that these group stakeholders have different views on environmental and social disclosure. This type of theory is also known as managerial stakeholder theory. Moreover, the managerial stakeholder theory allows managers and executives to identify major stakeholders who support the company as a going concern [31]. Therefore, in this research study, the researchers selected the key stakeholders that represent the relevant groups of stakeholders due their impact on relevant activities of the firm.

Characteristics of Descriptive Stakeholder Theory

Mitchell, Agle and Wood [32] suggested a model to identify stakeholders based on their importance. This entails grouping stakeholder traits by means urgency, power and legitimacy. Urgency is where interested parties strive for their demands to be met as quickly as possible in the stakeholder relationship with the manager. Legitimacy is where certain engagements are within the anticipations and needs of the other interested group either manager or stakeholder. Stakeholder power means abilities of stakeholders to control the activities of the company. For instance, Islam and Deegan [33] examine how stakeholder power affects the strategic decisions of
CSD in manufacturing firms in Bangladesh. They found that international buyers, which they regard as the most authoritative stakeholder, mostly affect their corporate social disclosure policies. Hence, [32] put forward that stakeholder power is the most important trait of corporations to stakeholder interactions.

**The different types of stakeholders and their impact on firm**

In this study, major stakeholders that influence CSD based on stakeholder power and attribute [34] are as depicted in Figure 1 below. This is because these stakeholders can control activities of firms [35]. Figure 1 illustrates the association of the business with its stakeholders who are interested in corporate sustainability. The business has to report on corporate sustainability activities to all stakeholders in order to create sustainable value.

![Diagram showing stakeholders connected to the business](source: Author’s Concept)
From the above figure the needs for stakeholders in any business are explained below:

*Shareholders*- these are the owners of the firms. Therefore, the environment in which the entity operates and secures their investments and returns. Moreover, shareholders need to be informed about the negative and positive effects of a firm’s action to the environment through sustainability reporting to improve firm sustainable practices. Massoud, Daily and Bishop [36] state that CSD has a direct influence on firms’ market value by increasing the shareholders’ value through increased earnings.

*Government*- is an essential stakeholder in the sense that government ensures compliance with environmental regulations and other social standards. However, should firms fail to comply with these environmental regulations, the going concern of the company may be threatened by forcing it into liquidation or to stop operating. On the other hand, CSD comes with issues such as energy conversation, recycling and the preservation of the environment. Therefore, governments can provide incentives that will result in more comprehensive CSD that decreases a firm’s cost [37].

*Employees*- human resources information is vital in CSD. Employees play a significant role in supporting firms’ going concern. Hence, the working environment should be safe and workable. Cooper and Owen [38] assert that significant workplace environmental issues include health and safety, working conditions, training, bursaries and worker satisfaction. According to Micah, Ofurum and Ihendinihu [39], the relationship between firms’ profitability and employee information disclosure in 52 Nigerian firms revealed that employee information disclosure is positively correlated to profitability. This implies that there is a high demand of human capital information to stakeholders when reporting. Consequently, a good association with employees can result in better productivity thereby reducing lawsuits, thereby reducing expenses and increased profitability [40].
Community- firms should be able to provide a social pact with the public, and the social pact assessment should be implemented. Often CSD draws on educational customs, business morals and community engagement to address issues such as giving back to the society, public-private partnerships. Moreover, Callan and Thomas [40] state that community involvement often attracts tax deductions from local governments, thereby increasing profitability. Furthermore, Nwidobie [41] encourages firms to be a good corporate citizen to their host community to attract acceptance, maintain uninterrupted firm operation and enhance profitability. Carroll [42] notices that community contributions reveal the approaches in which a firm cooperates within the ethical environment towards lenders, consumers, suppliers, environment, communities and government thereby increasing shareholders’ wealth in the long-run.

Customers- CSD is a way of informing customers about the quality and price of the product as well as how the product has improved to increase customers’ awareness. Consumers’ view of the quality of goods and services and the firm’s eco-friendly stance will attract positive impressions on the company brands, and indirectly increase a firm’s financial performance [43].

Moreover, stakeholders engage with the firm through different channels. As such, stakeholder engagement involves ways of staying in contact with parties who influence the firm’s activities indirectly or directly by providing resources [44]. Additionally, active stakeholder engagement can assist firms to increase its energy protection programs as well as waste management. This engagement could add to the valued managerial abilities [45]. Santoso and Feliana [46] argue that these abilities can increase productivity in asset and resource management for improved profitability. Freedman and Patten [47] state that stakeholder satisfaction and engagement can affect a firm’s financial performance. This can be achieved through the maintenance, development and creation of relations that provide critical resources to firms. Therefore, the core motive why firms engage in stakeholder engagement is to enhance profitability[35]. Aggarwal [48] argues that the neglect of
stakeholders’ interest may harm a firm’s reputation, which would negatively affect its profitability. Therefore, firms should always engage with its key stakeholders for its survival.

In conclusion, the form of communication to stakeholders that is relevant to this study is the integrated report because it is a formal way to notify the stakeholders about its social and environmental practices and issues as well as its credibility. Oliveira, Rodrigues and Graig [49] suggest that corporate sustainability reporting is a crucial instrument for negotiating the association between the firm and its stakeholders. Hence, firms maybe indebted to expand on sustainability actions that benefit the local societies in which they run their businesses and to avoid litigation risks.

Related literature

The literature that supports the formulation of hypothesis for the study is discussed below.

Environmental disclosure and firm financial performance

Many studies have shown that environmental disclosure have effect on firm financial performance using meta-analysis [50][51]. One study Endriakt et al, [50] suggested that the association is very strong when strategic approach underlying corporate environmental performance is proactive not passive. They also revealed a reasonableness effects of methodological constructs which may provide descriptions for the pervious study findings. Similarly, Dixon-Flower et al, [51] discovered that small companies seem to profit from the environmental practices than large companies. This was due to the fact that small firms can reimburse for the lack of loose resources by being flexible. Moreover, these findings were consistent with the previous studies. Therefore, these studies found that environmental disclosure is positively associated with firm financial performance. However, these researches
were limited for not having enough longitudinal data to measure the association between environmental disclosure and firm financial performance.

Many literatures in Japanese examined the impact of environmental disclosure on firm financial performance using regression analysis [52][53]. Iwata and Okada, [52] used waste reduction and greenhouse reduction as proxy for environmental disclosure. Their results suggest that greenhouse reduction disclosure leads to an increase in financial performance in the whole sample and clean industries as well as in the long run. Moreover, greenhouse reduction does not affect return on sales in the short run. However, waste reduction does not have any significant with firm financial performance. This research was limited to that the sample was not enough to reveal a longitudinal relationship. Furthermore, Nakamura examined 3237 Japanese firms and found that environmental investment does not affect firm performance in the short-run but in the long-run it increases firm performance. Similarly, Albertini [53] measured environmental performance represented by environmental awards, accidents and investments on the other hand firm value was represented by ROI, EPS, ROE and Tobin’s Q. The author’s results show a strongly positive relationship due to the regional differences, the activity sector and the duration of the studies.

On the other hand, European studies have shown that environmental disclosure has also a mixed result on firm financial performance [54][55]. Misani et al [54] analysed the impact of environmental disclosure and financial profitability level of 127 listed firms in Italy. Using least square regression, they identified that there are mixed results between environmental disclosure and firm financial performance. Mixed results propose that companies do not adopt the costs of ineffective carbon management. However, the outstanding firms in environmental performance tend to achieve financial benefits. Therefore, this research pointed out the benefits of responsive firms to climate change-internal savings, emission rebates and incentives for carbon reduction. In addition, Hortvathova [55] analysed the relationship between environmental performance and firm financial performance in Czech
Republic. The researcher used advanced methods of environmental practices. The findings show that the effect is negative between the variables above for the performance lagged with one-year lag and it becomes positive for two-year lag. Research findings from this study suggest that Porter hypothesis embraces in the long term. The authors did not have adequate evidence about the intertemporal effects of environmental practices on financial profitability.

In contrast, McPeak, Devian and Seaman, [56] and Wu, Liu, Sulkowski, [57], researched on the effect of environmental practices disclosed on firm financial performance by sampling Standard and Poors 500 companies. McPeak et al, [56] sampled 302 companies and used KLD stat which is a statistical tool to analyse trends in environmental and social performance. They found a negative association between the variables implying that firms might not harvest the full gains of their decisions towards being environmentally friendly. In addition, Wu et al, [57] used frequency word count to analyse 10 000 reports for the period ending 2008. The authors document that more environmental disclosure by firms indicates more implications which lowers profitability. They also point out that good performing firms and highly leveraged firms disclose lower environmental impacts hence they are in compliance with environmental regulations and laws.

Moreover, based on literature from American, European and Asian studies revealed that environmental disclosure has a negative impact on firm profitability [58][59][60][61]. Guidry et al, [59] used content analysis to measure environmental disclosure whereas profitability was represented by leverage, firm size, Tobin Q and stock return. They suggested that negative results exist if financial control variable are incorporated when analysing data. However, prior literature to date does not support the insertion of financial controls in environmental studies. Furthermore, Meng et al, [60] studied 533 companies in China and their negative results revealed that they vary from voluntary to mandatory disclosure. They suggest that when measuring the link between sustainability disclosure and firm profitability in the emerging markets one needs to be cautious which tend to change due to any form
of ownership and binding rules in place. Moreover, Smith et al, [58] sampled 49
Malaysian listed companies and used a content analysis to measure the link between
environmental disclosure score and return on assets (ROA). In their research an
inverse relationship existed due different priorities of reporting in Malaysian firms
as well as environmental laws. In support of this, Ho et al [61] suggest that this might
be as a result of national dissimilarities and environmental laws and regulations.
From the above analysis the researchers came up with the following hypothesis:

\[ H_1: \text{Environmental disclosure of JSE listed firms has significant effect on Return on Investment (ROI)} \]

Social disclosure and firm financial performance

Many studies in Nigeria analyzed the link of social disclosure on firm financial
performance using regression analysis [41][62][63]. In their studies they found a
strong relationship between the variables analysed. Nwidobile, [41] went on further
to stipulate that this shows that more firms spend on their products hence more
customers are lured to socially responsible companies leading to the increase in
economic profit. This also encourage Nigerian firms to be good corporate citizens to
their host society to attract the cost community aid, to maintain uninterrupted firm
operation and to enhance profitability. Furthermore, Micah et al, [62] sampled 52
firms, whereby social disclosure was represented by human resource. Their results
show a positive correlation with financial performance hence revealing that there is
demand for human capital information to stakeholders when reporting. The
researchers went to propose a standard to measure and identify human resource.
This will allow the appraisal of human capital, homogeneity reporting and
comparability of human capital traits. In Central and Eastern European countries,
Fijalkowska, Zyznarska-Dworczak & Garsztka, [63], studied about CSD and firm
financial performance. They employed panel regression analysis in measuring the
association between CSD and firm financial performance. They used dummy
variable and content analysis to measure corporate social responsibility and
profitability was represented by ROA and ROE. The findings from their study stipulated that Banks with better financial efficiency have higher efficiency CSD initiatives.

In contrast, many studies in United States of America examined the effect of employee disclosure on firm financial performance [64][65]. In these studies, firm financial performance was represented by ROA, ROE and EPS. Nawaiseh, [64] extracted annual reports from 73 Jordanian listed companies on Amman Stock Exchange which were analysed by conducting regression analysis, and the findings have shown a positive association between profitability measured by ROA on employee dimension. However, a negative relationship existed between CSD towards employees on ROE. Van der Laan et al, [65] sampled 734 S & P 500 firms for a period from 1997 to 2002. The researchers used hierarchical regression models to analyse data and found a negative and positive impact of bad and good social performance respectively on profitability. This difference was caused by information indifferent with which interested parties tend to evaluate the costs and benefits of social disclosure.

In addition, in European countries many studies also found mixed results between social disclosure and firm firm financial performance [66][67]. Garcia- Castro et al,[66] examined corporate disclosure dimensions in terms of employee relations, customer, product development, community relations and diversity issues against ROE, ROA, MVA and Tobin’s Q representing firm financial performance. OLS regression analysis was used to prove whether KLD measures (Social disclosure) have a strong positive effect on profitability on 658 firms from 1991-2005. The results show a weak negative results when endogeneity is suitably taken into consideration. Similarly, Skudience, et al [67], sampled 86 firms consists of 62 large banks and 28 large insurance European listed firms for a period of four years from 2005-2008. The financial data was downloaded from the reliable database (Financial Times Top 500). Moreover, the sample includes both cross-sectional and time series data and was constructed as a panel data. Correlation analysis shows that corporate social
performance and profitability are negatively correlated to each other. However, using sample t-tests there was a significant positive to ROA and ROA for firms involved in tactical and ad-hoc social disclosure. This study was limited to data which contains era of global financial crisis (2007-2008).

In contrast many studies have also shown that social disclosure has a negative impact on firm financial performance [68][69]. Lopez et al, [68] examined 55 firms which consist consists of two groups from DJSI and DJSI in Europe. Independent variables were profit before tax, growth of revenues, market capitalisation, ROA and Cost of Capital whereas dependant variable corporate social responsibility practices. The findings show a short-term negative effect on financial performance. This implies that other companies will be inhibiting from adopting corporate sustainability disclosure. Similarly, Cristomo, [69] analysed 296 Brazilian listed companies whereby social disclosure was represented by customers and employees. While profitability was proxy by Return on Equity and Return on Assets. They found a negative correlation between the variables stated above. This is because Brazilian companies are not enforced to report on social issues or impacts.

Previous studies done in American and Europe, had shown that there is U-shaped relationship between social disclosure and firm financial performance [70][71]. Nollet et al [70]suggested that in order to embark on social initiatives to meet all stakeholders’ needs, financial resources should be made available and corporate social expenditure pays off after the thresholds has been reached. Given the information above the hypothesis was formulated as follows:

\[ H: \text{Social disclosure of JSE listed firms has significant effect on Return on Investment (ROI).} \]

3. Data, Variables and Empirical Models

3.1 Sampling and Method of Collection

This paper used ten (10) JSE listed mining firms to investigate the relationship between corporate sustainability disclosure and firm financial performance. This
study used the entire mining firms listed on JSE SRI because they are all mandated to disclose issues of social and environment in their sustainability reports. Therefore, simple purposive sampling was used to select mining companies listed on JSE’s SRI index.

The financial indicators- return on investment, sales growth and leverage used in this study were collected from a reputable database called INET BFA. This database is the leading financial data provider in Africa. However, environmental and social disclosure was collected from sustainability and integrated reports. These sustainability reports are regarded as important in sustainability due to high degree of credibility because they are prepared using Global Reporting Initiatives Framework. The sustainability reports of companies under study were scrutinized from 2010 to 2014 as this allowed the data to be analyzed in depth. The data were collected from the JSE’s website because the data is readily available and accessible.

Therefore, the data collection method adopted in this research is a quantitative content analysis because it aims to produce counts of the raw data in terms of the categories specified by the coding rules from sustainability reports[72]. Furthermore, quantitative content analysis was used as a data collection method since the information is readily available on companies’ websites. Quantitative content analysis is also used to establish the number of disclosures and amount of disclosures within the perspective companies’ annual reports, recognizing that the latter indicates the importance of the issue of the reporting entity. This allowed the researcher to examine the relationship between corporate social disclosure and firm financial performance.

Content analysis was basically conducted by counting number of lines or words strongly associated to themes sustainability disclosure in the annual report of the company [73][74]. The most widely used statistical method to quantify corporate sustainability disclosure is the content analysis [75][76]. In the recent studies, corporate sustainability disclosure was quantified using number of pages, sentences,
words, number of news types and number of disclosure items[77]. Therefore, in this study words are used to quantify CSD.

3.2 Empirical models and variables

The model used to investigate the impact of corporate sustainability disclosure on firm financial performance was the panel data technique. Panelised data refers to a dataset constructed from recurring cross-sections and longitudinal sections over time [78]. Panel data analysis was performed using the data obtained from firms’ annual integrated reports, sustainability reports and financial statements. The models used for panel analysis are fixed and random effects model. Hausman test was employed to select the appropriate model in terms of the random and fixed effects. This test allowed the researcher to examine the data using Hausman test for validity and results in achieving the aim and objectives of the study. Furthermore, Breuch-Pagan test was employed to test heteroscedasticity in the data.

In determining a relationship between corporate sustainability disclosure and firm financial performance, we formulated the multi-regression equation stated below:

\[ \text{Financial Performance}_{i,t} = \beta_0 + \beta_1(\text{Disclosure}_{i,t}) + \beta_2(\text{Sales turnover}_{i,t}) + \beta_3(\text{Leverage factor}_{i,t}) + \epsilon_{i,t} \] (1)

Where, \( \beta_0 \) is the intercept; \( i = 1, 2 \ldots N \) pertains to the cross section unit; \( t = 1, 2 \ldots T \) refers to the time period; \( \beta_k \) is the gradient parameter; \( \epsilon_{i,t} \) is the random error; \( \text{Disclosure}_{i,t} \) = Environmental Disclosure; Social Disclosure and Financial.

In testing the equation above, corporate sustainability disclosure variables are the predictor variables whilst financial indicator-ROI represented firm financial performance is the responsive variable. Sale growth and leverage are control variables as companies’ characteristics can affect corporate sustainability disclosure and firm financial performance.
Furthermore, accounting based measures were employed in the study because of the reliability and credibility of audited financial data and measures are not affected by the market forces [68]. Therefore, Return on Investment was employed as firm financial ratio as it was used by the previous studies [79]. The ROI was used as the shareholders and investors expect return on initial capital invested on acquiring assets. However, social and environmental disclosure was proxy for corporate sustainability disclosure because in South Africa companies listed on JSE SRI are mandated to disclose their social and environmental activities. Therefore, social and environmental disclosure was represented by HIV/AIDS and water consumption respectively. Sales growth and leverage were control variables employed in this study. Sales growth represents the increase in firm’s resources undertaking its environmental and social activities [80]. Therefore, many researchers used sales growth in their research [81][82] in order to justify their findings. Prior studies used this ratio as a proxy for financial risk level in corporate sustainability disclosure [79][83]. Leverage increases financial risk such as agency costs and defaulting debt covenants hence reducing firm performance. Therefore, highly geared firms should increase the level of corporate disclosure[61]. Moreover, sustainability disclosure allows investors to analyse and make decisions about that firm’s long-term financial obligation [84].

4. Results

This section illustrates the results and discussion.

The Table 1 below shows 50 observations for a period of five years for ten mining companies listed on JSE SRI Index. Table 1 below shows an independent variable with a mean of 0.1890148 while dependant variables, environmental disclosure and social disclosure is 8.46 and 29.84 respectively. Moreover, sales growth and leverage as control variables have a mean of 0.0895764 and 0.237122 respectively.
However, standard deviation which measure the dispersion of variables, this research environmental disclosure has a deviation of 6.145215 and social disclosure has a dispersion of 29.16901. Return on investment has a deviation of 0.285276. Sales growth and leverage has a dispersion of 0.1938975 and 0.1041031 respectively.

In contrast, maximum and minimum for environmental is 1 and 30 whilst for social disclosure is 1 and 117. As for independent variable is -0.20819 and 0.928893. However, sales growth has minimum and maximum of -0.495868 and 0.653452 accordingly. Lastly, leverage as a control variable has 0.0669 and 0.5115 respectively.

### Table 1: Summary statistics for sample companies

<table>
<thead>
<tr>
<th>Variables</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edy</td>
<td>50</td>
<td>8.46</td>
<td>6.145215</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Sdy</td>
<td>50</td>
<td>29.84</td>
<td>29.16901</td>
<td>1</td>
<td>117</td>
</tr>
<tr>
<td>Roi</td>
<td>50</td>
<td>0.1890148</td>
<td>0.280528</td>
<td>-0.208</td>
<td>0.92889</td>
</tr>
<tr>
<td>Sales growth</td>
<td>50</td>
<td>0.0895764</td>
<td>0.193898</td>
<td>-0.496</td>
<td>0.65345</td>
</tr>
<tr>
<td>Leverage</td>
<td>50</td>
<td>0.237122</td>
<td>0.104103</td>
<td>0.0669</td>
<td>0.5115</td>
</tr>
</tbody>
</table>

Source: Authors’ results

The Table 2 shows that there is negative linear link between environmental disclosure and social disclosure of -0.1221. Likewise, environmental disclosure has a negative association between return on investment, sale growth and leverage of about -0.3126, -0.0433 and -0.1447 respectively. However, social disclosure has a positive association with return on investment. In contrast, social disclosure has a negative linear association with sales growth and leverage of -0.0599 and -0.0644 as shown in the Table 2 below.

From the Table 2 below return on investment also has a positive relationship of 0.1258 with sales growth as one of the control variable. However, a negative association of -0.1180 is shown between return on investment and leverage. Lastly, a positive linear relationship of 0.1147 was found as shown above between sales growth and leverage. All the variables under study indicate that they have very low
correlation coefficients which are not strong and hence close to one. This evidently indicates that the panelized data is free from the problem of multicollinearity.

Table 2: Correlation coefficients among the variables under study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Edy</th>
<th>Sdy</th>
<th>Roi</th>
<th>Sales growth</th>
<th>Leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edy</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sdy</td>
<td>-0.1221</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roi</td>
<td>-0.3126</td>
<td>0.3179</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales growth</td>
<td>-0.0433</td>
<td>-0.0599</td>
<td>0.2158</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>-1.1447</td>
<td>-0.0644</td>
<td>-0.118</td>
<td>0.1147</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Authors’ results

However, panel data analysis models employed in this study were random effects model and the fixed effects model. Therefore, random and fixed effect models were run to test the relationship between social disclosure and firm financial performance. The Table 3 and 4 below illustrates the panel data results using random and fixed effects model for return on investment (ROI).

4.1 Fixed Effect Model for Environmental Disclosure and Return on Investment

The table above also shows significant statistics where the confidence interval was set at 95% and p values less than 5% regarded to be significant. It also shows that there is negative association between ROI and environmental disclosure. This implies that the increase in environmental disclosure ROI decreases with by 0.0004%. The findings also show that there is a positive significant link between sales growth and ROI at the 5% significance level. This is shown by a coefficient of 0.1997456 with a p-value of 0.021. This depicts that increases in sales there is also an increase in ROI by 0.1997%. Leverage has shown that is has an significant inverse association with ROI of -1.019839 at the 1% significance level. This suggests that the increase in gearing there is a decrease in ROI by 1.09%. Therefore, highly geared firms will experience decrease in profits.
Table 3 Environmental disclosure and firm financial performance (ROI)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Random Effect Model</th>
<th></th>
<th>Fixed Effect Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Standard Error</td>
<td>Coefficient</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Edy</td>
<td>-0.0019603</td>
<td>0.0043171</td>
<td>-0.0004349**</td>
<td>0.0044799</td>
</tr>
<tr>
<td>Sales growth</td>
<td>0.2079847**</td>
<td>0.0821838</td>
<td>0.1997456**</td>
<td>0.0826443</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.9086022***</td>
<td>0.3401453</td>
<td>-1.0109839***</td>
<td>0.3677037</td>
</tr>
<tr>
<td>Constant</td>
<td>0.4024183</td>
<td>0.1236268</td>
<td>0.4166281</td>
<td>0.945937</td>
</tr>
<tr>
<td>Sigma_u</td>
<td>0.2714606</td>
<td></td>
<td>0.27508873</td>
<td></td>
</tr>
<tr>
<td>Sigma_e</td>
<td>0.10778816</td>
<td></td>
<td>0.10778816</td>
<td></td>
</tr>
<tr>
<td>Rho</td>
<td>0.86440187</td>
<td></td>
<td>0.86690334</td>
<td></td>
</tr>
<tr>
<td>$R^2$: Within</td>
<td>0.2752</td>
<td></td>
<td>0.2789</td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>0.0268</td>
<td></td>
<td>0.0131</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>0.0584</td>
<td></td>
<td>0.0401</td>
<td></td>
</tr>
<tr>
<td>Corr($u_i$, Xb)</td>
<td>0 (assumed)</td>
<td></td>
<td>-0.1982</td>
<td></td>
</tr>
<tr>
<td>F(3,37)</td>
<td></td>
<td></td>
<td>4.77</td>
<td></td>
</tr>
<tr>
<td>Prob &gt;F</td>
<td></td>
<td></td>
<td>0.0066</td>
<td></td>
</tr>
<tr>
<td>Wald ($X^2$)</td>
<td>14.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob &gt;chi2</td>
<td>0.0026</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hausman Test ($X^2$)</td>
<td>0.5804</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breuch-Pagan Test ($X^2$)</td>
<td>0.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number. of Obs.</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Notes: ***,** mean significant at 1,5 and 10% significant level; Source: Authors’ results

4.2 Random Effect Model for Environmental Disclosure and Return on Investment

The Table 3 below shows that ROI is negatively associated with environmental disclosure with a coefficient of -0.0019603. This implies that a 1% increase in environmental disclosure reduces ROI by 0.00196%. Guidry et al, [59] suggested that the inverse results exist if financial control variables are incorporated when analysing data. However, prior studies do not support the insertion of financial controls in environmental studies. However, sales growth is also significantly positively associated with ROI at the 5% significance level. This shows that environmental disclosure has a good impact on ROI. This will result in increase in firm financial performance of firms. This is as a result of increase of environmentally
friendly investment such as energy saving equipment and introduction of electro fuels cells which will decrease costs hence increasing revenue. Lastly, leverage is significantly negatively associated with ROI at the 1% significance level. This suggests that a 1% rise in leverage decreases ROI by 0.91%. Therefore, increase in debt will erode ROI by paying finance costs. These results are consistent with Dragomir (2010)[85] findings.

4.3 Fixed Effect Model for Social Disclosure and Return on Investment

The Table 4 below shows that social disclosure is positively associated with ROI with a coefficient of 0.0014069. This implies that firms disclose social impacts thereby increasing profitability. In addition, sales growth has significant positively related with ROI at the 5% significance level. The results show that sales have 0.1947259 positively associated with profitability represented by ROI.

Table 4: Social disclosure and firm financial performance (ROI)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Random Effect Model</th>
<th>Fixed Effect Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Sdy</td>
<td>0.0017045</td>
<td>0.001128</td>
</tr>
<tr>
<td>Sales</td>
<td>0.2031574**</td>
<td>0.826091</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.8515363***</td>
<td>0.3360223</td>
</tr>
<tr>
<td>Constant</td>
<td>0.3218711</td>
<td>0.1175239</td>
</tr>
<tr>
<td>Sigma_U</td>
<td>0.23270571</td>
<td></td>
</tr>
<tr>
<td>Sigma_E</td>
<td>0.10583757</td>
<td></td>
</tr>
<tr>
<td>Rho</td>
<td>0.8286008</td>
<td></td>
</tr>
<tr>
<td>R²: Within</td>
<td>0.3009</td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>0.0723</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>0.1059</td>
<td></td>
</tr>
<tr>
<td>Corr(u_i, Xb)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>F(3,37)</td>
<td></td>
<td>5.41</td>
</tr>
<tr>
<td>Prob&gt;F</td>
<td></td>
<td>0.035</td>
</tr>
<tr>
<td>Wald (X²)</td>
<td>16.08</td>
<td></td>
</tr>
<tr>
<td>Prob&gt;chi2</td>
<td>0.0011</td>
<td></td>
</tr>
<tr>
<td>Hausman Test (X²)</td>
<td>0.6961</td>
<td></td>
</tr>
</tbody>
</table>
Furthermore, from the table above, it shows that leverage is significantly negatively associated with ROI at the 1% significance level. This means that a 1% increase in leverage decreases ROI by 0.0992%. This suggests that as firms engaging in gearing their financial structure. This gearing will negatively reduce earning of the firms.

4.4 Random Effect Model for Social Disclosure Return on Investment

From the Table 4 above, social disclosure has a positive relationship with return on investment with a coefficient of 0.0017045. This depicts that a 1% increase in social disclosure, return on investment will increase by 0.0017% as shown in the table above. This is supported by Lan et al. [86] findings shows that more profitable firms report more than those firms with lower profit margins. Moreover, sales growth have a significant positive relationship with ROI at the 5% significance level. This implies that sales growth increases the ROI by 0.2%. These results were consistence with prior studies [68][82]. The leverage has a significant inverse relationship with Return on Investment at 1% significance level. As the firm is increasing its debt the ROI tend to decrease by -0.8515%. These results concur with Mathuwa and Kiweu, [87] findings which revealed that higher leverage has a negative contribution to profitability. However, these results incur with Guidra et al [88] findings which shows that companies which are highly geared engage more social disclosure.

5. Discussion

The Effect of Environmental Disclosure on Return on Investment

The main objective of this study is to examine the relationship between corporate sustainability disclosure and return on investment among listed mining companies in South Africa for a period of 5years that is from 2010 to 2014. Therefore, one of the objectives was to establish whether there is relationship between environmental
disclosure and return on investment as a measure of firm financial performance as explained below. The statistical findings on environmental disclosure concur with JSE listed mining companies that agreed that environmental disclosure does not motivated their profitability. This research is based on South African practices from 2010 to 2014. This research such is consistent with prior studies by [56][57][58][59][60]. On the other hand, it contradicts the findings of previous research by Ngwakwe [74] and Ameer et al [82]. In South Africa, based on the findings from this study which shows a negative relationship. This shows that JSE SRI firms, lack standard reporting requirements which hinders environmental investment [89]. This might be caused by improper application of Global Reporting Framework guidelines disclosure hence lowers profitability. Therefore, firms are not properly following specific frameworks for environmental disclosure such as Global Reporting Initiative Guidelines as well as lack of environmental audits that will make sure that Global Reporting Initiative Guidelines are adhered to. In addition, South Africa does not have auditors with environmental audit skills to audit environmental reports [90].

Moreover, the other cause is the increase in environmental expenditures incurred by mining companies. South Africa has environmental liabilities that are complex. For instance, carbon reduction costs, energy saving costs, rehabilitation costs, fines and penalties. Some of these costs they do not add value to the profitability of the firm in the long run such as penalties and fines as they are regarded as potential costs [91]. Furthermore, non-compliance with environmental violations disclosure laws has also impacted on firm profitability in form of financial outlay. In addition, firms might disclose environmental impacts in their sustainability reports for compliance reason but without benefiting from reporting such impacts. Therefore, this will increase compliance costs hence decreasing profitability. Furthermore, link between sales growth and ROI was positive. This means that the increase in sales will result in the increase in profitability. Therefore, the sales growth was predominantly
driven by rand prices of commodities. This indicates a normalisation of production volumes after a decline due global economic crisis 2008 which extended to 2010.

The Effect of Social Disclosure on Return on Investment

The main aim of this study is to examine the link between sustainability disclosure and firm financial performance among listed mining companies in South Africa for a period of 5 years that is from 2010 to 2014. Therefore, one of the objectives was to establish whether there is link between social disclosure and return on investment as a measure of firm financial performance as elaborated below. These results were in line with previous studies [19][88][92]. However, these findings contradict previous studied by Brammer et al, [79] and Lopez et al, [68]. South African firms empower South African communities through social expenditure. However, firms are aimed at creating shareholders value but may also have a business gain when incurring social expenditure as shown by the findings from this study. Social expenditure is aimed to uplift the society hence the government will grant a full tax deduction. Currently, in South Africa, firms with higher Black Economic Empowerment (BEE) ratings are likely to get governmental tender contracts hence increasing sales leading to the increasing in profits [93]. For instance, if firms grant scholarships to people with poor backgrounds with an aim to meet BEE score card requirements. Tax authorities are likely to allow the social expenditure as a tax deductible. Furthermore, if companies made a donation to communities may enhance profitability [94]. For example, donating goods with firm’s logo. This means that firms are advertising through those goods hence increasing sales. These goods might be T-shirts, football kit and sponsoring local teams and school. Moreover, there is also a possibility of tax deductions available for donated goods. This will increase firm’s reputation hence maximising shareholders value. Conclusively, sustaining and obtaining the essential skilled resources will need substantial investment to ensure well-organized and operative workforce to upkeep future growth hence profitability [95]. Many mining firms have internal training hubs and
fund studies through scholarships, grants and loans. However, keeping skilled and competent employees becomes progressively problematic in times of economic turnaround, with global competition for South Africa’s exclusive skilled labour becoming fiercer.

6. Conclusion

This study was designed to examine the relationship between corporate sustainability disclosure and firm financial performance among ten mining companies listed on JSE SRI. A quantitative research method was used in this research since it was based on gathering numerical secondary data from sustainability reports. Moreover, a multi-regression technique was used to test the link between the research variables. Results show that there is a negative relationship between environmental disclosure and return on investment. On the other hand, the research revealed that there is also a positive association between social disclosure and return on investment. This implies that an increase in corporate reporting of environmental and/or social issues results in heightened financial performance (through increase in return on investment). Therefore, firms are encouraged to report in their sustainability disclosure in order to gain financial benefits in the long run.

However, this paper recommends that companies may focus more on the current social activities as well as to improve social disclosure policies hence being socially responsible. Moreover, the researcher also suggests the use of social disclosure to legitimize firm’s products and investment opportunities to customers and investors. Therefore, generating financial benefits. In addition, this study recommends the adoption of social disclosure when regulators are making policies relating to sustainability in developing countries such as South Africa. The researcher also recommends that there should be a regulation which will increase environmental disclosure. Moreover, there should be consistent when reporting environmental activities. This study suggests that negative association between environmental and
return on investment should be seen as a temporary negative link. However, it should be also seen as beneficial in the long run. This study recommends that environmental and social impacts should be reported in the sustainability reports.

The limitation of this study is on sample of the study were only ten mining companies were considered under the JSE SRI Index. This may be inadequate to explain events in the mining sector; more so permit generalisation of results. Therefore, affecting the validity and inference of the results. Content analysis has a limitation in the sense that it is subjective when it comes to coding.

However, This study encourage the South African government to make corporate disclosure mandatory in the future since CSD is compulsory to those firms listed on the JSE SRI but voluntary to unlisted firms. In ensuring that CSD, governments should establish environmental-related laws and regulations. Moreover, study may be of interest to the worldwide and local accounting, and other standard-setting bodies who are currently investigating the development of social and environmental disclosure guidelines and the regulations of these disclosures. Moreover, the findings from this proposed research will increase a higher level of awareness to the society through corporate social disclosure as well as inducing a higher standard of acceptance to the entity’s sustainability activities. The community can be, thus, able to hold the entities as socially responsible citizens and follow up company financial performances matters related to the entities. Lastly, this research will give room for investors to assess their sustainability investments in line with the firm financial performance so that they will achieve higher returns.

Furthermore, the existing studies have revealed interesting and valuable contribution to the body of knowledge. They employed mostly KLD index, reputable and disclosure ratings and financial amounts. Therefore, this study is different from previous studies as it has also brought new insight in the literature, by employing new research variables in measuring environmental and social
disclosure. These new variables will be used as CSD measures in the corporate sustainability studies.

**In conclusion,** further studies can be conducted on the change from voluntary corporate social disclosure to mandatory disclosure. Furthermore, other studies should not be limited to the mining sector only but also to study other sectors within the South African economy. Researchers may need to increase the number of years from five (5) years period to 30 years to examine the trends. Moreover, further studies can be conducted on how to quantify CSD activities in monetary value to increase reliance in sustainability reporting.

**7. REFERENCES**


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