Investigating the Relationship Between ESG Factors and Firm Performance in Socially Challenged Jurisdictions Relative to Developed Jurisdictions

By

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Declaration

I, Lebohang Mofokeng, understand the meaning of plagiarism and declare that all the work in this document, save for that which is appropriately acknowledged, is my own.

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Abstract

This research work investigates the influence of the social factor of ESG on firm performance for firms in jurisdictions with socio-economic challenges versus firms in developed jurisdictions. For this research work, South Africa was used as a proxy for a jurisdiction with socio-economic challenges and Australia was used as a proxy for a developed market. Given socio-economic differences, the expectation was that the social factor is more important for South African firms than Australian firms. The corresponding financial and ESG data was collected from 2010 to 2019. The research work is quantitative, with regression models used to undertake the comparative study. The key dependent variables used for this research are share price performance and return on equity, and the primary independent variable of interest is the social factor of ESG. Fundamental and ESG data used for this research came from Refinitive with supplements from Bloomberg and firms' annual financial statements.

The study found that the social factor has a directionally negative relationship with share price performance for South African firms. However, the relationship between the social factor and ROE was found to be positive for South African firms. Secondly, the study found that, by comparing South African firms and Australian firms, the social factor has a directionally more positive relationship with return on equity for South African firms compared with their Australian counterparts. A directionally similar result was obtained for share price performance: South African firms exhibited a less negative effect on share price performance than Australian firms. For South African firms, the study also found that the social factor has a directionally more positive relationship with return on equity than the governance factor. However, the environmental factor exhibited a more positive relationship with return on equity than the social factor.

It is recommended that further research is conducted using ESG data from other service providers, given the high level of ESG scoring disagreements amongst data providers, as observed by academic research. As ESG gets more prevalent, an interesting study would be to run a similar analysis using unlisted businesses to capture the entire SA business ecosystem. This research study will contribute toward ESG research on South African firms. The study may also have indirect political and social implications in that if there is a prevalent relevance of the social factor, more firms may be incentivised to invest more in host communities' social development and welfare. The study also adds to the relevance and importance of social factor consideration when constructing investor portfolios.

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List of Acronyms

AG – Asset Growth

AUS – Australia

ASX – Australian Stock Exchange

CSR – Corporate Social Responsibility

EBITDA - Earnings Before Tax, Interest, Depreciation and Amortisation

EGLS - estimated generalised least squares

ESG – Environmental, Social and Governance

EPSg – Earnings Per Share growth

EVS – Environmental Factor Score

FGLS – feasible generalized least squares

FL – Financial Leverage

FS – Firm Size

GVS – Governance Factor Score

JSE – Johannesburg Stock Exchange

LSDV – Least Square Dummy Variable

MTB – Market to Book

OLS – Ordinary Least Squared

ROA – Return on Asset

ROE – Return on Equity

SA – South Africa

SCS – Social Factor Score

SRI – Social Responsibility Index

1. Introduction

1.1. Problem Background

ESG has been gaining prominence lately with evidence such as growth in assets under management for sustainability funds or funds with ESG mandates and investors incorporating ESG in securities valuation and respective portfolio management frameworks. Parallel to the growing relevance in the corporate space, we have also witnessed growth in academic research on ESG and how it links with firm performance. Academic literature has provided contradicting results regarding the relationship between ESG factors and firm performance. On the one hand, there is existing academic literature that found a positive relationship between ESG factors and firm performance measures such as stock price performance, return on asset and return on equity (Abdo & Fisher, 2007; Albuquerque et al, 2020; Broadstock et al, 2021Consoladi 2020; Eccles et al, 2014; Kruger, 2015; Ding et al, 2020). At a social factor level, company social investment enhances firm value through social capital and trust (Lins, Servaes & Tamayo, 2017), motivating employees (Edmans, 2012) and through stakeholder support (Deng, Levine, Lin and Xie, 2013). Academic literature articulates two key views on company social investment and firm enhancement: 1.) Doing well by doing good which means a firm can achieve long term superior financial performance by investing in host communities and employees (Jiang and Fu, 2019; Rekom et al., 2013) and 2.) delegated philanthropy which is a result of societies' demands on firms to deal with market and disruptive failures (Benabou and Tirole, 2010). Other studies find that the relationship between ESG factors and firm performance is negative. (Fisher-Vanden and Thorburn, 2011; Patten, 1991; Waddock and Graves, 2000). In fact, through conducting a meta study, Frede, Busch and Bassen (2015) found that only 62% of studies on ESG and firm performance point to an existing positive relationship with 38% pointing to either a negative or neutral relationship.

Based on social and economic research, developing and developed markets have varying socio-economic and ecological dynamics. Developing markets are characterised by high unemployment (particularly youth), poverty, substandard health services, and broader inequality. As such, one would expect ESG risks to vary between the two and integration to be contextualised as per the socio-economic and environmental dynamics (Baughn et al., 2007; Dobers and Halme, 2009). There is evidence of social unrest caused by underlying socio-economic challenges in emerging markets such as South Africa (Tenza, 2020; Vhumbunu, 2021). Social unrest can pose a business risk to firms and past events are a testament to this. In

South Africa, examples include project delays in the construction sector by disgruntled host communities and unemployment strikes in the mining sector by host communities.

We know from academic literature that there is some evidence of a positive relationship between ESG factors and firm performance. There is evidence in the academic literature of mechanisms through which company social investment on host communities and employees enhances firm value. There is also evidence of the business risks posed by socio-economic challenges to firms in developing markets. So, two similar firms, one in a developed market and one in a developing market, may manage these risks differently due to varying social and environmental dynamics. However, what we do not know is how important is the social factor of ESG to firms in developing markets relative to developed markets when it comes to influencing firm performance.

1.2. Research Questions

This research work aims to compare social factor relevance between a jurisdiction with socio-economic challenges and a developed jurisdiction. In essence, a comparative study on the social factor's influence on firm performance for a jurisdiction with socio-economic challenges and a developed jurisdiction. The research work will also investigate how the social factor is valued relative to the environmental and governance aspects of ESG, i.e., whether there is an established hierarchy between the three factors when it comes to influencing firm performance or not. The critical question for this research work is as follows:

"Due to social challenges faced by South Africans and social challenges presenting a business risk to firms, do firms which score better on the social factor experience better market performance, and how does this compare with firms in developed markets? "

In undertaking this research work, the two jurisdictions used are South Africa and Australia. Firstly, South Africa as a developing jurisdiction and Australia as a developed jurisdiction. Secondly, the two jurisdictions have a major commonality in that they are both resource-intense nations which we think will allow for a better like-for-like cross-comparison.

1.3. Research Contribution

This study will contribute toward broader ESG work on South African firms. There is evidence of the business risk posed by socio-economic challenges to firms in developing markets. Still, we do not know how important the social factor of ESG is when it comes to influencing firm performance in developing markets compared to developed markets. As such, the study will

also contribute to knowledge gaps in ESG contextualisation and integration as there is greater demand for firms in emerging markets to practice ESG due to socio-economic and ecological challenges The study may also have indirect political and social implications in that if there is a prevalent relevance of the social factor, more firms may be incentivised to invest more in host communities' social development and welfare. With evidence that socio-economic challenges can cause social unrest and impact firms, this work may also add to the relevance and importance of social factor consideration when constructing equity investor portfolios. The following section unpacks the literature review that motivated the undertaking of this research work.

2. Literature review

2.1. Corporate Social Investment and Socio-Economic challenges

For firms, ESG has become mainstream business activity compared to yesteryears when ESG was marginalised versus financial factors (Jebe, 2019). According to academic research, corporate social investment as part of ESG can enhance firm value through several channels. The first channel is through building social capital and trust, which can bode well for the firm in volatile times (Lins et al., 2017). The second channel is motivating employees, which can result in employee satisfaction (Edmans, 2012) and gaining stakeholder support (Deng et al., 2013). Other channels include lower cost of capital as a result of recognition from the capital markets (Goss and Roberts, 2011), attracting a positive reputation effect that may have an impact on firm valuation (Hong and Liskovich, 2016) and possibly attracting better ratings from sell-side research analysts (Bushee and Noe, 2001).

According to Raynard and Forstater (2002), social and environmental responsibility in developing countries can be characterised by the need for the host community support and responsible environmental rehabilitation. There are several views on corporate social responsibility and its impact on society, businesses, and other stakeholders. The first view is a win-win view which assumes no harm to society and the long-term profitability of the firm, which may come at the expense of short-term reduction in profitability (Rekom et al., 2013; Jiang and Fu, 2019). This view endorses the doing well by doing good theory, which translates to a firm becoming more profitable (achieving superior financial performance) by being a good corporate citizen. The rationale behind the "doing well by doing good" approach is that the incremental value created by the firm will not only be enjoyed by shareholders (as residual claimants) but will also be partly shared with other stakeholders. This assumes a long run value maximisation created by a long-term investment on the sustainability of the business. For the win-win view to work, short term biases on profitability need to be eliminated. These short-term biases limit longer term sustainability, and this can be linked to management incentives which are short term focused. This incentivises management to increase short term profits at the expense of long-term sustainability. A win-win vision makes sense in the case of attaining long term profitability and sustainability and avoiding long term contingent liabilities caused by actions to achieve short term/intertemporal profits.

The second view is delegated philanthropy, which refers to the emergence of social responsibility as a result of society's demand for corporations to deal with market and disruptive failures (Benabou et al, 2010). This view assumes corporate policies are used as mediums or channels to express citizen values. In this case, stakeholders are willing to forgo money to further social sustainability goals. It is referred to as delegated philanthropy because stakeholders require corporations to engage in philanthropy on their behalf. Magill, Quinzii and Rochet (2015) argue that CSR is motivated by investors' desire to internalise externalities on other stakeholders, which constitute significant risks to shareholders themselves. Therefore, firms should maximise the total welfare of their stakeholders rather than shareholder value alone. An example in South Africa is firms wanting more control over their philanthropy as they see their tax money wasted by government. Firms believe there is better value spending the tax money on corporate social investments themselves instead of government.

The third view articulates social responsibility as insider-initiated philanthropy and can be a manifestation of agency problems with potential corporate governance issues. This means that prosocial corporate behaviour, in part, does not reflect the demand of stakeholders to sacrifice money for a worthy cause but rather the corporate insider's desire to engage in philanthropy. Examples include charity work, where monies are channelled to charities associated with executives or board members of the corporation (Cai, Xu and Yang, 2020). It can also be the case with political contributions (contributing to parties they favour) (Cespa and Cestone, 2007) and institutions such as football clubs and art groups. In this case, managers may engage in social responsibility investments for their own personal preferences, which may not necessarily align with shareholder value maximisation. Based on the views discussed above, academic scholars classify social responsibility in three categories: 1) Strategic social responsibility, 2) Purely altruistic (not for profit) social responsibility and 3) Social responsibility resulting from agency problems.

So, there is some literature evidence on channels with which social responsibility adds value. There is also evidence that socio-economic challenges can cause social unrest (Tenza, 2020; Vhumbunu, 2021) and pose a business risk. Given that these challenges vary between developed and developing markets, there is a research gap worth investigating that focuses on social responsibility and firm performance as well as the relevance of social responsibility in developing markets versus developed markets. Firms in developing markets face a number of challenges with managers expected to navigate through challenges such as protests due to high

unemployment, the risk of infrastructure damage and theft, the risk of health challenges to employees due to poor healthcare systems and the challenge of making firms to meet international standards. The following section covers literature on the relationship between ESG performance and firm performance.

2.2. ESG and firm performance (financial and market performance).

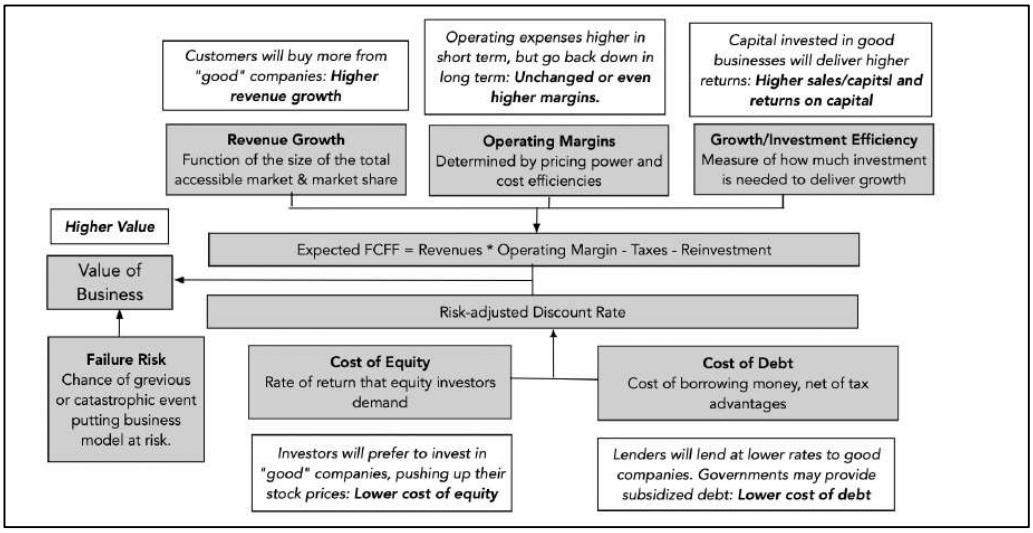
The importance of environmental, social, and governance (ESG) has increased over time, with assets under the sustainability umbrella quoted to be approximately US$ 30 trillion as at 2019 (Fish, Kim and Venkatraman 2019). Preceding studies on the relationship between ESG and firm performance have provided contradictory results in answering the question as to whether there is an existing positive relationship between ESG and firm performance (Friede et al, 2015). Frede et al. conducted a meta study on more than 2000 studies on the relationship between ESG and firm performance, with only 62% pointing to an existing positive relationship and the others pointing to a neutral or negative relationship.

Several research papers provide evidence of an existing positive relationship between ESG performance and firm performance. A study conducted using 180 listed US firms found that high sustainability firms outperform counterparts with lower sustainability over the longer term in terms of stock market performance and accounting performance (Eccles, Iannou and Serafeim, 2014). Adding to the existence of a directionally positive relationship between ESG and stock returns, Krüger (2015) found that investors respond weakly negative to positive corporate social responsibility and respond strongly negative to adverse events. Krüger also found that corporate social responsibility news carries vital legal and economic information and significantly impacts investors' reaction. A study by Consoladi (2020) found that ESG rating changes have a consistent impact on equity performance and that the markets seem to reward firms operating in spaces with high level of concentration of ESG materiality. The study used a large sample of US-listed firms included in the Russell 3000 from 2008 to 2019. Ntoi (2010) found that firms listed on the socially responsible investing index (SRI) perform better financially than those not listed. Ntoi used stock returns, price-to-book value, and price-to-earnings ratio as proxies for firm performance. Nkomani (2013) found a positive relationship between corporate social responsibility and firm performance. Nkomani used stock returns, price-earnings ratio, market-to-book value ratio, ROA, and ROE as proxies of firm

performance. Abdo and Fisher (2007) found a positive correlation between share price return and governance for JSE-listed firms.

Focusing on recent research, Shanaev and Ghimire (2021) found that ESG rating upgrades lead to positive but inconsistently abnormal returns of 0.5% per annum, and downgrades are detrimental to stock returns resulting in a statistically significant risk-adjusted return of -1.2% on average. They observed that these findings are more pronounced for ESG leaders than laggards. In terms of stock price returns and volatility during the covid -19 crisis, Albuquerque et al (2020) and Ding et al (2020) found that US-listed firms with high corporate social responsibility rating exhibited better financial performance in terms of higher stock returns and lower stock volatility. Broadstock et al (2021) found similar results for the China market, with firms with higher ESG rating performing better during the covid-19 crisis. In terms of portfolio and funds that have biases toward stock with high ESG ratings, academic literature point to material outperformance of these funds and portfolios formed from stock with high ESG rating (Khan, 2019; Alda, 2020; Consolandi et al., al.,2020).

Figure 1: ESG and Firm value map



Source: Cornell and Damodaran, 2020

Figure 1 shows some of the mechanisms through which ESG can enhance firm value. One of the mechanisms is failure risk which can be linked to risks such as infrastructure destruction caused by social unrest or environmental risk failure due to underinvestment in key environmental aspects of the business such as tailings dams for mining companies. The other one speaks to revenue growth and margin expansion as a result of customers willing to buy

more from good companies. This speaks to what Lins et al (2017) describe as stakeholder loyalty and trust obtained through corporate social investment.

Over time, research has been conducted to link these value drivers and ESG. In the pro-ESG corner, being a good corporate citizen in terms of ESG practices can make a firm more profitable. In finance literature, this is often referred to as "doing well by doing good" (Jiang and Fu, 2019; Rekom et al., 2013). This stance argues for a longer-term focus versus a short-term profit boost bias which most firms suffer from. The argument is that due to the nature of management incentives (short-term weighted incentives), management teams are incentivised to take decisions to increase short term profitability. This means sacrificing longer term business sustainability for short-term profit boosts. Examples include sacrificing safety and pollution controls for short term profitability which can create contingent liabilities in the longer run. As per the value map shown in figure 1, firms can benefit by doing good through lower cost of capital or through higher margins as customers are willing to pay a premium for products offered by firms with good ESG credentials. The critical question is: will the market overlook short term profit declines and reward sustainable firms with higher pricing?

Conversely, other lines of academic research have provided evidence of a negative relationship between ESG and firm performance (Fisher-Vanden and Thorburn, 2011; Patten, 1991; Waddock and Graves, 2000). Bae, El Ghoul, Gong and Guedhami (2021) found that there is no existing relationship between a firm's corporate social responsibility performance and financial performance after the covid-19 crisis hit the market. Also, a layer of research argues against the point that portfolios made up of stocks with high ESG ratings outperform (Halbritter and Dorfleitner, 2015; Naffa and Fain, 2021). In fact, Hubel and Scholtz (2020) note that stocks with low ESG ratings outperform the ones with high ESG ratings owing to the transition risks associated with investments in stocks with poor ESG performance. Folger-Laronde, Pashang, Feor and Elalfy (2020) argue that socially responsible investments on the fund level do not perform better subject to market downturns. Other lines of academic research have provided evidence that the relationship between ESG and firm performance is neutral. The reasoning behind this is that firms that do have social responsibility practices will have lower cost and then lower price. In contrast, those firms that take into consideration social responsibility practices in their production will suffer from higher costs and, as a result, their prices will be higher (McWilliams and Siegel, 2001).

The above discussion supports the observation made by Friede et al. (2015) in that evidence on the existence of a relationship between ESG, and firm performance is mixed. Taking from these mixed research findings, this relationship should be examined from time to time. there is evidence in academic literature of mechanisms through which company social investment on host communities and employees enhances firm value. There is also evidence of the business risks of socio-economic challenges to firms in developing markets. So, two similar firms, on in a developed market and one in a developing market, may manage these risks differently due to varying social and environmental dynamics. However, what we do not know is how important is the social factor of ESG to firms in developing markets relative to developed markets when it comes to influencing firm performance. Therefore, the prosed research work has empirical relevance as it will contribute towards ESG incorporation and social responsibility factor relevance in developing markets.

The point that we do not know how important the social factor of ESG is when it comes to influencing firm performance in developing markets compared to developed markets means this research work will contribute towards the body of knowledge on the significance of corporate social investment on firm performance for firms in socially challenged jurisdictions versus firms in developed markets. Also, the study contributes towards knowledge on social responsibility factor relevance relative to governance and environmental factors as well as. All this leads us to our main research question, which reads: **Due to social challenges faced by South Africans and social challenges presenting a business risk to firms, do firms which score better on the social factor experience better market performance and how does this compare with firms in developed markets where social pressures are presumably less?** The following section will detail hypotheses developed to answer our main research question.

3. Hypotheses

This section details hypotheses developed for our main research question. We have developed three hypotheses to help us answer our main research question.

Hypothesis 1:

Through this hypothesis, we are trying to compare social factor incorporation between two jurisdictions with different socio-economic dynamics (developed versus developing jurisdictions – in this case, South Africa and Australia). We are investigating the differences between the social factor and firm performance relationship between the two jurisdictions.

We are trying to assess how the relationship compares for firms in socially challenged jurisdictions to firms in jurisdictions with lesser social challenges. The question here is: Is the relevant or important factor as per jurisdiction reflected through a meaningful relationship with firm performance?

For example, is there a meaningful relationship between firm performance and the social factor for firms operating in jurisdictions with heightened social challenges (high unemployment, high labour disruptions) or not?

The hypothesis test is described as follows:

Null Hypothesis ($H1_0$)

There is no difference between social factor relevance between South African Firms and Australian Firms or the factor relevance is more meaningful for Australian firms than South African firms.

Formula ($H1_0$): $\beta_{SA} = \beta_{AUS}$

Alternative Hypothesis ($H1_a$)

The social factor for South African firms has a more meaningful relationship with firm performance compared with firms in Australia.

Formula ($H1_a$): $\beta_{SA} > \beta_{AUS}$

Hypothesis 2:

The main question that this hypothesis seeks to help us answer is as follows: Due to the social challenges faced by South Africa and social challenges presenting a business risk to firms, do firms which score better on the social factor benefit as measured by firm performance?

Here we try to answer this question by investigating the relationship between the social factor and stock price change as well as the return in equity (ROE). Stock price change represents market performance and will give us an indication as to whether firms benefit from their social work through share price performance and whether or not investors benefit from investing in firms with higher social scores.

The hypothesis test is described as follows:

Null Hypothesis ($H2_0$)

Firms which invest in social responsibility do not see this reflected in their market and financial performance. There is no existing relationship between the social factor and $\Delta \boldsymbol{P}$ *and ROE.*

Formula ($H2_0$): $\beta <= 0$

Alternative Hypothesis ($H2_a$)

Firms that invest in social responsibility in socially challenged jurisdictions should reflect a positive relationship between the social factor and $\Delta \boldsymbol{P}$*, as well as ROE.*

Formula ($H2_a$): $\beta > 0$

Hypothesis 3:

Through this hypothesis, we are trying to investigate how the social factor is valued relative to the Environmental and Governance parts of ESG i.e., whether there is an established hierarchy between the three factors.

Here we seek to establish the extent and nature of the relationship between the three factors and market and financial performance. The main question here is as follows: Is the relationship between the social factor and performance more significant than the relationship between the environmental and governance factor with firm performance?

The hypothesis test is described as follows:

Null Hypothesis ($H3_0$)

The social factor has a less significant relationship with firm performance (change in price and ROE) compared to the environmental factor and governance factor

Formula ($H3_0$): $\beta_{SCS} < \beta_{GVS}; \beta_{SCS} < \beta_{ENV}$

Alternative Hypothesis ($H3_a$)

The social factor has a much more significant relationship with firm performance (change in price and ROE) than the environmental factor and governance factor.

Formula ($H3_a$): $\beta_{SCS} > \beta_{GVS}; \beta_{SCS} > \beta_{ENV}$

The following section research details research design used for this research work. The section details study samples used (including data validation, exclusions, and cleaning), control variables used, respective hypotheses developed in line with our research question and the empirical model to test our hypotheses.

4. Method and Data

This section details the research design used for this research work. The section details study samples, control variables used, and empirical models used to test our hypotheses. The research work is skewed towards quantitative work with a touch of case studies to reference our findings.

4.1. Study sample

To select a data sample to outtake this research work, the criteria/framework adopted is shown in table 1. The study period is from 2010 to 2019, and the raw data (before cleaning) had 3629 observations from 123 JSE-listed companies and 306 ASX-listed companies which were used as representative samples for South African and Australian companies respectively (data on private/unlisted companies is not readily available). After applying data selection and cleaning criteria detailed in table 1 sample observations reduced to 2860.

Table 1: Data selection and cleaning criteria

Criteria	Data sample adjustment
Jurisdictions	We applied a filter based on the socio-economic status of a country. The aim was to collect data from a challenged jurisdiction from a socio-economic perspective (South Africa in this case) and a more advanced jurisdiction (Australia in this case) from a socio-economic perspective.
Dual Listed stocks	There are companies that were excluded from the South African Study as they have no operations in South Africa despite being listed locally (mainly due to disinvestments – e.g., including BHP).
	For dual-listed companies like Anglo Gold and Woolworths, we used geographic contribution towards EBITDA to decide which geography should the firm fall under for the research work. We also explored reserve and resource base (for mining companies).
ESG Data	We collected data for environmental, social and governance (ESG) performance from Thomson Reuters Eikon (Refinitive). The Thomson Reuters database is frequently used by academic researchers on the subject matter of the relationship between firm performance and ESG (e.g., Ahme et al., 2021; Krueger at al.,2020)
Fundamental Data	To collect company fundamental data, Eikon and Bloomberg platform were used. The reason behind using two databases was for data integrity checks – it is much better to use two platforms instead of one to avoid incorrect data points. For some firms, annual reports were used to confirm data reported or captured by Bloomberg and Refinitiv
Other Considerations	Data was cleaned by removing companies that do not have readily available ESG data. A number of mining companies which are in the exploratory phase were removed.
	We excluded the 2020 data due to the black-swan event in the Covid-19 pandemic.
	The firm size variable (represented by total assets) was log transformed

4.2. Study variables

For this research work, independent variables are environment score (EVS), social score (SCS) and governance score (GVS). Dependent variables used as a proxy for firm performance are return on equity (ROE) and stock price return (ΔP). Control variables used for the study are firm size (FS), financial leverage (FL), Asset growth (AS), Earnings growth (*EPSg*) and Market to Book (MTB). All these variables are defined fully below, with respective theoretical foundations underlined.

4.2.1. Independent variables

We used ESG data provided by Refinitiv for our research study. ESG data obtained from Refinitive is a derived score that uses information provided by firms in their annual integrated reports and other verifiable reported data in the public domain

Environmental Score: The environmental pillar refers to the impact of the business activity on the natural ecosystem, including the air, land, and water, as well as complete ecosystems. Eikon defines this pillar as a reflection of how a firm uses best management practices to avoid environmental risk. The score varies from 0% to 100%.

Social Score: The social pillar focuses on the firm's ability and capacity to generate trust and loyalty with its employees, host communities and other stakeholders. It can be further defined as the reflection of the firm's reputation and the health of its license to operate. The score varies from 0% to 100%.

Governance Score: Refinitive defines this pillar as a Firm's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a firm's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long-term shareholder value. The score varies from 0% to 100%.

4.2.2. Dependent variables

To evaluate firm performance, we used two metrics for the research. They are ROE (speaks to financial performance) and stock price return (speaks to market performance). Dependent variables used for this research work are described below:

Stock price return: For this study, this variable is defined as the percentage difference between the closing share price after financial year-end results and the closing price of the preceding year. Nkomani (2013) and Ntoi (2010) used stock price return as a proxy for firm performance for research work on social responsibility and firm performance in South Africa. The other commonly used market performance variable is Tobin's Q (not used for this research work). This measure is frequently used to evaluate firm performance in research pertaining to ESG and firm performance (Ahmad, Mobarek and Roni, 2021; Li, Liao and Albitar 2018). It is further argued that Tobin's Q not only does it reflect past performance but also represents firms' future developments (Li et al, 2019).

Return on Equity: This variable is defined as the net income divided by shareholders' equity. This measure is commonly used to evaluate firm performance in research pertaining to ESG and firm performance (Ahmad et al, 2021)

4.2.3. Control variables

To control for other variables that may impact dependent variables, we have included control variables for this research work. Control variables used for this research are described below:

Firm Size: According to Fama and French (1995), firm size explains a substantial portion of the variation in stock returns. Additionally, our choice of firm size as a control variable is informed by existing academic literature that found firm size as an essential control variable when assessing the relationship between ESG and firm performance. (Alareeni and Hamdan, 2020; Andersen and Dejoy, 2011; Engelhardt, Ekkenga and Posch, 2021; Garcia et al ,2017; Hamdan, 2018; Manescu, 2011). For firm size, we use total assets as the proxy. We avoided using the market cap as the cyclicality of commodity price may unfavourably impact market capitalisation.

Financial leverage: Firms with high financial leverage may be hindered in funding growth, which can affect earnings growth and market value performance. Under stressed scenarios such as black swan events, firms with high financial leverage may significantly underperform or present an increased risk of a rights issue. Due to this link between financial leverage and

earnings growth (which drives share price performance), we have included financial leverage as one of the control variables. For this research work, we defined financial leverage as total debt to total firm assets. It is a commonly controlled variable in ESG research (Alareeni et al, 2020; Hamdan et al, 2017;)

Market to Book (P/B): The inclusion of Market to Book as one of the control variables is informed by findings from Chen and Zhang (1998), who found that firms with high book-to-market values have persistently low earnings, earnings uncertainty and are likely to cut dividend pay-outs. Earnings uncertainty and dividend pay-out cuts do have an impact on market performance. As such, the inclusion of the market to book as a control variable is fair. Other academic researchers also use market-to-book as a control variable for work on firm performance and ESG and are considered one of the variables that may impact stock price performance. (Albuquerque et al, 2020; Engelhardt et al, 2021; Griffin et al, 2002; Manescu, 2011)

EPS Growth: High quality earnings growth is one of the key drivers of stock price performance. Deducing from discounted cashflow intrinsic value calculation framework, high growth drives higher NPVs (net present value) and thus a key driver of stock prices and profitability.

Asset Growth: Asset growth may come in the form of capital re-investment or acquisitive growth, and if done in a value accretive (returns exceeding the cost of capital), this may have an impact on profitability and in turn stock returns. Studies have found asset growth as one of the essential control variables when studying the relationship between firm performance and ESG (Alareeni and Hamdan, 2020; Andersen and Dejoy, 2011; Hamdan, 2018)

4.3. Empirical model

The empirical model was developed with key research question for this research work. At this stage, the models are presented in the generic form before determining which regression model is best suited for the sampled data. The mathematical expressions of empirical models used are shown below:

$$\Delta P = \beta_0 + \beta_1 ENV + \beta_2 MTB + \beta_3 EPSg + \beta_4 FL + \beta_5 FS + \beta_6 AG \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$\Delta P = \beta_0 + \beta_1 SCS + \beta_2 MTB + \beta_3 EPSg + \beta_4 FL + \beta_5 FS + \beta_6 AG \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

$$\Delta P = \beta_0 + \beta_1 GVS + \beta_2 MTB + \beta_3 EPSg + \beta_4 FL + \beta_5 FS + \beta_6 AG \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$ROE = \beta_0 + \beta_1 ENV + \beta_2 MTB + \beta_3 EPSg + \beta_4 FL + \beta_5 FS + \beta_6 AG \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

$$ROE = \beta_0 + \beta_1 SCS + \beta_2 MTB + \beta_3 EPSg + \beta_4 FL + \beta_5 FS + \beta_6 AG \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

$$ROE = \beta_0 + \beta_1 GVS + \beta_2 MTB + \beta_3 EPSg + \beta_4 FL + \beta_5 FS + \beta_6 AG \ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Table 2: Empirical model variables descriptions

Variable	Description
ΔP	*Firm performance: Stock price returns*
ROE	*Firm Performance: Financial performance*
EVS	*Environmental pillar score*
SCS	*Social pillar score*
GVS	*Governance pillar score*
FL	*Financial leverage (Debt: Assets)*
FS	*Firm size, which uses total assets as a proxy*
AG	*Asset Growth*
EPSg	*Earnings growth (FY_t EPS/FY EPS_{t-1})*
MTB	*Market to Book*

4.3.1. Panel Data Models

Panel data models are used to examine individual-specific or group-specific and time effects with the aim of dealing with unobserved heterogeneity effects or individual effects. The said effects can either be fixed or random. A fixed effect model assesses whether or not intercepts differ across a group or the time period and a random effect model assesses the difference in error variance components across the time period.

Pooled OLS

Pooled Ordinary Least squared (OLS) is the most basic method used to estimate a linear regression model. The model has a set of core assumptions, one of which is that individual or group effects do not exist. Under this condition, the OLS model yields efficient and consistent parameter models. Mathematically, OLS can be represented in functional form as follows:

$y = \alpha + X' \beta + \varepsilon \ (ui = 0)$ ……. ui: Individual effects

The core assumptions of OLS are as follows: (Green, 2008) and (Kennedy, 2008)

I. **Linearity** – dependent variables are formulated as a linear function of independent variables and the error terms.
II. **Exogeneity** – the value of error terms is zero or uncorrelated with any regressors.
III. **Homoskedasticity** - Error terms have the same variance
IV. **No Autocorrelation** – Error terms are not correlated with one another.
V. **No Multicollinearity** – There is not the exact relationship between independent variables

As described above, the overriding condition for OLS to be efficient is for individual effects not to exist. If the opposite applies, exogeneity and homoskedasticity assumptions are violated as error terms will not have similar variance and possibly correlate with one another (violating autocorrelation assumption). In such a case, the OLS is not the best estimator; instead, the fixed effect or random effect models should be used.

Fixed Effect and Random Effect models

Fixed effect model assesses individual difference in intercepts and assumes constant variance and slopes across individual or group. With the individual specific effect time invariant and considered part of the intercept, the error term is allowed to be correlated with other regressors. The fixed effect model can be estimated using the least square dummy variable (LSDV) regression and within effect estimates methods. Mathematically, OLS can be represented in functional form as follows:

$$Y_{it} = (\alpha + u) + X'_{it}\,\beta + v_{it} \qquad \text{where } v_{it} \sim IID\ (0, \sigma u^2)$$

A random effect model assumes that individual effects are uncorrelated with or are independent of any of the regressors. With the random effect model, the intercepts and slopes of the regressors are the same across. The difference among individuals or time period lies in their individual specific errors but not their intercepts. The model can be estimated using the generalised least squares when the covariance of an individual is known. In the random effects model, you can include time invariant variables, which is not the case in the fixed effects model. The feasible generalized least squares (FGLS) or estimated generalised least squares (EGLS) is used when the covariance of an individual is not known. Mathematically, OLS can be represented as in functional form as follows:

$$Y_{it} = \alpha + X'_{it}\,\beta + (u_i + v_{it}) \qquad \text{where } v_{it} \sim IID\ (0, \sigma u^2);\ \alpha_i \sim IID\ (0, \sigma u^2)$$

The Hausman specification test is used to examine which model between the two, fixed or random, is more relevant and significant for the data under study. For the Durbin-Wu-Hausman test, the null hypothesis is that the random effect model is statistically significant at the 5% significant level, and the fixed effect model is the alternative hypothesis. Expanding on this, for the p-value above 5% (0.05), the null hypothesis will not be rejected, and the random effect model will be used. For the p-value less than 5% (0.05), the fixed effect model will be employed to regress the dataset. To test for the suitability of OLS, we used one of the core assumptions, homoskedasticity. As long as the variance of the error term is constant (homoskedasticity fulfilled), then the OLS model can be used. The test used to test for homoskedasticity in the dataset is White's test.

5. Results and Discussion

5.1. Descriptive Analysis

This section presents the mean, standard deviation, minimum and maximum of the Johannesburg stock exchange (JSE) listed and Australian stock exchange (ASX) listed firms' data for this research work. This section also touches on the time series trends of the independent variables. As part of data validation, the firm size variable (represented by total assets) was log-transformed for the purpose of this research work. In its currency form, the firm size variable would unfavourably impact the model fit as the values are excessively large.

Table 3: Descriptive statistics of the SA firms' study variables

Descriptive statistics					
Variables	**Observations**	**Mean**	**Standard deviation**	**Maximum**	**Minimum**
Dependent Variables					
ΔPrice	913	14.06	41.16	424.27	-74.49
Return on Equity	913	15.89	20.55	132.34	-182.74
Independent Variables					
EVS	913	45.78	25.25	96.31	-
SCS	913	53.90	21.33	96.33	0.12
CGs	913	52.80	22.15	98.34	2.69
Control Variables					
Firm Size	913	193 255 419	471 771 140	3 523 208 025	604 014
Leverage	913	0.142	0.143	0.863	-
Book to Market	913	0.606	0.468	3.926	0.004
EPS Growth	913	174.868	7243	211 782	-45 950
Asset Frowth	913	11.306	24.54	263.44	-91

Source: Refinitiv, Bloomberg, firm annual reports, own calculations

As shown in Table 1, the social factor has the highest mean score of 53.90% as per the refinitive data. The environment factor has the lowest score among the three. There is scope to catch up for the environment disclosure relative to the other two factors. With regard to the standard deviation, the highest variation is recorded for the environment factor. This can be interpreted as firms having slightly higher diverging priorities regarding the environmental factor relative to the social factor and governance factor.

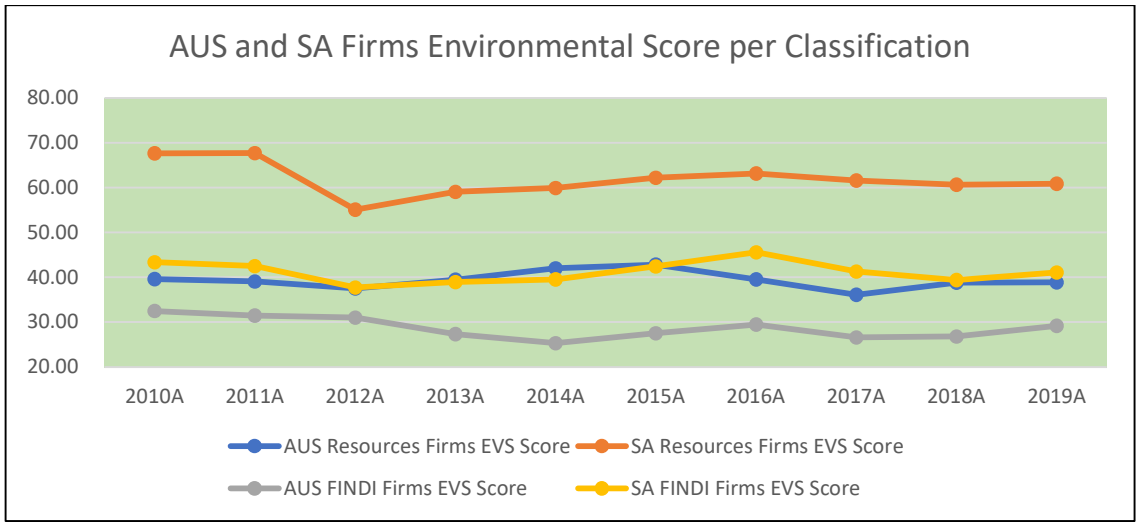
Table 4: Descriptive statistics of the Australian index study variables

Descriptive statistics					
Variables	**Observations**	**Mean**	**Standard deviation**	**Maximum**	**Minimum**
Dependent Variables					
ΔPrice	1947	22.16	61.13	746.67	-81.70
Return on Equity	1947	11.68	22.96	176.38	-480.89
Independent Variables					
EVS	1947	30.96	28.12	97.04	-
SCS	1947	42.69	22.35	96.84	0.48
CGs	1947	54.96	23.13	99.38	2.15
Control Variables					
Firm Size	1947	236 961 819	1 116 977 668	10 203 873 022	215 399
Leverage	1947	0.175	0.143	0.873	-
Book to Market	1947	0.603	0.513	10.349	-0.173
EPS Growth	1947	-1 094	46170	121 279	-2 008 061
Asset Frowth	1947	18.256	75.05	2364.64	-57

Source: Refinitiv, Bloomberg, firm annual reports, own calculations

Table 4 shows descriptive results for the Australian firms used in this research work. The governance factor has the highest mean score (54.96%), followed by the social factor (42.69%), while the environmental factor has the lowest score (30.96%). This implies that Australian firms positively practised governance factor disclosure and sought to increase the disclosure on corporate governance due to its impact on the firms. Globally, the governance factor was one of the first non-financial attributes of a firm scrutinised the most or received a lot of attention earlier than the other two factors. The environment factor mean is weak, and there is scope to close the gap to gain the benefits of environment factor disclosure. It is worth noting that the variation (as measured by standard deviation) is high for the environment factor relative to the other two factors, social and governance factors. This may be interpreted as firms having diverging priorities regarding environment disclosure relative to social and governance disclosure.

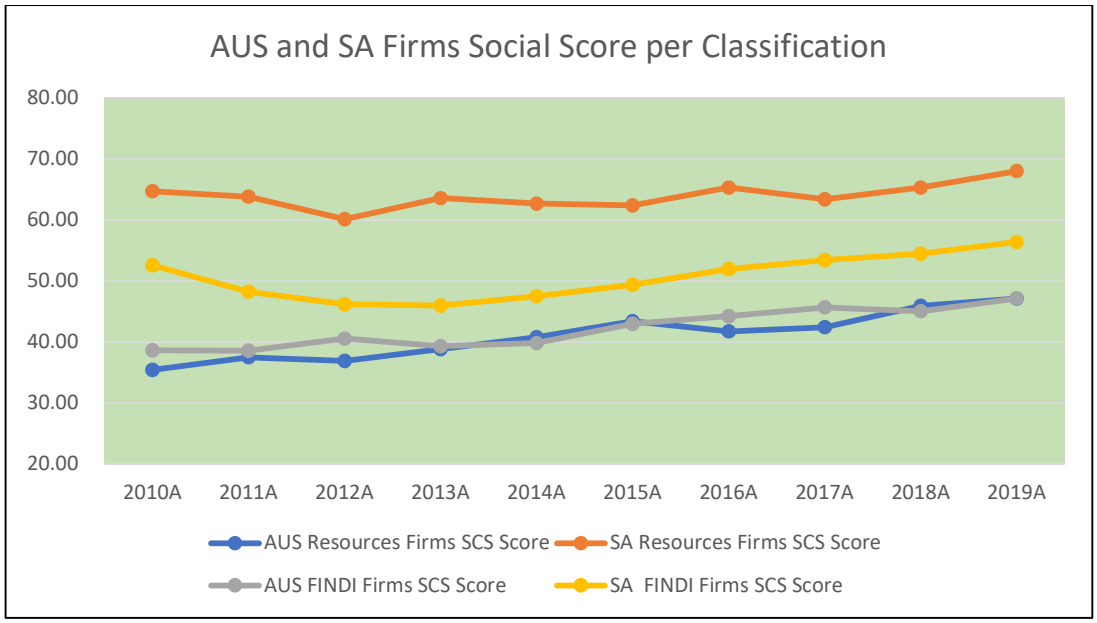
Figure 2: Environment factor scores of the Australian and South African firms



Source: Refinitiv, Bloomberg, Firm annual reports, own calculations

Figure 2 shows the environment factor trend from 2010 to 2019, with the South African resources firms noticeably having higher scores across calendar years and overall higher scoring relative to Australian resources firms. One of the reasons for this dispersion could be that the Australian resources component has a higher number of mid-cap mining firms, which may not be offering good disclosure like some of the large-cap firms, which are often under scrutiny on such. The Australian financials and industrials (FINDI) firms rank poorly relative to the South African Findi firms across the study calendar years.

Figure 3: Social factor scores of the Australian and South African Firms

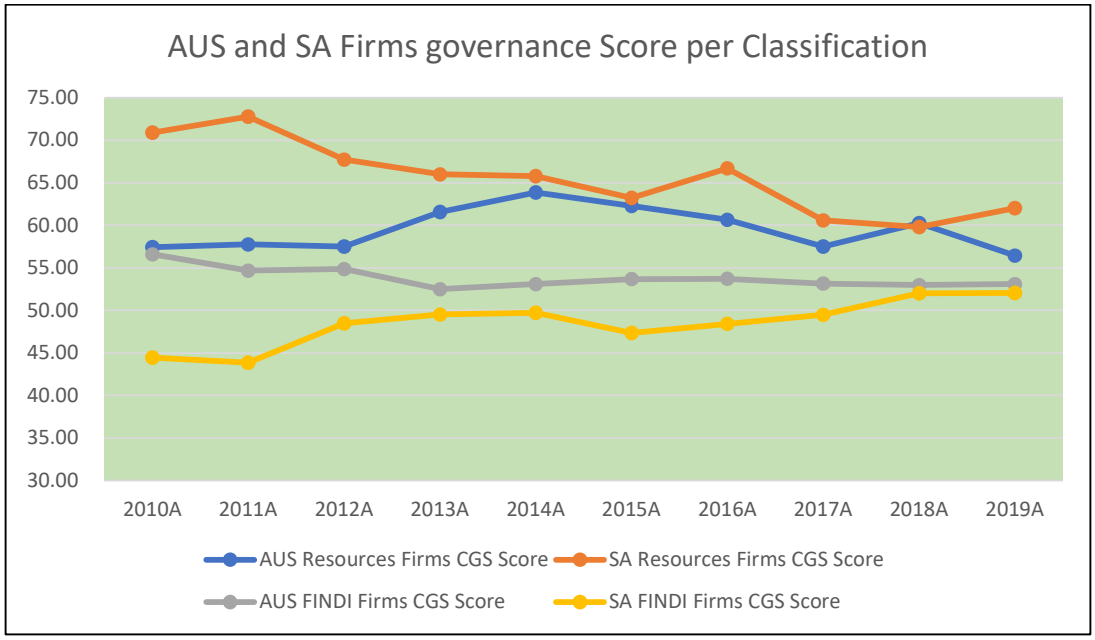


Source: Refinitiv, Own calculations

Figures 4 and 5 show a trend for the social and governance factors. Noticeably, there is a general upward trend in scoring on the social factor for all the components. South African resources firms rank highly for the social factor, and from intuition, this could be a result of better disclosure when it comes to this component and the work done by resources on social responsibility, given the social challenges faced by these firms. The South African Findi component ranks highly relative to both the Australian components, and this also can be due to the importance of social disclosure given the challenging socio-economic conditions in South Africa.

For the governance factor, the picture is different in that dispersion between the components is lower. The lower dispersion can be a result of firms having fewer diverging practices when it comes to governance disclosure, given the impact poor governance has on firm valuations globally. Noticeably, the South African Findi firms rank poorly on this factor but have experienced an improvement since 2010. The South African Resources firms rank high relative to the other subcomponents for this factor as well.

Figure 4: Governance factor scores of the Australian and South African Firms



Source: Refinitiv, Own calculations

From the descriptive statistics above, South African firms rank highly under the three ESG factors. The following section aims to investigate the relationship between firm value

performance and these ESG factors, particularly the social factor, which is the variable of focus for this research study.

5.2. Empirical Analysis

5.2.1. Correlation Analysis

Table 5 presents South African firms' correlation coefficients for variables used in this research study, with a focus on testing relationships between dependent and independent variables. Despite statistical insignificance, the three factors show a small negative relationship with ΔP. This is inconsistent with the findings by Abdo and Fisher (2007) for the governance factor. They found a positive correlation between price return and the governance factor for JSE-listed firms. The difference in findings may be attributable to the timing of the study as they conducted their study from 2003 to 2006 versus our study period of 2010 to 2019 for this research work. Also, because the JSE index is heavy on resources firms, the cyclicality of commodity prices may have an impact on the results obtained

Table 5: Correlation matrix: South African firms

CORRELATION MATRIX										
	Δ Price	*ROE*	*EVS*	*SCS*	*CGS*	*Firm Size*	*Leverage*	*Book to Market*	*EPS Growth*	*Asset Growth*
Δ Price	1.00									
ROE	0.197***	1.00								
EVS	-0.033	-0.020	1.00							
SCS	-0.053	-0.010	0.654***	1.00						
CGS	-0.051	-0.015	0.329***	0.381***	1.00					
Firm Size	-0.044	-0.068**	0.338***	0.289***	0.064*	1.00				
Leverage	-0.117***	-0.225***	0.020	0.028	0.056*	-0.024	1.00			
Book to Market	-0.280***	-0.440***	0.074**	-0.004	-0.012	0.059*	0.001	1.00		
EPS Growth	0.052	-0.023	-0.025	-0.041	-0.021	-0.009	0.003	-0.023	1.00	
Asset Growth	0.123***	0.234***	-0.098***	-0.101***	-0.110***	-0.006	0.072**	-0.155***	0.053	1.00

*Correlation results between study variables. Data sample consist of 913 observations collected from South African firms between 2010 and 2019. The table shows regression results for the three components of ESG. Data was collected from Refinitive and Bloomber. ENV is the environment factor score; SCS is the social factor score; GVS is the governance factor score; log transformed total asset is used as firm size; leverage is defined as total debt to total assets; EPS is defined diluted earnings per share and EPS growth is calculated using financial year end earnings numbers; Asset growth is defined as change in total assets. *, **, *** represent 10%,5% and 1% significance level respectively*

The results show a small negative correlation between ROE and the three factors (EVS, SCS and CG). The considerable component weighting of resources in the South African sample may also play a role in this relationship due to the cyclical nature of commodity prices. The

positive relationship between ROE and ΔP makes fundamental sense as returns drive share price performances. Sensibly, leverage has a negative relationship with both ROE and ΔP as high debt, if used ineffectively, can impact share price performance.

Table 6: Correlation matrix: Australian firms

CORRELATION MATRIX										
	Δ Price	*ROE*	*EVS*	*SCS*	*CGS*	*Firm Size*	*Leverage*	*Book to Market*	*EPS Growth*	*Asset Growth*
Δ Price	1.00									
ROE	0.167***	1.00								
EVS	-0.158***	-0.022	1.00							
SCS	-0.167***	-0.009	0.722***	1.00						
CGS	-0.163***	-0.062***	0.597***	0.533***	1.00					
Firm Size	-0.066***	0.008	0.355***	0.320***	0.264***	1.00				
Leverage	-0.110***	-0.067***	0.116***	0.177***	0.093***	0.009	1.00			
Book to Market	-0.265***	-0.267***	0.081***	0.025	0.126***	0.011	0.036	1.00		
EPS Growth	0.020	0.073***	0.003	0.004	-0.007	0.004	-0.046**	-0.147***	1.00	
Asset Growth	0.156***	0.073***	-0.119***	-0.110***	-0.142***	-0.037	-0.026	-0.091***	0.018	1.00

*Correlation results between study variables. Data sample consist of 1947 observations collected from Australian firms between 2010 and 2019. The table shows regression results for the three components of ESG. Data was collected from Refinitive and Bloomberg. ENV is the environment factor score; SCS is the social factor score; GVS is the governance factor score; log-transformed total asset is used as firm size; leverage is defined as total debt to total assets; EPS is defined diluted earnings per share and EPS growth is calculated using financial year-end earnings numbers; Asset growth is defined as change in total assets. *, **, *** represent 10%,5% and 1% significance level respectively.*

Table 5 presents Australian firms' correlation coefficients for variables used in this research study. The relationship between all the ΔP and the social factor (SCS) is negative. The same is true for the relationship between ΔP and the environment (EVS) and governance (CGs) factors. The two other factors show a small negative relationship with ΔP. This may be interpreted as an early indication that firms with social factor scores do not necessarily exhibit high market performance. In essence, firms with better disclosure in social performance and social responsibility investment do not necessarily exhibit higher share price performance, in fact, the relationship is negative.

Similar to SA firms, the correlation coefficient between ROE and the social factor is small and negative. The environment factor and governance factor also exhibit small negative correlation coefficients with ROE. The results may also be impacted by commodity price cyclicality and study timeline and length differences. These correlation results are a first step in uncovering the relationship between our ΔP, ROE, and the social factor. To further uncover the nature of

this relationship, regression tests will be conducted. The following sections will focus on regression analysis for our independent variables and dependent variables

5.2.2. F-Test for Fixed Effects

To run regression studies on a dataset, the pooled OLS, fixed effect and random effect models can be used. The nature of the sample is that firms used for this research work do not change over the time series. In other words, the sample is not random and as such the random effect model cannot be used in this instance. Instead, the F-test is employed to test the poolability of the data. The results of test p-values are shown in table 7 below:

Table 7: F-test for Australian and South African data

	F-Test	
P-values	**ΔPrice Model**	**ROE Model**
South Africa		
model (Independent variable: ENV)	9.70E-01	5.95E-07
model (Independent variable: SCS)	9.47E-01	4.66E-07
model (Independent variable: GVS)	9.82E-01	3.41E-07
Australia		
model (Independent variable: SCS)	2.61E-01	1.14E-58

Source: Own calculations, Refinitive, Bloomberg, firm reports.

For the F-test, the null hypothesis is that the pooled OLS model is statistically significant at the 5% significant level, and the fixed effect model is the alternative hypothesis. Expanding on this, for the p-value above 5% (0.05), the null hypothesis will not be rejected, and the pooled OLS model will be used. For the p-value less than 5% (0.05), the fixed effect model will be employed to regress the dataset. The table shows that the p-values for ROE models favour the fixed effect model and the ΔP models favour the pooled OLS model. The following section will unpack regression results obtained from running a fixed effect and pooled OLS regression analysis of the data.

5.2.3. Regression Analysis

This section will detail the results or outcomes from our hypotheses tests. Each hypothesis test is discussed, and the aim is to answer our research question and sub-questions, as described in our introduction and the hypothesis section.

Hypothesis 1:

For hypothesis 1, we are trying to investigate whether social factor incorporation is contextualised as per the socio-economic realities of a jurisdiction. We are trying to compare social factor incorporation between two jurisdictions with different socio-economic dynamics (developed versus developing jurisdictions – in this case, South Africa and Australia). We are investigating the differences in the social factor and firm performance relationship between the two jurisdictions.

Hypothesis formulas are as follows (see section 3):

Null Hypothesis ($H1_0$): $\beta_{SA} = \beta_{AUS}$

Alternative Hypothesis($H1_a$): $\beta_{SA} > \beta_{AUS}$ or $\beta_{SA} < \beta_{AUS}$

For the Δ***Price*** model, as shown in table 8, the coefficient of the social factor coefficient for SA firms (β_{SA}) is greater than the coefficient of the Australian firms (β_{AUS}). Directionally, ignoring statistical significance, this would imply the social factor has a less negative influence on stock price changes for South African firms compared with Australian firms.

The higher coefficient in South Africa may be reflecting the relative importance of the social factor for South African firms. As part of host community development and support, South African firms undertake meaningful social investment. In investing in host communities, various businesses alleviate the risk of business disruptions from the very same host communities. South Africa has a high unemployment challenge and judging from historical events this challenge may result in protests from disgruntled host communities. Compared with South Africa, Australia has better socio-economic conditions and as such the risk of the host community protests is higher in South Africa. The greater coefficient for South African firms may be pointing out that due to the risk posed by socio-economic challenges in South Africa, the social factor is much more important for South African firms relative to Australian firms.

Put differently, given that socio-economic challenges pose a business risk in South Africa, this could mean that social investment is more appreciated for South African firms relative to Australian Firms. Based on some of the commentary from mining firms in South Africa, there is a growing trend of preferring to spend more on social investment instead of paying more taxes to the government due to the perceived ill expenditure from the government. This can be tied to delegated philanthropy as discussed in the literature review section.

Table 8: Regression results of SA and Australian firms for the change in the Price Model

	ΔPrice Model			
	Australia		**South Africa**	
Variables/Statistics	*β*	*p-value*	*β*	*p-value*
Constant (β_0)	107.3720	1.98e-015***	25.572	0.0700*
Independent Variables				
SCS	- 0.1969	0.0094***	- 0.0998	0.1387
Constant Variables				
Firm Size	- 7.8250	0.0002***	1.5186	0.4478
Leverage	- 25.4381	0.0072***	- 35.2205	0.0001***
Book to Market	- 27.9859	9.78e-026***	- 23.6238	1.96e-016***
EPS Growth	-2.42E-15	0.3969	0.0002	0.1923
Asset Growth	0.0926	1.40e-07***	0.1415	0.0088***
R-squared	0.1187		0.1039	
P-Value	2.03E-51		2.99e-19	

*Regression results using the Δ**Price** model. Data sample consist of 2860 samples collected from South African firms and Australian firms between 2010 and 2019 for south African firm. The table shows regression results for the three components of ESG. Data was collected from Refinitive and Bloomberg. ENV is the environment factor score; SCS is the social factor score; GVS is the governance factor score; log transformed total asset is used as firm size; leverage is defined as total debt to total assets; EPS is defined diluted earnings per share and EPS growth is calculated using financial year end earnings numbers; Asset growth is defined as change in total assets. *, **, *** represent 10%,5% and 1% significance level respectively*

As much as statistical significance is not the end goal of this research, we are unable to conclude the results as absolute truth because of statistical significance. However, directionally we find very interesting results. As such we fail to reject the null hypothesis: *There is no difference*

between social factor relevance between South African Firms and Australian Firms or the factor relevance is more meaningful for Australian firms than for South African firms

Table 9: Regression results of SA and Australian firms for the ROE Model

	ROE Model			
	Australia		South Africa	
Variables/Statistics	*β*	*p-value*	*β*	*p-value*
Constant (β_0)	26.0756	1.15e-07***	51.3558	4.15e-011***
Independent Variables				
SCS	0.0088	0.7498	0.0129	0.703
Constant Variables				
Firm Size	-1.0040	0.2004	-3.1304	0.0040***
Leverage	-3.8745	0.2718	-30.9988	8.49e-013***
Book to Market	-11.5035	3.66e-033***	-15.5676	1.24e-024***
EPS Growth	1.63E-05	0.1073	-1.53E-05	0.8508
Asset Growth	0.0110	0.0736	0.1337	8.35e-08***
R-squared	0.1051		0.2237	
P-Value	3.16E-79		7.35E-46	

*Regression results using the **ROE** model. Data sample consist of 2860 observations collected from South African firms and Australian firms between 2010 and 2019 for south African firm. The table shows regression results for the three components of ESG. Data was collected from Refinitive and Bloomber. ENV is the environment factor score; SCS is the social factor score; GVS is the governance factor score; log transformed total asset is used as firm size; leverage is defined as total debt to total assets; EPS is defined diluted earnings per share and EPS growth is calculated using financial year end earnings numbers; Asset growth is defined as change in total assets. *, **, *** represent 10%,5% and 1% significance level respectively*

For the ***ROE*** model, as shown in table 9, the coefficient of the social factor regression coefficient for SA firms *is* greater than the coefficient of the Australian firms Directionally, ignoring statistical significance, this would imply the social factor has a more positive relationship with ROE for South African resources firms compared with Australian resources firms. Firstly, this is directionally consistent with findings by Nkomani (2013) who found a positive relationship between corporate social responsibility with ROE for South African firms. The greater coefficient for South African firms could be a result of greater efficiency from employees as a result of participation in share schemes and intense competition for employment

in South Africa due to high unemployment. By participating in share schemes employees feel more like owners versus employees only and that can have an efficiency effect. Also, due to high unemployment, employees in South African firms could be working harder to maintain their employment status which can result in better efficiencies. As part of social investment, the children of employees are offered bursaries and internships. This incentivises employees to work harder to sustain such benefits to their children.

As much as statistical significance is not the end goal of this research, we are unable to conclude the results as absolute truth because of statistical significance. However, directionally we find very interesting results. As such, we fail to reject the null hypothesis that there is no difference in the prevalence of the social factor regardless of the socio-economic status of a jurisdiction

Hypothesis 2:

This hypothesis investigates any meaningful/significant relationship between the social factor and firm performance. South Africa has heightened social challenges, and the recent protests in KZN and Gauteng, construction project delays by surrounding communities demanding employment and operation disruptions at mining areas by host communities are examples. These present a business risk as they can materially impact business cash flow or extinguish the existence of a business entirely (some of the smaller firms with no insurance suffered from the latest protests). Firms have embarked on social work to advance host communities, enhance host community loyalty, and alleviate this business risk. Some firms even pitched the idea of paying less tax to the government and redirecting those funds to uplifting host communities.

Due to the social challenges faced by South Africans and social challenges presenting a risk to firms, we are trying to investigate whether firms which score better on the social factor benefit from this through a meaningful and statistically significant relationship between the social factor and firm performance (presented as change in share price and return on equity). The two empirical models used are shown below:

Null Hypothesis ($H2_0$): $\beta <= 0$

Alternative Hypothesis($H2_a$): $\beta > 0$ or $\beta < 0$

For the SA firms, the independent variable **SCS** has a negative relationship with $\Delta \boldsymbol{P}$ with a coefficient less than zero (β = -0.0998) as shown in table 10. Given the importance of the social

factor for South African firms, one would expect at least a positive relationship between share price performance and social investment. Firstly, the negative relationship could be a result of the cyclical nature of commodities which may impact the relationship in times of cyclical troughs. Secondly, both the negative relationship and statistical insignificance can be interpreted as the social factor having not garnered enough relevance amongst the investor community to a point where it is significantly influential on the firm's share price performance. In the past, ESG factor relevance has been triggered by events. Examples include the relevance of governance after governance scandals such as that of Steinhoff and EOH as well as the environmental factor relevance after the Brumadinho dam disaster in Brazil. Also, it could be that the social factor score does not necessarily translate into social responsibility activity on the ground in which case this is not a true reflection of the relationship between social responsibility and share price performance. Lack of ESG disclosure could have an impact on the relevance of the social factor as the investor community may not have standardised information to work with and this can be worsened by the disagreement seen amongst third-party ratings.

Table 10: Regression results of SA firms for the change in the Price Model

	ΔPrice Model					
Variable(s)	*β*	*p-value*	***Variable(s)***	*β*	*p-value*	***Variable(s)***	*β*	*p-value*
Constant ***(β_0)***	29.0087	0.0448**	*Constant* ***(β_0)***	25.572	0.0700*	*Constant* ***(β_0)***	31.200	0.0253**
Independent Variables			**Independent Variables**			**Independent Variables**		
ENV	-0.0068	0.9055	SCS	-0.0998	0.1387	GVS	-0.0714	0.2304
Constant Variables			***Constant Variables***			***Constant Variables***		
Firm Size	0.3720	0.8535	Firm Size	1.5186	0.4478	Firm Size	0.5485	0.7643
Leverage	-35.4643	9.98e-05***	Leverage	-35.2205	0.0001***	Leverage	-34.8194	0.0001***
Book to Market	-23.3417	4.10e-016***	Book to Market	-23.6238	1.96e-016***	Book to Market	-23.4933	2.68e-016***
EPS Growth	2.40E-04	0.1817	EPS Growth	0.0002	0.1923	EPS Growth	0.0002	0.1855
Asset Growth	0.1488	0.0059***	Asset Growth	0.1415	0.0088***	Asset Growth	0.1419	0.0087***
R-squared	0.1018		R-squared	0.1039		R-squared	0.1032	
P-Value	8.52E-19		P-Value	2.99e-19		P-Value	4.29E-19	

*Regression results using the ΔP model. Data sample consist of 913 observations collected from South African firms between 2010 and 2019 for south African firm. The table shows regression results for the three components of ESG. Data was collected from Refinitive and Bloomber. ENV is the environment factor score; SCS is the social factor score; GVS is the governance factor score; log transformed total asset is used as firm size; leverage is defined as total debt to total assets; EPS is defined diluted earnings per share and EPS growth is calculated using financial year end earnings numbers; Asset growth is defined as change in total assets. *, **, *** represent 10%,5% and 1% significance level respectively*

As much as we get interesting insights from the directional relationship between firm share price performance and the social factor scoring, the regression coefficient is not statistically significant. As such, we fail to reject the null hypothesis that states: *Firms that invest in social responsibility do not see this reflected in their market and financial performance.*

For the ***ROE*** *model,* we find that the coefficient is positive for South African firms (β =0.0129) as shown in table 11. Intuitively, social responsibility channels such as employees share schemes should be an incentive enough to motivate employees and yield efficiencies. This could be one of the mechanisms with which social responsibility adds positively to the ROE of a firm. By participating in share schemes employees feel more like owners versus employees only and that can have a positive efficiency effect. The positive relation may also emanate from the point that by investing in communities, firms are paid back with loyalty by host communities and may experience minimum disruption. This may help firms avoid or alleviate the risk that comes with socially motivated disruptions and can be tied to the "doing well by doing good doing" view on social investment.

Table 11: Regression results of SA firms for the change in the Price Model

	ROE Model					
Variables/Statistics	β	*p-value*	***Variables/Statistics***	*β*	*p-value*	***Variables/Statistics***	*β*	*p-value*
nstant ***(β_0)***	53.9993	1.59e-011***	*Constant* ***(β_0)***	51.3558	4.15e-011***	*Constant* ***(β_0)***	50.5866	5.70e-011***
Independent Variables			**Independent Variables**			**Independent Variables**		
ENV	0.0412	0.1779	SCS	0.0129	0.703	GVS	0.0080	0.7973
Constant Variables			***Constant Variables***			***Constant Variables***		
Firm Size	-3.6317	0.0011***	Firm Size	-3.1304	0.0040***	Firm Size	-2.9928	0.0029***
Leverage	-31.1929	5.65e-013***	Leverage	-30.9988	8.49e-013***	Leverage	-30.9491	8.86e-013***
Book to Market	-15.5784	9.49e-025***	Book to Market	-15.5676	1.24e-024***	Book to Market	-15.5792	1.11e-024***
EPS Growth	-1.91E-05	0.8137	EPS Growth	-1.53E-05	0.8508	EPS Growth	-1.51E-05	0.8525
Asset Growth	0.1350	5.98e-08	Asset Growth	0.1337	8.35e-08***	Asset Growth	0.1336	8.82e-08***
Within R-squared	0.2240		Within R-squared	0.2237		Within R-squared	0.2223	
P-Value	3.73E-46		P-Value	7.35E-46		P-Value	7.59E-46	

*Regression results using the ROE model. Data sample consist of 913 observations collected from South African firms between 2010 and 2019 for south African firm. The table shows regression results for the three components of ESG. Data was collected from Refinitive and Bloomber. ENV is the environment factor score; SCS is the social factor score; GVS is the governance factor score; log transformed total asset is used as firm size; leverage is defined as total debt to total assets; EPS is defined diluted earnings per share and EPS growth is calculated using financial year end earnings numbers; Asset growth is defined as change in total assets. *, **, *** represent 10%,5% and 1% significance level respectively*

As much as we get interesting insights from the directional relationship between firm ROE and the social factor scoring, the regression coefficient is not statistically significant. As such, we fail to reject the null hypothesis that states: *Firms that invest in social responsibility do not see this reflected in their market and financial performance.*

Hypothesis 3:

With this hypothesis test, we are investigating how the social factor is valued relative to the environmental and governance parts of ESG i.e., whether there is an established hierarchy between the three factors. The social factor is a critical factor for South African firms as we believe social challenges present a business risk and as evidenced by social protests in the past. Based on this, one would think the social factor should be as relevant as the other two factors, governance and environmental factor.

Hypothesis formulas are as follows (see section 3):

Null Hypothesis ($H3_0$): $\beta_{SCS} = \beta_{GVS}; \beta_{SCS} = \beta_{ENV}$

Alternative Hypothesis ($H1_a$): $\beta_{SCS} > \beta_{GVS}; \beta_{SCS} > \beta_{ENV}$

For the Δ***Price*** model, we find that the social factor coefficient is negative and less than both the governance factor coefficient and the environmental factor coefficient as shown in table 10. Directionally, this means the social factor has a more negative relationship with the share price performance compared with the other two factors. Firstly, given the weight of resource firms in the South African firms' sample, the cyclicality of the commodity prices may impact the coefficients. Intuitively, given the fact that South Africa is a resource nation, the expectation would be that companies that have good environmental and social practices controlling for other factors should be positively rewarded. It could be the case that these scores do not reflect actual practices on the ground and that this negative relationship is not a true reflection of the relationship. As much as statistical significance is not the end goal of this research, we are unable to conclude which out of the three factors enjoys more relevance or has a greater influence on share price performance. As such, we fail to reject the null hypothesis

that states: *The social factor has a less significant relationship with change in price compared to the environmental factor and governance factor.*

For the ***ROE*** model, we find that the social factor coefficient is positive and greater than the governance factor coefficient but less than the environmental factor coefficient as shown in table 11. Directionally, ignoring statistical significance, the reason why the social factor coefficient is higher than that of the governance factor could be that firm performance is more sensitive to disruptions caused by social unrest and that firm performance may be less sensitive to governance-related matters given the scrutiny governance has gotten over time to an extent that companies employ best practices or have fewer governance-related cases. The other reason could be that through employees' participation in social investment channels such as share schemes the company is able to get more from employees in terms of operational efficiencies. The environmental factor has a higher positive relationship with ROE than the social factor. This could be the case in a scenario where an investment in matters pertaining to environmental factors yields more positive results. As an example, an environmental accident is likely to have a longer impact on the mine operation than striking host communities. A strike can be addressed through negotiations with a relatively quick turnaround time but environmental incidents such as tailings dam failure may require reinvestment which can be intensive in nature at times.

As much as we get interesting insights from the directional relationship between firm ROE and the three ESG subcomponents, the regression coefficients are not statistically significant. As such, we fail to reject the null hypothesis that states: *The social factor has a less significant relationship with change in price compared to the environmental factor and governance factor.*

6. Conclusion

6.1. Results Conclusion

The objective of this research work was to answer the proposed research question as described in the introduction section. The key research question for this research work is as follows:

Due to social challenges faced by South Africans and social challenges presenting a business risk to firms, do firms who score better on the social factor experience better market performance and how does this compare with firms in developed markets?

To answer the main research question, three hypotheses were developed addressing social factor relevance between a socially challenged jurisdiction (South Africa) and a developed jurisdiction (Australia), the impact of social factor rating on firm performance for a socio-economic challenged jurisdiction and social factor relevance relative to the governance and environment factor in South Africa. A statistical test was performed to determine the appropriate model for this research work, and the fixed effect and pooled OLS regression analysis were performed to test our key hypotheses.

The results of this research work suggest that directionally there is a negative relationship between the social factor and share price performance for South African firms. Intuitively, given the importance of social investment, the relationship would be expected to be positive. The negative relationship directionally could possibly be a result of the cyclical nature of commodities stocks. Also, it could be that the social factor score does not necessarily translate into social responsibility activity on the ground in which case this is not a true reflection of the relationship between social responsibility and share price performance. However, the relationship between ROE and the social factor is positive for South African firms. This is thought to be a function of efficiency and loyalty effect as firms invest in employees and host communities. Through social support and investing in employees and host communities, firms stand to yield efficiencies from motivated employees and loyalty from host communities that are meaningful participants in firm profit sharing.

The result obtained by comparing Australian firms and South African firms produced interesting insights. Directionally, South African firms have a higher regression coefficient compared with Australian firms. This is interpreted as the social factor for South African firms exhibiting a less negative effect on the ΔPrice relative to the Australian firms. This disparity can be attributable to the point that South Africa as a jurisdiction has socio-economic

challenges that if not addressed could potentially impact firm performance. Directionally, this could mean that social investment is appreciated more in South Africa as part of business risk management. This ties up with host community development and supports offered by South African firms and the directional difference between the two jurisdictions suggests that at least. The results also suggest that, directionally, south African firms have a more positive relationship between the social factor and ROE compared with Australian firms. This can be a result of the efficiency and loyalty effect as firms invest in employees through share scheme participation and offering employees' children internships and bursaries.

Lastly, based on the ROE model, research results show that directionally the social factor has a more positive relationship with ROE than the governance factor. As much as statistical significance is not the end aim of this research work, we are unable to accept the directional evidence as the absolute truth dues to statistical insignificance. However, the directional evidence from results has offered great insights regarding the social factor importance of South African firms and how that compares with a developed jurisdiction such as Australia. To answer the main research question, there is some directional evidence of the importance of the social factor as presented by the social factor score regardless of statistical significance and this relationship compare favourably relative to Australian firms.

6.2. Theoretical and Practical Contributions

This study will contribute toward broader ESG work on South African firms. Most of the studies on ESG have been on developed markets, and the study seeks to add to studies on South Africa as a developing country. The study will also contribute to knowledge gaps in ESG contextualisation and integration. The study may also have indirect political and social implications in that if there is a prevalent relevance of the social factor, more firms may be incentivised to invest more in the social development and welfare of host communities. This also adds to the relevance and importance of social factor consideration when constructing investor portfolios because part of the observations was a positive relationship between share price performance and the social factor rating (particularly in a socially challenged jurisdiction like South Africa).

6.3. Limitations and Suggestions for Future Research

Firstly, the key limitation of this research work is that when sampling, match sampling was not used. The reason behind this is the smaller pool of companies at the sector level to allow for match sampling. An example is matching South African resources firms with Australian resources firms. The number of resource firms that have the majority of their operations in SA is very small. Secondly, one of the key limitations is the assumption taken for this study that the relevant factor score reflects relevant factor activity on the ground. This may not necessarily be the case as the score are populated from information found in annual reports and management have control over what can be reported. The lack of standardisation when it comes to ESG may make this limitation very challenging to overcome. Factors such as commodity prices can impact mining firms and are not included in this research work. Also, the pool of firms that have the majority of their operation in South Africa has become smaller over the year as firms diversified geographically. Some firms are listed on the South African stock market but have no presence in South Africa – this dilutes the sample for SA-based operations. The research work was conducted with different sample sizes for South Africa and Australia, and this was the case because the study was a more generic assessment of the relevance of ESG in either jurisdiction. The South African sample observations are smaller in size relative to Australian sample observations because of the deep public markets in Australia and the availability of ESG data. The difference in sample observation is noted as a limitation. Lastly, endogeneity, as it exists in regression studies and the outcomes of this research work cannot be taken as the absolute truth.

In the future, a study using other ESG data service providers is worth investigating given the ESG scoring disagreement amongst service providers that have been captured by academic research. As ESG gets more prevalent, an interesting study would be to run a similar study using unlisted businesses to capture the entire SA business ecosystem. Also, further research can possibly run a similar study by using match sampling.

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Appendix A

Anglo American	Pick n Pay	BLU	Nedbank	Nepi
African Rainbow Minerals	Shoprite	Naspers	Coronation	Sun International
Exxaro	Spar	Datatec	JSE	RCL Food
Glencore	Whoolworths	Multichoice	PSG	Tsogo
Kumba	Clicks	Reunert	Quilter	Grindrod
Anglo Gold Ashanti	Dischem	Altron	Transactional Capitall	RMB Holdings
Gold Fields	Masmart	Barloworld	Discovery	Lewis
Harmony	Astral	Bidvest	Liberty	Remgro
DRD	AVI	Hudaco	Momentum	Bidvest
PAN African Resources	Oceanea	Imperial	Old Mutual	Reinet
Amplats	Tigerbrands	KAP	RMI	CASHBUILD
Implats	Mr Price	Metair	Sanlam	Famous Brand
Sibanye Stillwater	Pepkor	Motus	Santam	Emira
Royal Bafokeng	Foschini Group	Supergroup	Equites	Long 4 Life
Mondi	Truworths	Bidcorp	Fortress A	Liberty 2 Deg
Sappi	ADvTech	BTI	Fortress B	Curro
Sasol	Adcock	Richemont	Growthpoint	Cartrack
AECI	Aspen	ANH	Huprop	A Forbes
Omnia	Life Healthcare	Distell	Redefine	RFG group
Wilson Balyly	Mediclinic	Absa	Resilient	Spur
Raubex	Netcare	Capitec	SA Corp	Octodec
PPC	MTN	First rand	Vukile	Libstar
Murrays	Vodacom	Investec	Sirius Real Estate	BRAIT
AFROX	Telkom	Standard banks	Investec property fund	Montauk
Zeder	Attacq			

Appendix B (Australian Firms)

THE A2 MILK CO/d	CARSALESCOM/d	EML PAYMENTS/d	MAGELLAN FINAN/d	PERPETUAL/d	BABY BUNTING G/d
ABACUS PROPERT/d	COMMONWEALTH B/d	FLETCHER BUILD/d	MIRVAC GROUP/d	PLATINUM ASSET/d	BRAVURA SOLUTI/d
AUCKLAND INTER/d	CREDIT CORP GR/d	FLIGHT CENTRE /d	MONADELPHOUS G/d	QANTAS AIRWAYS/d	BWX/d
ARISTOCRAT LEI/d	CODAN/d	FISHER & PAYKE/d	MONEY3 CORPORA/d	QBE INSURANCE /d	CAPITOL HEALTH/d
ALS/d	CHALLENGER/d	GENWORTH MORTG/d	MEGAPORT/d	QUBE HOLDINGS/d	CITY CHIC COLL/d
ALTIUM/d	CHARTER HALL G/d	GOODMAN GROUP/d	MEDIBANK PRIVA/d	REA GROUP LTD/d	CONTACT ENERGY/d
ATLAS ARTERIA/d	CIMIC GROUP/d	GRAINCORP/d	MACQUARIE GROU/d	REECE/d	CLASS/d
AMP/d	CENTURIA INDUS/d	GROWTHPOINT PR/d	MESOBLAST/d	RAMSAY HEALTH /d	CHORUS/d
ANSELL/d	COLLINS FOODS/d	GPT GROUP/d	METCASH/d	RESMED INC/d	CENTURIA OFFIC/d
AUSTRALIA AND /d	CHARTER HALL L/d	G.U.D. HOLDING/d	MYSTATE/d	RELIANCE WORLD/d	CHARTER HALL S/d
EAGERS AUTOMOT/d	CROMWELL PROPE/d	HEALIUS/d	NATIONAL AUSTR/d	SCENTRE GROUP/d	CEDAR WOODS PR/d
AFTERPAY/d	COCHLEAR/d	HUB24/d	NANOSONICS/d	SHOPPING CENTR/d	DATA#3/d
APPEN/d	COMPUTERSHARE/d	HARVEY NORMAN /d	NEARMAP LTD/d	STEADFAST GROU/d	EBOS GROUP/d
ARB CORPORATIO/d	CHARTER HALL R/d	INSURANCE AUST/d	NINE ENTERTAIN/d	SEEK/d	IMMUTEP/d
ASX/d	CSL/d	IDP EDUCATION/d	NIB HOLDINGS/d	STOCKLAND/d	INTEGRATED RES/d
AUB GROUP/d	CORPORATE TRAV/d	IOOF HOLDINGS/d	NATIONAL STORA/d	THE STAR ENTER/d	JUMBO INTERACT/d
AURIZON HOLDIN/d	CLINUVEL PHARM/d	INGENIA COMMUN/d	NETWEALTH GROU/d	SONIC HEALTHCA/d	KATHMANDU HOLD/d
BAPCOR/d	CROWN RESORTS/d	INGHAMS GROUP/d	NEWS CORPORATI/d	SKYCITY ENTERT/d	LOVISA HOLDING/d
BENDIGO AND AD/d	CLEANAWAY WAST/d	IPH/d	NEXTDC/d	SEALINK TRAVEL/d	MCPHERSON'S/d
BEGA CHEESE/d	DOMAIN HOLDING/d	IRESS/d	OMNI BRIDGEWAY/d	SUPER RETAIL G/d	MERIDIAN ENERG/d
BLACKMORES/d	DOMINO'S PIZZA/d	INVOCARE/d	PENDAL GROUP/d	SUNCORP GROUP/d	MICHAEL HILL I/d
BANK OF QUEENS/d	DOWNER EDI/d	JB HI-FI/d	PRO MEDICUS/d	SEVEN GROUP HO/d	MCMILLAN SHAKE/d
BREVILLE GROUP/d	DEXUS/d	JANUS HENDERSO/d	PREMIER INVEST/d	TABCORP HOLDIN/d	MONASH IVF GRO/d
BWP TRUST/d	ECLIPX GROUP/d	KOGAN.COM LTD/d	PINNACLE INVES/d	TRANSURBAN GRO/d	MYER HOLDINGS/d
BRAMBLES/d	ELDERS/d	LINK ADMINISTR/d	POLYNOVO/d	TECHNOLOGY ONE/d	MAYNE PHARMA G/d
SIGMA HEALTHCA/d	SUPERLOOP/d	STARPHARMA HOL/d	SEVEN WEST MED/d	TELSTRA CORPOR/d	NICK SCALI/d
SMART GROUP COR/d	SYNLAIT MILK/d	SUNRISE ENERGY/d	SOUTHERN CROSS/d	THE REJECT SHO/d	NAVIGATOR GLOB/d
SPARK INFRASTR/d	SPARK NEW ZEAL/d	SERVCORP/d	TASSAL GROUP/d	VIRTUS HEALTH/d	OFX GROUP/d
AGL ENERGY/d	TREASURY WINE /d	XERO/d	ESTIA HEALTH/d	REGIS HEALTHCA/d	OOH!MEDIA/d
AIR NEW ZEALAN/d	UNIBAIL-RODAMC/d	AUSTRALIAN AGR/d	EMECO HOLDINGS/d	RURAL FUNDS GR/d	ORIGIN ENERGY/d
ARDENT LEISURE/d	VICINITY CENTR/d	AUDINATE GROUP/d	EQT HOLDINGS/d	RIDLEY CORPORA/d	PACIFIC CURREN/d
AMA GROUP/d	VIRGIN MONEY P/d	ADAIRS/d	FLEETWOOD/d	SUNLAND GROUP/d	PUSHPAY HOLDIN/d
AUSTRALIAN PHA/d	WESTPAC BANKIN/d	DEXUS IND REIT/d	GDI PROPERTY G/d	SG FLEET GROUP/d	PRAEMIUM/d
ARENA REIT/d	WEBJET/d	HUMM GROUP/d	G8 EDUCATION/d		
AUSTAL/d	WESFARMERS/d	INFOMEDIA LTD/d	GWA GROUP/d		
AUSNET SERVICE/d	WOOLWORTHS GRO/d	HOTEL PROPERTY/d			
AVENTUS GROUP/d	WAYPOINT REIT/d	HANSEN TECHNOL/d			
ACCENT GROUP/d	WISETECH GLOBA/d	HT&E/d			

Appendix B (Australian Firms)

ADBRI/d	GRANGE RESOURC/d	ORORA/d	SENEX ENERGY/d
ANGLOGOLD ASHA/d	HIGHFIELD RESO/d	OROCOBRE/d	SYRAH RESOURCE/d
AMPOL/d	IGO/d	ORICA/d	VIVA ENERGY GR/d
ALKANE RESOURC/d	ILUKA RESOURCE/d	OIL SEARCH/d	WEST AFRICAN R/d
AMCOR PLC/d	IMDEX/d	OZ MINERALS/d	WAGNERS HOLDIN/d
AURELIA METALS/d	IONEER LTD/d	PANORAMIC RESO/d	WESTGOLD RESOU/d
APA GROUP/d	INCITEC PIVOT/d	PALADIN ENERGY/d	WHITEHAVEN COA/d
ALUMINA/d	JAMES HARDIE I/d	PACT GROUP HOL/d	WOODSIDE PETRO/d
BELLEVUE GOLD/d	JUPITER MINES/d	PILBARA MINERA/d	WESTERN AREAS/d
BHP GROUP/d	KAROON ENERGY/d	PERENTI GLOBAL/d	Z ENERGY/d
BRICKWORKS/d	KINGSGATE CONS/d	PERSEUS MINING/d	WORLEY/d
BORAL/d	LENDLEASE GROU/d	RED 5/d	
BEACH ENERGY/d	LYNAS RARE EAR/d	RIO TINTO/d	
BASE RESOURCES/d	MACMAHON HOLDI/d	RAMELIUS RESOU/d	
BLUESCOPE STEE/d	MINCOR RESOURC/d	REGIS RESOURCE/d	
CHAMPION IRON/d	MOUNT GIBSON I/d	RESOLUTE MININ/d	
COOPER ENERGY/d	MINERAL RESOUR/d	SOUTH32/d	
CSR/d	MACA/d	ST BARBARA/d	
CARNARVON PETR/d	NEWCREST MININ/d	SANDFIRE RESOU/d	
DACIAN GOLD/d	NEW CENTURY RE/d	SIMS/d	
EVOLUTION MINI/d	NEW HOPE CORPO/d	SILVER LAKE RE/d	
FORTESCUE META/d	NORTHERN STAR/d	WASHINGTON H S/d	
FLINDERS MINES/d	NUFARM/d	SERVICE STREAM/d	
GREENLAND MINE/d	NRW HOLDINGS/d	SSR MINING CDI/d	
GOLD ROAD RESO/d	OM HOLDINGS/d	SANTOS/d	