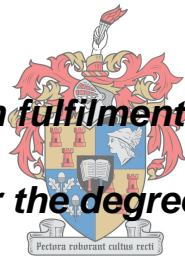


ASSESSING THE BUSINESS CASE FOR ENVIRONMENTAL, SOCIAL AND CORPORATE GOVERNANCE PRACTICES IN SOUTH AFRICA

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19 April 2018

DECLARATION

By submitting this thesis electronically, I declare that the entire work contained therein is my own, original work; that I am the sole author thereof (save to the extent explicitly otherwise stated); that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights; and that I have not previously, in its entirety or in part, submitted it for obtaining any qualification.

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ABSTRACT

Firms, their stakeholders and society at large are increasingly confronted with sustainability-related challenges, such as climate change, the depletion of natural resources, and energy security. In the wake of these challenges, investors have shown increased interest and consideration of pertinent non-financial information during their investment analyses. Responsible investors in particular incorporate environmental (E), social (S) and corporate governance (G) (ESG) aspects in their investment analyses and ownership practices. These investors realise the potential positive and long-term impact of sound ESG risk management on corporate financial performance (CFP). Despite the growing interest in sustainable corporate practices, limited ESG-related research has been conducted in South Africa, with most existing studies focusing specifically on responsible investment practices and corporate governance.

Against this background, the primary objective of this study was to assess the business case for ESG practices of selected Johannesburg Stock Exchange (JSE) listed firms over a six-year period, from 2011 to 2016. A combination of convenience and judgement sampling was utilised to draw a sample of 66 companies from six JSE sectors.

The study adopted a positivistic research approach. Selected accounting-based (return on assets [ROA] and earnings per share (EPS)) and market-based (earnings yield [EY] and total shareholder return [TSR]) CFP measures were employed. While accounting-based measures are typically used to reflect on short-term CFP, market-based measures provide an indication of investors' perceptions regarding past performance and the future financial prospects of a firm. The study expanded on the work of previous researchers in the emerging market context by including value-based CFP measures (return on invested capital [ROIC], market value added [MVA], the spread, and cash return on invested capital [CROIC]). The required data were sourced from the Bloomberg and IRESS databases. The resulting panel dataset was analysed by means of descriptive and inferential statistics.

The descriptive statistics revealed a growing trend in the overall ESG disclosure by the considered firms. When the individual ESG aspects were examined, it was evident that the E- and S-disclosure scores contributed mostly to the overall increase in ESG

disclosure. Although an increase in E-disclosure was observed over the study period, it was at a slow pace. The disclosure of social considerations, however, revealed a more notable increase. Corporate governance disclosure remained relatively consistent over the study period.

The panel regression analyses conducted between the individual ESG disclosure scores and CFP revealed significant associations for EPS and TSR. A significant negative relationship was found between E-disclosure and EPS. In contrast, a significant positive association was observed between S-disclosure and EPS. When S-disclosure scores were lagged for one-year, the significant relationship persisted. A statistically significant negative relationship emerged between S-disclosure and TSR. Significant relationships were also noted at the sector level between the individual E-, S- and G-disclosure scores and various accounting-based, market-based and value-based CFP measures.

Based on the results of this study, the researcher recommends that corporate managers, directors and investors should not only focus on the traditional financial-performance approach, but also incorporate pertinent ESG aspects in their decision-making and investment analyses. Furthermore, corporate managers should acknowledge that ESG risk management forms part of the core business function of firms. Since ESG risks and sustainability concerns often differ among sectors, the JSE could set sector-specific E- and S-targets. Finally, given their ownership rights and responsibilities, more shareholders should engage with companies on ESG concerns, be it in public or in private.

Keywords: Environmental practices; social considerations; corporate governance; ESG; disclosure; corporate financial performance; accounting-based; market-based; value-based

OPSOMMING

Maatskappye, hul belangroepe en die breë samelewing staan toenemend volhoubaarheidsuitdagings soos klimaatsverandering, energievoorsiening en die uitputting van natuurlike hulpbronne in die gesig. In die lig hiervan, toon beleggers verhoogde belangstelling in nie-finansiële inligting wanneer hulle beleggings ontleed. Sosiaal verantwoordelike beleggers in die besonder neem veral omgewings- (E), sosiale(S)-, en korporatiewe bestuursfaktore (G) (ESG aspekte) in ag tydens hulle investeringsbesluite en eienaarspraktyke. Verantwoordelike beleggers besef toenemend watter positiewe langtermyn uitwerking doeltreffende ESG-risikobestuur kan hê op 'n maatskappy se finansiële prestasie. Nieteenstaande die groeiende belangstelling in volhoubare sakepraktyke, is beperkte ESG-verwante navorsing in Suid-Afrika gedoen. Navorsers het hoofsaaklik gekonsentreer op verantwoordelike investeringspraktyke en korporatiewe bestuur.

Gegewe hierdie agtergrond, was die hoofdoel van hierdie studie om die sakemotivering van ESG-praktyke van gekose genoteerde maatskappye op die Johannesburgse Effektebeurs (JSE) oor 'n periode van ses jaar (2011 tot 2016) te ondersoek. 'n Kombinasie van oordeel- en geriefsteekproefneming is ingespan om 'n steekproef van 66 maatskappye uit ses sektore op die JSE saam te stel.

'n Positivistiese navorsingsbenadering is gevolg. Die maatstawwe wat gebruik is sluit in rekeningkundige gebaseerde maatstawwe (verdiens te per aandeel [VPA] en ondernemingsrentabiliteit), asook mark gebaseerde maatstawwe (verdiens te-opbrengs en die totale opbrengs van aandeelhouerskapitaal [TOA]). Rekeningkundige gebaseerde maatstawwe word gewoonlik gebruik om 'n oorsig te verkry oor 'n maatskappy se korttermyn finansiële prestasie, terwyl markgebaseerde maatstawwe beleggers se sienings aandui oor 'n maatskappy se geskiedkundige prestasie en sy toekomstige finansiële vooruitsigte. In hierdie studie is daar voortgebou op werk van vorige navorsers in ontluikende markte deurdat waardegebaseerde maatstawwe ook ingesluit is, naamlik die rentabiliteit van aangewende kapitaal, kontantrentabiliteit van die aangewende kapitaal, die verspreiding en markwaarde toegevoeg. Die data is verkry van die Bloomberg en IRESS databasisse. Die gevolglike paneeldata is ontleed deur middel van beskrywende en inferensiële statistiek.

Die beskrywende statistiek het 'n stygende tendens aangetoon in die algehele ESG-openbaarmakingbepunte van die maatskappye gedurende die studietydperk. Met

die ontleding van die individuele ESG-faktore, is vasgestel dat die omgewings- (E) en sosiale (S) openbaarmakingbepunting die meeste bygedra het tot hierdie styging. Hoewel 'n toename in die E-openbaarmaking waargeneem is, was dit slegs 'n geleidelike styging. Die openbaarmaking van sosiale faktore het egter 'n beduidende toename getoon. Maatskappye se openbaarmakingbepunting t.o.v. korporatiewe bestuurspraktyke het relatief standhoudend gebly gedurende die studietydperk.

Die paneel regressie-ontledings wat uitgevoer is op die individuele ESG-openbaarmakingbepunting en die korporatiewe finansiële maatstawwe het beduidende verwantskappe uitgewys t.o.v. die VPA en die TOA. 'n Beduidend negatiewe verwantskap is gevind tussen E-openbaarmaking en die VPA. In teenstelling hiermee, is 'n beduidend positiewe verwantskap waargeneem tussen S-openbaarmaking en die VPA. Selfs met die vertraging van die S-openbaarmakingsbepunting oor een jaar, het die beduidende verwantskap voortgeduur. 'n Statisties beduidende negatiewe verwantskap is tussen S-openbaarmaking en die TOA gevind. Beduidende verwantskappe is ook waargeneem op die sektorvlak tussen die individuele E-, S- en G-openbaarmakings telling en verskeie rekeningkundige baseerde, markgebaseerde en waardegebaseerde maatstawwe.

In die lig van die bevindinge word aanbeveel dat korporatiewe bestuurders, direkteure en beleggers nie net fokus op die tradisionele finansiële prestasie benadering nie, maar dat hulle ook belangrike ESG-faktore in hulle besluitnemings en beleggingsontledings insluit. Korporatiewe bestuurders moet voorts aanvaar dat ESG-risikobestuur 'n belangrike deel van die kernfunksies van maatskappye uitmaak. Aangesien ESG risiko's en volhoubaarheidskwessies dikwels verskil in die onderskeie sektore, kan die JSE E- en S-teikens vir maatskappye stel wat toepaslik is op 'n spesifieke sektor. Laastens, gegewe hulle eienaarskapregte en -verantwoordelikhede, behoort meer aandeelhouers maatskappye oor ESG-kwessies te pols, ongeag of dit in die openbaar of agter geslote deure plaasvind.

Sleutelwoorde: Omgewingspraktyke; sosiale oorwegings; korporatiewe bestuur; ESG; openbaarmaking; korporatiewe finansiële prestasie; rekeningkundige gebaseerde; mark gebaseerde; waarde gebaseerde

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	-	Acquired Immunodeficiency Syndrome
ANOVA	-	analysis of variance
ASISA	-	Association for Savings and Investment South Africa
BATS	-	British American Tobacco
B-BBEE	-	Broad-based Black Economic Empowerment
CAPM	-	capital asset pricing model
CEO	-	chief executive officer
CFP	-	corporate financial performance
CG	-	Consumer Goods
CRISA	-	Code for Responsible Investing in South Africa
CROIC	-	cash return on invested capital
CS	-	Consumer Services
CSP	-	corporate social performance
CSR	-	corporate social responsibility
DAWN	-	Distribution and Warehousing Network
EPS	-	earnings per share
ESG	-	environmental, social and corporate governance
EUROSIF	-	European Sustainable Investment Forum
EVA	-	economic value added
EY	-	earnings yield
FCF	-	free cash flow
FTSE	-	Financial Times Stock Exchange
GEPF	-	Government Employees Pension Fund
GRI	-	Global Reporting Initiative
HEPS	-	headline earnings per share

HIV	-	Human Immunodeficiency Virus
ICGN	-	International Corporate Governance Network
IIRC	-	International Integrated Reporting Council
IND	-	Industrials
IoDSA	-	Institute of Directors in Southern Africa
IRC	-	Integrated Reporting Committee
JSE	-	Johannesburg Stock Exchange
LSD	-	least significant difference
MSCI	-	Morgan Stanley Capital International
MVA	-	market value added
NOC	-	net operating capital
NOPAT	-	net operating profit after tax
NPV	-	net present value
OECD	-	Organisation for Economic Cooperation and Development
OLS	-	ordinary least squares
PIC	-	Public Investment Corporation
RI	-	responsible investing
ROA	-	return on assets
ROE	-	return on equity
ROIC	-	return on invested capital
SARB	-	South African Reserve Bank
SRI	-	socially responsible investment
TSR	-	total shareholder return
UN PRI	-	United Nations Principles for Responsible Investment
USA	-	United States of America
VBM	-	value-based management
WACC	-	weighted average cost of capital

CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

“Sustainable development should meet the needs of the present [generation] without compromising the ability of future generations to meet their own needs.”

This quote by the Brundtland Commission, formerly known as the World Commission on Environment and Development (1987) emphasises that organisations should give sufficient attention to the current and future needs of their relevant stakeholders. Corporate managers and directors have increasingly been confronted with sustainability-related concerns raised by several stakeholder groups over the last three decades. Concerns are, inter alia, related to climate change, water and energy security and the preservation of natural resources (Spence, Agyemang & Rinaldi, 2012: 9). The effects that a firm may have on the economy and environment in which it functions should therefore be carefully managed to ensure that corporate development occurs in a sustainable manner (Institute of Directors in Southern Africa [IoDSA], 2011).

The concept of sustainability is of particular importance to investors who engage in responsible investing (RI). In addition to focusing on financial performance, these investors also aim to improve long-term sustainability by incorporating environmental, social and corporate governance (ESG) aspects into their investment decision-making and ownership practices (Mutezo, 2014: 120; Van der Ahee & Schulschenk, 2013: 3).

Regarding ESG practices in South Africa, initial research mainly focused on the G-component of ESG, namely corporate governance (Van der Ahee & Schulschenk, 2013: 12). This tendency could be ascribed to the country's well-developed corporate governance framework provided by the King Reports on corporate governance. However, corporate managers and directors may be encouraged to pay more attention to ESG aspects if the inclusion of non-financial performance aspects could be related to financial gains (United Nations Principles for Responsible Investing [UN PRI], 2012: 10).

Previous research has been conducted on the relationship between ESG and corporate financial performance (CFP) in the developed market context (Ferrero-Ferrero, Fernández-Izquierdo & Muñoz-Torres, 2014; Pasquini-Descomps & Sahut, 2013; Velnampy & Pratheepkanth, 2013; Balatbat, Siew & Carmichael 2012; Kocmanová & Dočekalová, 2012). Limited research has, however, been carried out on the ESG practices of companies doing business in developing economies (Aaltonen, 2013; Sustainable Investment Research Analyst Network, 2009). The current study was therefore undertaken to assess the business case for ESG practices of selected listed companies in South Africa by employing various accounting-based, market-based and value-based CFP measures over the period 2011 to 2016.

The rest of this chapter is structured as follows: Firstly, a background discussion is provided, followed by a discussion of the problem statement, research objectives and hypotheses. Thereafter, the research design and methodology are outlined and the contribution of the study is presented. Finally, the orientation of the study is provided.

1.2 BACKGROUND TO THE STUDY

Sustainability can be defined as the “creation of a good quality life for present and future generations by reaching a balance between economic wealth, ecosystem feasibility and fairness in society” (Carroll & Buchholtz, 2014: 432). This concept denotes an integrated business approach that is related to the so-called ‘triple bottom line’ performance paradigm (Carroll & Buchholtz, 2014: 432). In other words, if a company aims to be sustainable, its business approach and strategy should include economic (profit-related), environmental (planet-related) and social (people-related) aspects. The concepts of sustainability and the triple bottom line have been used by firms as a foundation for their corporate social responsibility (CSR) policies (Breuer & Nau, 2014: 10).

According to Carroll (1991), CSR can be defined as “the social responsibility of a business which encompasses the economic, legal, ethical, and discretionary philanthropic expectations that society has of organisations at a given point in time”. The CSR concept is regarded as one of the building blocks for corporate social performance (CSP) (Carroll, 1999). The term CSP can be defined as “the configuration of principles of social responsibility, processes of social responsiveness and

observable outcomes as they relate to a firm's societal relationships" (Wood & Jones, 1995: 236). The definitions for both CSR and CSP thus focus primarily on environmental and social aspects but fail to address the key aspect of corporate governance (Carroll & Shabana, 2010: 91).

Responsible investors, however, tend to include all three ESG aspects when making investment decisions and conducting ownership practices, which broadens the scope of their investment analysis by including corporate governance aspects (Pasquini-Descomps & Sahut, 2013: 1; Eccles, De Jongh, Nicholls, Sinclair & Walker, 2007: 5).

1.2.1 Responsible investing

As mentioned in Section 1.1, the term RI can be defined as an investment strategy that integrates ESG aspects with financial objectives in investment analysis and decision-making processes (Hassel & Semenova, 2013: 7). The term SRI is essentially underpinned by ethical requirements to shape the market, while the RI concept integrates both ESG and financial aspects into mainstream investment decision-making (Van der Ahee & Schulschenk, 2013: 2). Since the launch of the UN PRI, more researchers and practitioners have been using the term 'responsible investing' rather than 'socially responsible investing' (Viviers, Krüger & Venter, 2012: 122). For the purpose of the present study the term 'responsible investing' was preferred.

A responsible investment strategy entails the generation of both financial and sustainable value (Financial Times, 2016). Responsible investors include those with an orientation towards financial analysis, sustainability aspects and moral or ethical investment beliefs (Eccles *et al.*, 2007: 7). According to Eccles *et al.* (2007: 8), financial materiality might encourage responsible and mainstream investors to engage with firms on ESG issues. Investors can consider several ESG performance indicators to compare possible investee firms. Some of the most prominent performance indicators, as identified by previous researchers, are shown in Table 1.1.

Table 1.1: Key environmental, social and corporate governance considerations

Environmental considerations	Social considerations	Corporate governance considerations
Climate change	Workplace circumstances	Board composition
Development of environmental management systems	Human capital management	Board and board committee meeting attendance
Efficiency related to waste, water and energy management	Unemployment	Executive remuneration
Clean technology	Human Immunodeficiency Virus (HIV) or Acquired Immunodeficiency Syndrome (AIDS)	Performance of the board
Alternative energy	Diversity	Separation of the role of the chairperson and chief executive officer (CEO)

Sources: Adapted from Hebb, Hawley, Hoepner, Neher & Wood (2016); Kocmanová & Dočekalová (2012); Idowu & Filho (2009)

As can be seen in Table 1.1, key environmental performance indicators include a firm's contribution towards climate change and the management of waste. Social performance indicators include the management of employees and diversity aspects, while key corporate governance performance indicators relate to the functioning and composition of a board. The board is widely regarded as the focal point of the local corporate governance system (IoDSA, 2009: 9). The following sub-section provides a discussion of the most prominent ESG factors considered in the South African context.

1.2.2 Consideration of environmental, social and corporate governance aspects in South Africa

Despite the existence of ESG-related codes and regulation in South Africa, the local investment industry still encounters ESG challenges, including those related to the practical integration of ESG aspects with investment decision-making and ownership practices (Van der Ahee & Schulschenk, 2013: 2). The increased interest in RI has paved the way for the introduction of socially responsible investment (SRI) indices by stock exchanges globally over the last two decades (1994-2014) (Marozva, 2014: 143). The Johannesburg Stock Exchange (JSE) was the first emerging market stock exchange to introduce an SRI index in 2004 (JSE, 2014a). The creation of this index, which includes several ESG dimensions, highlighted the importance of corporate sustainability to local firms (Turk, Shackleton & Wellington-Jones, 2013: 77; Visser, 2005: 36).

In the South African context, emphasis was mainly placed on the corporate governance ESG dimension in the 1990s and early 2000s. When the first King Report on corporate governance was published in 1994, South Africa was regarded as a global corporate governance pioneer (Rossouw, 2005: 93). The King II Report was published in 2002 (IoDSA, 2002). Sustainability-related guidelines were provided in this report, according to which JSE-listed firms should disclose the extent of their non-financial (i.e. social, ethical and environmental) considerations.

The publication of the new Companies Act (No. 71 of 2008) and global corporate governance-related changes necessitated the adaptation of the King II Report (Gstraunthaler, 2010: 148). The King III Report was subsequently published in 2009. One of the King III guidelines entailed that JSE-listed firms should publish integrated reports on an annual basis. In contrast to annual reports, which predominantly focused on firms' financial performance (Integrated Reporting Committee [IRC] of South Africa, 2015), a JSE-listed company's integrated report should include details on its financial and non-financial (ESG) performance.

The King IV Report was published in 2016. This report centres on value creation in a sustainable manner (IoDSA, 2016: 3). King IV furthermore highlights the need for firms to move from siloed reporting to integrated reporting (IoDSA, 2016: 5). Locally, integrated reporting is promoted by the IRC of South Africa. One of the main objectives of the IRC is to design, distribute and encourage standardised integrated reporting guidelines. An efficient integrated report should reflect the economic, social and environmental dimensions of a firm (IRC of South Africa, 2015).

When the King III Report was released in 2009, the King Committee recommended that a separate report on the expectations of institutional investors should be drafted. A committee on responsible investing in South Africa was subsequently formed to develop a local RI code, called the Code for Responsible Investing in South Africa (CRISA) (Bertrand, 2011a: 1). This code, which was published in July 2011, provides guidelines to institutional investors regarding responsible investment analysis and the implementation of sound corporate governance practices (IoDSA, 2011: 3). The code provides a set of principles aimed at guiding the South African investor community to implement the guidelines of the King III Report and the UN PRI initiative (Hebb *et al.*, 2016: 106). The UN PRI, the King Reports and CRISA provide an ESG framework to

corporate role-players in South Africa (Van der Ahee & Schulschenk, 2013: 4; IoDSA, 2011: 7).

Due to the non-mandatory nature of the King Reports and CRISA, their implementation could be more efficient if it is administered by bodies with vested market interests, such as institutional investors (IoDSA, 2011: 6). Institutional investors have a fiduciary duty to act in the best interests of their beneficiaries (Hebb *et al.*, 2016: 21; Investment Leaders Group, 2014: 16). Beneficiaries might, however, question whether ESG aspects are related to financial performance benefits. Researchers have differed on whether ESG performance is associated with long-term financial performance and corporate sustainability (Van der Ahee & Schulschenk, 2013: 2).

1.2.3 Corporate financial performance

The CFP of a firm is related to its ability to create wealth by utilising its available assets (Erasmus & Van den Berg, 2011: 5). It is mainly the responsibility of management to increase and optimise a firm's financial performance, especially the value of its shareholders' wealth (Correia, Flynn, Uliana & Wormald, 2013).

In the current study, CFP was measured by employing accounting-based, market-based and value-based metrics. Accounting-based CFP measures focus on a firm's past performance (Margolis & Walsh, 2001: 6). The return on assets (ROA) and earnings per share (EPS) ratios are commonly used to measure accounting-based performance (Porter & Norton, 2016: 662). Critique against accounting-based measures include that such ratios might be manipulated by managers through changing accounting methods or accruals, it can be influenced by inflation and it may be difficult to interpret such ratios across sectors (Velnampy & Pratheepkanth, 2013: 124; Venanzi, 2012: 2).

Market-based CFP measures are typically based on the value of a company's ordinary shares. Such measures are used to reflect on expectations about future performance (Martin, Petty & Wallace, 2009: 37; Margolis & Walsh, 2001: 6). Market-based methods can be affected by exogenous factors, such as the overall share market performance. The market-based measures that were used in the study are the earnings yield (EY) and total shareholder return (TSR) ratios. The EY ratio compares the EPS to the market price per share. The TSR measure considers the dividend income and the

change in the share price over the investment horizon (Megginson, Smart & Lucey, 2008: 194).

Value-based CFP measures are often regarded as an improvement of the traditional performance measures (Erasmus, 2008: 66; Maditinos, Šević & Theriou, 2006). Such methods take the cost of capital into account in an attempt to determine a firm's potential to create value. The return on invested capital (ROIC), the spread, market value added (MVA) and cash return on invested capital (CROIC) are examples of value-based measures that can be employed to remove some of the accounting distortions that are associated with the more traditional financial performance measures (Erasmus, 2008: 66). The ROIC measure compares the net operating profit after tax (NOPAT) generated by a firm to the amount of the net operating capital (NOC) employed. The spread is utilised to consider the difference between a firm's ROIC and weighted average cost of capital (WACC). If the ROIC generated by a firm is larger than its WACC, growth is profitable and the firm is adding value (Brigham & Daves, 2010: 233). The difference between the market value of a firm's shares and the equity capital supplied by investors is referred to as the MVA. In contrast to ROIC, the CROIC measure represents the amount of free cash flow (FCF) being generated in a firm in comparison to the NOC.

In the next section, the focus is placed on prior academic research on the relationship between ESG aspects and CFP.

1.2.4 Previous studies on environmental, social and corporate governance aspects and corporate financial performance

Previous researchers reported contradictory results (ranging between positive, negative or no association) when examining the relationship between ESG aspects and several CFP measures (Ferrero-Ferrero *et al.*, 2014; Pasquini-Descomps & Sahut, 2013; Velnampy & Pratheepkanth, 2013; Balatbat *et al.*, 2012; Kocmanová & Dočekalová, 2012). Most of these studies were, however, conducted in developed countries.

Limited ESG-related research has been conducted in South Africa. The majority of local researchers focused on corporate governance aspects (Mans-Kemp, 2014; Waweru, 2014; Ntim, Opong, Danbolt & Thomas, 2012; Mangena & Chamisa, 2008;

Rossouw, Van der Watt & Malan, 2002). Mitchell (2014) considered the reporting mechanisms and disclosure of ESG aspects for a sample of JSE-listed firms. Similarly, Van der Ahee and Schulschenk (2013) and Eccles *et al.* (2007) conducted surveys to determine the consideration given to ESG aspects by local institutional investors. They reported a number of encouraging ESG-related developments as well as concerns. Herring, Firer and Viviers (2009) and Viviers, Eccles, De Jongh, Bosch and Smit (2008) also reported various challenges, drivers, barriers and enablers of RI in the country.

More recently, Chetty, Naidoo and Seetharam (2015), Marozva (2014), Mutezo (2014) and Nkomani (2013) studied the financial performances of companies that formed part of the JSE SRI Index during the 2000s. These authors considered whether a company complied as a constituent member of the JSE SRI Index, using the firm's compliance status as a proxy for SRI or CSR respectively. Given the complex nature of ESG, the usage of a one-dimensional aggregated index as a proxy for ESG is questionable. These authors did not employ ESG disclosure scores or report on the specific compliance criteria used by the JSE SRI Index.

1.3 PROBLEM STATEMENT

Sustainability-related challenges such as climate change, waste management and diversity cannot be ignored if managers aim to create sustainable businesses. Corporate leaders should therefore give greater attention to their firms' CSR and CSP initiatives and properly address sustainability concerns. As mentioned in Section 1.2, these two concepts narrowly focus on environmental and social aspects, but omit the corporate governance dimension.

Responsible investors tend to incorporate pertinent ESG aspects into investment decision-making and ownership practices (Pasquini-Descomps & Sahut, 2013). There has been a growing interest in RI, both internationally and locally. The majority of previous RI and ESG-related research initiatives were, however, conducted in developed countries (Pasquini-Descomps & Sahut, 2013; Velnampy & Pratheepkanth, 2013; Balatbat *et al.*, 2012). A lack of ESG measurement criteria and standardised ESG data resulted in limited ESG studies in the emerging market context (Van der Ahee & Schulschenk, 2013: 13).

In South Africa, progress has been made with both voluntary (CRISA and the King Reports) and regulatory ESG-related guidance since 1994. Due to the well-developed local corporate governance framework, previous researchers mainly considered the corporate governance practices of JSE-listed companies. Studies were also conducted on CSR and CSP aspects specifically related to the environmental and social aspects of sustainability. Local researchers (Chetty *et al.*, 2015; Marozva, 2014; Mutezo, 2014; Nkomani, 2013; Gladyssek & Chipeta, 2012; Demetriades, 2011) used the constituent status of companies which formed part of the JSE SRI Index as a proxy for CSR and SRI.

Previously, local researchers mainly employed accounting-based and non-risk adjusted market-based financial performance measures. The potential risk-reducing benefits that sound ESG practices could hold for emerging market firms were thus largely ignored by them.

The reason for conducting the current study was to assess the business case for ESG practices for selected listed South Africa companies from 2011 to 2016. Comprehensive ESG disclosure scores and a selection of accounting-based, market-based and value-based CFP measures were employed for this purpose.

1.4 RESEARCH OBJECTIVES AND HYPOTHESES

In the following section, details on the primary and secondary research objectives, as well as the hypotheses and research questions, are provided.

1.4.1 Primary research objective

The primary research objective was to assess the business case for ESG practices of selected listed South African companies from 2011 to 2016.

1.4.2 Secondary research objectives

To give effect to the primary research objective, the following secondary objectives were formulated:

- to conduct an in-depth review of the literature on RI, ESG and CFP;
- to select an appropriate research design and methodology;

- to collect and analyse secondary ESG and CFP data; and
- to provide valuable conclusions and recommendations to relevant stakeholders.

1.4.3 Research questions

Given the purpose of the research and the aforementioned research objectives, the following research questions were formulated:

- What is meant by RI?
- What is meant by ESG?
- How can ESG be measured?
- Which measures can be used to evaluate CFP?
- What was the trend in the ESG disclosure of the sample firms over the research period?
- What was the trend in CFP of the sample firms over the research period?
- Are there significant differences in the ESG disclosure scores of the sample firms over the entire research period?
- Are there significant differences in the ESG disclosure scores of the sample firms on an annual basis?
- Are there differences between the ESG disclosure scores of companies listed in different JSE sectors?
- Does a company's sector classification play a role when assessing the relationship between ESG and accounting-based CFP?
- Does a company's sector classification play a role when assessing the relationship between ESG and market-based CFP?
- Does a company's sector classification play a role when assessing the relationship between ESG and value-based CFP?
- Was the relationship between ESG disclosure and CFP lagged?
- Was the relationship between ESG disclosure and CFP lagged for the considered sectors?

1.4.4 Research hypotheses

Based on the primary objective, the following research hypotheses were formulated:

H_{01} : There is no relationship between the ESG disclosure scores and the accounting-based CFP of selected JSE-listed firms from 2011 to 2016.

H_{02} : There is no relationship between the ESG disclosure scores and the market-based CFP of selected JSE-listed firms from 2011 to 2016.

H_{03} : There is no relationship between the ESG disclosure scores and the value-based CFP of selected JSE-listed firms from 2011 to 2016.

In the following section, the research design and methodology are discussed.

1.5 RESEARCH DESIGN AND METHODOLOGY

Business research involves the collection, analysis and interpretation of data to reduce uncertainty and to improve corporate decision-making (Coldwell & Herbst, 2004: 2). A nine-step research process as suggested by Cant, Gerber-Nel, Nel and Kotzé (2003) was followed in the current study. This research process and the sections where the different steps were applied in the study are shown in Figure 1.1.

Research process	Step 1: Identify and formulate the research problem (see Section 1.3)
	Step 2: Determine the research objectives (see Sections 1.4.1 and 1.4.2)
	After the research problem and research objectives have been defined, decide which research type(s) is appropriate (see Sections 1.5.2 and 4.4)
	Step 3: Develop a research design (see Sections 1.5.1 and 4.3)
	Step 4: Conduct secondary research (see Sections 1.5.2 and 4.4)
	Step 5: Conduct primary research (see Sections 1.5.2 and 4.4)
	Step 6: Determine the research frame
	Specific attention should be given to the study's population and sample (See Sections 1.5.3 and 4.5)
	Step 7: Collect the data (refer to Section 4.6)
Step 8: Analyse the data (see Sections 1.6 and 4.7)	
Step 9: Report the research findings (see Chapters 5 and 6)	

Figure 1.1: The nine-step research process

Source: Adapted from Cant *et al.* (2003)

The research problem and research objectives were provided in Sections 1.3 and 1.4 respectively. The quantitative research design and the collection and processing of the data are outlined next.

1.5.1 Quantitative research design

Various research types can be employed to investigate a research problem. The current study was descriptive in nature. The researcher aimed to describe the phenomena under question, namely the ESG aspects and the CFP of selected JSE-listed companies.

Positivistic and phenomenological research paradigms are mostly considered by social scientists. The main difference between the two paradigms is the manner in which data are collected and analysed (Abou-Seada & Abdel-Kader, 2003: 50). When a positivistic approach is followed, a researcher attempts to observe relationships between different variables based on the analysis of quantitative data (Abou-Seada & Abdel-Kader, 2003: 50; Walsh & Wiggins, 2003: 21). The phenomenological approach focuses on the collection and analysis of qualitative data. Qualitative research typically entails the observation of research participants (Abou-Seada & Abdel-Kader, 2003: 50; Hale & Napier, 2013: 13). Quantitative research, on the other hand, is based on the analysis and interpretation of numerical data. For the purpose of the current study, a positivistic paradigm was adopted, which resulted in the collection and analysis of quantitative data.

1.5.2 Secondary research

Researchers can collect both secondary and primary data. Secondary data are already in existence, whereas primary data are collected by a researcher for the first time (Kothari, 2004: 95). For the purpose of the current study, no primary research was conducted. Three sets of secondary data were collected. Firstly, a literature study was conducted by examining academic journals, books and relevant websites. Secondly, the required financial data were sourced from the IRESS (2017) database. Finally, the composite ESG disclosure scores and individual environmental (E)-, social (S)- and corporate governance (G)-disclosure scores were obtained from the Bloomberg (2017) database. The Bloomberg database is a widely utilised secondary data source by the investment industry and academics.

1.5.3 Population and sample

The population consisted of all JSE-listed firms for the period 2011 to 2016. A combination of convenience and judgement sampling techniques were used to draw a sample from six JSE sectors. The convenience sampling technique was employed based on ease of collecting readily available standardised ESG and CFP data. The judgement sampling method entailed collecting data by considering specific criteria that were determined by the researcher. These criteria were as follows:

- a firm had to be listed on the JSE for at least two years (to ensure that there would be sufficient data points for statistical analysis);
- a firm's CFP data had to be available on IRESS; and
- a firm's ESG disclosure score had to be available on the Bloomberg database.

No delisted companies were considered, as Bloomberg's database did not provide ESG disclosure scores for such companies. JSE-listed firms in the Consumer Goods, Consumer Services, Health Care, Technology, Telecommunications and Industrials sectors (hereafter referred to as the 'considered' sectors) were examined. Firms listed in the Basic Materials and Financial sectors were excluded from the sample as their annual financial statements, nature of activities and level of regulation differs from those of the firms listed in the considered sectors. No companies were listed in the Utilities sector during the six-year study period.

1.5.4 Data collection

Research typically entails a process of collecting information regarding specific variables and assessing change(s) in and/or relationships between these variables (Singh, 2007: 122). A summary of the considered variables and relevant sources is provided in Table 1.2. Refer to Section 4.8 for a detailed discussion on the collection of the ESG and CFP data.

Table 1.2: Variables considered in the study

Variable	Source
Independent variable: ESG disclosure	
Composite ESG disclosure score Consisting of: an E-disclosure score; a S-disclosure score; and a G-disclosure score	Sourced from Bloomberg (2017)
Dependent variable: CFP	
Accounting-based CFP measures	
ROA	Sourced from IRESS (2017)
EPS	Sourced from IRESS (2017)
Market-based CFP measures	
EY	Sourced from IRESS (2017)
TSR	Sourced from IRESS (2017)
Value-based CFP measures	
ROIC	Sourced from IRESS (2017)
The spread (ROIC – weighted average cost of capital)	Sourced from IRESS (2017)
MVA	Sourced from IRESS (2017)
CROIC	Sourced from IRESS (2017)

Source: Researcher's own construction

1.6 DATA ANALYSIS

Data analysis entails the summation, computation and application of reasoning to understand the collected data (Zikmund & Babin, 2010: 66). Several descriptive and inferential statistics were employed to analyse the panel dataset. Descriptive statistics (the mean, median, minimum value, maximum value and standard deviation) were employed to summarise and describe the collected data.

A mixed-model analysis of variance (ANOVA) was employed to determine whether the mean composite ESG disclosure scores and individual E-, S- and G-disclosure scores differed significantly over the study period. The Fisher's least significant difference (LSD) test was used to determine whether the mean composite ESG disclosure scores, as well as the mean individual E-, S- and G-disclosure scores, differed significantly from one year to the next.

Inferential statistics were furthermore used to consider the relationship between the dependent and the independent variables. Panel regression analyses were utilised due to the panel nature of the dataset. The fixed effects and random effects regression analyses are the most commonly associated with panel data analysis (Hassett & Paavilainen-Mäntymäki, 2013: 43). To select the appropriate regression models, the *F*-test for fixed effects and the Hausman-test were considered. Sections 4.9.2.2 to 4.9.2.6 provide a detailed discussion on the regression models and the applicable tests. Panel regression analyses were conducted on the composite and individual ESG disclosure scores as the independent variables and ROA, EPS, EY, TSR, ROIC, the spread, MVA and CROIC variables as the dependent variables.

Four specification errors may occur when conducting regression analysis, namely autocorrelation, normality of errors, multicollinearity and heteroskedasticity (Das, 2012: 278). A detailed explanation of these potential errors is provided in Section 4.9.2.8. Care was taken in the current study to identify and address these potential errors.

1.7 CONTRIBUTION OF THE STUDY

As mentioned in Section 1.3, previous research in South Africa focused primarily on the relationship between CSR and CFP. A firm's status as being a constituent of the JSE SRI Index was often used as a proxy for CSR (Nkomani, 2013; Gladyssek & Chipeta, 2012, Demetriades, 2011). These authors focused on accounting-based and market-based financial performance measures. As pointed out in Section 1.2, CSR narrowly centres on environmental and social aspects. In contrast, comprehensive ESG disclosure scores provided by Bloomberg (2017) were employed for the purpose of the current study. Several accounting-based, market-based and value-based CFP measures were considered to obtain a more detailed overview of financial performance.

The study's main contribution was to address the gap in knowledge regarding the relationship between the ESG practices and the CFP of selected JSE-listed firms since the advent of integrated reporting. While the majority of previous studies were conducted in developed markets, the current study provided an emerging market perspective on the topic.

The results of the current study should enhance the understanding of ESG and the willingness of managers and directors of JSE-listed firms to implement ESG initiatives. The research findings may also be relevant to both mainstream and responsible investors. Areas for future research emanating from the current study's findings and limitations experienced during the research process are outlined in Chapter 7.

1.8 ORIENTATION OF THE STUDY

The study comprises seven chapters. A brief overview of each chapter follows next.

Chapter 1: Introduction to the study

This chapter includes a broad overview of the study. A background discussion is provided, followed by the research problem, research objectives and hypotheses. The research design and methodology are then outlined, followed by an overview of the contents of the thesis.

Chapter 2: Environmental, social and corporate governance considerations

The focus of Chapter 2 is on ESG-related aspects. This chapter commences by defining the concept of sustainability, highlighting the paradigm shift required in the way in which firms in the 21st century would need to function. A discussion is provided on the history of RI, strategies employed by responsible investors, organisations advocating RI and the development of RI indices globally. Attention is also given to local ESG-related developments.

Chapter 3: Corporate financial performance

Chapter 3 provides an explanation of financial performance objectives, such as profit maximisation, shareholder wealth maximisation, stakeholder wealth maximisation and value-based management. The evaluation of financial performance objectives by utilising selected accounting-based, market-based and value-based metrics. The advantages and disadvantages related to the discussed CFP measures are also highlighted.

Chapter 4: Research design and methodology

This chapter offers a detailed explanation of the research process that was followed. The nine steps include identifying and formulating the research problem and related objectives, developing an appropriate research design, conducting secondary and primary research, determine the research frame to collect the relevant data, analyse the data and lastly, reporting the research findings.

Chapter 5: Empirical results: Descriptive statistics

The descriptive statistics for the independent and dependent variables are reported in Chapter 5. The descriptive statistics of the composite ESG and the individual E-, S- and G-disclosure scores are discussed. The trends in the ESG disclosure of the considered sectors are outlined. Finally, trends in various CFP measures are discussed.

Chapter 6: Empirical results: Inferential statistics

Chapter 6 offers the results of the inferential statistics. The results of the mixed-model ANOVA which determined whether the mean composite ESG disclosure scores, as well as the individual E-, S- and G-disclosure scores, differed significantly over the study period is firstly presented. Secondly, the results for the panel regression analyses conducted on the composite and individual ESG disclosure scores and CFP measures are discussed. Thirdly, the results of the relationship between the individual E-, S- and G-disclosure scores and the CFP measures at a sector level are provided. Finally, the results obtained when variables were lagged for one-year are reported.

Chapter 7: Summary, conclusions and recommendations

A summary of the study is provided in the final chapter. Conclusions are drawn and recommendations are offered based on the research findings. Suggestions for future research are also provided, based on the identified limitations.

CHAPTER 2

ENVIRONMENTAL, SOCIAL AND CORPORATE GOVERNANCE CONSIDERATIONS

2.1 INTRODUCTION

“Creating a strong business and building a better world are not conflicting goals – they are both essential ingredients for long-term success.”

This quote by William Clay Ford Jr., executive chairperson of the Ford Motor Company (2011), underlines the importance for business owners, directors and investors to consider sustainability issues while building successful businesses. Managers and directors are increasingly experiencing sustainability challenges related to social and environmental issues, such as poverty, climate change and the preservation of natural resources (De Bruin, 2012: 1; Werbach, 2009: 10). The pertinent consideration of sustainability and corporate governance considerations remain a key challenge for the leaders of firms (IoDSA, 2009: 11).

The concept of RI entails the consideration of ESG aspects during ownership practices and investment decision-making (Roy & Gitman, 2012; Eccles *et al.*, 2007: 7). The four King Reports on corporate governance provide a well-developed corporate governance framework. In South Africa, focus has mainly been placed on the G component of ESG. In 2011, the publication of CRISA brought all three RI-components to the corporate foreground. The code gives guidance to institutional investors on how to effectively perform investment analysis (IoDSA, 2011: 3). The code furthermore highlights that investors require financial and ESG information to make informed investment decisions. The release of CRISA and various local regulatory and legal provisions relating to ESG aspects in South Africa provides a favourable environment to conduct ESG-related research (Van der Ahee & Schulschenk, 2013: 4; IoDSA, 2011: 7).

In this chapter, sustainability is firstly defined, including the theoretical link between CSR, CSP and RI. Thereafter, the focus shifts to RI by providing information relating to its history, prominent strategies, organisations that promote RI and the development

of RI indices both globally and locally. The local ESG context and pertinent ESG-related developments are also examined.

2.2 SUSTAINABILITY, CORPORATE SOCIAL RESPONSIBILITY AND CORPORATE SOCIAL PERFORMANCE: CLARIFICATION OF TERMS

The concept of sustainability refers to the effect of the current generation's actions on the ecosystems, societies and environments of the future (Ameer & Othman, 2012: 61). The term is often used to describe philanthropic actions of organisations to protect the environment. Environmental sustainability in isolation is, however, not adequate to manage the future of overall firm sustainability (Werbach, 2009: 9). Sustainability comprises four components, namely social (people-related), economic (profit-related), environmental (planet-related) and cultural (diversity-related) components (Werbach, 2009: 10). A sustainable organisation should aim to incorporate actions to eliminate any potential negative impact pertaining to all four these components (Eweje & Perry, 2011: 9).

The challenges faced by firms in the 21st century require a fundamental change in the way in which businesses function. Traditionally, firms and investors aimed to reach the “ultimate investment goal”, namely to maximise return given a certain level of risk (Marozva, 2014: 143). Challenges such as climate change, insufficient energy provision and the depletion of natural resources, however, also require attention, since it can have a considerable impact on the long-term sustainability of firms (Quinn & Baltes, 2007: 4). A paradigm shift is therefore needed in the way in which (some) firms and investors construct their investment portfolios.

In an attempt to address sustainability challenges, firms started to engage in CSR initiatives in the late 1990s (Nkomani, 2013: 1; Carroll & Shabana, 2010: 88). As indicated in Section 1.1, CSR can be defined as “the social responsibility of a business which encompasses the economic, legal, ethical, and discretionary philanthropic expectations that society has of organisations at a given point in time” (Carroll, 1991). Furthermore, Matten and Moon (2008) highlights that CSR consists of clearly articulated and communicated firm policies and programmes that reflect a company's

responsibility for broader societal good. Porter and Kramer (2011) argued that so-called shared value creation is possible if companies generate economic value whilst simultaneously creating value for society and addressing societal challenges. CSR initiatives include sustainability, corporate sustainability and the triple bottom line aspects.

The concept corporate sustainability acknowledges the need for profitability, but differs from the traditional profit-maximising viewpoint. Pertinent emphasis is placed on transparency pertaining to environmental, social and economic performance (Wilson, 2003: 5). Managers of companies should analyse the costs and effects of social and environmental initiatives on overall corporate profitability (Ameer & Othman, 2012: 62).

The CSR concept could be considered as a building block for CSP (Carroll, 1999). The term CSP is a comprehensive assessment of a firms' observable outcomes as it relates to socially responsible behaviour (Van der Laan, Van Ees & Van Wittelosstuijn, 2008: 300; Simpson & Kohers, 2002: 100). The key motivation for firms to engage in CSR, while improving their CSP, is to contribute to an improved society at large. The definitions for both CSR and CSP focus mainly on environmental and social considerations (Carroll & Shabana, 2010: 91). These definitions, however, omit the important aspect of corporate governance (Dahlsrud, 2008: 4).

Corporate governance can be defined as the system by which companies are directed and controlled (Rossouw *et al.*, 2002: 289; Cadbury, 1992). Globally, various corporate governance mechanisms have been introduced to mitigate agency problems. A board of directors, for example, should exercise control over management to protect shareholders' interests. The concepts of CSR and corporate governance are both concerned with how firms are managed and how the leaders of these firms could make an impact on the business environment in which they function (Breuer & Nau, 2014: 13). Both directors and managers play an important role to develop and uphold ethical and sustainable corporate practices.

In the mid-1990s, John Elkington developed the triple bottom line framework to measure an entity's sustainability and economic performance efforts. The framework incorporates social, environmental and economic performance dimensions.

Accordingly, the scope of a firm's performance was expanded beyond financial aspects (Slaper & Hall, 2011).

Responsible investors include E-, S- and G-aspects in addition to risk-and-return considerations when assessing investee firms (Marozva, 2014: 143). The inclusion of a wider range of pertinent non-financial information in addition to aspects of corporate performance, broadens the scope of investment analysis and decision-making (Pasquini-Descomps & Sahut, 2013: 1; Bassen & Kovács, 2008: 183; Eccles *et al.*, 2007: 5), as explained in the following section.

2.3 RESPONSIBLE INVESTING

In addition to risk and return considerations, responsible investors actively incorporate ESG aspects into their investment decision-making and ownership practices (Marozva, 2014: 143; Eccles *et al.*, 2007: 7). The term ESG describes the three key aspects of concern which were developed as the focal points when assessing the sustainability and ethical impact of investments in firms (De Bruin, 2012: 1). Pertinent ESG aspects can be divided into the following three broad categories (De Bruin, 2012: 1):

- Environmental factors, which focus on aspects related to, amongst others, ecosystems, climate change and renewable energy sources.
- Social factors, which concentrate on, amongst others, diversity, human rights and consumer protection.
- Corporate governance factors, which include management structures, the composition of a board of directors and risk management.

The concepts RI and CSR are closely linked. Both support the idea that although firms generate wealth from limited resources, they need to remain cognisant of the relevant legal, social and environmental frameworks in which they function. Whereas CSR focuses on wealth creation from the perspective of firms, RI considers wealth creation from the viewpoint of investors (Viviers *et al.*, 2012: 120).

RI can be distinguished from traditional investment practices in two ways. Firstly, RI requires a longer-term perspective. Responsible investors should thus aim to obtain sustainable gains over the long term. Secondly, RI requires investors to be mindful of factors other than mere financial performance (UN PRI, 2015c). The financial

community is gradually realising that topical research, analysis and evaluation of ESG aspects are fundamental when assessing the value and performance of investments over the medium to long term (UN PRI, 2015c).

Responsible investors realise that the operations of investee firms could create environmental and social externalities which are not necessarily included in the market value of their products or services (Turk *et al.*, 2013: 75). Similarly, managers are also becoming more aware that the efficient implementation of socially responsible practices could result in long-term value creation and reputation benefits (Turk *et al.*, 2013: 75).

There are various misconceptions related to the inclusion of ESG-related aspects in investment analysis and decision-making. Some investors believe that the integration of ESG aspects during investment decision-making and ownership practices would result in a high-risk investment with a low return. However, this is not necessarily the case. With RI, investors are encouraged to act as long-term shareholders and less like share traders. Active shareholders are expected to engage with investees on various ESG concerns (Eccles *et al.*, 2007: 8). The proper evaluation of a firm's ESG practices thus facilitates a better understanding of the risks and opportunities relevant to a firm (Bassen & Kovács, 2008: 184).

2.3.1 History of responsible investing

The RI discipline dates back to the early 18th century. Religious institutions, such as the Quakers, avoided investments in firms which were involved in war and slavery. The Methodists also aimed to manage their funds by using social or ethical screens based on their moral values (European Sustainable Investment Forum (Eurosif), 2012: 8; Demetriades, 2011: 9). The religious origin of RI is evident in the avoidance of so-called 'sin stocks' by socially conscious investors in the United States of America (USA), who avoid from investing in, for example, firms that manufacture tobacco and alcohol (Demetriades, 2011: 9).

RI was further emphasised by the green and peace movements of the 1960s (Giamporcaro & Pretorius, 2012: 1). Later, in the 1980s, socially responsible investors shunned South African companies during the Apartheid regime to compel the South African government to bring the regime to an end (Demetriades, 2011: 9).

In the early 1990s, local trade unions also refused to invest in firms that were supportive of Apartheid or those who practised poor labour relations (Herringer *et al.*, 2009: 12). Responsible investors in the USA and Europe supported these initiatives and pressurised firms conducting business in South Africa to redirect their business to other countries (Renneboog, Ter Horst & Zhang, 2008: 1725). The former investors furthermore avoided companies that failed to include and comply with the original Sullivan Principles formulated in 1977. One of the objectives was that firms should support economic, social and political justice in the countries where they function. Focus was placed on equality at all levels of employment across demographics (University of Minnesota, 2016). The principles have been updated in 1999. The new Global Sullivan Principles of Social Responsibility were developed to increase the active participation of firms in the advancement of human rights and social justice on a global level (Annan, 1999).

There are various strategies that can be employed by responsible investors during their investment analysis and decision-making process as discussed next.

2.3.2 Responsible investment strategies

Several RI approaches have been developed over time. These approaches centre on ESG aspects, while taking other sustainability-related themes into account (Eccles *et al.*, 2007: 7). Responsible investors mainly consider three strategies when selecting investee firms, namely screening, shareholder activism and impact investing (Viviers, Bosch, Smit & Buijs, 2008: 39).

The first strategy encompasses positive and negative screening. Negative (exclusionary) screening occurs when investors refrain from investing in firms that produce 'undesirable' or 'controversial' products and/or services or firms that conduct business in certain countries or industries (Eurosif, 2014: 14). Firms that are typically excluded are those involved with the sale and production of alcohol, tobacco, weapons, pornography and nuclear energy (Viviers, 2007: 4; Sethi, 2005: 101). Exclusionary screening is the oldest RI strategy employed by investors wishing to integrate religious beliefs into their investment decisions (Viviers, 2007: 4). Positive screening involves the inclusion of investee firms that investors believe are good corporate citizens that meet a range of ESG criteria (Giamporcaro & Pretorius, 2012: 9; Viviers, 2007: 5).

Positive screens usually centre on a public concern, a medium to long-term time horizon, and selected qualitative objectives which are not easily expressed in monetary terms (Viviers, Bosch, Smit & Buijs, 2009: 6).

The second strategy that investors typically use when selecting investee firms, is shareholder activism. Shareholder activism, also known as active engagement, entails that investors communicate with boards on pertinent ESG aspects (Viviers, Ractliffe & Hand, 2011: 221). Engagement can be done through direct dialogue, by filing resolutions, exercising voting rights or divesting from firms (Viviers *et al.*, 2009: 7). Active investors exercise their voting rights with the aim of influencing investee firms' behaviour relating to ESG aspects over the long term (Eurosif, 2012: 10; Viviers *et al.*, 2011: 221).

The shareholder activism strategy has two shortcomings. Firstly, majority shareholders typically have more influence on companies than minority shareholders. The support of institutional investors is therefore important to efficiently achieve the desired outcome of encouraging firms to consider ESG aspects in their policies and practices. Secondly, it is often very time-consuming and resource-intensive to analyse a firm's activities and annual reports before filing shareholder resolutions and discussing concerns with managers (Viviers *et al.*, 2009: 7).

If the third strategy, namely an impact investment strategy is employed, an investor supports a particular ESG cause by financing it (Viviers, 2007: 87). Impact investments often have a considerable and visible impact on the economy, specifically related to employment and infrastructure development (Viviers, 2007: 87). These investments are usually project-specific and differ from philanthropic investments, given that investors maintain ownership of the asset while expecting a positive financial return (Eurosif, 2012: 10). Impact investment strategies in South Africa are generally aimed at improving the living standard of previously disadvantaged communities (Giamporcaro & Pretorius, 2012: 9; Viviers, 2007: 87). Although the need for enhanced impact investing exists in the country, institutional investors are sometimes reluctant to invest, due to a lack of feasible options and the illiquidity and long-term nature of such investments (Viviers *et al.*, 2009: 8).

Eurosif identified seven RI approaches, namely exclusion of holdings from the investment universe (negative screening), engagement and voting on sustainability matters, impact investing, sustainability-themed investment, best-in-class investment, norms-based screening and the integration of ESG factors into financial analysis (Eurosif, 2014: 8). These approaches are used by investors who wish to incorporate responsibility and sustainability considerations into their investment decision-making (Eurosif, 2012: 10).

The sustainability-themed investment approach entails investing in firms related to a range of identified themes, such as green energy and water purification. Responsible investors will typically consider investee firms that aim to make their consumption and production processes more sustainable (Eurosif, 2014: 11). The best-in-class approach entails that possible investee firms with superior ESG performance across different sectors should be identified (Eurosif, 2014: 11; Corporate Analysis Enhanced Responsibility, 2011: 8).

The norms-based screening strategy can be employed to assess investee firms according to specific ESG and performance standards. These standards are based on norms set by international organisations such as the Organisation for Economic Cooperation and Development (OECD) and the United Nations Global Compact. Investors could decide which standards to use or design their own standards based on international initiatives. Investors can either engage with investee firms that do not act in line with these norms, or exclude such firms from their portfolios (Eurosif, 2014: 12).

The ESG integration approach entails the explicit incorporation of risks and opportunities into traditional investment analysis and decisions (Eurosif, 2014: 17). This strategy involves the consideration and inclusion of ESG aspects, while simultaneously considering financial factors that are likely to affect investment decisions (Eurosif, 2012: 10). In addition to Eurosif, various international and local institutions promote RI.

2.3.3 Organisations advocating responsible investing

Several international organisations encourage sustainable practices and transparent ESG and financial disclosure to provide investors with sufficient information to make informed investment decisions. These organisations include the Global Reporting

Initiative (GRI), the International Integrated Reporting Council (IIRC), the IRC of South Africa, the United Nations and the International Corporate Governance Network (ICGN).

2.3.3.1 Global Reporting Initiative

The GRI is an independent organisation that was established to assist firms, governments and other organisations to better understand and disclose the impact of their pertinent sustainability-related initiatives (GRI, 2015). This organisation pioneered the development of a sustainability-reporting framework in the late 1990s. Before the release of the first GRI guidelines in 2000, no widely accepted standardised framework existed that firms could use to guide them when disclosing non-financial information (IoDSA, 2002). As a result, firms' reporting on economic, environmental and social considerations differed considerably. This tendency resulted in inconsistencies and a lack of transparency, specifically in terms of reporting on non-financial matters. Investors thus experienced difficulty to compare investee companies, based on these companies' non-financial (sustainability-related) disclosure (IoDSA, 2002).

The GRI guidelines are referenced in the King II Report. These guidelines promote a common framework for reporting on non-financial aspects, thereby improving transparency and allowing meaningful comparisons of firms (IoDSA, 2002). Since the initial publication of the GRI guidelines, considerable changes have occurred in the global corporate arena. Enhanced focus is placed on sustainability globally. As such, the majority of organisations worldwide are encouraged or, in some cases enforced, to report on their sustainability-related activities and concerns (GRI, 2015).

The initiative provides the most widely used standards for sustainability reporting and disclosure (GRI, 2015). The GRI has established regional hubs across continents to improve sustainability reporting. The African continent's hub is located in Johannesburg and serves countries such as South Africa, Nigeria, Ghana, Kenya and Mauritius (GRI, 2015).

In May 2013, the GRI launched the so-called G4 guidelines, which is the fourth update of the guidelines. By implementing the guidelines, firms are encouraged to disclose their most critical impacts on the environment, society and economy. The guidelines are applicable to all sizes and forms of organisations operating in different sectors

(GRI, 2018a). Since October 2016, the G4 guidelines have been superseded by the GRI standards. The standards represent global best practice in sustainability reporting and encourage credible non-financial reporting by firms (GRI, 2018b).

2.3.3.2 *International Integrated Reporting Council*

As the number of firms that acknowledge and include sustainability practices in their business activities increase globally, corporate role players require guidance on how to properly disclose this information to investors and other stakeholders. In 2009, the King III Report recommended that JSE-listed firms should publish integrated reports. Such a report should include details regarding a firm's financial and non-financial (ESG) performance (IRC of South Africa, 2015). The King III Report thus established the benchmark for transparent integrated reporting in Africa (Rea, 2012: 4). Since 2011, all JSE-listed companies should publish annual integrated reports (Zerbst, 2011). These reports are a combination of the traditional annual reports, that focused mainly on financial performance, and sustainability reports.

Integrated reporting guidance is offered by both the IIRC and its local counterpart (IRC of South Africa, 2018). The IIRC is an alliance consisting of regulators, firms, investors, non-governmental organisations (NGOs) and accounting professionals (IIRC, 2013: 1). This alliance aims to promote communication related to sustainable value creation (IIRC, 2015). The term sustainable value creation refers to a firm's ability to receive the highest possible economic benefit from the environment in which it functions, while establishing a competitive advantage (IIRC, 2015). The IIRC furthermore encourages firms to align their allocation of capital and corporate behaviour to broader goals such as financial stability and sustainable development (IIRC, 2015). In March 2014, the IRC of South Africa endorsed the International Framework released by the IIRC. The framework offers guiding principles for the preparation and presentation of an integrated report. The framework identifies 18 requirements that must be included in an integrated report. The local IRC assists JSE-listed firms by offering best-practice guidance when preparing their integrated reports (IRC of South Africa, 2018).

2.3.3.3 *United Nations Principles for Responsible Investment*

The UN PRI is a global network of investors who work together to put into practice defined principles for responsible investing. These principles were developed by a

global group of institutional investors (UN PRI, 2016a). Such investors have the fiduciary duty to act in the long-term best interest of their beneficiaries. The UN PRI signatories publicly demonstrate their commitment to responsible investing. They furthermore commit themselves to cooperate with and learn from their fellow signatories (UN PRI, 2016a).

The UN PRI aims to assist organisations to understand sustainability consequences for investors. The initiative furthermore provides support to signatories to include these aspects in their decision-making and ownership practices (UN PRI, 2016a; Girdwood, 2013: 9). Organisations can employ the UN PRI's principles according to their own discretion. The principles show that ESG aspects could affect corporate performance and therefore signatories should give pertinent consideration to these principles (De Bruin, 2012: 1).

The UN PRI plays a leading role in the promotion of RI globally and in South Africa (Viviers *et al.*, 2012: 122). For instance, in October 2017, there were 1 853 PRI global signatories, which consisted of asset owners (365), investment managers (1 253) and professional service partners (235). At the time, South African signatories constituted eight asset owners, 35 investment managers and nine professional service partners (UN PRI, 2017).

The UN PRI promotes six principles to assist signatories in aligning their decision-making and ownership practices with the broader objectives of society (UN PRI, 2016a). These six principles and examples of possible ways to apply them are provided in Table 2.1.

Table 2.1: The six UN PRI principles

	Principles for signatories	Possible actions
1.	We will include ESG issues in our investment analysis and decision-making processes.	Promoting ESG training for investment professionals; encouraging ESG-themed research; assessing the capacity of both internal and external investment managers on the inclusion of ESG aspects; and supporting the expansion of ESG-related mechanisms, metrics and analyses.
2.	We will be active owners and incorporate ESG issues into our ownership policies and practices.	Developing an engagement capability; interacting with firms on ESG aspects and requesting investment managers to provide feedback; participating in cooperative engagement initiatives; submitting shareholder resolutions in line with long-term ESG aspects; developing and disclosing an active ownership policy; and exercising voting rights or monitoring compliance with voting policy.
3.	We will seek appropriate disclosure on ESG issues by the entities in which we invest.	Requesting standardised reporting on ESG aspects; soliciting that ESG aspects are incorporated in annual financial reports; requesting ESG-related information from firms; and supporting shareholder initiatives and decisions taken which encourage ESG disclosure.
4.	We will promote acceptance and implementation of the principles in the investment industry.	Including the extent to which the principles have been incorporated in requests for proposals; revealing a long-term perspective by aligning investment mandates, monitoring processes, performance indicators and incentive structures where appropriate; ensuring that investment service providers are aware of ESG expectations; reviewing service providers who fail to meet ESG expectations; supporting the establishment of tools to determine best practice in terms of ESG integration; and supporting the regulatory or policy developments which enable the implementation of the principles.
5.	We will work together to enhance our effectiveness in implementing the principles.	Jointly addressing relevant emerging issues; developing or supporting suitable cooperative initiatives; and supporting or engaging in networks and information-sharing mechanisms to sharing tools; and combining resources and utilising investor reporting as a method of building capacity.
6.	We will report on our activities and progress towards implementing the principles.	Disclosing the extent of integration of ESG aspects with investment activities; reporting on active ownership practices; disclosing the requirements from service providers in respect of the principles; determining the influence of the principles; communicating with beneficiaries about ESG aspects and the principles; disclosing the improvements related to the principles while following the 'comply-or-explain' approach and using disclosure as a means to raise awareness among stakeholders.

Source: Researcher's own construction based on the UN PRI (2016a)

2.3.3.4 International Corporate Governance Network

The ICGN is an investor-led organisation that was established in 1995 to promote effective standards of corporate governance and investor stewardship. Participants are guided by the ICGN Global Governance Principles and Global Stewardship Principles (ICGN, 2018a). These principles provide a framework to implement stewardship practices in achieving an investor's fiduciary responsibilities. According to the ICGN, stewardship relates to the preservation and enhancement of long-term value as part

of a RI approach. The seven global stewardship principles are as follows (ICGN, 2018b):

1. Internal governance: foundations of effective stewardship.
2. Developing and implementing stewardship policies.
3. Monitoring and assessing investee firms.
4. Engaging firms and investor collaboration.
5. Exercising voting rights.
6. Promoting long-term value creation and integration of ESG factors.
7. Enhancing transparency, disclosure and reporting.

These principles offer a basic framework of key stewardship responsibilities and were drafted for application in both developed or developing markets (ICGN, 2018b). Principle six specifically mentions the integration of material ESG factors, highlighting that investors should encourage long-term value creation. The ICGN mentions that investors should consider ways to examine, monitor, evaluate and integrate ESG risks and opportunities into their monitoring, voting and engagement practices (ICGN, 2018b).

The increased interest in RI resulting from these organisations and initiatives has paved the way for the introduction of RI indices by stock exchanges globally and in the local context (Marozva, 2014: 143).

2.3.4 Development of responsible investing indices

Various RI indices have been established globally to offer investors the opportunity to trade shares of firms that are regarded as socially responsible. As indicated in Table 2.2, examples of such indices include the Financial Times Stock Exchange (FTSE) 4Good Indices, Morgan Stanley Capital International (MSCI) Global SRI Index and the Dow Jones Sustainability Index.

Table 2.2: Global responsible investing indices

Index	Sub-Index
FTSE4Good Index Series	FTSE4Good Global 100
	FTSE4Good UK 50
	FTSE4Good US 100
	FTSE4Good Europe 50
	FTSE4Good Australia 30
	FTSE4Good Japan Benchmark
FTSE4Good Environmental Leaders Europe 40 Index	No sub-indices
FTSE4Good IBEX	
FTSE4Good Global Minimum Variance Index	
FTSE4Good Bursa Malaysia Index	
MSCI Global SRI Index	MSCI KLD 400
	MSCI Global Sustainability Index
	MSCI Global ex Controversial Weapons Index
	MSCI Global Environmental Indexes
	Barclays MSCI ESG Fixed Income Index
	Custom MSCI ESG Index
Dow Jones Sustainability Index	No sub-index

Source: Researcher's own construction based on FTSE (2015), MSCI (2015b) and RobecoSAM (2015)

The FTSE4Good Index Series was created to measure the performance of firms that exhibit excellent ESG practices. The clearly defined ESG criteria of the index series can be used by market participants for investment analysis and decision-making purposes (FTSE, 2015). The six constituent benchmark indices can be employed to keep track of investments, financial instruments or fund products with an RI-focus. The indices cover the global and European regions, the USA, Japan, UK and Australia (FTSE, 2016). The series can furthermore be employed as a research tool to identify environmentally and socially responsible firms, as a standard to assess firms' progress and achievement and as a benchmarking tool (FTSE, 2015). Other ESG-focused FTSE indices include the FTSE4Good Environmental Leaders Europe 40 Index, the FTSE4Good IBEX Index, the FTSE4Good Global Minimum Variance Index and the FTSE4Good Bursa Malaysia Index.

The MSCI KLD 400 Social Index, previously known as the Domini 400 Social Index, was created in May 1990. The index was one of the first SRI indices launched. It is a weighted index of 400 securities from the USA. This index provides a list of ESG scores for selected companies, excluding those that have a negative social and environmental impact (MSCI, 2015a).

The MSCI KLD 400 Social Index forms part of the MSCI Global SRI Index, one of six MSCI ESG indices (MSCI, 2015b). The MSCI ESG indices offer investors the opportunity to choose which index best suits their specific needs. In 1999, the Dow Jones Sustainability Index (DJSI) was launched as the first international sustainability benchmark. This index, which sets global, country-specific and regional standards, acts as a benchmark for investors who aim to incorporate sustainability aspects into their portfolios. The DJSI also provides an active engagement platform for firms that want to embrace sustainable best practices (RobecoSAM, 2015).

Sustainability indices provide assurance to investors that the included companies are continuously monitored, screened and assessed according to certain ESG criteria (Gladyssek & Chipeta, 2012: 430). South Africa has followed international trends and established the JSE SRI Index in May 2004 (Gladyssek & Chipeta, 2012: 429). This index is the first of its kind in the emerging market context. The key objectives of the index are as follows (JSE, 2014a: 2):

- to identify listed firms that are integrating the triple bottom line principles and good corporate governance into their operations;
- to be used as a holistic assessment tool of a firm's policies and practices against global and local corporate responsibility principles;
- to act as a RI facilitation tool for investors aiming to include non-financial risk criteria during investment decision-making; and
- to contribute to the overall expansion of responsible business practices in South Africa.

The index was based on the triple bottom line (environmental, social and economic) performance principles, with good corporate governance underpinning each aspect. Furthermore, the index offers standardisation with international best-practice criteria and a yearly review of constituent firms' policies, performance and disclosure (JSE, 2014a: 2).

In November 2014, the index had 82 constituents and eight best performers. These performers, of which 50 per cent were mining companies, formed part of the Top 40 and Mid-cap indices (JSE, 2014b). This percentage reiterates the observation made by Gray and Niklasson (2013) that South African mining firms are increasingly

considering ESG aspects, motivated by the premise that it can have positive financial implications.

The inclusion criteria are continuously evolving to be closely aligned with international benchmarks, while remaining cognisant of local developments (JSE, 2014b). In June 2015, the JSE announced its partnership with the global index provider FTSE Russell, and launched the FTSE/JSE Responsible Investment Index Series. The JSE's ESG disclosure indicators and data collection methods were therefore aligned with the FTSE Russell approach. As a result, JSE-listed firms will form part of a network of international corporations whose disclosure practices are assessed against advanced ESG criteria. The partnership provides investors with more opportunities to integrate ESG considerations into their investment analysis (JSE, 2015).

Although all firms that are listed on the JSE are required to prepare integrated reports, many (responsible) investors still experience difficulty to obtain sufficient ESG information from these reports (Viviers *et al.*, 2012: 120).

2.4 ENVIRONMENTAL, SOCIAL AND CORPORATE GOVERNANCE IN SOUTH AFRICA

South African investors have been slow to engage with the boards of investee firms on ESG aspects. However, local investors are gradually starting to acknowledge and integrate ESG aspects into their investment activities and decision-making (Bertrand, 2011a: 1). Considerable development is foreseen for shareholder activism in future (Herringer *et al.*, 2009: 13).

The local investor community, particularly institutional investors, has considerable capacity to influence and encourage investee firms to take ESG aspects into account (De Bruin, 2012: 2). If RI is actively pursued by local investors, positive contributions can be made to socio-economic development in South Africa (Viviers, Eccles, De Jongh, Bosch, Smit & Buijs, 2009: 13). Many investors, however, still question the justification and effectiveness of RI.

The increased interest in firms' ESG considerations stems particularly from the institutional investor community. Given that South Africa is one of Africa's largest institutional investment markets, institutional investors play a critical role in influencing

local corporate behaviour. They can encourage positive (ESG-related) reforms in the investment sector (Marozva, 2014: 145).

A prominent environmental concern for organisations globally and locally is climate change (Herringer *et al.*, 2009: 13; Bassen & Kovács, 2008: 185). An improved understanding of climate change might enable firms to address the effects thereof more efficiently. Climate change will most likely have an even larger effect on firms' operations, revenues and costs in future than what is currently the case (Girdwood, 2013: 11). In the South African context, a lack of water, the destruction of natural habitats, overfishing, the introduction of exotic species and pollution have been highlighted as the severest environmental issues. As such, these aspects should be taken into account as part of investors' environmental screening criteria (Hebb *et al.*, 2016: 109).

Pertaining to social considerations, South Africa differs substantially from developed economies. Prominent social concerns in the country include unemployment, HIV/AIDS, poverty, crime and insufficient security (Hebb *et al.*, 2016: 109). Furthermore, the country has a legacy of social injustices that have hampered its socio-economic development (Herringer *et al.*, 2009: 17). Regulatory measures such as the Employment Equity Act (No. 55 of 1998) and the Broad-based Black Economic Empowerment (B-BBEE) Act (No. 53 of 2003) have aimed to address the inequalities brought about by the Apartheid system. Furthermore, the increasing number of individuals living with HIV/AIDS still places enormous pressure on the country's social and economic development. HIV/AIDS results in both indirect expenditures (because of increased absenteeism from work and decreased productivity) and direct expenditure in firms (such as increased healthcare and awareness training costs). Local companies should therefore be encouraged to implement initiatives such as HIV/AIDS-related policies, counselling and awareness training (Hebb *et al.*, 2016: 100).

With regard to corporate governance issues, South Africa has a well-developed framework for corporate governance provided by the King Reports. These reports were written from the perspective of the board as the central point of corporate governance. Corporate governance is often regarded as the first level of integration of ESG practices by the local investor community (World Federation of Exchanges, 2010: 2).

2.4.1 King Reports on corporate governance

South Africa pioneered amongst emerging countries with the first report on corporate governance that was published in 1994 by the IoDSA (IoDSA, 1994). The release of the first King Report marked the institutionalisation of corporate governance in the country (De Bruin, 2012: 1). This report furthermore created public awareness regarding sound corporate governance compliance practices (Malherbe & Segal, 2001: 59). Standards of acceptable conduct were provided to the boards of listed firms. Such standards related to the composition of the board and the role and function of board members (Malherbe & Segal, 2001: 59).

The first King report adopted an inclusive approach to corporate governance. The inclusive approach entailed that firms should consider both the shareholders and the broader community when carrying out its activities (Mans-Kemp, Erasmus & Viviers, 2012: 4). Global corporate governance developments necessitated the revision of the first King report (West, 2009: 12; Rossouw *et al.*, 2002: 298).

Consequently, the King II Report was released in 2002. This report focused on aspects such as boards and directors; accounting and auditing; internal auditing; control and risk management; and compliance and enforcement (West, 2008: 12; IoDSA, 2002). The King II Report also provided guidelines to the corporate role players of South African firms related to corporate governance disclosure practices (Cliffe Dekker Attorneys, 2002: 14). Attention was given to sustainability reporting by focusing on the disclosure of triple bottom line (economic, social and environmental) performance aspects (Gstraunthaler, 2010: 148; Cliffe Dekker Attorneys, 2002: 14). The compliance of JSE-listed companies with both the first and second King Reports was voluntary. However, locally listed firms were obliged as part of the JSE listing requirements to disclose the extent of their compliance or non-compliance. Reasons had to be given in the case of non-compliance (Mangena & Chamisa, 2008: 31).

The new Companies Act (No. 71 of 2008) and changes in global corporate governance trends necessitated the revision of the King II Report (IoDSA, 2009). As a result, the King III Report was launched in 2009 and became effective in March 2010. This report centred on leadership, integrated sustainability reporting and corporate citizenship (Hendrikse & Hendrikse, 2012: 101). In contrast to the first two King Reports, the King

III Report was based on an 'apply-or-explain' approach. JSE-listed firms should accordingly focus on how the King III Report guidelines could be applied in practice. This compliance would be strengthened if institutional investors monitored its implementation (IoDSA, 2009). The King III Report also highlighted the need for firms to provide integrated reports. In addition to financial performance, aspects related to strategy, risk and sustainability should also be presented in an integrated manner in such a report (IoDSA, 2009: 11).

The fundamental changes that characterised the 21st century for both companies and society resulted in the drafting of the King IV Report. The main theme of this report centres on value creation in a sustainable manner (IoDSA, 2016: 3). Key concepts include ethical leadership, the organisation in society, sustainable development, corporate citizenship, stakeholder inclusivity, integrated thinking and integrated reporting (IoDSA, 2016: 4).

In contrast to its predecessor, the King IV Report adopts an 'apply-and-explain' approach. Moreover, the report contains only 17 basic principles in comparison to the 75 principles of its predecessor. One of these principles specifically applies to institutional investors. The King IV Report also highlights the need for firms to move from siloed reporting to integrated reporting. It further emphasises that although reporting on sustainability is important, this type of reporting on its own remains insufficient. Resources used by firms are interconnected and it is imperative that a firm's reporting should reflect this interconnectedness. Firms are therefore encouraged to publish integrated reports in which the six capitals of their business model are clearly stipulated. The six capitals are financial, manufacturing, human, intellectual, natural and social and relationship capital (IoDSA, 2016: 5).

After the publication of the King III Report, in 2011 a recommendation was made that a separate report should be released, focussing on the expectations of institutional investors (IoDSA, 2011: 7).

2.4.2 Code for Responsible Investing in South Africa

As explained in Section 1.2.2, CRISA was released in 2011 to guide institutional investors on how to effectively perform investment analysis and activities and to encourage good governance in firms. CRISA, along with the King Reports, aim to

encourage corporate best practices in ESG-related aspects. As such, CRISA forms part of an effective local governance framework (IoDSA, 2011: 8).

The five main principles of the code entail that (IoDSA, 2011: 3):

- an institutional investor should include sustainability considerations (inclusive of ESG) in their investment analysis and activities;
- an institutional investor should indicate their acceptance of ownership responsibilities in their investment arrangements and activities;
- where applicable, institutional investors should consider a cooperative approach to encourage the acceptance and implementation of CRISA principles and other applicable codes and standards;
- institutional investors should identify the circumstances and relationships that hold potential for conflict of interest and should proactively manage such conflict should it occur; and
- institutional investors should be transparent about the content and implementation of their investment policies. They should also disclose how CRISA is applied to enable stakeholders to make informed decisions.

The code emphasises the role of institutional investors in the investment community, given their considerable share ownership and rights. Institutional investors have a strategic ability to influence investee firms to improve their ESG practices (IoDSA, 2011: 6). CRISA highlights that it is no longer appropriate for institutional investors to narrowly focus on the monetary benefits to beneficiaries. Attention should also be given to ESG aspects which could have an impact on long-term sustainability and value creation (IoDSA, 2011: 7).

CRISA applies to institutional investors (such as pension funds and insurance companies) as well as asset owners and service providers of institutional investors (e.g. asset and fund managers) (IoDSA, 2011: 3). The code's recommendations could be adopted by institutional investors and service providers on an 'apply-or-explain' basis. Institutional investors should therefore publicly disclose the extent of their application of the recommendations at least once a year (Bertrand, 2011a: 2). In the event that the code's recommendations are not applied, reasons should be given (Bertrand, 2011a: 2).

The guidelines provided by the UN PRI, the King IV Report and CRISA offer a comprehensive ESG framework to the local investment community. As a result, South Africa provides a conducive environment to conduct ESG-related research (Van der Ahee & Schulschenk, 2013: 4; IoDSA, 2011: 7).

Alongside CRISA, other legislation in the country has been promulgated and/or amended to increase the awareness and participation of investors in RI. Such legislation includes the B-BBEE Act (No. 53 of 2003) and the amendment to Regulation 28 of the Pension Funds Act (No. 24 of 1956).

2.4.3 Enabling legislation and regulation in South Africa

More stringent regulation can serve as a driver of local RI (Viviers *et al.*, 2008). As indicated in Table 2.3, there are various local regulatory and legal provisions pertaining to ESG aspects (Hebb *et al.*, 2016: 106).

Table 2.3: Legal provisions regarding ESG considerations in South Africa

Environmental aspects	Social considerations	Corporate governance
<ul style="list-style-type: none"> • National Environmental Management Act (1998) • Environmental Conservation Act (1989) • National Water Act (1998) • National Environmental Management: Protected Areas Act (2003) • Air Quality Act (2004) 	<ul style="list-style-type: none"> • B-BBEE Act (2003) • Skills Development Act (1998) • Housing Protection Measures Act (1998) • Unemployment Insurance Act (2001) • Basic Conditions of Employment Act (1997) • Promotion of Equality and Prevention of Unfair Discrimination Act (2000) • Pension Funds Act (1956) 	<ul style="list-style-type: none"> • Companies Act (2008) • National Credit Act (2005) • Insider Trading Act (1998)

Source: Hebb *et al.* (2016)

Since the first democratic election was held in 1994, the South African government has been given a clear mandate to address the inequalities of the past. The B-BBEE strategy was published in 2003 as a forerunner to the B-BBEE Act (No. 53 of 2003). The main objective of the B-BBEE Act was to enhance the participation of black people in the country's economy (Department of Trade and Industry, 2015). The act places strong emphasis on social transformation in the ownership and organisational structures of firms (Wolmarans, 2012: 4975).

The proclamation of the B-BBEE Act (No. 53 of 2003) and the related sector charters, including the Financial Sector Code and scorecards have been promoters of RI in

South Africa (Herringer *et al.*, 2009: 15; Viviers, 2007: 167). The Financial Sector Code was prepared following the publication of the Act. The code, which was introduced in 2003, binds its signatories (including South African banks, insurance firms and pension funds) to mobilise substantial resources for impact investments (Viviers, 2007: 167). Signatories commit themselves to actively encourage a transformed and globally competitive financial sector that reflects the demographics of South Africa. Furthermore, signatories agree to contribute to the establishment of an equitable society by providing accessible financial services to black people (Financial Sector Charter Council, 2016).

The interest in RI mainly stems from the institutional investor domain (Hassel & Semenova, 2013: 4; Pasquini-Descomps & Sahut, 2013: 1; The Forum for Sustainable and Responsible Investing, 2013: 7). Institutional investors, which include pension funds, insurance firms and religious organisations, are tasked with the role of managing funds on behalf of clients (Viviers *et al.*, 2012: 120). Institutional investors have the fiduciary duty to act in the best interests of their principals (clients) by performing investment activities which are in line with their fund mandates (Viviers *et al.*, 2012: 120). The role of institutional investors as involved shareholders and change agents cannot be over-emphasised given the size of their investment portfolios globally (Viviers *et al.*, 2012: 120). Pension funds can be a major RI force, since they hold large equity positions in public firms (Sethi, 2005: 100). As such, they can influence the corporate conduct of their investee companies (Sethi, 2005: 114).

The largest pension fund in South Africa is the Government Employees Pension Fund (GEPF). The GEPF had more than 1.2 million active members in 2015 (GEPF, 2015). Furthermore, the pension fund managed assets worth over R1 trillion as at 31 March 2014 (GEPF, 2014: 13). It has significant holdings in government bonds, corporate bonds, equity (listed and unlisted) and property (GEPF, 2013: 78). The Public Investment Corporation (PIC), a signatory of the UN PRI, is one of the largest investment managers in Africa and invests on behalf of the GEPF and various other public sector entities (PIC, 2018). The GEPF was also one of the founding signatories of the UN PRI in 2006, and played a leading role in the development of CRISA (GEPF, 2013: 78).

In 2010, the GEPF published a document consisting of investment policy guidelines for responsible investing (GEPF, 2013: 78). The aim was to address issues such as the inclusion of ESG aspects in investment decisions; displaying active ownership; dedicating a part of the GEPF's assets towards impact investing; encouraging ESG-related research; and ensuring the transparent and accountable application of the GEPF RI Policy (Bertrand, 2011b: 8).

According to Viviers *et al.* (2008), amendments to pension fund legislation can be regarded as one of the most important drivers of RI globally. Such amendments can take two forms, namely requirements in terms of policy disclosure or asset allocation prescriptions (Viviers *et al.*, 2008: 39). The revised Regulation 28 of the Pension Funds Act (No. 24 of 1956) requires a retirement fund to provide an investment policy statement which should be revised annually (Moyo, 2011).

The revised Regulation 28 that came into effect in March 2011 clearly states that prudent investing should take into account all factors that could significantly affect an investment, including ESG aspects (Viviers & Firer, 2013: 219; Girdwood, 2013: 7). Pension funds' investment policies should furthermore describe their approach regarding the incorporation and disclosure of ESG aspects (Bertrand, 2011a: 1).

Research indicated that the revision of Regulation 28 resulted in an increased interest in RI in South Africa. More local institutional investors started to integrate ESG aspects into their policies than before the revision (Girdwood, 2013: 7).

2.4.4 Enablers, drivers and barriers impacting responsible investing in South Africa

Various enablers, drivers and barriers can have an impact on RI in South Africa. Enablers include mainstream RI benchmarks. The development of suitable benchmarks that stakeholders can employ to evaluate RI performance is an important driver of RI. The development of SRI indices resulted in improved awareness of RI globally. These indices provide a valuable framework to track and benchmark the RI performance of listed firms (Viviers *et al.*, 2008: 40).

The shortage of both expertise and skills among investment analysts and asset managers, particularly relating to impact investing, can be addressed by introducing

concentrated RI training programmes (Herringer *et al.*, 2009: 16; Viviers *et al.*, 2009: 12; Viviers *et al.*, 2008: 40). Training can therefore act as an enabler of local RI.

Prominent drivers of RI are, amongst others, investment risk reduction and the alignment of a firm's mission and values with RI principles. ESG aspects can pose various risks which in turn can affect the financial performance of firms, if it is not effectively managed (Van der Ahee & Schulschenk, 2013: 2; Viviers *et al.*, 2012: 124; Viviers *et al.*, 2008: 39). RI has been acknowledged as an approach that can be implemented to manage these ESG risks effectively (Viviers *et al.*, 2008: 39). ESG indicators can be used to assess the competencies of a firm's management and the successful implementation of risk management mechanisms (Galbreath, 2012: 2). Furthermore, if a firm's values and mission statements include the concept of sustainability, it is likely to influence investment decision-making to encourage RI (Viviers *et al.*, 2008: 39).

In 2007, Eccles *et al.* conducted a survey-based study to determine the state of RI in South Africa. The survey was aimed at pension funds, asset managers and investment advisory service providers. The general awareness of RI among participants varied considerably, ranging from 53 per cent for pension funds, 79 per cent for asset managers to 82 per cent for advisory service providers. Participants were questioned on the importance of selected ESG aspects including corporate governance, climate change, sustainability and employee relations. Sixty-nine per cent of pension funds noted that corporate governance was the most important ESG consideration. This finding could be partly attributed to the publication time of the survey results after the recommendations of the King II Report were published and global corporate scandals such as WorldCom occurred (Eccles *et al.*, 2007: 16).

Participants in Eccles *et al.*'s (2007) study regarded climate change as the largest "somewhat important" ESG consideration. This finding is ironic, given the negative impact of climate change experienced globally. According to the GEPF, climate change and the scarcity of water require urgent attention by firms in South Africa (Girdwood, 2013: 12). The asset managers and investment advisory service providers that partook in the Eccles *et al.* (2007) study were of the opinion that infrastructure development was the most important ESG aspect. Social aspects that were highlighted included B-

BBEE and gender empowerment issues. These concerns remain important in the South African context, given the country's political history.

Eccles *et al.* (2007) noted that pension funds and retail investors (typical clients of institutional investors) gave minimal consideration to RI aspects. When the study was conducted in 2007, asset managers reported that they had believed that the short-term (three years) demand for ESG inclusion was likely to increase, especially from institutional investors.

In a more recent study conducted by Van der Ahee and Schulschenk (2013) on the state of RI in South Africa, 84 per cent of the considered institutional investors indicated that ESG aspects influenced their investment decision-making. Participants suggested that the main incentives for the disclosure of ESG aspects by listed companies was the perceived positive impact thereof on their corporate reputation and the potential of increased financial return (Van der Ahee & Schulschenk, 2013: 6).

CRISA and the UN PRI were also noted in Van der Ahee and Schulschenk's (2013) study as influential drivers pertaining to the consideration and inclusion of ESG aspects by investee companies. Some institutional investors, however, disregard ESG aspects due to the absence of adequate measurement tools. The qualitative nature of ESG aspects makes it challenging to depict ESG performance in numerical terms (Van der Ahee & Schulschenk, 2013: 7; 13).

Although there are still considerable barriers to RI and ESG in South Africa, there are also encouraging developments, such as the establishment of the JSE SRI Index, CRISA and the amendments to Regulation 28 of the Pension Funds Act (No. 24 of 1956).

2.5 CONCLUSION

Various sustainability concerns, such as climate change and water scarcity have been highlighted in recent years (De Bruin, 2012: 1; Werbach, 2009: 10). The development of RI approaches and initiatives play a critical role to bring the corporate consideration of sustainability-related concerns into the mainstream.

Responsible investors aim to address non-financial (ESG-related) aspects, in addition to financial performance, when making investment decisions. In the South African context, focus was initially placed on the G-component of ESG, given the country's well-developed corporate governance framework that has been in existence since 1994.

Global and local developments since the 2000s encouraged listed companies to give more attention to environmental and social considerations, in addition to corporate governance aspects. The UN PRI, GRI, IIRC and the development of various SRI indices have raised awareness of RI globally. In the local context, the publication of the King III and King IV Reports, CRISA, the development of the JSE SRI Index and the amendment of Regulation 28 of the Pension Funds Act (No. 24 of 1956) resulted in enhanced local interest pertaining to responsible investment practices. South Africa therefore provides a favourable environment to conduct ESG-related research. An assessment of the business case for ESG in South Africa is likely to further promote the consideration of RI in the country.

The following chapter comprises a discussion of various accounting-based, market-based and value-based financial performance measures. A summary of previous studies that centred on the relationship between ESG-aspects and CFP is also provided.

CHAPTER 3

CORPORATE FINANCIAL PERFORMANCE

3.1 INTRODUCTION

“Not everything that can be counted, counts; and not everything that counts can be counted.”

When assessing the relationship between ESG and CFP, this quote by Albert Einstein (1879-1955) is particularly appropriate when deciding on the appropriate measures of performance. As indicated in Section 2.2, various sustainability challenges have emerged in recent years. As a result, corporate decision-makers should give attention to pertinent challenges such as climate change, natural resource depletion and energy security. Responsible investors aim to consider ESG aspects in addition to CFP. The qualitative nature of ESG initiatives, however, makes it difficult to measure (Van der Ahee & Schulschenk, 2013: 12).

To make informed decisions, managers, investors and other relevant stakeholders should evaluate both a firm’s ESG and CFP (Van der Poll, Booyse, Pienaar, Büchner & Foot, 2011: 123). The financial performance of a firm can be assessed in various ways. Firms have several stakeholders with differing and conflicting interests. As such, management is entrusted with the responsibility of making trade-offs between conflicting constituent demands. Decision-makers in firms should consider several financial objectives applicable to different stakeholder groups. The most well-known financial objectives are profit maximisation, shareholder wealth maximisation, stakeholder wealth maximisation and value-based management (VBM). The measurement of CFP largely depends on the financial objective decided on by management. Financial performance measures provide a link between the chosen objective and the expected outcome.

Researchers have previously reported divergent results (ranging from positive, negative or no association) with regard to the relationship between ESG aspects and financial performance. The majority of these studies have been conducted in developed markets. Furthermore, previous authors have mainly focused on accounting-based and market-based measures of financial performance.

In this chapter, financial performance is defined in Section 3.2 followed by a discussion on the various CFP objectives and measures. An overview of previous studies conducted on ESG and CFP is furthermore provided in Section 3.5.

3.2 DEFINING CORPORATE FINANCIAL PERFORMANCE

A firm's financial performance relates to its ability to generate wealth by utilising its assets (Erasmus & Van den Berg, 2011: 5). Corporate managers are predominantly responsible to optimise their firms' financial performance, particularly to maximise the value of shareholders' wealth (Correia *et al.*, 2013: 28). Financial performance also assesses the fulfilment of a firm's economic goals (Gentry & Shen, 2010: 516).

Financial performance is a multidimensional concept that relates to various aspects, such as operational effectiveness, corporate reputation and organisational survival (Gentry & Shen, 2010: 514). Increased financial performance is likely to result in improved wealth for a firm's various stakeholders (Fauzi, Svensson & Rahman, 2010: 1347).

Various financial performance objectives exist. The measurement of financial performance establishes a link between corporate decision-making and the extent to which the stated financial performance objective has been achieved (Epstein & Buhovac, 2014: 128).

3.3 CORPORATE FINANCIAL PERFORMANCE OBJECTIVES

As explained in Section 3.1, the management of firms have several financial performance objectives that they can pursue. The measurement of CFP largely depends on the stated objective(s) of a firm (Crosson & Needles, 2008: 658). The achievement of a specified objective is in turn monitored and evaluated by utilising appropriate CFP measures (Crosson & Needles, 2008: 658). More details on the most well-known financial performance objectives of profit maximisation, shareholder wealth maximisation, stakeholder wealth maximisation and VBM are provided in the following four sections.

3.3.1 Profit maximisation

Traditionally, one of the foremost objectives of management has been to maximise profits (Friedman, 1970). To achieve profit maximisation, financial managers should only pursue actions which are likely to generate increased revenues which exceed the expenses incurred (Megginson *et al.*, 2008: 22). Profit can be regarded as a test for economic efficiency and provides a benchmark by which economic performance can be assessed. Resources should accordingly be allocated and directed towards assets and projects which will result in optimal profit generation (Khan & Jain, 2005: 14).

One of the advantages of profit maximisation is the simplicity of calculating profits. Furthermore, this objective simplifies the link between corporate financial decision-making and profits attained by a firm (Shim & Siegel, 2008: 3). However, profit maximisation is criticised for ignoring the issues of timing and risk associated with generating profit (Els, Erasmus & Viviers, 2014: 9). Under the profit maximisation objective, the income that has been received over different years has equal weighting. The value of income received at present, however, is greater than the value of the income received in later years, because the former can be reinvested to earn additional income (Mittal, 2010: 349; Khan & Jain, 2005: 14).

The profit maximisation objective furthermore ignores the so-called 'quality of benefits' related to the financial action or decision. The term quality in this context refers to the degree of certainty that benefits can be expected. The more certain the expected profit, the higher the quality of the benefit. Given that investors can be assumed to be risk-averse, they would probably prefer profits with a low variance over time (Khan & Jain, 2005: 15).

Given that the ultimate goal of this objective is profit optimisation, the more profit a firm generates, the more value it is believed to add to society (Martin *et al.*, 2009: 7). The blatant pursuit of short-term profits has however, been criticised. For this reason, other financial objectives focusing on longer-term wealth creation and considering various stakeholders, including shareholders, have been developed.

3.3.2 Shareholder wealth maximisation

In large listed firms, ownership is often diffused among many shareholders, including large institutional investors. Shareholders invest capital to obtain a return on their investment (Boatright, 2010: 440). In line with the shareholder wealth maximisation objective, managers are typically expected to act and make decisions which would be in accordance with the interests of a firm's owners (Megginson *et al.*, 2008: 22). As a result, Milton Friedman defined shareholder wealth maximisation as the primary responsibility of a firm's management (Danielson, Heck & Shaffer, 2008: 1).

Unlike profit maximisation, shareholder wealth maximisation is a future-oriented goal with the main aim of increasing the future wealth of a firm's owners. At any point in time, shareholder wealth is influenced by the number of shares a shareholder owns and the current share price. To maximise shareholders' wealth, managers should engage in activities which are likely to have a positive impact on a firm's share price (Els *et al.* 2014: 10).

A firm's shareholders can be described as the 'residual' claimants of the firm. Shareholders only have a claim on the remaining cash flows after employees, suppliers, creditors and other stakeholders (such as the South African Revenue Service) are paid in full. If a firm cannot settle all stakeholder costs, shareholders are likely to receive no monetary compensation. As a result, shareholders bear most of the risk associated with a firm's business activities. It can be argued that if firms' managers do not focus on shareholder wealth maximisation, investors will have little incentive to accept the inherent risk of investing in a firm's shares (Megginson *et al.*, 2008: 23).

As managers might pursue their own interests, conflict might occur between shareholders' goals and managerial actions (Megginson *et al.*, 2008: 22). This conflict is described as the agency problem (Megginson *et al.*, 2008: 24). If the objectives of managers and shareholders differ, agency costs are likely to arise. These costs can be both direct (i.e. measurable) and indirect (i.e. missed opportunities) (Els *et al.*, 2014: 15). Managers who do not act in the best interests of their firm's shareholders often make use of excessive debt or excessive risk-taking based on overconfidence (Tse, 2011: 59). Shareholders in turn can address agency problems in various ways. Remedial steps include relying on market forces to apply managerial discipline,

establishing monitoring structures to supervise managers, and structuring managerial packages to align the interests of managers with those of the shareholders (Megginson *et al.*, 2008: 24).

Given that shareholder wealth maximisation narrowly focuses on shareholders, the objective is often criticised for not being compatible with the social obligations of a firm (Yahanpath, 2011: 70). Some opponents of shareholder wealth maximisation believe that a firm should balance the interests of relevant stakeholders when making business decisions (Danielson *et al.*, 2008: 1). If corporate managers do not establish good relationships with their stakeholders, the business might suffer financial and non-financial consequences (Tse, 2011: 57).

3.3.3 Stakeholder wealth maximisation

Freeman (1984) defines stakeholders as “any group or individual who can affect or is affected by the achievement of a firm’s objectives”. The stakeholder wealth maximisation objective is linked to stakeholder theory, which rejects the idea of only maximising shareholders’ wealth (Muswaka, 2015: 219). The key objective under the stakeholder approach is to balance the conflicting interests of a firm’s relevant stakeholders (Roberts, 1992: 597).

A firm that focuses on its stakeholders’ interests is likely to deliberately avoid making decisions which could have a negative impact on stakeholders. The goal is not to maximise the interests of all stakeholders, but rather to preserve their interests. Stakeholder theory rejects using the share price as an indicator of financial performance. Stakeholder wealth maximisation proponents rather encourage the usage of a broader range of aspects which are likely to impact on long-term performance (Bavoso, 2012: 42). The consideration of stakeholders’ interests form part of the social responsibility of a firm, which provides long-term benefits to shareholders (Megginson *et al.*, 2008: 23).

Given this background, stakeholder theory is closely linked to CSR. The notion that firms should function in a socially responsible manner and consider their impact on stakeholders is supported by CSR (Martin *et al.*, 2009: 12). Proponents of CSR believe that firms are often too narrowly focused on wealth maximisation in order to benefit shareholders only. They therefore propose that firms should consider their

responsibility towards all their relevant stakeholders, including shareholders (Martin *et al.*, 2009: 104). The fundamental problem with stakeholder theory is, however, that it is highly unlikely to maximise more than one aspect at a time (e.g. generating profit, ensuring efficiency, gaining market share, and considering the quality of products or services), while balancing stakeholders' conflicting interests (Martin *et al.*, 2009: 27).

Jensen (2001) highlights the relationship between value maximisation and stakeholder theory, by suggesting that the concepts of 'enlightened' value maximisation and 'enlightened' stakeholder theory could be used interchangeably. Enlightened value maximisation encompasses the structure of stakeholder theory, but acknowledges long-term value maximisation as the criterion for making trade-offs between conflicting stakeholder demands. While the enlightened stakeholder theory focuses on meeting the demands of stakeholders, long-term value maximisation is specified as a firm's primary objective. As such, the overall objective of long-term value maximisation gives management an impartial criterion to use when balancing conflicting stakeholder interests (Jensen, 2001: 9).

An approach that combines the two discussed concepts of a shareholder-centric approach with that of a stakeholder-centric orientation is VBM. This approach entails that the two concepts are not regarded as mutually exclusive, but rather as complementary to one another (Martin *et al.*, 2009: 6). This approach therefore combines the two concepts of value creation and CSR to create a well-rounded business (Martin *et al.*, 2009: 11).

3.3.4 Value-based management

VBM is based on the premise that, although the ultimate goal of a firm should be to maximise its value over the long term, the goal should not be pursued without acting in a socially responsible manner. The value of a firm refers to the amount of benefits derived by shareholders from investing in the shares of that firm (Rashid & Islam, 2008: 2). In other words, firm value denotes the long-term market value of the expected benefits generated by a firm (Jensen, 2001: 11).

The VBM approach aims to change corporate mindsets to centre on maximising firm value in a sustainable manner over the long run (Martin *et al.*, 2009: 11). This objective provides a foundation for what has been termed the "virtuous circle of CSR" which

simply entails “doing well by doing good” (Martin *et al.*, 2009: 11). The latter implies that a firm is able to achieve financial success while behaving in a socially responsible manner.

The key difference between the VBM approach and the stakeholder approach is that VBM-oriented managers do not regard a firm as an entity with “claims against it”, but rather as a “device for creating value” (Young & O’Byrne, 2001: 14). Such managers perceive their main role as using corporate resources to create value, whereas those who support the stakeholder view are more concerned with distributing value to the stakeholders. In line with the stakeholder approach, a firm’s shareholders have no superior claim on a firm’s resources compared to other stakeholders (Young & O’Byrne, 2001: 14).

Given that VBM focuses on the long-term value creation of a firm, it is important for management to understand a firm’s value drivers. A value driver is an identified variable that has a significant effect on the value-creating potential of a firm (Martin *et al.*, 2009: 67; Armitage & Jog, 1997: 3). Value drivers establish a direct link between corporate decision-making and firm value. Value drivers are thus important factors to consider when creating value from a VBM perspective (Martin *et al.*, 2009: 67).

The VBM approach has been criticised by some authors for having the tendency to place more emphasis on shareholders’ interests, than the interests of stakeholders. Other academics, however, argue that value for shareholders is optimised when a firm delivers value to other stakeholders as well (Beck & Britzelmaier, 2012: 3; Young & O’Byrne, 2001: 13). This argument is based on the likelihood that unsatisfied customers would switch to competitors and employees would seek other employment opportunities should they feel undervalued (Young & O’Byrne, 2001: 13).

Shareholders expect that a firm’s management should create value which exceeds the cost of the resources that were utilised in the value-creation process. If shareholders are not fairly compensated for the risk of investing in companies, they are likely to withdraw their capital in search of higher returns. Firms that are destroying value therefore often experience difficulty in attracting capital in future (Armitage & Jog, 1997: 2).

Several CFP measures can be applied to determine whether the chosen financial objective has led to the anticipated financial performance outcome. In the following section, some of the CFP measures that can be used by managers, researchers and investors when assessing the ability of a firm to generate wealth for its various stakeholders are discussed.

3.4 CORPORATE FINANCIAL PERFORMANCE MEASURES

As mentioned in Section 3.2, the financial performance of a firm reflects its ability to operationalise and utilise the available assets to create wealth (Erasmus & Van den Berg, 2011: 5). The specific CFP measure(s) that a firm decides to employ is determined by its financial performance objective(s) (Van der Poll *et al.*, 2011: 123). Financial performance metrics are thus quantitative tools that can be utilised to measure a firm's performance in relation to a specific objective or expected outcome (Crosson & Needles, 2008: 20). CFP can be measured by employing, *inter alia*, accounting-based, market-based or value-based metrics. Researchers have previously predominantly used accounting and/or market-based performance measures to reflect on the financial performance of a firm, as explained in the following two sections.

3.4.1 Accounting-based corporate financial performance measures

Accounting-based CFP measures have been at the core of quantitative approaches to measure a firm's financial performance (Neely, 2002: 3). Such measures reflect historical information and tend to mostly focus on short-term financial performance (Gentry & Shen, 2010: 514; Margolis & Walsh, 2001: 6; Rowe & Morrow, 1999: 59). When pursuing the financial objective of profit maximisation, accounting-based measures are mainly considered.

One advantage of accounting-based measures is that its application does not require a firm to be listed on a stock exchange. As such, the measure could be employed to examine private and smaller firms for investment purposes (Groß, 2007: 26). The accuracy of accounting-based measures has, however, been broadly scrutinised. Critique include that such measures are subject to earnings management. If managers are subjective in financial reporting and in structuring transactions which alter financial

reports, earnings management occurs. This can be done to either mislead certain stakeholders about a firm's financial performance or to influence contractual outcomes which are dependent on reported figures (Ronen & Yaari, 2008: 26). Accounting-based CFP measures are furthermore influenced by inflation and are sometimes difficult to interpret across different sectors (Velnampy & Pratheepkanth, 2013: 124; Venanzi, 2012: 2).

Despite these weaknesses, accounting-based measures have frequently been used by researchers who investigated the relationship between various non-financial and financial performance aspects (Chetty *et al.*, 2015; Mutezo, 2014; Demetriades, 2011). The most widely used accounting-based measures are profitability measures, such as ROA and return on equity (ROE), and EPS (Gentry & Shen, 2010: 519; Verweire & Van den Berghe, 2004: 21).

3.4.1.1 Profitability ratios

Profitability ratios can be used to measure the efficiency with which firms use their capital to generate revenue. When evaluating a firm's financial performance, it is important to consider its level of profitability. Firms that are able to use invested capital more efficiently will most likely generate larger profits, resulting in increased value creation (Els *et al.*, 2014: 74).

The ROA profitability measure reflects how well a firm's management has used its total assets to generate profit for a given year (Friedlob & Plewa, 1996: 225). ROA represents the broadest measure of a firm's operating performance, and considers all forms of capital, including debt and equity (Breuer & Nau, 2014: 33; Porter & Norton, 2016: 659).

An improvement in the ROA ratio over time usually indicates that a firm is applying its total assets more effectively, or that it increased its profit margins. Although a decrease in the total assets required over the short term might result in an improved ROA ratio, it can have a negative impact on sustainability and the profit-generation capacity of assets over the longer term (Els *et al.*, 2014: 75). Given that ROA reflects the total assets of a firm, this measure is also affected by the age of a firm's plant and equipment. When 'old' productive fixed assets are still in use and depreciated, it results

in very low book values. The resultant lower value of total assets is likely to inflate the ROA ratio (Baker & Powell, 2005: 63).

When managers focus on the creation of long-term shareholder value, ROE is often preferred over ROA. The ROE measure focuses specifically on the value of equity (Groß, 2007: 26). The ratio can thus be used to determine profitability from the perspective of an equity investor (Damodaran, 2011: 218). The measure could be used by shareholders to determine whether their invested capital is generating greater returns than an alternative investment option (Obst, Graham & Christie, 2007: 135).

A firm that consistently produces a lower ROE, in comparison to other investment opportunities available to shareholders, does not necessarily imply a poor investment. To obtain an objective indication of the overall growth in shareholders' wealth, the change in the value of a firm's assets also need to be considered. For instance, a firm with an investment in land which appreciates over time could still be profitable, given that the capital gain will likely be reflected as a change in equity over the life span of a firm (Obst *et al.*, 2007: 135).

A firm's leverage furthermore influences its ROE. Conservative firms tend to use relatively more equity capital and less debt. More aggressive firms are likely to be more leveraged, utilising more debt capital than equity capital. Although a firm that is more leveraged can earn a higher ROE, a higher risk is also incurred (Hettinger & Dolan-Heitlinger, 2011: 156). The increased risk results from the firm's need to generate sufficient operating profits to repay the interest on additional debt capital (Els *et al.*, 2014: 84; Hettinger & Dolan-Heitlinger, 2011: 156). While ROE allows for comparisons among firms, the different combinations of debt and equity capital utilised by firms can affect the result and should be considered (Hettinger & Dolan-Heitlinger, 2011: 157).

In addition to profitability ratios, the EPS ratio is one of the most widely used accounting-based CFP measures among publicly listed companies and their shareholders (Porter & Norton, 2016: 662).

3.4.1.2 Earnings per share

The EPS ratio reflects the amount of attributable earnings that were earned per ordinary share in a specific year (Els *et al.*, 2014: 87). Prospective shareholders and

investors are usually interested in the potential earnings of a share before making their investment decisions. The EPS ratio allows investors to compare the price they paid per share to the current attributable earnings earned per share, as well as the current share price (Porter & Norton, 2016: 662; Els *et al.*, 2014: 87). Although the entire EPS is not paid out to investors, the measure highlights the ability of a firm to pay out dividends. Dividends are usually a portion of the EPS, based on a firm's dividend policy (Periasamy, 2009: 31).

Many financial managers around the globe employ EPS as a financial performance measure (Vernimmen, Quiry, Dallochio, Le Fur & Salvi, 2014: 500). Despite the widespread usage of the measure, there are misconceptions pertaining to the application thereof. Some users believe that EPS includes the cost of equity and as a result, also the cost of risk. A further misconception is the notion that accounting-based measures, such as EPS, will directly influence the value of a firm. A change in an accounting method employed by a firm might have an impact on the EPS, but not necessarily on the value of the firm. Therefore, it is a misinterpretation that any financial decision that increases EPS, will as a result improve the value of a firm (Vernimmen *et al.*, 2014: 500).

To address some of the inadequacies of accounting-based CFP measures, some previous authors have included market-based measures when considering the link between ESG and CFP (Hörnmark, 2015; Marozva, 2014; Pasquini-Descomps & Sahut, 2013).

3.4.2 Market-based corporate financial performance measures

During the late 1980s, shareholder activism gradually increased in developed markets. Subsequently, many firms centred on shareholder wealth maximisation. The increased awareness of shareholder wealth maximisation promoted the adoption of market-based performance measures since the early 1990s (Gentry & Shen, 2010: 516).

Market-based CFP measures reflect how well a firm is performing in relation to its market price per share (Masa'deh, Tayeh, Al-Jarrah & Tarhini, 2015: 136). Such measures provide an indication of investors' perceptions regarding past performance and future prospects of the company. Furthermore, these measures are less subject to managerial manipulation than accounting-based metrics (Gentry & Shen, 2010:

517). These measures are typically utilised by the potential investors of a firm (Masa'deh *et al.*, 2015: 136).

In an efficient market, share prices quickly adapt to new information that becomes available. Given that market data are available on a continuous basis, market-based measures can therefore be more regularly updated in comparison to accounting-based measures (Groß, 2007: 23). According to Fama (1970), an efficient market is one in which prices always reflect all available information. Investors choose among investment opportunities with the assumption that a given share's price is fully reflective of the information available at a specific point in time. There are three forms of efficient markets. In the case of a weak form of market efficiency, the prices of shares are reflective of historical price-related information. The semi-strong form entails that share prices reflect all information that is publicly available. The strong form suggests that share prices reflect all public and private information (Els *et al.*, 2014: 297).

The efficient market hypothesis hence suggests that if a firm has publicly available ESG ratings and discloses its ESG-related information, the share price of the firm will already have reflected the information to investors. As such, the significance of such ratings and information and the value contribution for investors are included in the share prices of firms (Hörnmark, 2015: 10). Research on market efficiency, however, indicates that share markets are not always efficient. The JSE in particular was found to exhibit a weak form of market efficiency (Mobarek & Mollah, 2016: 20; OECD & African Development Bank, 2002: 122).

Market-based measures that have been used by researchers when investigating CFP include the EY and TSR, as discussed in Sections 3.4.2.1 and 3.4.2.2.

3.4.2.1 Earnings yield

The price earnings (P/E) ratio indicates the amount that investors are willing to pay per Rand of the reported earnings of a firm. A higher P/E ratio is usually an indication of a firm with strong expected future growth, while it is lower for riskier firms (Els *et al.*, 2014: 293). The EY ratio, on the other hand, is the inverse of the P/E ratio. The EY ratio is thus a comparison of the EPS to the market price per share. This ratio provides an indication of the return that is earned on the market price of a share (Erasmus & Van den Berg, 2011: 46). As a result, the lower the P/E ratio, the higher the EY

becomes. Given that the EY ratio is quoted as a percentage, it is useful when comparing different investment opportunities (Browne, 2007).

3.4.2.2 Total shareholder return

TSR is a frequently used market-based performance measure. The measure entails a comparison of the dividends received by shareholders and the change in the share price, with the original price paid per share (Collier & Agyei-Ampomah, 2009: 23; Megginson *et al.*, 2008: 194).

The advantages of employing the TSR measure include that it represents an understandable figure of the overall financial benefits that are created for shareholders. The measure could be interpreted as an indication of how the market evaluated the performance of a firm for a specific period. Furthermore, TSR is expressed as a percentage that allows the measure to be easily comparable among firms (QFINANCE, 2014; Chandra, 2008: 844).

Critique against the usage of the TSR measure centres on the “controllability principle”. This principle entails that managers should only be held accountable for the factors that they can control. However, the TSR can be influenced by various external factors, such as economic conditions and government actions. As a result of these factors, it is difficult to determine whether an improvement in a firm’s TSR is because of managerial actions or external factors (Martin *et al.*, 2009: 30). Another disadvantage is that the measure also presumes that all dividends earned by shareholders are reinvested in a firm. A further disadvantage is that TSR does not consider the risk associated with an investment in a share. Rational investors do not only pursue higher returns, but rather higher risk-adjusted returns (Martin *et al.*, 2009: 31).

Risk-adjusted abnormal returns can be estimated by considering the actual TSR less the expected return (Sharma, 2013: 81). The capital asset pricing model (CAPM) is commonly used to estimate risk-adjusted abnormal returns (Brigham & Daves, 2010: 47).

3.4.2.3 Cost of capital

The term cost of capital refers to the costs that a firm incurs when acquiring debt and equity capital to fund its operations. To maximise shareholders’ wealth, a firm should

generate a sufficient return to pay capital providers (lenders and shareholders). Once the cost of capital is determined, a firm should aim to achieve returns in excess of this cost (Els *et al.*, 2014: 341).

The CAPM can be utilised to calculate a firm's cost of equity. According to Fabozzi and Drake (2009: 256), the CAPM was the first asset pricing model formulated by Sharpe (1964), Lintner (1965), Treynor (1961) and Mossin (1966). The CAPM is based on a number of assumptions, namely (Fabozzi & Drake, 2009: 258):

- investors make decisions based on expected return and the variance of returns;
- investors are rational and risk-averse;
- all investors have the same investment horizon;
- investors have identical expectations;
- investors can borrow any amount at a given risk-free rate; and
- capital markets are fully competitive.

The first four assumptions of the model consider the way investors make decisions, while the last two assumptions centre on the characteristics of the capital market (Fabozzi & Drake, 2009: 258). According to the CAPM, a share's expected return can be estimated by considering the risk-free rate, its beta and the market risk premium (Megginson, Smart & Graham, 2010: 208).

The CAPM commences by considering the risk-free rate. The yield on long-term government bonds is typically used as a proxy for the risk-free rate (Brigham & Daves, 2010: 332). Long-term government bonds, such as the R186 in South Africa, are considered to have virtually no default risk (Els *et al.*, 2014: 261). The market risk premium is the difference between the expected market return and the risk-free rate (Brigham & Daves, 2010: 333). In South Africa, the FTSE/JSE All Share Index is frequently used as a proxy for the return on the market.

The beta (β) considered in the CAPM is a measure of volatility for a share price. The riskier an investment in comparison to the market in general, the higher its beta (Els *et al.*, 2014: 327). The CAPM reflects the return that an investor requires from a risky asset, assuming that the investor is exposed to only the systematic risk (Fabozzi & Drake, 2009: 256). This risk is inherent to the market and is captured by beta.

Systematic risk occurs mainly due to macroeconomic interruptions affecting the economy. This risk cannot be avoided by diversification, but can be mitigated by means of hedging (Dash, 2009: 90).

The CAPM allows for risk to be incorporated into the cost of equity component of a firm's WACC (Els *et al.*, 2014: 347). The WACC is the overall return that a firm must generate on its existing assets to maintain the value of its sources of capital. The WACC of a firm is determined by considering the contribution and the cost of each long-term capital component, given that each source of capital has a different risk level (Els *et al.*, 2014: 353).

3.4.3 Value-based corporate financial performance measures

Value-based measures aim to remove the accounting distortions that are evident in a firm's financial statements (Erasmus, 2008: 66). In line with the value-based view, value is created when revenue exceeds expenditure, including the total cost of capital (Armitage & Jog, 1997: 2). Value-based CFP measures thus incorporate a firm's WACC into their calculations to determine the value-creating ability of a firm (Erasmus, 2008: 66). In those cases where the returns that are generated are higher than the WACC, projects will yield a positive net present value (NPV) and, as a result, value is created for shareholders. The NPV method discounts all future cash flows by the cost of capital to determine potential value creation. Performance below the WACC of a firm is likely to destroy shareholder value (Brigham & Daves, 2010: 415; Erasmus, 2008: 66).

Researchers can use value-based CFP measures, such as FCF, EVA and MVA, if they aim to remove accounting distortions associated with more traditional financial performance measures and want to ensure that the cost of capital is included in their calculations (Erasmus, 2008: 66).

3.4.3.1 Free cash flow

FCF is the cash flow which can be distributed to all external capital providers after a firm has made the necessary fixed and working capital investments required to support the future growth (Brigham & Daves, 2010: 230). The cash flow that is generated from

a company's operations and investment in assets corresponds with the cash flow that will be received by investors (Martin *et al.*, 2009: 51).

Martin *et al.* (2009: 54) also point out that the FCF of a firm is the result of management's policies and practices that have implications for investors. Increasing FCF can be seen as a way for management to make firms more valuable (Brigham & Daves, 2010: 231), and is furthermore a key determinant when assessing the value of a firm as determined by the capital markets (Martin *et al.*, 2009: 57). FCF is the cash flow investors consider in their valuation of a firm in the capital market. As such, a link exists between internal CFP (as measured by FCF) and the share market valuation (as measured by the present value of the FCF investors receive) (Ehrhardt & Brigham, 2009: 148).

The composition of a firm's FCF and its distribution to shareholders provides important information to investors regarding a firm's cash resources (Martin *et al.*, 2009: 55). A conflict of interest might occur between shareholders and management over the payout method of FCF, particularly when a firm generates a substantial amount of FCF (Brigham & Daves, 2010: 232). There are several ways in which FCF can be used in a firm, including to pay interest or redeem debt capital. It can also be used to pay dividends to shareholders, or to repurchase a company's shares. Furthermore, it can be used to make short-term investments or purchase other non-operating assets. By definition, FCF already takes into account the purchase of all operating assets that are required to support a firm's growth. In practice, firms tend to use a combination of these options (Brigham & Daves, 2010: 232).

On the other hand, high FCFs might be misused by managers who decide to invest it in assets that do not add value. Such decisions are often not in the best interest of a firm's shareholders (Brigham & Daves, 2010: 232). Managers could "stockpile" positive FCFs in the form of marketable securities (Brigham & Daves, 2010: 385). Managers should be motivated by a firm's board to distribute FCF, instead of investing it at a rate below the cost of capital (Jensen, 1986: 323). Stockpiling harms investors, as it prevents them from allocating the funds to other firms with feasible growth opportunities. Furthermore, managers often use positive FCFs to overpay for a target firm during an acquisition (Brigham & Daves, 2010: 385).

There are various reasons for the reluctance of managers to pay out FCF to investors. One reason is that having extra cash on hand reduces company risk. This risk reduction results from FCF being used as a form of additional financing instead of debt financing (Kruschwitz & Löffler, 2006: 97). In addition, the distribution of substantial amounts of FCF might also be regarded seen as a 'confession' by management that a firm lacks good investment opportunities. Given that executives of large firms are often highly compensated, and that distributing FCF reduces the size of a firm rather than increasing it, FCF distribution could result in lower compensation to executives (Brigham & Daves, 2010: 385).

The value of a firm depends on the present value of its expected future FCF (Martin *et al.*, 2009: 56). As a result, firms should always strive to generate positive future FCFs. Growing firms, however, often generate negative FCFs, given the substantial investment in operating assets required. A negative FCF is thus not necessarily a negative sign if it is due to a large investment in assets to support growth. If FCFs are negative because NOPAT was negative, it is not a good sign for the company as the company is then possibly experiencing operational difficulties (Brigham & Daves, 2010: 233). It is thus important to distinguish between investment in profitable and unprofitable growth.

The ROIC can be utilised to determine whether firm growth is profitable. The measure indicates how much NOPAT is created for each rand that is invested in operating capital. If the ROIC generated by a firm is larger than their WACC, growth is profitable and the firm is adding value (Brigham & Daves, 2010: 233). One problem associated with ROIC is that the measure fails to consider opportunity costs. As such, ROIC can result in situations in which wealth-destroying projects are funded and wealth-creating projects are not accepted (Martin *et al.*, 2009: 38).

As mentioned earlier in this section, to create shareholder wealth and increase firm value a firm needs to generate positive future FCF. The CROIC measure can be calculated to provide an indication of whether a firm will generate positive or negative future FCFs. If the CROIC value is positive, it can be expected that the business will experience positive future free cash flows and vice versa.

One of the problems associated with FCF is that the measure is unstable from year-to-year. To help address this issue the value-based CFP measure EVA can be used. EVA is a better measure for annual performance evaluation given that it considers the NOC of a specific year and not the change in NOC from one year to the next. The EVA metric determines the extent to which a firm has created shareholder value during a specific period (Brigham & Daves, 2010: 236).

3.4.3.2 Economic value added

The EVA measure entails an assessment of the economic profit generated by a firm that contributes to the creation of shareholder value (Collier & Agyei-Ampomah, 2009: 23; Erasmus, 2008: 66). The economic profit captured by the EVA measure indicates the amount by which earnings exceed the minimum rate of return that shareholders can earn by investing in other securities with the same level of risk. Economic profit is thus earned once the capital costs of firms have been recovered (Collier & Agyei-Ampomah, 2009: 23).

EVA determines the remaining profit after both the cost of equity (as measured by the CAPM) and the cost of debt have been taken into account (Van der Poll *et al.*, 2011: 125). The EVA measure therefore offers investors a more acceptable and comprehensive method of determining a firm's financial performance than accounting-based measures (Van der Poll *et al.*, 2011: 123).

The EVA measure centres on management's effectiveness to create value over a certain period (Brigham & Daves, 2010: 235). As such, EVA is often used when management's performance is evaluated as part of an incentive compensation programme. The maximisation of the long-term EVA of a firm is thus likely to result in long-term value creation (Van der Poll *et al.*, 2011: 123).

The EVA measure can be calculated in terms of the ROIC, in which a firm's investment in NOC and the spread is considered. The spread refers to the difference between ROIC and WACC. Given that firms of different sizes might realise considerable differences in their NOC, the spread can be utilised to standardise the EVA.

Van der Poll *et al.* (2011: 127) provided a number of advantages of using the EVA approach as a financial performance measure. These include that EVA might assist in

aligning the interests of managers and shareholders and represents a good estimate of managerial performance. In addition, managers become aware that capital has a cost, thus helping managers in their decisions of acquiring and disposing of assets. Finally, EVA helps managers to focus on the objective of shareholder value maximisation. A weakness of EVA is that the measure is not easily applicable to all firms, and that it has been found to be more appropriate for capital-intensive firms than companies that make extensive use of intellectual capital (Van der Poll *et al.*, 2011: 130).

Whereas the EVA measure focuses on value created during a particular period, the MVA metric considers the value created since the inception of a firm (Brigham & Daves, 2010: 235).

3.4.3.3 Market value added

To maximise shareholders' wealth does not only benefit shareholders, but it also assists in ensuring allocative efficiency of scarce resources. As a result, the pursuit of this objective should also have a positive impact on the economy (Brigham & Ehrhardt, 2008: 103). In line with the MVA measure, shareholder wealth is maximised when the difference between the market value of a firm's shares and the equity capital supplied by investors is maximised (Martin *et al.*, 2009: 92). MVA is regarded as the premium that the market estimates for a firm in excess of the invested capital provided by its shareholders, based on expectations pertaining to future cash flows (Martin *et al.*, 2009: 92).

MVA can also be seen as the present value of all future EVAs (Martin *et al.*, 2009: 84). A direct relationship therefore exists between MVA and EVA. If a firm has a history of negative EVA values, the MVA will most likely be negative as well, and vice versa. Given that the share price is a key element in the MVA calculation, the measure is more dependent on expected future performance than on historical performance. As a result, a firm with historical negative EVA values could have a positive MVA if investors' expectations regarding future EVA values become positive (Brigham & Ehrhardt, 2008: 106).

When evaluating managerial performance as part of an incentive compensation programme, EVA is preferred over MVA. The reasons for this preference include that

EVA reflects the value added during a specific year, whereas MVA reflects the performance over the long-term (i.e. since the inception of a firm) (Brigham & Daves, 2010: 235). The EVA measure can also be applied to units or divisions of a large firm, while MVA can only be applied to a firm in its entirety (Brigham & Ehrhardt, 2008: 106).

Financial performance measures have mainly been the basis on which current and potential investors have conducted investment analysis and decision-making. There are, however, sustainability-related risks which pose a threat to the long-term value creation capacity of a firm, including climate change and water scarcity. In the past, ESG aspects were often ignored in investment analysis and corporate decision-making. Some managers and investors, however, have started to include these non-financial considerations when making financial decisions.

3.5 THE RELATIONSHIP BETWEEN ENVIRONMENTAL, SOCIAL AND CORPORATE GOVERNANCE ASPECTS AND CORPORATE FINANCIAL PERFORMANCE

In this section, the focus is placed on previous researchers who examined the relationship between sustainability-related (ESG) aspects and CFP. International studies will be firstly discussed followed by an overview of local studies.

3.5.1 International studies

Table 3.1 provides a comparative, chronological summary of international studies investigating the relationship between sustainability-related measures and financial performance based on a comprehensive literature review.

Table 3.1: Overview of international studies

Author(s) and year of publication	Applicable country/countries	Sustainability-related measure ^{a)}	Performance measure(s)	Key findings
Waddock & Graves (1997)	USA	Constructed an index for CSP based on eight CSP attributes rated by KLD	ROA; ROE; return on sales	Significant positive relationship between CSP and ROA. Insignificant positive relationship between CSP and ROE. Significant positive relationship between CSP and return on sales.
Orlitzky, Scmidt & Rynes (2003)	Meta-analysis of 52 studies across a number of countries considering CSP and CFP	A construct of four broad measurement strategies: a) CSP disclosures; b) CSP reputation ratings; c) social audits, CSP processes and observable outcomes; and d) managerial CSP principles and values	Accounting-based measures (ROA, ROE, EPS), market-based measure (price-earnings (P/E) ratio) and surveys conducted on CSR by the authors considered.	The results of the meta-analysis revealed a positive relationship between CSP and CFP across industries and across study contexts.
Galema, Plantinga & Scholtens (2008)	USA	KLD Research and Analytics CSR ratings as a proxy for SRI	Monthly TSR; net sales; net income. Fama-French three-factor model; Carhart's four-factor model	SRI portfolios (particularly those that scored positively on diversity, environment and product categories) had a significant impact on share returns.
Balatbat, Siew & Carmichael (2012)	Australia	ESG scores by Corporate Analysis Enhanced Responsibility	Accounting-based measures (ROA, ROE, ROIC, earnings before interest tax depreciation and amortisation, net operating profit less adjusted taxes) and market-based measures (EPS, dividends per share, dividends yield, price earnings ratio, enterprise value, market capitalisation to trading revenue, price to book value)	Weak positive correlation between ESG scores and financial performance, including one-year and two-year lag analyses.

Author(s) and year of publication	Applicable country/ countries	Sustainability-related measurea)	Performance measure(s)	Key findings
Kocmanova & Dočekalova (2012)	Czech Republic	Sustainability aspects disclosed in the integrated reports of manufacturing firms	Key performance indicators (KPIs) related to financial performance	22 economic performance indicators (KPIs) which could be used in relation to ESG performance indicators were identified.
Pasquini-Descomps & Sahut (2013)	Switzerland	Global EthicalQuote ® score including E, S and G dimensions	TSR; Fama-French three-factor model; Carhart's four-factor model; ROA; ROE	Insignificant positive relationship between ESG and market performance. Firms with increasing ESG scores had a positive impact on ROA.
Ferrero-Ferrero, Fernández-Izquierdo & Muñoz-Torres (2014)	Listed companies from 15 member states of the European Union	Integrated ESG performance composite index with equal weights for E, S and G dimensions; three different levels of ESG consistency by means of interaction variables	Economic performance score provided by Thomson Reuters Datastream - ASSET4	Significant positive relationships were reported between the level of ESG performance (particularly the social and environmental aspects) and economic performance.
Breuer & Nau (2014)	USA	Thomson Reuters Datastream - ASSET4 ESG scores	ROA; Tobin's Q	ESG scores were positively related to ROA and Tobin's Q.
Hörnmark (2015)	Selected firms in sub-Saharan Africa and the USA	Thomson Reuters Datastream - ESG Index (MSCI)	CAPM; Fama-French three-factor model	ESG-integrated portfolios generated positive and significant alphas in emerging markets.
Friede, Busch & Bassen (2015)	Vote-count studies, sample and meta-analyses of previous studies that considered the relationship between ESG and CFP	ESG scores and indices	Various accounting-based and market-based measures which were used by the considered authors	Approximately 90 per cent of the considered authors indicated a positive or neutral association between ESG and financial performance.

Source: Researcher's own construction based on the indicated studies

a) Sustainability-related measures include CSR, CSP, ESG and SRI

Perusal of Table 3.1 reveals that earlier international studies mainly included accounting-based CFP measures, such as ROA and ROE, when evaluating the relationship between CSP and CFP. As explained earlier, CSP focuses on principles of social responsibility and the social responsiveness of a firm (Orlitzky *et al.*, 2003: 403). In more recent years, international researchers have included ESG scores as a sustainability-related measure. These researchers have also included risk-adjusted abnormal return estimation models such as the CAPM and the Fama-French three-factor model. Although the measurement of CFP has improved over time, none of the considered studies included value-based financial performance metrics. This exclusion results in a gap in the literature, as value-based CFP measures focus on the long-term sustainable value creation potential of a firm in a socially responsible context, by including a firm's cost of capital into calculations to determine its value creating ability.

3.5.2 Local studies

In the South African context, limited ESG-related research has been conducted. The majority of local researchers have focused on one aspect of ESG, namely corporate governance (Mans-Kemp, 2014; Waweru, 2014; Ntim *et al.*, 2012; Mangena & Chamisa, 2008; Rossouw *et al.*, 2002). Table 3.2 provides a comparative summary of sustainability-related studies that have been conducted in South Africa.

Table 3.2: Overview of local studies

Author(s)	Applicable country/countries	Sustainability-related measure ^{a)}	Performance measure(s)	Key findings
Viviers, Bosch, Smit & Buijs (2008)	South Africa	Local RI funds	Sharpe ratio; Sortino ratio; upside-potential ratio	Domestic RI funds underperformed relative to their respective benchmark indices during the first two sub-periods (1 June 1992 to 31 August 1999 and 1 September to March 2002), but significantly outperformed their benchmark indices during sub-period three (1 April 2002 to 31 March 2006). Domestic RI funds significantly underperformed relative to the general equity market during 1 September 1998 to 1 March 2002, but performed on par with the FTSE/JSE All Share Index during 1 June 1992 to 31 August 1998 and 1 April 2002 to 31 March 2006.

Author(s)	Applicable country/countries	Sustainability-related measure ^{a)}	Performance measure(s)	Key findings
Demetriades (2011)	South Africa	JSE SRI Index as a proxy for CSR	ROA; ROE	Prior financial performance (ROE and ROA) had no significant relationship with social performance. Over a 10- and 15-year period, the SRI portfolio outperformed the conventional portfolio.
Gladyssek & Chipeta (2012)	South Africa	JSE SRI Index as a proxy for CSR	Daily abnormal share returns	By employing an event study methodology, it was reported that investors did not earn any significant abnormal returns when investing in the JSE SRI Index at the time when constituents were announced (except for 2005).
Nkomani (2013)	South Africa	JSE SRI Index as a proxy for CSR	Total return index consisting of market-to-book ratio; P/E ratio; net profit margin; ROA; ROE	Companies not included in the JSE SRI Index, on average, perform better than JSE SRI Index companies in terms of the considered measures of performance.
Mutezo (2014)	South Africa	JSE SRI Index as a proxy for SRI	ROE; ROA; EPS	Insignificant positive relationships were noted between SRI and ROE and ROA respectively. A significant positive relationship was reported between EPS and SRI.
Marozva (2014)	South Africa	JSE SRI Index as a proxy for SRI	Average monthly return; CAPM; Sharpe ratio; Treynor ratio; Sortino ratio; upside potential ratio	During periods of economic growth, the JSE SRI Index neither significantly outperformed nor underperformed the exchange-traded funds (ETFs) (JSE All Share Index). During periods of economic decline, the JSE SRI Index significantly underperformed ETFs. Risk-adjusted performance measures displayed evidence that the JSE ETFs performed better than the JSE SRI Index over different periods of economic growth.
Chetty, Naidoo & Seetharam (2015)	South Africa	JSE SRI Index as a proxy for CSR	Daily abnormal share returns; ROE; ROA; EPS	CSR activities led to no significant differences in financial performance.

Source: Researcher's own construction based on the indicated studies

^{a)} Sustainability-related measures include CSR, CSP, ESG and SRI

As depicted in Table 3.2, domestic authors who have considered the relationship between CSR or SRI and CFP have used the JSE SRI Index as a proxy for CSR or SRI (Demetriades, 2011; Gladyssek & Chipeta, 2012; Nkomani, 2013; Mutezo, 2014; Marozva, 2014; Chetty *et al.*, 2015). As mentioned in Section 3.2, CSR narrowly centres on the environmental and social aspects of a firm but omits the equally important aspect of corporate governance. Furthermore, given the complex nature of ESG (or SRI), the usage of a one-dimensional aggregated index as a proxy for ESG is questionable. None of the considered studies used ESG scores or disclosed the specific compliance criteria applied by the JSE SRI Index.

Furthermore, in these studies CFP was mainly measured by employing accounting-based metrics such as ROA, ROE and EPS. A single performance measure, however, does not efficiently reflect the CFP of a large sample of firms over time (Davidson & Worrell, 1988). A few of the authors considered market-based measures, such as daily abnormal share returns, the Sharpe ratio and the Sortino ratio. Marozva (2014) was the only researcher to include a risk-adjusted abnormal returns estimation model, namely the CAPM.

When comparing the studies that are referred to in Table 3.2, it is evident that no researcher included ESG scores or value-based performance measures when considering the relationship between sustainability-related performance and CFP. Given the divergent results displayed in Tables 3.1 and 3.2, it is apparent that inconclusive evidence exists on the relationship between ESG-related aspects and long-term CFP in both the international and local contexts.

3.6 CONCLUSION

In addition to financial performance, corporate decision-makers have to consider various sustainability-related (ESG) factors. Issues such as climate change, energy and natural resource depletion are key aspects to consider to ensure the sustainability of a firm. The non-financial nature of ESG, however, has proved to be problematic to measure (Van der Ahee & Schulschenk, 2013: 12).

Corporate financial managers have an important responsibility to determine the overall financial objective of a firm. Managers have to regard the (often conflicting) demands

of various stakeholders of a firm, while at the same time pursuing improved CFP. However, the consideration of these demands does not necessarily mean that the demands can always be met. Once a financial objective has been chosen, CFP can be measured by means of various performance measures. These performance measures include accounting-based, market-based and value-based CFP metrics. As pointed out in this chapter, the measurement of CFP establishes a link between corporate decision-making and the extent to which the stated financial performance objectives have been achieved (Epstein & Buhovac, 2014: 128).

Previous research on the relationship between ESG and CFP has been conducted mostly in the developed market context. Results have been found to be divergent, i.e. ranging between positive, negative or no association. When studying the link between various non-financial and financial aspects, researchers have primarily used accounting-based and market-based CFP measures.

The following chapter outlines the research methodology that was used in the current study.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

Corporate managers have the responsibility of making crucial decisions in a changing and uncertain environment. Business research can result in improved and informed decision-making. This is achieved by either providing new information on a topic or adding information to an existing body of knowledge (Bajpai, 2011: 9).

The business research process involves a series of steps which are aimed at investigating a corporate challenge or opportunity. These steps include identifying the research problem, formulating the research design, selecting a research method, deciding on the sampling method and collecting and analysing the data (Sreejesh, Mohapatra & Anusree, 2014: 13). As indicated in Section 1.4.1, the primary objective of the researcher was to assess the business case for ESG practices in South Africa for selected JSE-listed firms over the period 2011 to 2016. South African firms face various sustainability-related challenges. Corporate managers therefore require sufficient data on ESG and other corporate matters to make informed decisions.

The preceding two literature review chapters provided a comprehensive discussion on ESG and CFP. A discussion of what business research entails is provided next, followed by a nine-step research process that was applied in the current study.

4.2 DEFINING BUSINESS RESEARCH

Research can be defined as a systematic process of scientific investigation. Business research is specifically important to social scientists, as it plays an important role in finding solutions to corporate problems (Murthy & Bhojanna, 2008: 1). This field of research involves a process of collecting information to improve business-related decision-making (Wilson, 2014; Hair, Wofinbarger Celsi, Money, Samouel & Page, 2011: 164). Corporate decision-makers often have distinctive information regarding specific challenges. Business research can be used to either substantiate these

identified issues or result in improved knowledge to address these challenges by following a scientific research method (Bajpai, 2011: 6).

The business research process involves a series of steps which should be executed in an organised and planned manner. A nine-step research process as suggested by Cant *et al.* (2003) was adopted in the current study and outlined in Section 1.5. The research design and the collection and processing of data are discussed in subsequent sections.

The primary research objective of the current study was to assess the business case for ESG practices in South Africa. In line with the primary research objective, the following research questions were formulated:

- What is meant by RI? (See Chapter 2)
- What is meant by ESG? (Defined in Chapter 2)
- How can ESG be measured? (Outlined in Section 4.8.2)
- Which measures can be used to evaluate CFP? (Refer to Sections 4.8.3 to 4.8.5)
- What was the trend in the ESG disclosure of the sample firms over the research period? (Discussed in Chapter 5)
- What was the trend in the CFP of the sample firms over the research period? (Outlined in Chapter 5)
- Are there significant differences in ESG disclosure of the sample firms over the entire research period? (Reported in Chapter 6)
- Are there significant differences in ESG disclosure of the sample firms on an annual basis? (Refer to Section 6.2)
- Are there differences among the ESG disclosure scores of companies listed in different JSE sectors? (Discussed in Section 5.2.5)
- Does a company's sector classification play a role when assessing the relationship between ESG and accounting-based CFP? (See Section 6.3.2)
- Does a company's sector classification play a role when assessing the relationship between ESG and market-based CFP? (See Section 6.3.2)
- Does a company's sector classification play a role when assessing the relationship between ESG and value-based CFP? (See Section 6.3.2)

- Was the relationship between ESG disclosure and CFP lagged? (See Section 6.3.3)
- Was the relationship between ESG disclosure and CFP lagged for the considered sectors? (See Sections 6.3.3.1 to 6.3.3.3)

The different types of research are discussed in the following section.

4.1 TYPES OF RESEARCH

Research can be broadly classified into three main types, namely descriptive, causal and exploratory research. The research type that is chosen for a specific study depends on the research problem being addressed (Zikmund, Babin, Carr & Griffin, 2013: 52).

Descriptive research is the most commonly conducted type of research (Hall, 2008: 9). Researchers can collect descriptive data which explain the composition and characteristics of the population being investigated. This type of research can provide the researcher with important insights of the research problem (Neelankavil, 2015: 134). Descriptive research is often conducted in a preliminary study, followed by further research (Wilson, 2014).

Descriptive studies can answer a range of research questions which are of interest to social researchers (Hall, 2008: 9). Such studies may be either qualitative (describing in words) or quantitative (describing in numbers) (Burns & Burns, 2008: 82). This research type can be utilised to determine the degree of interaction between variables, but cannot be employed to examine cause-and-effect relationships (Ríos & Del Campo, 2013).

Cause-and-effect relationships can be examined by conducting causal research. Causal research, also known as explanatory research, assists the researcher in deducing inferences about relationships among variables. Causality is focused at demonstrating that change(s) in one variable will lead to a predictable change in another variable (Coldwell & Herbst, 2004: 11). For causal inferences to be supported, specific scientific evidence has to exist (Zikmund *et al.*, 2013: 55).

The first piece of evidence is temporal sequence, which considers the time order of events. It is important for the cause to occur before the effect (Ríos & Del Campo, 2013). The second piece of causal evidence is concomitant variation, when two occurrences systematically co-vary or correlate. This means that when a change in the cause occurs, a change in the outcome should also be prevalent (Zikmund *et al.*, 2013: 55). Finally, a non-spurious association should exist. This means that any correlation among cause-and-effect variables should be true, and not because of another variable (Ríos & Del Campo, 2013). The main causal research method is hypothesis testing through experimentation (Polonsky & Waller, 2011: 94).

The third type of research is exploratory research. The aim of exploratory research is to investigate a new topic that little is known about, or to discover potential business opportunities (Zikmund *et al.*, 2013: 52; Hall, 2008: 8). Exploratory research may be conducted as a result of a new development or an existing issue that has gained importance because of a change in social conditions (Hall, 2008: 8). As a result, an exploratory research design is a viable option where there is a lack of knowledge on a certain topic (Wilson, 2014). Exploratory research is often carried out to ascertain the feasibility of further research. In such cases, the objective would be to enable future researchers to formulate more specific research questions (Hall, 2008: 9). Exploratory research is usually conducted first, with an expectation that further research will lead to more conclusive evidence (Zikmund *et al.*, 2013: 52).

In the current study, descriptive research was chosen to determine the nature and characteristics of the ESG and CFP variables.

4.2 QUALITATIVE AND QUANTITATIVE RESEARCH

There are two main paradigms from which a research methodology can be derived, namely positivistic and phenomenological paradigms. The primary difference between these paradigms is the manner of data collection and selected methods of analyses employed (Beech, 2015: 56).

With the phenomenological approach, research is viewed from the perspective that human behaviour cannot be easily measured. The approach is primarily concerned with understanding the behaviour from the participants' own subjective frame of reference. With this approach, the research methods are chosen to describe, interpret

and explain a phenomenon from the perspective of individuals who are usually also the subject of the research. As a result, qualitative research is associated with this paradigm (Hale & Napier, 2013: 14).

A qualitative research approach is followed to explore and understand the meaning that individuals assign to a certain problem (Creswell, 2003: 4). The data collected for qualitative research are thus mostly textual, visual or oral (Zikmund *et al.*, 2013: 135). Advantages of utilising qualitative research methods include its flexibility, versatility and the amount of time it takes to complete the research. Consequently, this type of research is mostly used in exploratory research (Neelankavil, 2015: 125). One of the main disadvantages of qualitative research is the interpretation of the data. Given that researchers often draw conclusions derived from their personal opinions, the results may be subjective and include certain biases. In other words, qualitative research often lacks intersubjective verifiability, which refers to the ability of different researchers following the same research procedure and producing the same results or conclusions (Zikmund *et al.*, 2013: 134). Furthermore, given that smaller samples are considered in these studies, the results can often not be projected to the larger population (Neelankavil, 2015: 125).

The positivistic paradigm is characterised by the researcher being objective and detached from the topic being researched. This approach to research aims to investigate the facts or causes of a social phenomenon in a systematic way. With a positivistic approach, the researcher conducts quantitative research (Hale & Napier, 2013: 14). Quantitative research can be used to address research objectives through empirical assessments that include numerical measurement and analysis approaches (Zikmund *et al.*, 2013: 134). In other words, concepts are converted into numbers and are quantified. Quantitative research can be used to consider the relationships or correlations between variables and the predictability of occurrences (Hale & Napier, 2013: 15). As such, quantitative research is mostly considered in descriptive and causal research designs (Zimund *et al.*, 2013: 135). Quantitative researchers often employ larger samples. This approach is appropriate when the research objective involves investigating a standard for managerial action (Neelankavil, 2015: 105; Zikmund *et al.*, 2013: 134).

A major advantage of quantitative research is its statistical reliability. The researcher can reliably determine whether one alternative is better than the other alternatives being considered. A further advantage is that the findings of quantitative research can be projected to the entire population (Nykiel, 2007: 56). However, given that quantitative research is based on numerical measurement only, it is criticised for not providing a researcher with the same level of context as qualitative research (Myers, 2009: 9).

Quantitative research methods can enable a researcher to obtain a so-called 'bigger picture' perspective, as the results from a representative sample can be generalised to the population. Qualitative methods, on the other hand, are more focused on the details, specific trends and themes within a particular sample (Hale & Napier, 2013: 15). The current study employed a positivistic paradigm and quantitative research was therefore conducted.

4.3 PANEL RESEARCH DESIGN

There are two main types of research designs that can be used for descriptive research, namely cross-sectional and longitudinal designs (Murthy & Bhojanna, 2008: 58).

A cross-sectional research design entails collecting data for more than one subject at a specific point in time. This design allows the collection of quantitative data for two or more variables (Bryman & Bell, 2015: 62). This research design is not meant to establish relationships over time, but rather to identify particular characteristics that exist in groups. A cross-sectional study can therefore be completed timely and at a relatively lower cost than a longitudinal study (Pellissier, 2007). Cross-sectional studies can either be conducted by means of a field study or a field survey (Murthy & Bhojanna, 2008: 60). A field study involves an in-depth investigation of a particular problem in a real-world setting. With field studies, data are gathered utilising various techniques, such as field notes, on-site interviews, observations and relevant documents (Riazi, 2016: 121). Field surveys are similar to field studies, but usually involve a larger sample being investigated which often leads to increased costs and a longer period for the research to be carried out (Murthy & Bhojanna, 2008: 60).

Longitudinal studies are often associated with the positivistic research paradigm. A longitudinal study is a method of investigating variables over a long period of time (Collis & Hussey, 2014: 64). Therefore, longitudinal studies measure the same variables more than once. The time period between the measurements should be long enough for changes to occur in variables (Stangor, 2014: 176). A longitudinal design is the most appropriate choice when research questions and hypotheses are used to consider how variables differ over time (Hair *et al.*, 2011: 158). Three longitudinal research designs exist, namely cohort analysis, time-series research and panel studies (Blaikie, 2010: 202).

A cohort consists of a group of observations that share the same characteristics. A researcher either selects the entire cohort, or randomly selects a sample from the cohort for investigation. This approach is, however, rarely followed in business and management research (Bryman & Bell, 2015: 66).

A time-series design is defined as a sequence of data gathered over a time period with the objective of analysing the pattern in the arranged data for interpretation and projection purposes. Time-series research aims to identify the nature of the phenomenon depicted by the observations in the dataset. Once a pattern is identified, time-series research could be utilised to forecast the future values of a time-series variable (Singh, 2007: 224).

Panel studies track the changes in multiple sample objects over time, while a time-series study is used to consider the changing effects over time of a specific object (Blaikie, 2010: 202). A panel study considers the same characteristics of a sample over time. The researcher assesses changes in the characteristics of the considered variables to identify and assess changes over time (Singh, 2007: 65). Panel data allow a researcher to conduct a thorough analysis based on the collection of comprehensive (Beri, 2008: 64).

Given that the ESG and CFP data of 66 JSE-listed firms were assessed for the period 2011 to 2016, a panel research design was chosen. By using this research design, it was possible for the researcher to track changes in sample objects over the observed period (Blaikie, 2010: 202).

As indicated in step four of Figure 1.1, once the research design was developed, the researcher determined whether primary or secondary research should be conducted.

4.4 PRIMARY AND SECONDARY RESEARCH

Primary research refers to the collection of data that are not in existence yet. This type of research therefore requires the collection of new information known as primary data (Jugenheimer, Kelley, Hudson & Bradley, 2015: 29). Primary data can be collected by means of several techniques such as questionnaires, investigations, surveys and focus groups (Nykiel, 2007: 25). Primary data can be collected by an individual, organisation or agency for a particular purpose (Srivastava & Rego, 2011).

An advantage of primary research is that the data are specifically collected for the purpose of a study. As such, only relevant information is collected. Disadvantages include that the collection of primary data is time-consuming and often expensive. Furthermore, the collection of primary data is at times unfeasible, e.g. if the sources of data are scattered geographically (Srivastava & Rego, 2011). Although a study may be based on primary research, secondary research still needs to be conducted to guide a researcher in terms of previous studies conducted in a specific field (Jugenheimer *et al.*, 2015: 34).

Secondary research refers to information that has not originally been collected for a specific study. Such research has been conducted for another purpose by other researcher(s) or has been made public by other parties (Lee, Lee & Lee, 2000: 14). Stated otherwise, secondary research can be defined as the collection and summary of data that are already in existence. When conducting secondary research, the researcher uses known information to address the relevant research questions and to formulate arguments (Jugenheimer *et al.*, 2015: 29). Although the information already exists, it does not mean that secondary research is simple to conduct. Secondary data collection and analysis should be just as rigorous as primary research (Jugenheimer *et al.*, 2015: 30).

The advantages of secondary research include that there are usually minimal costs involved in the collection of such information, and that information is often readily available (Nykiel, 2007: 29; Jugenheimer *et al.*, 2015: 30). The researcher can also use multiple studies for argumentation purposes. Conversely, the disadvantages of

secondary research include that the research often do not address the specific needs of the researcher (Srivastava & Rego, 2011).

For the purpose of the current study, secondary data were collected. A literature study was conducted by examining various academic journals, books and relevant websites. The required financial data were sourced from the IRESS (2017) database, while ESG disclosure scores were obtained from the Bloomberg (2017) database.

4.5 POPULATION AND SAMPLE

A population refers to the entire group of individuals or items from which a researcher draws a conclusion (Levine, Stephan, Krehbiel & Berenson, 2008: 5). Ideally, a researcher would prefer to collect data from the entire population. This data are referred to as a census. It is, however, often impractical, time-consuming and expensive to conduct a study on the entire population. As such, a sample of a population is drawn for analysis (Hair *et al.*, 2011: 163). For the purpose of the current study, the population consisted of all JSE-listed firms for the period 2011 to 2016.

A sampling frame is known as a comprehensive list of all the elements from which a sample is drawn (Hair *et al.*, 2011: 166). It is important for a sampling frame to be representative of the population under consideration (Wilson, 2014). A sample is a small subset of the total population (Hair *et al.*, 2011: 163). A sample should also be representative of the considered population to be able to determine characteristics of the population (Hair *et al.*, 2011: 165; Coldwell & Herbst, 2004: 74).

Sampling techniques are divided into two broad types, namely probability (or random) and non-probability (or non-random) sampling (Wilson, 2014). In a probability sample, the researcher selects the items based on known probabilities. As such, the researcher can make objective inferences about the population under investigation (Levine *et al.*, 2008: 253). The most widely used probability sampling techniques include simple random sampling, stratified random sampling, systematic sampling and cluster sampling. Non-probability sampling techniques involve selecting items without knowing the probability of an item being selected (Levine *et al.*, 2008: 253). Although non-probability sampling techniques are usually inexpensive and easy to utilise, they often do not permit an objective evaluation of the results of the sample. For this reason the results are often not statistically projectable to the population (Neelankavil, 2007:

240). Non-probability sampling techniques include convenience sampling, judgement sampling, quota sampling and snowball sampling.

Convenience sampling is the most commonly utilised sampling technique employed in behavioural sciences (Gravetter & Forzano, 2018: 122). Attention is given to how conveniently units can be chosen for observation (Bryman & Bell, 2015: 200; Coldwell & Herbst, 2004: 81). Social scientists often select the convenience sampling technique because of the ease of collecting readily available standardised data. Furthermore, the sampling method is inexpensive and less time-consuming than other techniques (Gravetter & Forzano, 2018: 122). A judgement sample is selected according to specific criteria that are determined by a researcher (Bajpai, 2011: 105). The researcher selects the items to be included in the sample using sound judgement to save costs and time (Pellissier, 2007: 32).

Non-probability samples include advantages, such as convenience, timeliness and lower cost in comparison to probability samples. One main disadvantage, however, is the possibility of selection bias. The results can therefore not be generalised to the entire population (Levine *et al.*, 2008: 253).

For the purpose of the present study, a combination of convenience and judgement sampling techniques was employed. The criteria for the inclusion of a firm in the study's sample were as follows:

- a firm had to be listed on the JSE for at least two years (to ensure sufficient data points for statistical analysis);
- a firm's CFP data had to be available on the IRESS (2017) database; and
- a firm's ESG disclosure score had to be available on the Bloomberg (2017) database.

Firms that were examined were those listed in the Consumer Goods, Consumer Services, Health Care, Technology, Telecommunications and the Industrials sectors of the JSE (henceforth referred to as the 'considered' sectors). Firms listed in the Basic Materials and Financial sectors were excluded from the sample as their annual financial statements, nature of activities and degree of regulation differ from those of the firms listed in the considered sectors. Furthermore, no firms were listed in the Utilities sector.

4.6 DATA COLLECTION

To make sound decisions, corporate managers need appropriate information. However, this information is often not available in the required format. Data consist of individual observations or measurements of a specific characteristic related to a population (Wegner, 2007: 3). The selected research design will largely determine the type of data that will be collected (quantitative or qualitative) (Rose, Spinks & Canhoto, 2015: 7).

4.6.1 Defining the independent and dependent variables

Variables refer to characteristics of an organisation or individual that can be measured or observed (Singh, 2007: 122). Variables often take different forms depending on how they are recorded or measured (Israel, 2008). Research typically entails a process of collecting information regarding specific variables and considering change(s) in and/or relationships among these variables (Singh, 2007: 122). Different types of variables which can be employed by researchers are, amongst others, independent, dependent and control variables (Creswell, 2003: 52).

Independent variables are those that most likely cause or affect outcomes. These variables could also be called predictor or antecedent variables (Creswell, 2003: 52). Previously, researchers such as Breuer and Nau (2014); Ferrero-Ferrero *et al.* (2014); and Pasquini-Descomps and Sahut (2013), have typically regarded ESG as the independent variable when they investigated the relationship between ESG and CFP. In line with these international studies, ESG was also considered as the independent variable for the purpose of the current study as depicted in Table 4.1.

Table 4.1: ESG variables considered in the study

Independent variable: ESG disclosure score	
Variable	Source
Composite ESG disclosure scores Consisting of: An E-disclosure score; a S-disclosure score; and a G-disclosure score	Sourced from Bloomberg (2017)

Source: Researcher's own construction

Dependent variables are the outcomes or results derived from the influence of the independent variables. Dependent variables are also known as the effect or response variables (Creswell, 2003: 52). For the purpose of the current study, the dependent variable was CFP. Various CFP measures are discussed in Sections 4.8.3 to 4.8.5. Table 4.2 summarises the CFP variables that were used in the current study, consisting of accounting-based, market-based and value-based metrics.

Table 4.2: Corporate financial performance variables considered in the study

Dependent variable: Corporate financial performance (CFP)	
Variable	Source
Accounting-based CFP measures	
ROA	Sourced from IRESS (2017)
EPS	Sourced from IRESS (2017)
Market-based CFP measures	
EY	Sourced from IRESS (2017)
TSR	Sourced from IRESS (2017)
Value-based CFP measures	
ROIC	Sourced from IRESS (2017)
The spread (ROIC - WACC)	Sourced from IRESS (2017)
MVA	Sourced from IRESS (2017)
CROIC	Sourced from IRESS (2017)

Source: Researcher's own construction

In addition to independent and dependent variables, control variables are often employed in quantitative studies. These variables are included as they might have an influence on the dependent variable. Control variables are included to determine the “true influence” of the independent variable on the dependent variable (Creswell, 2003: 53). Previously, researchers who considered the relationship between ESG and CFP (such as Breuer & Nau, 2014; Ferrero-Ferrero *et al.*, 2014; Pasquini-Descomps & Sahut, 2013; Balatbat *et al.*, 2012) controlled for, amongst others, firm size, leverage and the industry in which a firm functions. In line with these authors, the researcher of the current study controlled for firm size, leverage and industry.

Firm size is of importance, as it is likely that smaller firms will not have the same level of ESG consideration than larger firms, mostly because of financial reasons. As firms become larger, it is expected that they will receive more attention from various external stakeholders. In the same way, these firms will have a tendency to respond to

stakeholder demands (Waddock & Graves, 1997: 14). The market capitalisation can be used as a proxy for firm size and is calculated as follows (Berk, DeMarzo, Harford, Ford, Mollica & Finch, 2014: 31):

$$\text{Market capitalisation} = \text{Market price per share} \times \text{number of shares outstanding} \quad (4.1)$$

Leverage has been highlighted as another relevant control variable. Management's attitude toward risk could have a direct impact on CFP, as a result of decisions relating to cost management and investment opportunities (Breuer & Nau, 2014: 36; Waddock & Graves, 1997: 14). The debt-to-assets ratio can be utilised as a proxy for management's risk tolerance and can be calculated as follows (Breuer & Nau, 2014: 36; Els *et al.*, 2014: 83):

$$\text{Debt-to-assets ratio} = \frac{\text{Total debt}}{\text{Total assets}} \quad (4.2)$$

Given that the researcher selected firms from several industries, it is important to control for industry. As mentioned in Section 4.7, six JSE sectors were considered.

4.6.2 Composite ESG disclosure scores

The relationship between the total ESG disclosure score and selected CFP measures were examined. International researchers have predominantly used a composite ESG disclosure score that consolidates a firm's performance on the individual E-, S- and G- aspects. However, according to Ferrero-Ferrero *et al.* (2014: 4), it is possible that a composite ESG disclosure score can "conceal different levels of uniformity in the ESG dimensions". Limkriangkrai, Koh and Durand (2017) furthermore argue that firms engage with the individual E-, S- and G- aspects at varying degrees. As such, the relationships between the individual E-, S- and G-disclosure scores and different CFP measures were considered.

ESG disclosure scores obtained from the Bloomberg (2017) database were based on the disclosure of ESG initiatives of the considered JSE-listed firms. The selected Bloomberg ESG categories are indicated in Table 4.3.

Table 4.3: Bloomberg’s environmental, social and corporate governance score categories

Environmental aspects	Social aspects	Corporate governance aspects
Risks created by operational decisions	Risks arising from human resources policies and practices	Risks stemming from flaws in corporate governance policies
Carbon emissions	Supply chains	Voting practices
Climate change	Discrimination	Executive compensation
Pollution	Political contributions	Shareholders’ rights
Waste disposal	Diversity	Takeover defences
Renewable energy	Human rights	Staggered boards (election of board members)
Resource depletion	Community relations	Independent directors

Source: Researcher’s own construction based on data provided by Bloomberg (2017)

Since 2009, the Bloomberg database has been providing standardised ESG data for JSE-listed companies (Bloomberg, 2014). The available ESG data are gathered from publicly disclosed corporate information (such as CSR reports, annual/integrated reports and company websites). Proprietary surveys are also conducted by Bloomberg which entail that specific data are directly requested from firms (Bloomberg, 2014: 13). It should be noted that these scores do not per se reflect the actual ESG performance of a firm, but is rather based on the disclosure of ESG aspects by a company.

4.6.3 Accounting-based corporate financial performance measures

In line with the recommendations of ESG researchers (such as Mutezo, 2014; Pasquini-Descomps & Sahut, 2013; Balatbat *et al.*, 2012), ROA and EPS were selected as the accounting-based performance measures to be included in the current study.

4.6.3.1 Return on assets

The ROA is a profitability ratio that is used to measure how effective a firm’s assets are being employed to generate an income (Els *et al.*, 2014: 75). For the purpose of the current study, the ROA ratios of considered firms were sourced from the IRESS (2017) database on an annual basis. The equation for the ROA ratio is as follows (IRESS, 2017a: 5):

$$\text{ROA} = \frac{\text{Profit/(loss) before interest and tax}}{\text{Total assets}} \times 100 \quad (4.3)$$

4.6.3.2 Earnings per share

Potential investors and shareholders are interested in knowing what their potential earnings are before making investment decisions. The EPS ratio allows investors to compare the price they paid per share to the current profit that can be earned on a per-share basis, as well as the current trading price (Porter & Norton, 2016: 662). The EPS ratio can be calculated as follows (Els *et al.*, 2014: 88):

$$\text{EPS} = \frac{\text{Profit after tax - non-controlling interest - preference dividends}}{\text{Number of ordinary shares}} \quad (4.4)$$

The EPS ratios of the included firms were sourced from the IRESS (2017a) database. In addition to the selected accounting-based performance measures, market-based performance metrics were also considered.

4.6.4 Market-based corporate financial performance measures

The current study considered the EY and TSR ratios as market-based financial performance measures.

4.6.4.1 Earnings yield

The EY ratio compares the EPS to the market price per share. The EY ratio was sourced from the IRESS (2017a) database and is calculated as follows:

$$\text{EY} = \frac{\text{Headline earnings per share (HEPS)}}{\text{Share price at company financial year end}} \times 100 \quad (4.5)$$

where:

HEPS = determined by excluding separately identifiable re-measurements (net of related tax and non-controlling interest) from the EPS equation.

4.6.4.2 Total shareholder return

The TSR is one of the most commonly utilised market-based performance measure. TSR refers to the return that a shareholder receives over a specified period. The equation for the TSR measure (calculated on an annual basis) is as follows (IRESS, 2017b: 2):

$$\text{TSR} = 100 \times \left[\left(\frac{P_t + D_t}{P_{t-1}} \right) - 1 \right] \quad (4.6)$$

where:

- P_t = the share price at end of the year
 P_{t-1} = the share price at the beginning of a year
 D_t = the published final dividend per share

In addition to the considered accounting-based and market-based CFP measures, the author applied value-based CFP measures.

4.6.5 Value-based corporate financial performance measures

Value-based CFP metrics are often regarded as an improvement on the more 'traditionally used' financial performance metrics. Value-based CFP measures aim to remove accounting distortions that are evident in the financial statements of firms (Erasmus, 2008: 66). In the current study, ROIC, the spread, MVA and CROIC value-based CFP measures were used.

4.6.5.1 Return on invested capital

The ROIC can be utilised to determine whether firm growth is profitable. The ratio is calculated by comparing the NOPAT to the total NOC of a firm (Brigham & Daves, 2010: 233):

$$\text{ROIC} = \frac{\text{NOPAT}}{\text{NOC}} \times 100 \quad (4.7)$$

where:

- NOC = long-term operating capital + net operating working capital

The measure indicates the percentage return earned in the form of NOPAT for each rand that is invested in operating capital. If the ROIC generated by a firm is larger than their WACC, growth is profitable and the firm is adding value (Brigham & Daves, 2010: 233).

4.6.5.2 The spread

EVA reflects managerial effectiveness at creating value in a given year and can be calculated as follows (Boatright, 2010: 442; Brigham & Daves, 2010: 235):

$$\text{EVA} = \text{NOPAT} - (\text{NOC} \times \text{WACC}) \quad (4.8)$$

Alternatively, EVA can also be calculated in terms of ROIC (Brigham & Daves, 2010: 235):

$$\text{EVA} = \text{NOC} \times (\text{ROIC} - \text{WACC}) \quad (4.9)$$

The latter formula calculates EVA by considering the firm's investment in operating capital multiplied by the spread. The spread refers to the difference between ROIC and WACC. Given that firms of dissimilar sizes are likely to realise large differences in their operating capital, the spread is utilised to standardise the measure of EVA among firms with varying size. If the spread is positive, a firm is adding value and reports a positive EVA. If the WACC is greater than the ROIC, then new investments in operating capital will diminish firm value (Brigham & Daves, 2010: 235).

4.6.5.3 Market value added

The MVA of a firm refers to the difference between the market value of a firm and the invested capital (Martin *et al.*, 2009: 92). The measure reflects the accumulated value created since the inception of a firm (Brigham & Daves, 2010: 235). MVA can thus also be expressed as the present value of a firm's EVA. The MVA of a firm is calculated as follows (Brigham & Daves, 2010: 234):

$$\text{MVA} = \text{Market value of shares (market capitalisation)} - \text{Total common equity} \quad (4.10)$$

Similar to the EVA measure, firms of dissimilar sizes tend to experience large differences in their MVA values. To standardise the measure between firms of different sizes, MVA can alternatively be calculated as follows:

$$\text{MVA} = \frac{\text{Market capitalisation}}{\text{Book value of ordinary shareholder's equity}} \quad (4.11)$$

The latter formula simplifies the MVA calculation and increases the comparability among firms in the current study. An MVA value larger than one indicates that a firm has created aggregated value over time. The current study employed Equation 4.11 when calculating MVA.

4.6.5.4 Cash return on invested capital

The CROIC represents the amount of the current FCF that is being generated in a firm compared to the capital in operation. The CROIC of a business can be calculated as follows:

$$\text{CROIC} = \frac{\text{FCF}}{\text{NOC}} \times 100 \quad (4.12)$$

If the calculated CROIC value is positive, it provides an indication that a firm is likely to earn positive future FCFs. Should the calculated value be negative, however, a firm can expect to generate negative future FCFs.

The manner in which the CROIC ratio is calculated also standardises for firm size. Larger firms generally generate larger FCFs in comparison to their smaller counterparts. In other words, by dividing a firm's FCF by the operating capital employed, the ratio is more comparable among firms of different sizes.

4.7 DATA PROCESSING

Data analysis is seen as an integral part of the research process (Bajpai, 2011: 7). There are two main methods of analysis that can be used by researchers, namely descriptive and inferential statistics. In the case of descriptive statistics, data can be summarised and described. Inferential statistics can be used to draw conclusions about the total population based on a sample's data (Levine *et al.*, 2008: 3).

4.7.1 Descriptive statistics

Quantitative data analysis includes utilising descriptive statistics to gain an understanding of the data (Hair *et al.*, 2011: 299). The data can be organised and summarised by considering either measures of central tendency or measures of dispersion. Measures of central tendency assist in locating the centre of the data distribution (Hair *et al.*, 2011: 310). These measures include the mean, median and mode. Dispersion measures include the variance, standard deviation and range (Lee *et al.*, 2000: 4).

4.7.1.1 The mean

The mean (denoted as \bar{x}) is the arithmetic average and the most widely used measure of central tendency (Hair *et al.*, 2011: 310). Data typically reveal some degree of central tendency if most of the data points are close to the average. The mean is determined by adding all the values in the dataset divided by the number of observations. The mean can be calculated as follows (Francis, 2008: 96):

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} \quad (4.13)$$

where:

$\sum_{i=1}^n x_i$ = the sum of all the observations

n = the total number of observations in the sample

4.7.1.2 The median

The median is the central observation in a dataset when all the data are arranged in either ascending or descending order (Sekaran & Bougie, 2016: 282). The median can be determined as follows (Levine *et al.*, 2008: 99):

$$\text{Median} = \frac{n+1}{2} \text{ ranked value} \quad (4.14)$$

where:

Rule 1: should there be an odd number of observations, the median would be the middle-ranked number.

Rule 2: should there be an even number of observations, the median would be equal to the average of the two middle-ranked numbers.

Advantages of utilising the median include that the value is easy to understand and to calculate. The median is also less affected by extreme values than the mean. The measure is therefore often utilised in a dataset which has a number of extreme values. A disadvantage of the measure is that it can be more affected by the number of observations rather than the values of observations in the dataset (Sharma, 2007: 111).

4.7.1.3 The mode

The mode represents the most frequently occurring observation (Sekaran & Bougie, 2016: 282). A dataset can also be bimodal if more than one observation appears several times, resulting in two modes (Coldwell & Herbst, 2004: 104).

Advantages of calculating the mode include that the measure is easy to understand, is not affected by extreme values and can be utilised to describe both qualitative and quantitative data. The main disadvantage of the mode occurs when there are more than one mode which might complicate interpretation and comparison (Sharma, 2007: 121).

4.7.1.4 Variance and standard deviation

The variance (denoted as σ^2) is a measure of dispersion around the mean (Zikmund *et al.*, 2013: 417). The measure is calculated by finding the square of the difference between each observation and the mean. The sum of these squared differences is then divided by the number of observations in the sample minus one. The formula for the calculation of the variance is (Sekaran & Bougie, 2016: 283):

$$\sigma^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1} \quad (4.15)$$

where:

x_i = each individual observation in the dataset
 \bar{x} = the mean

The standard deviation (denoted as σ) is a commonly used measure of dispersion utilised in statistics and probability theory (Zikmund *et al.*, 2013: 417). The measure is used to indicate the extent of variation of the data points from the mean. A low standard deviation reveals that the data points are located closer to the mean, whereas a higher standard deviation indicates greater dispersion from the mean. The standard deviation is the square root of the variance and can therefore be measured as follows (Zikmund *et al.*, 2013: 417):

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}} \quad (4.16)$$

4.7.1.5 Range

The range is the difference between the maximum and minimum values in a dataset. It is the simplest descriptive measure of variation and can be calculated as follows (Levine *et al.*, 2008: 105):

$$\text{Range} = x_{largest} - x_{smallest} \quad (4.17)$$

where:

$x_{largest}$ = the largest observation in the dataset

$x_{smallest}$ = the smallest observation in the dataset

In addition to descriptive statistics, various inferential statistics were conducted in the study, as discussed in the following section.

4.7.2 Inferential statistics

Inferential statistics, also referred to as inductive statistics, can be used to draw conclusions and make certain generalisations about the characteristics of a population on the basis of the sample (Holcomb, 2016; Neelankavil, 2015: 244; Black, 2012: 6). Inferential statistics utilise the probability concept to analyse the sample data to improve the researcher's knowledge about the population (Asadoorian & Kantarelis, 2005: 2).

A descriptive measure of a population is known as a parameter, whereas a descriptive measure of a sample is known as a statistic. The difference between the terms parameter and statistic is important in the context of inferential statistics. Given the infeasibility of calculating parameters, statistics of a sample can be considered, and by estimation the value of the parameter can be inferred. The premise of inferential statistics is therefore the ability to make decisions about parameters without having to conduct a census (Black, 2012: 6).

Inferential statistics can be divided into two main categories, namely parametric and non-parametric statistics. Parametric statistics involve values with a known, continuous distribution. In the case where values do not conform to the normal distribution, then non-parametric statistics are generally utilised (Zikmund *et al.*, 2010: 548).

The suitability of data analysis largely depends on the nature of the data gathered and the level of measurement. Measurement is a process of assigning numbers to certain characteristics of variables. Once measurements are recorded and scored, it can be denoted as data. Stated otherwise, data are recorded measurements (Black, 2012: 7). The four most common data measurement scales are nominal, ordinal, interval and ratio scales (Black, 2012: 8). A ratio scale is the highest level of data measurement (Black, 2012: 9). In addition to order and equal units of measurement, ratio data have an absolute zero that indicates the absence of a specific characteristic being studied (Black, 2012: 9; Jackson, 2015: 75). The ratio scale therefore has all three characteristics of measurement, namely magnitude, equal unit size and an absolute zero (Jackson, 2015: 75). Parametric statistics involve interval or ratio data and require certain assumptions about the distribution of the data. Non-parametric statistics are used to analyse ordinal or nominal data (Black, 2012: 13).

Inferential statistics typically measures the difference or the association between two or more variables (Blanche, Durrheim & Painter, 2004: 234). Different inferential statistics, such as analysis of variance (ANOVA) and t-tests are utilised to test for differences between variables. Associational inferential statistics, such as correlation and regression analyses, test for a relationship between two or more variables (Leech, Barrett & Morgan, 2015; Gliner & Morgan, 2000: 76).

4.7.2.1 Hypothesis testing

A hypothesis can be defined as an informed speculation with regard to the possible relationship between two or more variables (Bryman, 2012: 712). The null hypothesis (H_0) identifies the status quo and is considered true unless statistical evidence states otherwise. The H_0 typically posits that there is no relationship between variables or no difference between the populations being studied. The alternative hypothesis (H_A) states that there is a relationship or difference between the considered variables (Hatcher, 2003: 297).

Hypothesis testing is a statistical procedure that assists the researcher to objectively decide whether or not to reject the hypothesis based on the data (Bajpai, 2011: 211; Sweeney, Williams & Anderson, 2011: 378). The research hypotheses that were formulated for the purpose of the current study are provided in Section 1.4.4.

There are essentially two ways to conduct hypothesis testing, namely the critical and p-value approaches. The critical value approach entails that a rejection region(s) is identified based on the critical value(s) (Mendenhall, Beaver & Beaver, 2009: 394). The level of significance or alpha (α) is then utilised to determine the critical value and rejection rule (Sweeney *et al.*, 2011: 361). If the probability of H_0 being true is equal to or less than the level of significance, the hypothesis should be rejected, otherwise it should not be rejected (Sharma, 2007: 330). For the purpose of the current study, levels of significance of one per cent and five per cent were considered.

The p-value approach is often referred to as the observed significance approach (Sharma, 2007: 340). A p-value is computed based on the value of the test statistic and is used to determine whether H_0 should be rejected or not (Sweeney *et al.*, 2011: 354; Mendenhall *et al.*, 2009: 394). The p-value is known as the smallest value of α for which the H_0 can be rejected (Black, 2012: 308). If the p-value is smaller than or equal to the significance level, H_0 is rejected (Mendenhall *et al.*, 2009: 351).

In most cases, the statistical procedure of hypothesis testing should result in the rejection of the H_0 , i.e. if the statement is not true. However, given that the rejection decision depends on sample data and sample statistics, the possibility of making errors exists (Sharma, 2007: 333; Zikmund *et al.*, 2013: 514). According to Mendenhall *et al.* (2009: 356) there are two main errors which can occur during hypothesis testing, namely Type I and Type II errors. Table 4.4 indicates the correct interpretations of H_0 and the errors which can occur.

Table 4.4: Hypothesis testing decision

Statistical decision	H_0 true	H_0 false
Reject H_0	Type I error	Correct decision
Accept H_0	Correct decision	Type II error

Source: Adapted from Mendenhall *et al.* (2009: 356)

A type I error has a probability of α and occurs when a true H_0 is rejected. Given that the probability of a Type I error occurring is the same as the level of significance (α), it can be controlled by the researcher (Mendenhall *et al.*, 2009: 356). This error occurs when a true condition of a population is rejected based on sample statistical observations. The researcher thus concludes that a relationship or difference exists in a population when in reality it is false (Zikmund *et al.*, 2013: 514). A Type II error has

the probability of beta (β) and occurs when a researcher fails to reject the H_0 when the H_A is true. Type I and Type II errors are inversely related. As a result, reducing the probability of a Type I error simultaneously increases the probability of a Type II error occurring (Zikmund *et al.*, 2013: 515).

The explanatory power of regression analysis lies in hypothesis testing. Regression analysis is frequently utilised to test relational hypotheses (Zikmund *et al.*, 2013: 576). Due to the panel nature of the current study's dataset, panel regression analyses were employed. The most frequently used panel regression analyses are discussed in the following sections.

4.7.2.2 Pooled ordinary least squares regression

For longitudinal data, the pooled ordinary least squares (OLS) is a generally used regression model that is employed if observations are independent. Pooling entails that all individual-year data are regarded as unique and independent observations (Mertens, Pugliese & Recker, 2017: 82). The equation for the pooled OLS regression model is (Menard, 2008: 234):

$$y_{it} = \beta_0 + \beta_1 x_{it} + \epsilon_{it} \quad (4.18)$$

where:

y_{it}	=	dependent variable for unit i at time t
β_0	=	intercept
β_1	=	regression coefficient
x_{it}	=	independent variable for unit i at time t
ϵ_{it}	=	error term

The pooled OLS regression model ignores that observations are nested within individuals and assumes independence of observations. This assumption will possibly result in inflated sample sizes, biased coefficients and the underestimation of standard errors. As a result of these biases, more appropriate models are usually selected (Mertens *et al.*, 2017: 82). The two most commonly used panel regression techniques are fixed effects and random effects (Hassett & Paavilainen-Mäntymäki, 2013: 45).

4.7.2.3 Fixed effects regression

In the fixed effects regression model longitudinal data are analysed with constant measures for both independent and dependent variables (Hassett & Paavilainen-Mäntymäki, 2013: 45). Furthermore, in this model the individual-specific effect is a random variable which is allowed to be correlated with the explanatory variables (Schmidheiny, 2015: 4). This regression model controls for omitted variables in panel data that vary across cross-sectional units but remain constant over time (Gossy, 2008:126).

The equation for the fixed effects regression model is (Menard, 2008: 234):

$$y_{it} = \beta_{0i} + \delta_t + \beta_1 x_{it} + \epsilon_{it} \quad (4.19)$$

where:

y_{it}	=	dependent variable for unit i at time t
β_{0i}	=	($i = 1 \dots n$) is the intercept for each unit (separate intercepts are indicated for each unit)
δ_t	=	dummy variable for each time period
β_1	=	regression coefficient
x_{it}	=	independent variable for unit i at time t
ϵ_{it}	=	error term

The i and t subscripts indicate that there were observations for i units over t time periods.

4.7.2.4 Random effects regression

The random effects regression model assumes that the individual-specific effect is a random variable which is uncorrelated with all the observed variables (Schmidheiny, 2005: 3; Williams, 2015: 6). The equation for the random effects regression model is (Menard, 2008: 234):

$$y_{it} = \beta_0 + \beta_1 x_{it} + \mu_i + \omega_t + \epsilon_{it} \quad (4.20)$$

where:

y_{it}	=	dependent variable for unit i at time t
β_0	=	intercept
β_1	=	regression coefficient
x_{it}	=	independent variable for unit i at time t

μ_i, ω_t = separate error terms for unit i and time t
 ϵ_{it} = within-unit error

The removal of subscript i from the intercept in equation 4.20 compared to equation 4.19 should be noted. The random effects model assumes that unobserved differences between units and time are random variables, in comparison to the assumption included in equation 4.20 that they are fixed (Menard, 2008: 234).

4.7.2.5 The F-test for fixed effects

The F -test for fixed effects is used to test whether the regression model selected is the most appropriate to analyse the panel data. Researchers who utilise panel data tend to include unit and time dummy variables, without determining if this approach is appropriate. An F -test of either unit and/or time dummies can be used to establish whether unit and time heterogeneity should be controlled for. If the F -tests are significant, the researcher should include time and unit dummy variables (Menard, 2008: 237). The equation for the F -test statistic for overall significance is (Anderson, Sweeney, Williams, Camm & Cochran, 2018: 725):

$$F = \frac{MSR}{MSE} \quad (4.21)$$

where:

MSR = mean square due to regression = $\frac{SSR}{k}$
 SSR = sum of squares due to regression
 k = corresponding degrees of freedom
 MSE = mean square due to error = $\frac{SSE}{n-k-1}$
 SSE = sum of squares due to error
 $n-k-1$ = corresponding degrees of freedom

4.7.2.6 The Hausman-test

The Hausman-test is an econometric test to determine the appropriate regression model when considering panel data. If the test result is significant ($p < 0.05$), the fixed effects regression model is appropriate. Otherwise, the random effects model should be applied (Hasset & Paavilainen-Mäntymäki, 2013: 47). The Hausman-test statistic (H) can be calculated as follows (Menard: 2008: 236):

$$H = \frac{(\hat{\beta}_1 (FE) - \hat{\beta}_1 (RE))^2}{\sigma_{\hat{\beta}_1 (FE)}^2 - \sigma_{\hat{\beta}_1 (RE)}^2} \quad (4.22)$$

where:

$\hat{\beta}_1$ = estimated coefficient for the independent variable

$\sigma_{\hat{\beta}_1}^2$ = estimated variance of the coefficient

and

FE (fixed effects): denote values that were obtained by fixed effects estimation

RE (random effects): denote values that were obtained by random effects estimation

4.7.2.7 Summary of the considered regression models

A summary of the appropriate regression model (pooled OLS, fixed effects and/or random effects) that could be used for the inferential analysis is provided in Table 4.5. The appropriate model is selected based on the rejection (or not) of the stated hypothesis of the fixed and/or random effects regression models.

Table 4.5: Selecting the appropriate regression model

Fixed effects (<i>F</i> -test)	Random effects (Breusch-Pagan test)	Appropriate regression model
H₀ is not rejected: no fixed effects	H ₀ is not rejected: no random effects	Data are poolable Use the pooled OLS regression model
H₀ is rejected: fixed effects	H ₀ is not rejected: no random effects	Use the fixed effects regression model
H₀ is not rejected: no fixed effects	H ₀ is rejected: random effects	Use the random effects regression model
H₀ is rejected: fixed effects	H ₀ is rejected: random effects	Recommendation: choose one of the fixed or random effects models depending on the result of the Hausman test Alternatively: fit a model with a fixed group effect and a random time effect (or vice versa) using a least squares dummy variable model and a random effects model

Source: Park (2011)

When incorporating variables in a panel regression model, there are four specification errors that might occur (Das, 2012: 278). These errors, namely autocorrelation, normality of errors, multicollinearity and heteroskedasticity, are discussed in the following sections.

4.7.2.8 Specification errors

All forms of regression models are subject to specification error(s) (Dixon, Singleton & Straits, 2016: 390). Specification errors often lead to difficulties pertaining to the estimation and interpretation of the data (Allen, 1997: 166).

4.7.2.8.1 Autocorrelation

Autocorrelation (also known as serial correlation) is an error typically associated with time-series data. This error occurs when observations of the dependent variables are correlated to one another over time. As such, the dependent variable in one time period is similar to observations in adjacent time periods (Levine *et al.*, 2008: 534; Fleming & Nellis, 2000: 321). Autocorrelation often occurs in the case of financial data, and the data reflect minimal fluctuation from one year to the next (Fleming & Nellis, 2000: 321).

First-order autocorrelation refers to the instance where the value of y in time period t is related to its observation in time period $t-1$. Should the value of y_t be related to the observation in time period $t-2$, second-order autocorrelation exists (Anderson *et al.*, 2018: 792).

Autocorrelation can be corrected by changing the dependent and/or independent variables by expressing them in first-difference form. First-difference form refers to subtracting the previous observation from the current value (Fleming & Nellis, 2000: 321). If significant autocorrelation is present, it is important to determine whether one of the independent variables that have time-ordered effects on the dependent variable have been omitted. If not, the inclusion of an additional variable measuring the time of observation will assist in reducing the degree of autocorrelation (Fleming & Nellis, 2000: 321).

4.7.2.8.2 Normality of errors

The normality of errors assumption requires that error terms should be normally distributed. If this assumption is not adhered to, a panel regression model could produce unrealistic estimations of coefficients (Davis & Pecar, 2013: 370).

4.7.2.8.3 Multicollinearity

Multicollinearity is an important consideration when multiple regression models are employed (Wackerly, Mendenhall & Scheaffer, 2008: 634). Multicollinearity occurs when two or more of the independent variables of a multiple regression model are strongly correlated. A correlation often exists between two independent variables in business research studies. The problem of multicollinearity occurs when the inter-correlation between independent variables are high. The strong relationship between predictor variables can result in various other difficulties, specifically with regard to the interpretation of the regression analysis (Black, 2012: 582). A sample correlation coefficient larger than +0.7 or less than -0.7 between two independent variables often indicates that multicollinearity exists (Anderson *et al.*, 2018: 728). In the current study, the possible effects of multicollinearity were moderated by the overall fit of the selected regression models. Acceptable tolerance values were determined for the predictors.

4.7.2.8.4 Heteroskedasticity

The assumption is often made by researchers that the variance of the error in a regression is constant across observations. The errors are therefore assumed to be homoskedastic. In financial data, however, errors are often heteroskedastic (DeFusco, McLeavey, Pinto, Runkle & Anson, 2014: 408). Heteroskedasticity occurs when the standard error terms do not all have the same variance (Wang & Jain, 2003: 91; Kacapyr, 2015: 114). The error results from the widespread dispersion between the minimum and maximum values of the dependent variable, which leads to larger residuals for certain observations. Heteroskedasticity occurs mainly in cross-sectional data analysis (Lewis, 2012: 416).

When errors are heteroskedastic, *t*-tests for the significance of regression coefficients are unreliable. This unreliability emanates from heteroskedasticity that introduces bias into estimators of the standard error of regression coefficients (DeFusco *et al.*, 2014: 408). When considering financial data, the most common result of heteroskedasticity is that the estimated standard errors will be underestimated and the *t*-statistics are inflated. Should heteroskedasticity be ignored, a researcher might infer significant relationships where none are present (DeFusco *et al.*, 2014: 410).

The Breusch-Pagan Lagrange multiplier is most frequently utilised in financial research to test for heteroskedasticity (DeFusco *et al.*, 2014: 410; Verbeek, 2008: 99). The formula for the Breusch-Pagan (BP) test for one-way random effects is (SAS Institute, 2012: 1400):

$$BP = \frac{NT}{2(T-1)} \left[\frac{\sum_{i=1}^N [\sum_{t=1}^T \hat{u}_{it}]^2}{\sum_{i=1}^N \sum_{t=1}^T \hat{u}_{it}^2} - 1 \right]^2 \quad (4.23)$$

where:

- N = number of cross-sectional units
- T = number of time periods
- \hat{u}_{it} = OLS residuals of the pooled model

The test can be generalised for a two-way random effects model if required (SAS Institute, 2012: 1400).

In addition to the discussed regression models in Sections 4.9.2.2, 4.9.2.3 and 4.9.2.4, a mixed-model ANOVA was used in the current study. The model was employed to determine whether there was a significant trend in the observed composite ESG disclosure scores and the individual E-, S- and G-disclosure scores over time.

4.7.2.9 Mixed-model ANOVA

The ANOVA model is a special case of the linear regression model with three specific characteristics, namely parameters which are estimated by OLS, the F -test is used for hypothesis testing and betas (β_1, \dots, β_n) are assumed to be fixed parameters (Demidenko, 2013: 5).

A mixed-model ANOVA is conducted to test for differences between two (or more) groups, as well as within groups (Brown, 2017: 69). A model can be viewed as a combination of the fixed effects ANOVA model where observations do not correlate and a random effects model variance component forms the mixed-model ANOVA. The fixed effects factor is a between-subjects variable and the random effects factor is a within-subjects variable (Demidenko, 2013: 5; Tavakoli, 2012: 361).

The equation for the linear mixed-model ANOVA (Demidenko, 2013: 6) is:

$$y_i = x_i\beta + z_i\gamma_i + \epsilon_i \quad (4.24)$$

where:

- y_i = dependent variable
- β = vector of parameters associated with the fixed factors
- x_i = gathers all fixed effects
- z_i = matrix gathering all the random effects
- γ_i = vector of parameters associated with the random effects
- ϵ_i = error term

The restricted maximum likelihood method is mainly used as an estimator for the variance components when using a mixed-model ANOVA. This method aims to obtain unbiased estimates of variance and covariance parameters by defining the likelihood of residuals (Little, 2013: 368).

4.7.2.10 Fischer's least significant difference test

If an ANOVA is performed and the overall F -test indicates a significant difference, the null hypothesis of equal means can be rejected. In such a case, the Fisher's LSD test can be used to determine where the differences occurred (Anderson *et al.*, 2018: 584). The Fisher's LSD test uses the t -test formula to calculate the smallest difference between two means to state that a difference is statistically significant (Bors, 2018: 420).

The Fisher's LSD test statistic (t) for comparing two sample means (Anderson *et al.*, 2018: 586) is:

$$t = \frac{\bar{x}_i - \bar{x}_j}{\sqrt{MSE \left(\frac{1}{n_i} + \frac{1}{n_j} \right)}} \quad (4.25)$$

where:

- \bar{x}_i = historic mean of sample i
- \bar{x}_j = historic mean of sample j
- n_i = sample size of group i
- n_j = sample size of group j
- MSE = mean square error obtained from the ANOVA test

If the p -value is less than or equal to the level of significance, the null hypothesis should be rejected. If the critical value approach is used, the null hypothesis should be rejected

if $t \leq -t_{\alpha/2}$ or $t \geq t_{\alpha/2}$. Where the value of $t_{\alpha/2}$ is based on a t -distribution with $n_T - k$ degrees of freedom (Anderson *et al.*, 2018: 586).

4.8 CONCLUSION

The research process that was followed in the current study was explained in this chapter. A positivistic quantitative research methodology was selected based on the numerical measurements employed in the study. As such, quantitative data were sourced to test the formulated hypotheses.

The population of the study consisted of all JSE-listed firms for the period 2011 to 2016. A combination of convenience and judgement sampling was employed to draw a sample of 66 firms from six JSE sectors. Secondary research was conducted. The financial performance of firms was measured by employing various accounting-based, market-based and value-based CFP measures. The financial data of firms were sourced from the IRESS (2017) database. The Bloomberg (2017) database was employed for the collection of the required ESG disclosure scores.

After the panel data were collected, descriptive statistics were conducted to describe and summarise the data. Thereafter, various inferential statistics were employed to draw conclusions about the overall population. The results of the descriptive and inferential analyses are discussed in the following chapters.

CHAPTER 5

EMPIRICAL RESULTS: DESCRIPTIVE STATISTICS

5.1 INTRODUCTION

As highlighted in Section 2.3, responsible investors aspire to earn sustainable returns. These investors recognise that the lack of ESG risk management could adversely affect CFP. The author set out to investigate the ESG disclosure scores and the CFP of selected JSE-listed firms over the period 2011 to 2016. The research process employed in the present study was explained in Section 4.2. Step nine of the adopted research process entails reporting the descriptive and inferential findings.

Given this background, the first section of this chapter provides details on the ESG disclosure of the 66 JSE-listed firms from the considered sectors. The researcher obtained 373 firm-year observations for ESG disclosure scores from the Bloomberg (2017) database and processed the data by using Excel.

Thereafter, the researcher considered the CFP of the firms over the research period. Accounting-based CFP measures (ROA and EPS), market-based (EY and TSR) and value-based measures (ROIC, CROIC, the spread and MVA) were used to assess different aspects of CFP. These financial performance measures were obtained from the IRESS (2017) database.

5.2 ENVIRONMENTAL, SOCIAL AND CORPORATE GOVERNANCE DISCLOSURE SCORES

The ESG disclosure scores reflect the extent of ESG reporting of the considered firms over the six-year research period. The total dataset included observations of firms listed in six different JSE sectors, namely the Consumer Goods, Consumer Services, Telecommunications, Health Care, Technology and the Industrials sectors.

5.2.1 Composite ESG disclosure scores

ESG was regarded as the independent variable in the current study, represented by an aggregated value of the firms' ESG disclosures on an annual basis. Descriptive

statistics were utilised to analyse the nature and trend of the ESG disclosure scores over time. The descriptive statistics for the composite ESG disclosure scores for the sample are depicted in Table 5.1.

Table 5.1: Composite ESG disclosure scores^{a)}

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	55	31	31	10	66	13
2012	59	30	33	10	55	12
2013	65	31	33	10	55	12
2014	62 ^{b)}	34	37	10	55	12
2015	66	35	36	10	55	11
2016	66	35	34	11	55	11
Overall period	373	33	33	10	66	12

a) The lowest possible composite ESG disclosure score was 0 and the highest possible score was 100.

b) The decrease in the number of companies in 2014 was due to no ESG disclosure scores being available for Truworths, BidCorp, Bidvest and Value Group on the Bloomberg (2017) database.

The increase in the number of firms shown in Table 5.1 reveals that over the study period more companies started to disclose ESG information. The annual mean ESG disclosure scores reflected an increasing trend over the research period. Since the advent of integrated reporting in 2011, JSE-listed firms have been encouraged to disclose pertinent non-financial (ESG) information (IRC of South Africa, 2018). Although the mean composite ESG disclosure score was still below 50 per cent in 2016, the increasing trend can be regarded as a positive development.

Perusal of the minimum and maximum values over the research period reveals that some firms performed better than others at disclosing ESG aspects. The minimum score of 10 indicates that some companies disclosed extremely limited ESG information. The overall range of 56 and standard deviation of 12 illustrate that ESG disclosure varied considerably among the considered companies. The top performers in ESG disclosure included Woolworths in 2011 (ESG score of 66), British American Tobacco (BATS) and Tongaat Hulett with ESG scores of 55 over the period 2012 to 2016. The reason for the marked decline noted in the ESG disclosure score of Woolworths (66 in 2011; 49 in 2016) was a decrease in the disclosure level of their environmental and corporate governance practices.

A composite ESG disclosure score could conceal differing degrees of disclosure of individual ESG aspects across various firms. Given the increase observed in ESG disclosure over time, it became important to determine the source of the increase by considering the individual aspects. In the following three sections, attention is therefore given to the separate E-, S- and G-disclosure scores.

5.2.2 Environmental disclosure scores

Environmental concerns, such as a lack of potable water, pollution and the destruction of natural habitats have been highlighted as the most pressing environmental issues in South Africa (Hebb *et al.*, 2016: 109). By examining the descriptive statistics of E-disclosure scores over time, the researcher aimed to identify the trend exhibited by this individual ESG aspect over time. Of further interest was whether the individual E-disclosure trend was comparable to that of the composite ESG disclosure score displayed in Table 5.1. The descriptive statistics for the E-disclosure scores are shown in Table 5.2.

Table 5.2: Environmental disclosure scores^{a)}

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	55	19	19	0	59	14
2012	59	19	21	0	47	14
2013	65	19	19	0	50	14
2014	62	22	22	0	48	14
2015	66	22	22	0	48	13
2016	66	22	22	0	48	12
Overall period	373	20	21	0	59	14

^{a)} The lowest possible E-disclosure score was 0 and the highest possible score was 100.

As can be seen in Table 5.2, the annual mean and median E-disclosure scores reveal an increasing trend over the study period. It should, however, be noted that the average level of E-disclosure is considerably low with the annual mean values never exceeding 22 per cent. Although more firms were gradually giving attention to environmental practices and disclosing the details thereof, it appears to be progressing at a slow pace. Furthermore, fifteen of the considered firms did not disclose any environmental practices over the study period as reflected by the minimum values of 0. In Giamporcaro *et al.*'s (2010) study, asset managers highlighted the inadequate E-

disclosure by South African companies as a challenge when analysing a firm's environmental risk. The lack of standardisation of environmental data, such as water and energy consumption was specifically mentioned (Giamporcaro *et al.*, 2010: 16).

In 2011 and 2012, Woolworths and Anheuser-Busch InBev were the top disclosers of environmental practices. BATS had the highest E-disclosure score over the period 2013 to 2016. This firm disclosed information pertaining to their reduction in CO₂ emissions, energy and water usage. BATS also invested in energy-efficient technologies. This company highlighted that eight per cent of the Group's energy came from renewable sources. Furthermore, BATS managed to reduce their waste-to-landfill by 67 per cent in 2016 (BATS, 2016: 30).

5.2.3 Social disclosure scores

The second component of the ESG disclosure score focuses on the extent of disclosure related to a firm's social considerations. Social concerns include aspects such as employment equity, human rights and consumer protection (De Bruin, 2012: 1). Descriptive statistics (refer to Table 5.3) were conducted to identify the trend in S-disclosure of firms over the research period.

Table 5.3: Social disclosure scores^{a)}

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	55	34	44	0	68	21
2012	59	32	44	0	74	21
2013	65	35	44	0	68	20
2014	62	40	39	0	68	20
2015	66	42	37	0	79	18
2016	66	42	33	0	79	17
Overall period	373	38	42	0	79	20

^{a)} The lowest possible S-disclosure score was 0 and the highest possible score was 100.

The annual mean S-disclosure scores showed an increasing trend over the study period as reflected in Table 5.3. From 2014 to 2016 the annual mean values increased, while the median values decreased. This change in trends could be ascribed to some firms realising considerable increases in their S-disclosure scores, while the S-disclosure scores of others either remained at low levels or decreased between 2014

and 2016. For example, Tsogo Sun (2012-2014: 0 to 2015-2016: 53), Reunert (2014: 58 to 2015-2016: 79) and Aspen Pharmacare (2014-2015: 51 to 2016: 61) had steep increases in the S-disclosure scores. In contrast, firms that realised sharp decreases include Anheuser-Busch InBev (2013-2015: 63 to 2016: 53), Invicta (2015: 39 to 2016: 23) and Sun International (2015: 33 to 2016: 21).

Similar to the E-disclosure scores, fifteen firms did not disclose any social considerations as reflected by the minimum values of 0 over the research period. On the other hand, a number of firms excelled in disclosing their social considerations. The top performers in this respect were Woolworths (2011), Tongaat Hulett (2012 and 2014), Tiger Brands (2013 and 2014), Clicks (2014), Distell (2016) and Reunert (2015 and 2016).

Given Distell's business operations, the firm highlighted their involvement with non-governmental organisations to address alcohol abuse among the youth (Distell, 2016). Nationally, foetal alcohol syndrome remains a prominent challenge (World Health Organisation, 2011). Distell therefore supported a number of programmes with the aim of raising awareness of alcohol abuse among pregnant women. Furthermore, the firm engaged in 'drinking-and-driving' awareness campaigns. In terms of their human capital, the firm focused on talent management, succession planning, fair employment practices and learning and development opportunities. Moreover, the firm committed itself to implementing the B-BBEE Codes of Good Practice in all spheres of the firm (Distell, 2016).

Similarly, in their 2016 integrated annual report, Reunert highlighted their customer-centric approach and alignment with national transformation objectives. Employees also received market-related remuneration packages and care was taken to improve the physical work environments. The firm spent R14 million on socio-economic development and corporate social investment. The firm furthermore integrated the protection of human rights into its existing business processes and procedures. The Reunert College offered previously disadvantaged students an opportunity to improve their matric mathematics, physical science and accounting marks. These students were accordingly eligible for a bursary upon successful completion of their course (Reunert, 2016).

A comparison of Tables 5.2 and 5.3 reveal that the considered firms disclosed more information about their social considerations than their environmental practices. As mentioned in Section 2.4, South Africa has a legacy of social injustices which has hampered socio-economic development. As such, an increased awareness was noted between some firms to address the imbalances of the country's past by, amongst others, encouraging job creation and skills development initiatives and improving conditions of employment.

5.2.4 Corporate governance disclosure scores

The final individual component of the composite ESG disclosure score focuses on the disclosure of information related to the considered firms' corporate governance aspects over the research period. Corporate governance refers to the implementation of effective and ethical leadership by a corporate governing body (IoDSA, 2016: 11). The descriptive statistics for the sample's G-disclosure scores are portrayed in Table 5.4.

Table 5.4: Corporate governance disclosure scores^{a)}

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	55	56	57	38	73	21
2012	59	55	57	38	68	21
2013	65	55	57	38	68	20
2014	62	55	52	32	70	20
2015	66	55	57	38	70	18
2016	66	55	57	14	70	17
Overall period	373	55	57	14	73	20

^{a)} The lowest possible G-disclosure score was 0 and the highest possible score was 100.

As shown in Table 5.4, the annual mean and median corporate governance disclosure scores remain relatively stable over the research period. Both the mean and median values are considerably higher than the corresponding E- and S-disclosure scores (see Tables 5.2 and 5.3). In contrast to the minimum values of zero for the E- and S-disclosure scores, all firms disclosed some level of corporate governance practices over the study period. This trend could be attributed to South Africa's well-developed corporate governance framework provided by the King Reports. The top performers in

corporate governance disclosure were Anheuser-Busch InBev (2014 to 2016), BATS (2013), Reunert (2012) and Woolworths (2011).

In 2016, Anheuser-Busch InBev had fifteen board members of whom all are non-executive directors. Only two females were, however, represented on the board. The company acknowledges the increased need for gender diversity and will start identifying women candidates to become board members. The board had various committees, namely audit, nomination, finance and remuneration committees. Furthermore, the board conducts annual performance evaluations of the board and its committees (Anheuser-Busch InBev, 2016a).

In 2013, BATS had twelve members on their board of directors of whom seven were non-executive directors. Of the 12 board members, three were females. The chairperson and CEO were two different individuals. All newly appointed directors received a full induction and each member of the board had a training and development plan which was reviewed annually. The board also had audit and accountability, CSR, nominations, and remuneration committees (BATS, 2013).

Figure 5.1 provides a comparison of the trends identified in the mean scores of the three individual components relative to the composite ESG mean disclosure score on an annual basis. The figure furthermore illustrates how changes in the individual components contributed to the change in the composite ESG disclosure score over the study period.

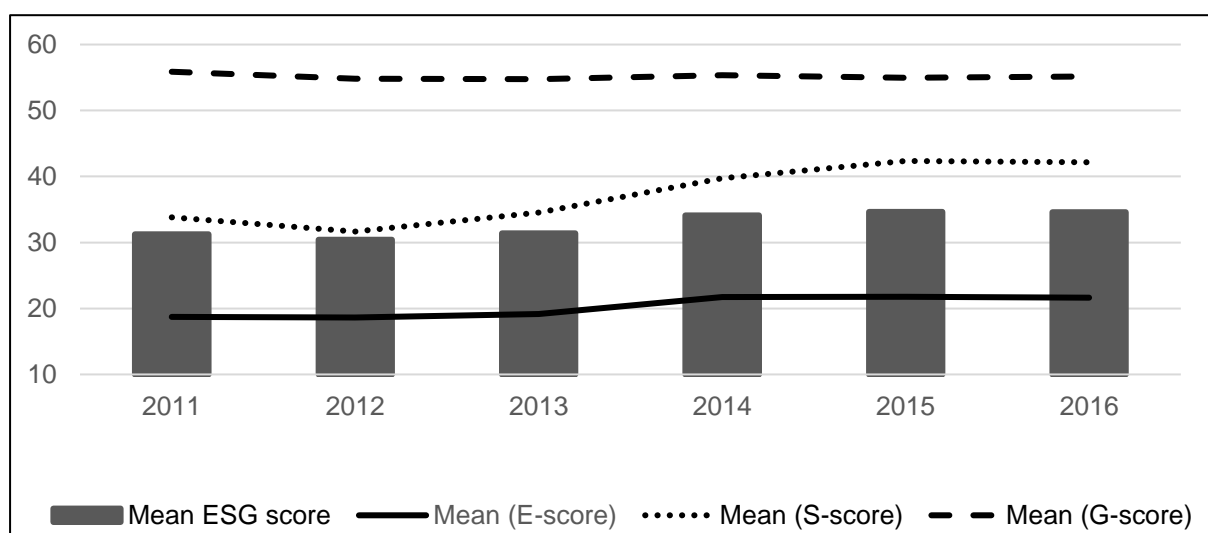


Figure 5.1: Annual mean values for the composite and individual E-, S- and G-disclosure scores

Figure 5.1 reaffirms that environmental practices were the least disclosed aspect over the research period. Resource depletion and the effects of climate change are some of the environmental realities that leaders of firms should consider to ensure corporate sustainability. However, in light of the results reported so far, limited attention was given to the disclosure of environmental aspects.

The disclosure of social considerations displayed an increasing trend over the research period. Given the socio-economic context of the country, it was expected that social aspects such as B-BBEE, poverty and HIV/AIDS policies would receive considerable attention. In a study conducted by Van de Ahee and Schulschenk (2013), institutional investors were questioned on the level of importance they had placed on ESG components. The results revealed that environmental and social aspects were viewed as “less important” than corporate governance aspects. Some respondents even stated that environmental and social aspects were “not important” or “irrelevant”. The heightened level of attention given to corporate governance aspects could partly be attributed to the surge in corruption cases in South Africa. Van de Ahee and Schulschenk (2013) highlighted corruption as one of the most important challenges facing the business environment. Furthermore, in the latest World Economic Forum Global Competitiveness Report (2017-2018), corruption was also emphasised as the most problematic factor when doing business in South Africa (World Economic Forum, 2017).

When comparing the individual scores to the composite ESG disclosure score, it is evident that the E- and S-disclosure scores mostly contributed to the increase in ESG disclosure over time. The disclosure score for corporate governance aspects remained relatively stable over the study period, thus having a smaller contribution to the overall increasing trend of the composite ESG disclosure score. Furthermore, based on the results in Figure 5.1, it is evident that the individual G-disclosure score makes up the biggest contribution to the overall composite ESG disclosure score.

5.2.1 Comparing ESG disclosure scores among the different sectors

It is possible that the considered firms conducting business in different sectors had varying levels of ESG disclosure. As such, firms from six JSE sectors were included in

the current study to compare ESG disclosure among the different sectors. The number of companies included in each of the considered sectors is outlined in Table 5.5.

Table 5.5: The composition of the considered sectors

Sector	Number of firms	Percentage (%)
Consumer Goods	11	16.67
Consumer Services	23	34.85
Telecommunications	4	6.06
Health Care	5	7.58
Technology	2	3.03
Industrials	21	31.82
Total	66	100

As can be seen in Table 5.5, the majority of the considered companies were listed in the Consumer Goods (16.67%), Consumer Services (34.85%) and Industrials (31.82%) sectors. Given the higher representation of these sectors in the sample, it should be noted that the reported results could be more relevant to these sectors. Figure 5.2 displays the annual mean composite ESG disclosure scores per sector for each year of the study period.

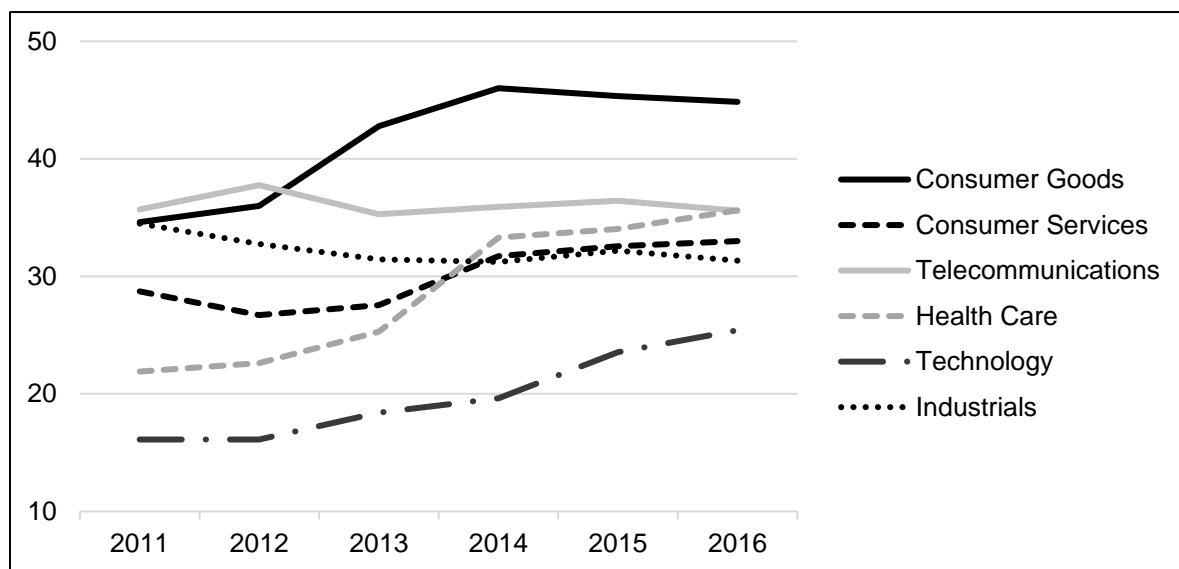


Figure 5.2: Annual mean composite ESG disclosure score per sector

Perusal of Figure 5.2 reveals that firms across all six sectors displayed limited ESG disclosure, given that the annual mean composite ESG disclosure scores were below 50. Over the research period, the Consumer Goods sector showed the largest improvement, attaining the highest mean ESG disclosure score of 46 in 2014. The Technology, Health Care and Consumer Services sectors also showed encouraging

improvements. The Industrials sector's mean composite ESG disclosure score, however, decreased between 2011 and 2014.

Both consumers and investors increasingly expect that consumer-focused firms should conduct their business in a manner that is considered to be green and ethical (Battle, 2012: 1). As such, these firms should include sustainability aspects as the primary factor of consideration during strategic product and business model innovation. Since 2013, firms listed in the Consumer Goods and Consumer Services sectors have shown improvement in their ESG disclosure, which could be in reaction to changes in consumer and investor attitudes towards broader environmental and sustainability issues. Consumers are also becoming more firm in their demand for greener and more responsibly manufactured products, and firms will need to respond to these changing patterns in consumer behaviour (Battle, 2012: 2). One way in which firms can address the changing expectations and behaviour of consumers and investors is to incorporate sustainable business practices into their business activities, and to disclose the aspects that are being addressed in their integrated annual reports.

The three individual ESG components will now be considered to investigate differences in disclosure at a sector level over the study period. In line with the format of the discussion in the previous sections, E-disclosure is considered first before progressing to S and G-disclosure. The annual mean E-disclosure scores for the six JSE sectors included in the study are displayed in Figure 5.3.

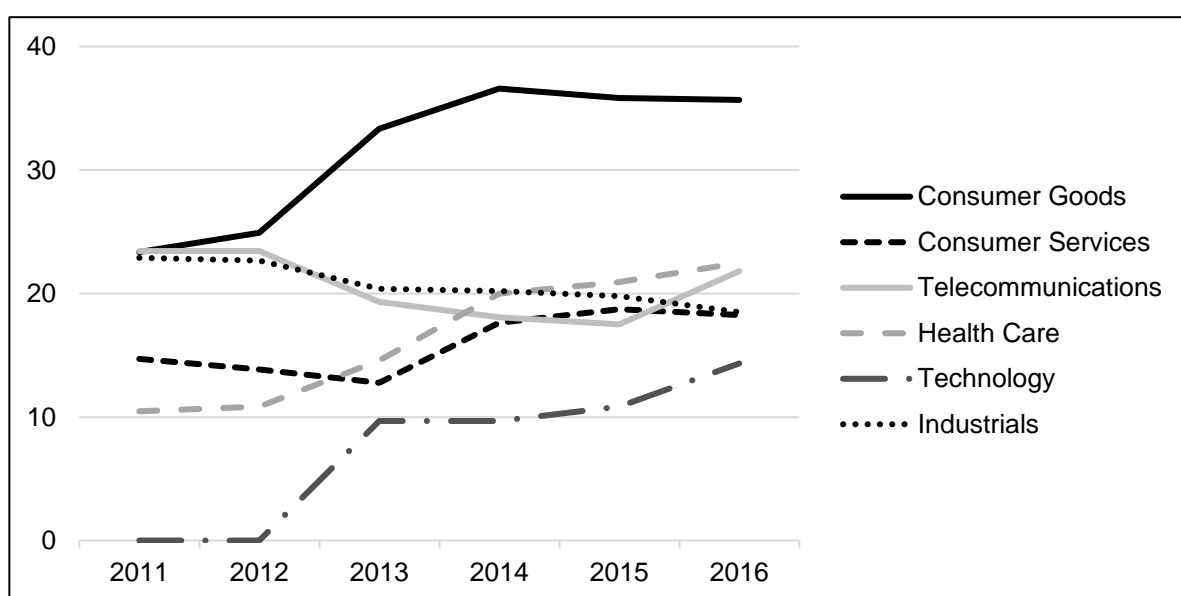


Figure 5.3: Annual mean E-disclosure scores per sector

Perusal of Figure 5.3 reveals that the level of E-disclosure across all sectors remained relatively low over the research period, with average scores consistently below 40. Not even a single company in the Technology sector disclosed environmental practices in 2011 and 2012. The Consumer Goods sector, however, showed substantial improvement in the disclosure of their environmental practices, reaching the highest average E-disclosure score of all the sectors in 2014. Since 2013, the Health Care and Consumer Services sectors have shown encouraging improvements in the disclosure of their environmental initiatives.

Given the differences noted in the E-disclosure scores between sectors, the S-disclosure scores are considered next to determine if a similar trend emerged. Figure 5.4 depicts the mean S-disclosure scores for each of the considered sectors over the research period.

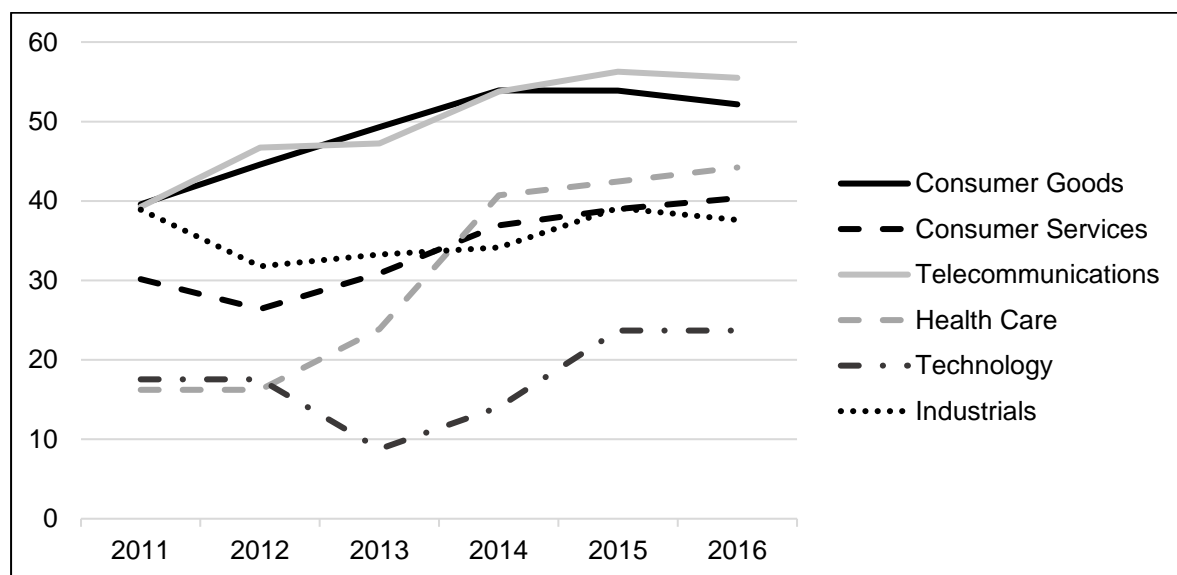


Figure 5.4: Annual mean S-disclosure scores per sector

Overall, Figure 5.4 reveals that the disclosure of social considerations among firms in different sectors improved considerably over the research period. Firms listed in all six sectors displayed an increasing trend in their social disclosure between 2013 and 2016. When compared to Figure 5.3, it can be seen that at a sector-level, more attention was given to the disclosure of social considerations than environmental aspects. This result corresponds with the results reported in Section 5.2.3.

The Telecommunications sector outperformed the Consumer goods sector from 2014 onwards with regard to the disclosure of social considerations. Telkom had the highest S-disclosure score over the period 2014 to 2016. Among other social considerations, the Telkom Foundation worked closely with communities to address socio-economic challenges through various programmes which were aimed at educational and social development. This telecommunications provider also focuses on transformation at the executive level and addresses the changing needs of consumers (Telkom, 2017).

Finally, trends in the level of G-disclosure for firms listed in the various sectors over time are considered (refer to Figure 5.5).

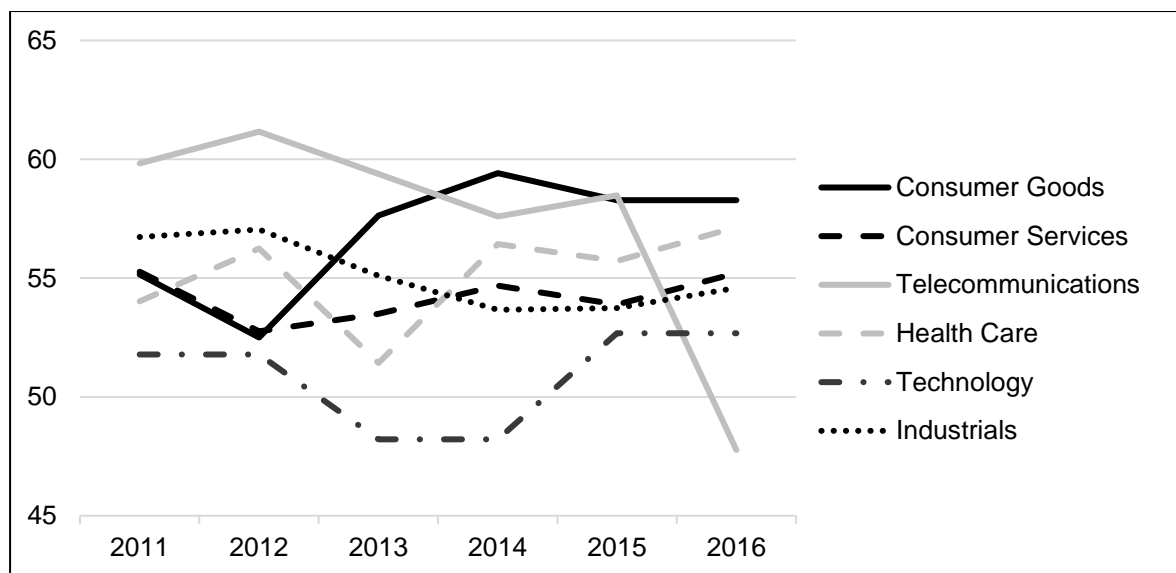


Figure 5.5: Annual mean G-disclosure scores per sector

Figure 5.5 illustrates that the disclosure of corporate governance aspects remains the most disclosed ESG component at a sector level. For all sectors, the annual mean G-disclosure scores remained above 50 with the exception of the Technology sector in 2013 and 2014. Furthermore, the Telecommunications sector realised a considerable decrease in their G-disclosure score from 2015 to 2016. This marked decline was mainly as a result of the Blue Telecommunications company that showed a sharp decline in their G-disclosure score, from 47.14 in 2015 to 14.29 in 2016. Given that only two Technology companies were considered, this decline had a considerable impact on the sector's average.

5.3 CORPORATE FINANCIAL PERFORMANCE

A firm's financial performance relates to its ability to generate wealth by utilising its assets (Erasmus & Van den Berg, 2011: 5). CFP assesses the fulfilment of a firm's economic goals (Gentry & Shen, 2010: 516) and represents the dependent variable in the study. As a result, it was necessary to consider the nature of the data obtained in terms of the variables used to measure various aspects of CFP. In this section, the descriptive statistics for the accounting-based, market-based and value-based CFP measures are discussed.

5.3.1 Accounting-based corporate financial performance measures

As alluded to in Section 3.5.2, researchers who previously investigated the relationship between non-financial and financial performance mostly used accounting-based CFP measures (Chetty *et al.*, 2015; Mutezo, 2014; Demetriades, 2011). These types of measures were also employed in the current study to reflect the historical performance of the firms. The accounting-based CFP measures considered in the current study included ROA and EPS.

5.3.1.1 Return on assets

When evaluating a firm's financial performance, it is important to consider its level of profitability. Since this provides an indication of both the level of profit, as well as the investment required to generate it. The ROA measure was therefore used to identify trends in the level of profitability over the study period. ROA measures the efficiency of a firm to utilise its total assets to generate revenue (Els *et al.*, 2014: 75). Table 5.6 reflects the descriptive statistics for the ROA performance measure.

Table 5.6: ROA values for the sample (%)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	16.41	12.58	-3.59	74.73	12.92
2012	58	15.40	13.64	-25.76	78.42	14.39
2013	63	15.22	12.85	-27.28	65.61	13.13
2014	60	13.29	11.16	-28.44	68.76	13.87
2015	64	13.90	11.65	-3.76	72.29	11.26
2016	60	13.21	10.98	-25.25	59.44	11.62
Overall period	359^{a)}	14.53	11.80	-28.44	78.42	12.85

^{a)} ROA data were only available for 359 firm-year observations on the IRESS (2017) database.

As can be seen in Table 5.6, the annual mean ROA values declined over the research period, reflecting less efficient utilisation of assets and/or a decrease in the profitability of the sample firms. This decrease over time could possibly be attributed to decreasing profit margins or sales which could be partly ascribed to the general slowdown in the economy from 2011 to 2016. Economic growth, as measured by the gross domestic product (GDP) in South Africa, also indicated a similar downward trend, decreasing from 3.28 per cent in 2011 to a mere 0.3 per cent in 2016 (World Bank, 2017). Furthermore, the negative minimum ROA values over the study period suggest that there some firms operated at a loss.

On the other hand, a number of firms excelled in generating profits in relation to the assets employed, as indicated by the maximum ROA values. It should be noted, however, that if firms divested their assets while their profits remained relatively stable, it could falsely improve their ROA values and have a negative effect on their future profitability (De Vries & Erasmus, 2017: 28). It is therefore important for investors to determine whether the increase in ROA values are truly the result of an increase in profitability, or if other factors contributed towards the change.

5.3.1.2 Earnings per share

The EPS ratio is one of the most widely utilised measures of financial performance among listed companies (Porter & Norton, 2016: 662). The measure was therefore included in the current study. Table 5.7 displays the descriptive statistics for the EPS financial performance measure.

Table 5.7: EPS values for the sample (cents per share)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	422.12	332.20	-505.00	1 575.00	412.68
2012	58	425.98	319.50	-246.00	1 689.00	420.34
2013	63	520.32	341.40	7.10	3 037.95	556.61
2014	60	532.21	406.50	-362.10	3 030.77	572.96
2015	64	685.25	451.77	-144.30	6 643.23	1 015.67
2016	66	644.51	407.30	-435.10	4 160.86	931.44
Overall period	365^{a)}	544.13	369.70	-505.00	6 643.23	708.38

a) EPS data were only available for 365 firm-year observations on the IRESS (2017) database.

In contrast to the ROA values reported in the previous section, the mean and median EPS values reported in Table 5.7 increased over the study period. Although an increase in EPS over time can partly be ascribed to factors such as inflation and reinvestment in the firm, this result is somewhat surprising, given that this increase would indicate that the decline in ROA is the result of an increase in the amount of assets employed or used less efficiently. Perusal of Table 5.7 furthermore reveals that the mean EPS values were relatively higher than the median values over the research period, pointing towards the presence of outlier values in the dataset. When considering the minimum and maximum values, a relatively large range between reported EPS values is observed, contributing towards the large standard deviations.

Current and potential investors are typically interested in firms with increasing EPS values since it could reflect improvements in their financial performance (Gilbertson, Lehman & Harmon-Gentene, 2014: 533; Gupta, 2009: 583). The EPS ratio of a firm can increase if the profit increases and/or the number of ordinary shares decrease. An increase in the profit reflects a growing firm. A share repurchase, however, can also result in an improved ratio, without a firm increasing its actual financial performance (the latter could even have deteriorated). It should therefore be noted that an improvement in a firm's EPS ratio is not necessarily because of actual superior financial performance (Damodaran, 2011: 552).

The negative minimum EPS values as reflected over the largest part of the research period reveal that some firms were operating at a loss. In fact, it was only during 2013 that all considered firms were generating positive EPS values. In line with the ROA

values reported in the previous section, the EPS values also notably decreased over the period 2015 to 2016.

Anheuser-Busch InBev realised the largest EPS values in 2015 and 2016. The firm listed on the JSE in 2016 after it acquired SABMiller. Anheuser-Busch InBev indicated that the decrease in its EPS value from 2015 to 2016 was mainly because of the adverse impact of the depreciation of their key currencies (Anheuser-Busch InBev, 2016b: 43). The Rand/Dollar exchange rate in particular, substantially depreciated from the end of 2015 to the middle of 2016 after the President dismissed the then Minister of Finance, Mr Nhlanhla Nene. Following this unexpected announcement, the Rand depreciated to R16.89 per US Dollar in January 2016, but recovered to levels around R14 in July 2016 (South African Reserve Bank [SARB], 2017a).

5.3.2 Market-based corporate financial performance measures

Given that accounting-based measures tend to focus on only the historical financial performance of firms, it is important to consider the companies' performance in the market as well (Gentry & Shen, 2010: 514). Market-based CFP measures provide some indication of investors' expectations about a firm's financial performance (Masa'deh *et al.*, 2015: 136). In this section, the focus is therefore placed on two market-based measures of financial performance, namely EY and TSR.

5.3.2.1 Earnings yield

Table 5.7 reveals an increase in the mean EPS values over time. It was noted that investors are usually interested in investing in those companies that are expected to generate an increase in their EPS. This increase in the demand for the shares of a firm could contribute to an increase in its share price. The EY compares the EPS generated to the market price per share. The value of this ratio is an indication of the return earned by investors on the market price per share (De Vries & Erasmus, 2017: 49). The descriptive statistics for the EY performance measure are displayed in Table 5.8.

Table 5.8: EY values for the sample (%)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	7.21	7.57	-17.47	15.11	4.52
2012	58	6.22	6.42	-12.76	12.58	4.23
2013	63	7.12	6.19	0.45	18.14	3.46
2014	60	5.04	5.79	-84.41	26.18	12.43
2015	63	6.66	6.23	-20.94	35.07	6.45
2016	66	4.69	5.71	-19.79	16.41	6.78
Overall period	364^{a)}	6.12	6.37	-84.41	35.07	7.02

^{a)} EY data were only available for 364 firm-year observations on the IRESS (2017) database.

As can be seen in Table 5.8, the mean EY values reveal a decreasing trend over the research period, with the exception of 2015, where an increase is observed. One interpretation of this trend could be that investors were earning less EPS each year in comparison to the market prices of their shares. This argument, however, would be a direct contradiction of the increasing trend noted in the annual mean EPS values depicted in Table 5.7. Consequently, the decline in the EY values over time is most probably due to an increase in share prices during the study period.

For the largest part of the research period, the minimum EY values were negative, indicating that some investors were experiencing negative returns on their investments. Closer inspection reveals that all firms that experienced negative returns over the research period were from the construction industry. Given the general decline in public infrastructure expenditure in the economy, many of these firms experienced losses or a decline in their profits (Basil Read, 2014: 14). The minimum EY value of -84.41 per cent in 2014 can be ascribed to Basil Read that reported a 362.10 cents loss per share (see Table 5.7). The company experienced a number of losses related to delays in major projects including the Eskom contracts for the Medupi and Kusile power stations worth R105 million (Basil Read, 2014: 14). The firm, however, managed to recover substantially in 2015 and consequently reflected the highest EY value of 35.07 per cent.

5.3.2.2 Total shareholder return

In the previous section, a declining trend in EY was noted during the period under review. This trend was in contrast with the increasing trend observed for the EPS ratio

discussed in Section 5.3.1.2, and raised the question of the potential impact that increased market prices would have on this ratio. Table 5.9 reflects the descriptive statistics for the TSR earned on the shares of the companies included in the present study.

Table 5.9: Annual TSR values for the sample (%)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	1.90	0.42	-37.74	45.21	19.20
2012	58	25.06	25.73	-48.74	82.41	28.84
2013	63	21.63	17.01	-31.81	112.86	33.35
2014	60	14.53	8.47	-57.62	150.00	36.22
2015	63	-3.24	-5.99	-87.01	99.28	33.68
2016	64	8.44	0.27	-84.16	251.33	42.24
Overall period	362^{a)}	11.40	8.17	-87.01	251.33	34.63

^{a)} TSR data were only available for 362 firm-year observations on the IRESS (2017) database.

Table 5.9 reveals that positive mean TSR values were earned from 2011 to 2014, followed by a negative return in 2015. The market recovered to some extent during 2016, once again returning to a positive level. This trend explains the changes in the mean EY values observed in Table 5.8, where the negative mean TSR value observed for 2015 corresponds with the increase in the mean EY value that was reported in the same year. As previously mentioned, the country has been experiencing numerous challenges hampering economic growth which could be a reason for the decrease in share prices and the resultant decreasing trend in this financial performance measure.

The mean and median values differed considerably for some years, as confirmed by the corresponding standard deviations, indicating large degrees of variation in the TSR values. These large variations in the TSR values are also reflected by the substantial range of values observed between the minimum and maximum values. It should, however, be noted that various factors could have an impact on a firm's share return, such as the market's perception of a firm's ESG risk management and slow economic growth. TSR could also be influenced by EPS, the size of a firm and the stability of dividends (Erasmus, 2013: 18; Madura, Tucker & Wiley, 1997: 2).

5.3.3 Value-based corporate financial performance measures

While the market-based CFP measures reported in the previous section are considered an improvement over the accounting-based CFP measures, it is often argued that market-based CFP measures fail to take into account the long-term wealth creation potential of a firm (Martin *et al.*, 2009: 29). In an attempt to overcome this concern, value-based CFP measures were included, as they focus on a firm's ability to create sustainable value over the long term by incorporating their cost of capital. The descriptive statistics of the value-based CFP measures included in the current study are presented in this section.

5.3.3.1 Return on invested capital

While the ROA measure focuses on the accounting profit earned relative to the book value of assets, the ROIC considers the return earned from an operating perspective. Table 5.10 provides the descriptive statistics for the ROIC values generated during the period under review.

Table 5.10: ROIC values for the sample (%)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	19.13	17.88	-19.10	56.63	13.63
2012	58	17.64	16.15	-30.45	49.42	14.98
2013	63	18.23	14.99	-39.23	52.30	15.08
2014	60	15.31	15.00	-72.85	56.38	18.49
2015	64	16.62	12.97	-25.22	56.27	13.38
2016	65	14.07	12.98	-58.86	83.56	18.08
Overall period	364^{a)}	16.76	14.91	-72.85	83.56	15.76

^{a)} The data required to calculate ROIC data were only available for 364 firm-year observations on the IRESS (2017) database.

The mean and median ROIC values reveal a decreasing trend during the research period as shown in Table 5.10. This downward trend suggests that the value creation ability of the firms included in the study diminished over time. The decrease in ROIC values can either be ascribed to a decrease in the NOPAT, or an increase in the NOC. ROIC has furthermore been recognised as a measure of business risk that arises from the uncertainty in the projection of a firm's cash flow. The more unstable the NOPAT

and/or the capital requirement of a firm, the more business risk the ordinary shareholders could be confronted with (Brigham & Daves, 2010: 520).

Perusal of the minimum ROIC values reveals that some firms earned negative returns on their invested capital over the study period. These negative returns serve as a stark indication of the diminishing value over time. On the other hand, other firms that created above average returns, as reflected by the minimum values in Table 5.10.

It is important to consider the ROIC generated by a firm in combination with its cost of capital. Only in those cases where a firm is able to earn a spread above its cost of capital would value be created. If the difference between the ROIC and WACC is positive, it can be deduced that a firm has managed to create value and has a positive EVA value (Brigham & Daves, 2010: 235). Negative differences therefore indicate that value diminished in a particular year, given that the cost of capital exceeded the return earned on invested capital. The descriptive statistics for the spread values are displayed in Table 5.11.

Table 5.11: Spread values for the sample (%)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	7.24	4.10	-37.98	43.05	15.01
2012	58	8.23	3.98	-35.01	37.58	14.66
2013	63	9.13	4.86	-47.39	44.61	14.95
2014	60	6.01	6.04	-80.68	45.51	18.52
2015	63	7.39	7.82	-13.27	51.87	12.62
2016	65	3.28	7.29	-68.54	42.09	15.62
Overall period	363^{a)}	6.84	5.30	-80.68	51.87	15.33

^{a)} The data required to calculate ROIC were only available for 363 firm-year observations on the IRESS (2017) database.

On average, firms managed to earn returns in excess of their cost of capital over the entire research period as reflected by the positive mean spread values in Table 5.11. The minimum and maximum values, however, varied considerably over the study period as confirmed by the relatively large standard deviation values. Based on the negative minimum values, it is evident that some firms generated negative EVA values.

In 2016, for instance, the Distribution and Warehousing Network (DAWN) Company, which is listed in the Construction and Materials sector, realised a large negative

spread. The company generated a negative NOPAT for the year. This resulted in the firm generating a ROIC value of -58.86 per cent while having a WACC of 9.68 per cent. The firm acknowledged the economic downturn and the delay in government spending on water projects as the main contributing factors to the firm's poor financial performance in 2016 (DAWN, 2016: 18).

To assess the impact of the sample companies' cost of capital on their spread values, Figure 5.6 displays the annual mean values for ROIC and WACC (both expressed in percentages) over the study period.

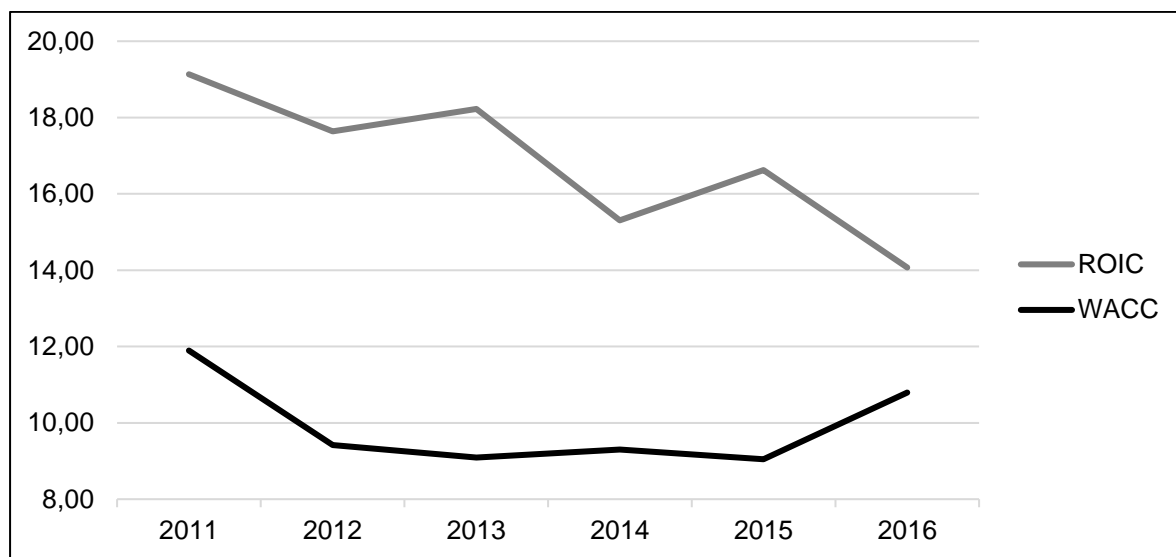


Figure 5.6: Annual mean ROIC and WACC values for the sample (%)

The average returns earned by the firms on their capital investment decreased from 19.13 per cent in 2011 to 14.07 per cent in 2016 as shown in Figure 5.6. During the same period, their cost of capital displays a more stable trend, almost stabilising below 10 per cent for the largest part of the research period (2012 to 2015). It is important to note, however, that the gap between the ROIC and the WACC values started to narrow from 2013 onwards. This trend signals the deteriorating business environment in which South African firms function.

If firms experienced decreasing NOPAT values, *ceteris paribus*, it could be because of decreasing profit margins due to the general slowdown in the economy. As mentioned in Section 5.3.1.1, South Africa experienced substantial decreases in the level of the GDP from 2013 onwards. While the country realised an economic growth rate of 2.5 per cent in 2013, the GDP growth rate dropped substantially to only 0.3 per cent in

2016 (World Bank, 2017). Towards the end of the study period, firms furthermore had to contend with an increase in their overall cost of capital. The prime lending rate could have a considerable influence on the WACC, especially for those firms that used a large portion of debt capital. Over the research period, the prime interest rate in South Africa increased from 9 per cent in 2011 to 10.50 per cent in 2016 (SARB, 2017b).

It can be argued that if a firm's cost on the capital it employs increases, while returns earned on the capital decreases, a firm may become less likely to address ESG aspects which might, in some cases, require additional capital investment. As pointed out by Waddock and Graves (1997), management's level of risk tolerance has an impact on their attitude towards actions. Such actions can either build an environmentally friendly firm or destroy a business if it is perceived as environmentally unfriendly. Furthermore, these actions can produce savings (e.g. waste reduction efforts which can be costly initially, but which can result in long-term saving) or result in a firm incurring future or present costs (e.g. equipment that controls emissions resulting in decreased fines).

5.3.3.2 *Cash return on invested capital*

The CROIC value-based measure provides an indication whether a business will generate positive or negative future FCFs. If the CROIC value is positive, it could be expected that a firm should experience positive future FCFs and vice versa. The descriptive statistics for the CROIC values are provided in Table 5.12.

Table 5.12: CROIC values for the sample (%)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	12.06	5.44	-33.30	150.77	27.62
2012	58	6.73	4.77	-71.17	47.46	23.03
2013	63	4.40	4.57	-72.21	194.05	32.30
2014	62	7.20	1.46	-42.35	69.24	22.56
2015	63	4.44	7.91	-50.47	47.25	17.67
2016	64	7.37	9.21	-33.79	155.49	28.38
Overall period	364^{a)}	6.91	5.70	-72.21	194.05	25.64

^{a)} The data required to calculate CROIC were only available for 364 firm-year observations on the IRESS (2017) database.

On average, firms were expected to generate positive future FCFs given the positive mean values over the entire research period. This observation is encouraging, given that value is only created if firms are able to generate positive future FCFs. The minimum CROIC values displayed in Table 5.12 allude that there are firms that generated largely negative FCFs compared to the operating capital they employed annually. As such, these firms possibly could also expect to earn negative future FCFs. In contrast to the minimum values observed, the maximum values over the research period indicate that there were firms earning FCFs in excess of their operating capital. It can therefore be deduced that these firms could expect to earn positive future FCFs.

5.3.3.3 *Market value added*

The MVA measure refers to the cumulative level of shareholder value that has been created since the inception of a firm (Brigham & Daves, 2010: 235). Shareholder wealth maximisation is not only expected to benefit shareholders, but it could also help to ensure that resources are efficiently allocated in a sustainable manner (Brigham & Daves, 2010: 234). MVA values larger than one indicate that a firm managed to create shareholder value over time. The descriptive statistics for the MVA values are depicted in Table 5.13.

Table 5.13: MVA values for the sample

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	2.62	1.75	0.00	10.36	2.89
2012	58	3.08	1.85	0.00	24.21	4.13
2013	63	2.69	1.87	0.00	10.52	3.14
2014	60	2.95	1.52	0.00	12.99	3.34
2015	63	3.02	1.64	0.00	15.31	3.57
2016	66	2.49	2.21	-5.99 ^{b)}	12.64	3.16
Overall period	364^{a)}	2.81	1.83	-5.99	24.21	3.38

^{a)} The data required to calculate MVA were only available for 364 firm-year observations on the IRESS (2017) database.

^{b)} If this large negative MVA value was excluded from the 2016 descriptive statistics, the mean would have been calculated as 2.62.

As reflected by the annual mean and median values in Table 5.13, the majority of the considered firms managed to create shareholder value over their lifetime. When observing the minimum and maximum values, it can be noted that over the research

period, some firms diminished considerable value, while others have managed to create substantial value.

The negative minimum value observed for 2016 relates to Sun International. This firm realised a negative value for ordinary shareholders' interest, given that their non-controlling shareholders were allocated their share of the net asset value of their put options. As a result, ordinary shareholders' equity noticeably decreased, while the non-controlling interest remained the same (Sun International, 2017). On the other end of the spectrum, was the MVA of 24.21 observed in 2012. This was also the highest observed MVA value over the study period and relates to Netcare. The company realised an increase in both the number of ordinary shares in issue and the market price per share from 2011 to 2012. As a result the market capitalisation increased considerably in 2012 (Netcare, 2012).

5.3.4 Control variables included in the current study

As mentioned in Section 4.8.1, the current study controlled for industry, firm size and leverage. Table 5.14 depicts the descriptive statistics for firm size (measured by market capitalisation).

Table 5.14: Market capitalisation values for the sample (Rand '000)

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	11 026 248.77	5 241 611.31	6 503.88	142 986 324	21 780 731.48
2012	58	14 126 100.85	4 129 533.94	8 654.76	161 483 701.50	25 824 631.19
2013	63	33 260 784.13	2 746 758.64	6 639.84	1 094 813 11.86	140 178 116.22
2014	60	45 252 436.37	3 319 715.15	6 642.00	1 292 219 45.68	177 934 332.28
2015	63	58 488 789.05	2 228 350.17	6 586.32	1 707 311 14.88	232 649 248.41
2016	66	104 689 271.70	5 092 475.68	6 583.32	2 889 067 86.00	412 580 208.92
Overall period	364^{a)}	46 207 671. 72	4 878 007.29	6 503.88	2 889 067 86.00	222 322 166.64

^{a)} The data required to calculate market capitalisation were only available for 364 firm-year observations on the IRESS (2017) database.

The firm size of the sample varied considerably over the research period as depicted by the minimum and maximum values in Table 5.14. The average size of a sample firm increased noticeably from 2011 to 2016. As mentioned in Section 4.8.1, firm size

is important as it is likely that smaller firms will not have the same level of ESG consideration than larger firms, mostly due to their financial ability.

The descriptive statistics for leverage (measured by the debt-to-assets ratio) are provided in Table 5.15.

Table 5.15: Debt-to-assets ratios for the sample

Years	Valid <i>n</i>	Mean	Median	Minimum value	Maximum value	Standard deviation
2011	54	0,54	0,58	0,04	1,06	0,21
2012	58	0,52	0,61	0,05	1,07	0,21
2013	63	0,55	0,58	0,12	1,16	0,20
2014	60	0,57	0,57	0,12	1,21	0,21
2015	64	0,60	0,54	0,11	1,80	0,27
2016	66	0,60	0,54	0,10	1,99	0,27
Overall period	365^{a)}	0,57	0,56	0,04	1,99	0,23

^{a)} Debt-to-assets data were only available for 365 firm-year observations on the IRESS (2017) database.

Perusal of Table 5.15 reveals that on average more than 50 per cent of the considered firms' total assets were financed by debt capital. Over the research period, the average usage of debt capital has increased with six per cent. As was shown in Figure 5.6, firms had to contend with an increase in their WACC towards the end of the study period. The increase in the usage of debt capital as reflected in Table 5.15, coupled with the increase in the country's prime lending rate could have resulted in the overall increases noted in the sample firms' cost of capital. The maximum values above one over the research period denote negative equity values that is mainly due to share buy-backs.

5.4 CONCLUSION

In this chapter, trends in the independent and dependent variables were discussed, as reflected by the descriptive statistics. On average, the mean composite ESG disclosure scores of the sample firms increased over the research period. To determine which of the individual ESG aspects contributed to the overall increase observed in the composite ESG disclosure score, the individual disclosure scores were considered.

In terms of E-disclosure, even though more firms disclosed details on their environmental practices, it appears to be at a slow pace. Fifteen of the considered firms did not disclose any environmental practices. The disclosure of social considerations also displayed an increasing trend over the research period. Given South Africa's socio-economic context and the related developmental challenges of, it was expected that social issues such as B-BBEE, poverty and HIV/AIDS policies would receive considerable attention. In comparison to the E- and S-disclosure scores, all firms disclosed corporate governance aspects over the research period. This trend can be explained by the country's well-developed corporate governance framework provided by the King Reports. The G-disclosure scores of the firms remained relatively constant over the study period.

The considered companies operated in six industries. Firms in the Consumer Goods and Telecommunications sectors had the highest composite ESG disclosure scores. The same trend was observed for the individual E-, S- and G-disclosure scores at the sector level in comparison to the entire sample.

When considering accounting-based CFP measures, the profitability of firms (measured by ROA) declined over the study period. In contrast, the EPS on average increased on an annual basis. The EY market-based CFP measures displayed a decreasing trend over the research period, while the TSR values fluctuated considerably.

The sustainable long-term value creation ability of the sample firms decreased somewhat between 2011 and 2016, as reflected by the decrease in the ROIC and spread values. The results imply that firms were realising smaller returns on invested capital, while the cost of capital increased. When examining the minimum and maximum MVA values, it was noted that some firms diminished substantial value while others managed to create considerable value. The results of the inferential statistics are presented in the following chapter.

CHAPTER 6

EMPIRICAL RESULTS: INFERENCE STATISTICS

6.1 INTRODUCTION

Given that difficulties are often associated with interpreting raw data, researchers use statistics to convert the data into a more interpretable format. Several statistical analyses were conducted to address the research objectives of the current study.

As mentioned in Section 3.5, previous researchers have reported divergent results on the nature of the relationship between ESG aspects and CFP. In the current study, a distinction was made between the overall composite ESG disclosure score and its three individual components. This distinction was made to investigate whether the individual aspects would exhibit different relationships with CFP for the entire sample and for the considered sectors. Attention was also given to whether the relationship(s) between the identified variables did not manifest immediately, but only after a year. As a result, one-year lag periods were built into the regression analysis models.

In the remainder of this chapter, the results of the mixed-model ANOVA analyses that were conducted to evaluate differences in the ESG disclosure scores over the study period are discussed in Section 6.2. This section also includes the results of the Fisher's LSD tests that were conducted to determine whether the mean composite ESG disclosure scores, as well as the mean individual E-, S- and G-disclosure scores differed significantly from one year to the next. The various panel regression analyses results for the sample and the considered sectors are discussed in Section 6.3. This section also includes the one-year lagged E-, S- and G-disclosure scores' regression analyses results.

6.2 MIXED-MODEL ANOVA

The descriptive statistics reported in Section 5.2 revealed that the sample firms' mean composite and individual ESG disclosure scores increased over the research period. A mixed-model ANOVA model was employed to determine the significance of the observed trends over the entire study period. The model incorporates both within

subjects (i.e. random effects) and between subjects (i.e. fixed effects) factors (Berkman & Reise, 2012: 141). For the current study, the fixed effects factor was 'year' and the random effects factor was 'company'. Fisher's LSD tests were conducted to determine whether the annual mean composite ESG disclosure scores, as well as the annual mean individual E-, S-, and G-disclosure scores, differed significantly from one year to the next.

One of the assumptions of a mixed-model ANOVA is that the dependent variable is approximately normally distributed. As the financial dataset (including the control variables) contained a number of outlier values, it was winsorised before the researcher proceeded with the inferential analysis. Winsorisation involves replacing extreme values with values closer to the mean (Vinzi, Chin, Henseler & Wang, 2010: 333). This technique improved the deviation from the normality assumption observed for the initial dataset. Winsorisation was also applied to the G-disclosure scores to address outlier values.

The results of the mixed-model ANOVA conducted on the annual mean composite ESG disclosure scores are displayed in Table 6.1, and the results of the Fisher's LSD test are shown in Table 6.2.

Table 6.1: Results of the mixed-model ANOVA conducted on the annual mean composite ESG disclosure scores

Effect	Numerator degrees of freedom	Denominator degrees of freedom	F-value	p-value
Year	5	302	10.28**	0.00

** Significant at the 1% level

* Significant at the 5% level

Table 6.2: Fisher's LSD test for the annual mean composite ESG disclosure scores over time

Year	2011	2012	2013	2014	2015	2016
2011		0.92	0.21	0.00**	0.00**	0.00**
2012			0.17	0.00**	0.00**	0.00**
2013				0.01**	0.00**	0.00**
2014					0.42	0.47
2015						0.94
2016						

** Significant at the 1% level

* Significant at the 5% level

As can be seen in Table 6.1, the annual mean composite ESG disclosure scores of the considered firms differed significantly over the entire research period. The results of the mixed-model ANOVAs conducted on the annual mean E-, S- and G-disclosure scores are reflected in Tables 6.3, 6.5 and 6.7. The Fisher's LSD test results for the individual disclosure scores are shown in Tables 6.4, 6.6 and 6.8.

Table 6.3: Results of the mixed-model ANOVA conducted on the annual mean E-disclosure scores

Effect	Numerator degrees of freedom	Denominator degrees of freedom	F-value	p-value
Year	5	302	5.23**	0.00

** Significant at the 1% level

* Significant at the 5% level

Table 6.4: Fisher's LSD test for the annual mean E-disclosure scores over time

Year	2011	2012	2013	2014	2015	2016
2011		0.68	0.27	0.00**	0.00**	0.00**
2012			0.48	0.01**	0.00**	0.00**
2013				0.04*	0.01**	0.01**
2014					0.66	0.74
2015						0.92
2016						

** Significant at the 1% level

* Significant at the 5% level

Table 6.5: Results of the mixed-model ANOVA conducted on the annual mean S-disclosure scores

Effect	Numerator degrees of freedom	Denominator degrees of freedom	F-value	p-value
Year	5	302	16.73**	0.00

** Significant at the 1% level

* Significant at the 5% level

Table 6.6: Fisher's LSD test for the annual mean S-disclosure scores over time

Year	2011	2012	2013	2014	2015	2016
2011		0.77	0.11	0.00**	0.00**	0.00**
2012			0.05*	0.00**	0.00**	0.00**
2013				0.00**	0.00**	0.00**
2014					0.16	0.20
2015						0.91
2016						

** Significant at the 1% level

* Significant at the 5% level

Table 6.7: Results of the mixed-model ANOVA conducted on the annual mean G-disclosure scores

Effect	Numerator degrees of freedom	Denominator degrees of freedom	F-value	p-value
Year	5	302	0.43	0.83

** Significant at the 1% level

* Significant at the 5% level

Table 6.8: Fisher's LSD test for the annual mean G-disclosure scores over time

Year	2011	2012	2013	2014	2015	2016
2011		0.30	0.39	0.83	0.62	0.96
2012			0.84	0.40	0.57	0.26
2013				0.51	0.71	0.34
2014					0.77	0.78
2015						0.56
2016						

** Significant at the 1% level

* Significant at the 5% level

Tables 6.3 and 6.5 show significant differences in the annual mean E- and S-disclosure scores over the research period. Similar to the findings reported in Table 6.2, several significant annual differences can be observed for the E- and S-disclosure scores in Tables 6.4 and 6.6.

As can be seen in Table 6.7, there was no significant difference in the annual mean G-disclosure scores over the entire research period. Furthermore, Table 6.8 reveals no significant annual differences in the annual mean G-disclosure scores.

6.3 ANALYSIS OF THE PANEL DATA

As explained in Section 5.2, the ESG disclosure dataset comprised 373 firm-year observations for 66 JSE-listed firms. The financial data required for the study were, however, only available for 359 firm-year observations, as discussed in Section 5.3.

Two commonly used regression models that are suitable for panel data are the fixed effects and random effects regression models (Hassett & Paavilainen-Mäntymäki, 2013: 45). The choice between these two models depends on the nature of the study's dataset. To determine the appropriate regression model for each of the analyses conducted in the current study, the F-test for fixed effects and the Hausman-test for random effects were used. The Breusch-Pagan-test was furthermore employed to test for heteroscedasticity and where necessary, t-statistics were adjusted. The results of these tests are reported as part of the regression results in this section.

Both simple and multiple regression analyses were conducted. Multiple regression analysis is an extension of simple linear regression. Multiple regression models are used when a researcher wants to explain the value of a variable based on the value of two or more variables (Lee *et al.*, 2000: 653).

In line with previous authors who investigated the relationship between ESG and CFP (such as Breuer & Nau, 2014; Ferrero-Ferrero *et al.*, 2014; Pasquini-Descomps & Sahut, 2013; Balatbat *et al.*, 2012), the researcher also controlled for leverage (measured by the debt-to-assets ratio), firm size (measured by market capitalisation) and industry. To simplify the structure of the chapter, only significant associations between ESG (composite and individual disclosure scores) and the various CFP measures are reported in the respective sub-sections, after adjusting for heteroskedasticity where applicable, while the remaining results for the sample and sectors are provided in five appendices. The only exceptions are Tables 6.9 and 6.10, as explained in Section 6.3.1.1.

6.3.1 Regression analysis results for the sample

To investigate the relationship between the composite ESG disclosure scores and various measures of CFP, regression analyses were conducted with the ESG disclosure scores as the independent variable for the entire sample. Subsequently, the regression analyses conducted for the considered sectors are presented in Section 6.3.2.

6.3.1.1 Composite ESG disclosure scores as the independent variable

Eight regression analyses were conducted on the sample data with the composite ESG disclosure score as the independent variable and CFP as the dependent variable, measured by ROA, EPS, EY, TSR, ROIC, MVA, the spread and CROIC respectively. The regression analyses results for the composite ESG disclosure scores and the considered CFP measures were all insignificant. The results for the EPS and TSR measures are reported Tables 6.9 and 6.10, as significant relationships were noted between these CFP measures and the individual E- and S-disclosure scores, as described in Section 6.3.1.2.

Table 6.9: Regression analysis results for the composite ESG disclosure scores and EPS

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
One-way fixed effects		36.38**	28.66**	12.36** (3, 293)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
ESG	0.93	1.76	0.53	0.60	
Leverage	-119.12	106.90	-1.11	0.27	
Size	468.04	87.18	5.37**	0.00	

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity	
ESG	645.50**		0.56	
Leverage			-0.91	
Size			3.53**	

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.11

The quality of fit of the preferred one-way fixed effects regression model was significant.

Table 6.10: Regression analysis results for the composite ESG disclosure scores and TSR

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)		
Pooled OLS		1.08	2.70* (3, 354)		
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	-4.86	11.94	-0.41	0.68	
ESG	-0.19	0.14	-1.33	0.19	
Leverage	-5.71	7.98	-0.41	0.68	
Size	3.10	1.26	2.47**	0.01	

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity	
Intercept	125.58**		-0.40	
ESG			-1.37	
Leverage			-0.76	
Size			2.34*	

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.02

The quality of fit of the preferred pooled OLS regression model was significant.

A positive, but not significant composite ESG regression coefficient was observed in Table 6.9. Although investors are interested in EPS as a measure of accounting-based performance, the measure is based on historical performance and often subject to earnings management (Ronen & Yaari, 2008: 26). As mentioned in Section 5.3.1.2, the EPS ratio can be improved by repurchasing shares, without representing an actual

improvement in CFP (Damodaran, 2011: 552). Given that the composite ESG disclosure scores are based on reporting by firms, it could also be manipulated by window-dressing techniques. The positive association observed between the composite ESG disclosure scores and EPS was therefore not entirely unexpected, as both variables are under the direct influence of management.

Balatbat *et al.* (2012) reported a weak positive relationship between ESG scores and financial performance (including EPS). In contrast to the result reported in Table 6.9, Mutezo (2014) found a significant positive relationship between SRI (measured by being a constituent of the JSE SRI Index) and EPS. As explained in Section 1.2.1, the term SRI is underpinned by ethical requirements to shape the market, while RI incorporates ESG and financial aspects into mainstream investment decision-making (Van der Ahee & Schulschenk, 2013: 2).

A negative, but not statistically significant composite ESG regression coefficient is noted in Table 6.10. The negative relationship between ESG and TSR might be linked to the perceived cost of integrating ESG risk management initiatives. Such initiatives are regarded by some firms as being too costly to implement (Pasquini-Descomps & Sahut, 2013: 19). Some investors might also regard (expensive) ESG initiatives as unnecessary. Based on these perceptions, the market might penalise firms with high composite ESG disclosure scores, resulting in the negative association that was observed between the composite ESG disclosure score and the market-based CFP measure. This negative relationship contradicts the results of previous studies. Pasquini-Descomps and Sahut (2013) reported an insignificant, but positive relationship between ESG and market performance in Switzerland.

6.3.1.2 Individual E-, S- and G-disclosure scores as the independent variables

As mentioned in Section 5.2.1, a composite ESG disclosure score could conceal varying levels of reporting on individual ESG aspects. Limkriangkrai *et al.* (2017) argue that firms often engage with the individual ESG aspects to varying degrees. As such, the individual impact of each aspect should be evaluated. By conducting such an in-depth analysis, the researcher is able to gain greater insight into the relationship between ESG aspects and CFP. The significant results of the regression analysis that

was conducted for the E-, S- and G-disclosure scores and EPS are reported in Table 6.11.

Table 6.11: Regression analysis results for the individual E-, S-, and G-disclosure scores and EPS

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way fixed effects	37.10**	19.52**	10.09** (5, 291)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
E	-5.04	-2.71**	0.01
S	2.79	2.64**	0.01
G	3.75	1.68	0.09
Leverage	-108.21	-1.02	0.31
Size	454.14	5.30**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	667.83**	-2.80**
S		2.39*
G		1.92
Leverage		-0.89
Size		3.35**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.15

The quality of fit of the preferred one-way fixed effects regression model was significant.

While no significant relationship was noted between the composite ESG disclosure score and EPS (refer to Table 6.9), statistically significant E- and S-regression coefficients are reported in Table 6.11. These conflicting results highlight the importance to investigate the individual ESG aspects, rather than focusing only on the overall ESG disclosure score.

A statistically significant negative regression coefficient is shown for the E-disclosure score in Table 6.11. Based on this finding, it can be inferred that firms with high E-disclosure scores reported low EPS ratios. The costs required to incorporate sound environmental initiatives could have a negative effect on the earnings realised by a firm, offering a potential explanation for the observed negative relationship.

In contrast, a statistically significant positive S-disclosure regression coefficient is observed in Table 6.11. It can therefore be concluded that the higher the S-disclosure score of a sample firm, the higher the firm's reported EPS ratio. Firms that disclose

more details on their social considerations are therefore generating higher accounting-based earnings. In line with this finding, Chetty *et al.* (2015) also noted a significant positive relationship between CSR and EPS in South Africa. As mentioned in Section 1.2, CSR mainly focuses on the environmental and social dimensions of ESG. Balatbat *et al.* (2012) similarly reported a statistically significant positive association between social aspects and economic performance for listed Australian firms.

An insignificant positive relationship was observed for the G-disclosure score in Table 6.11. In contrast to this finding, Mans-Kemp (2014) found a significant positive association between corporate governance and accounting-based earnings over the study period 2002 to 2010.

The relationships between the E-, S- and G-disclosure scores and the market-based TSR measure are reported in Table 6.12.

Table 6.12: Regression analysis results for the individual E-, S-, and G-disclosure scores and TSR

Model summary		
Preferred model	Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS	1.10	2.64* (5, 352)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	-6.93	18.44	-0.38	0.71
E	0.20	18.44	1.13	0.26
S	-0.30	0.12	-2.54**	0.01
G	0.10	0.30	0.33	0.74
Leverage	-8.67	8.05	-1.08	0.28
Size	3.00	1.25	2.40*	0.02

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	138.36**	-0.40
E		1.08
S		-2.29*
G		0.37
Leverage		-1.21
Size		2.31*

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.04

The quality of fit of the preferred pooled OLS regression model was significant.

A statistically significant negative regression coefficient is reported for the S-disclosure score in Table 6.12. This result suggests that those firms with higher S-disclosure scores, had lower TSR values. According to Richardson and Welker (2001), a possible

explanation for this negative relationship is that socially responsible investments made by firms are consistently negative net present value projects that contribute to overall risk. Although proponents of responsible corporate behaviour highlight the potential cost savings and long-term strategic advantages of CSR, the market could hold a different view. This negative relationship might therefore be partly ascribed to market participants perceiving the spending on social projects as superfluous.

Attention was also given to associations between the E-, S- and G-disclosure scores and the CFP measures at the sector level. Firms from six JSE sectors were included in the current study. Regression analyses could, however, only be conducted for the Consumer Goods, Consumer Services and Industrials sectors, as only these sectors had sufficient data to conduct sector analyses.

6.3.2 Regression analyses results for the considered sectors

As mentioned in Section 6.3.1.2, firms engage with ESG aspects at varying degrees. Differentiation in the consideration of ESG aspects could also be apparent for firms operating in different sectors. For example, a firm might engage in environmentally friendly activities, but could regard social responsibility aspects as less important, given that the firm's operations rely heavily on preventing environmentally damaging production processes.

All sector regression analyses were conducted with the individual E-, S- and G-disclosure scores as the independent variables, and the respective CFP measures as the dependent variable.

6.3.2.1 Consumer Goods

The Consumer Goods (CG) sector includes firms that produce and sell tangible products. These firms are generally involved with, amongst others, food production, packaged goods, clothing, beverages and electronic products. The results of the regression analyses conducted for ROA and EPS based on the Consumer Goods sector are reported in Tables 6.13 and 6.14.

Table 6.13: Regression analysis results for the individual E-, S- and G-disclosure scores and ROA (CG)

Model summary				
Preferred model		Test for fixed effects (F)	Hausman-test for random effects (F)	Fit of the model F (df)
One-way fixed effects		18.36**	11.58*	4.18** (5, 42)

Regression coefficient		Standard error	t-value	Pr > t
E	-0.18	0.12	-1.53	0.13
S	0.00	0.07	0.05	0.96
G	0.33	0.13	2.55**	0.01
Leverage	-15.74	4.93	-3.20**	0.00
Size	6.43	4.70	1.37	0.18
Breusch-Pagan test for heteroskedasticity (BP)			22.57	

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.33

The quality of fit of the preferred one-way fixed effects regression model was significant.

No adjustment was made for heteroskedasticity, since the Breusch-Pagan test statistic was not significant.

A statistically significant positive relationship is observed between the G-disclosure score and ROA in Table 6.13. This positive association reflects that Consumer Goods firms with high G-disclosure scores also reported high ROA ratios. As such, better-governed Consumer Goods firms were more effective at utilising their assets to generate income than their poorly governed counterparts. In their study on sub-Saharan African firms, Munisi and Randøy (2013) also found a significant positive relationship between corporate governance and ROA. Mans-Kemp (2014), however, reported an insignificant positive association between corporate governance and ROA. Her sample included local firms listed in the Consumer Goods sector from 2002 to 2010.

The relationship between the composite ESG disclosure score and ROA (not reported here) was not significant for the Consumer Goods sector. In contrast to this finding, Balatbat *et al.* (2012) found a significant positive association between ESG and ROA for selected listed Food and Beverage firms in Australia.

Table 6.14: Regression analysis results for the individual E-, S- and G-disclosure scores and EPS (CG)

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
One-way fixed effects		38.67**	446.22**	6.85** (5, 42)	

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-12.83	4.31	-2.98**	0.00	
S	7.17	2.59	2.77**	0.01	
G	-0.54	4.82	-0.11	0.91	
Leverage	-8.03	183.75	-0.04	0.97	
Size	810.75	175.38	4.62**	0.00	

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity	
E	88.58**	-2.14*	
S		2.00*	
G		-0.14	
Leverage		-0.16	
Size		3.26**	

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.45

The quality of fit of the preferred one-way fixed effects regression model was significant.

Similar to the results reported for the overall sample in Table 6.11, a statistically significant negative regression coefficient was observed for the E-disclosure score in Table 6.14. Based on this outcome, it can be deduced that Consumer Goods firms with higher E-disclosure scores generated lower accounting-based earnings over the research period. As pointed out earlier, environmental initiatives are often expensive to implement, which might have contributed to a decrease in the earnings.

Also, in line with the findings reported in Table 6.11, a significant positive relationship between the S-disclosure score and EPS is reflected for the Consumer Goods sector in Table 6.14. Therefore, the higher the S-disclosure score for a sample firm listed in this sector, the higher the EPS reported by the firm. Mutezo (2014) also observed a significant positive relationship between SRI and EPS for firms listed on the JSE SRI Index, which included selected Consumer Goods firms.

The association between the individual E-, S- and G-disclosure scores and the market-based EY performance measure was also examined. The results for the Consumer Goods sector are reported in Table 6.15.

Table 6.15: Regression analysis results for the individual E-, S- and G-disclosure scores and EY (CG)

Model summary			
Preferred model	Test for fixed effects (F)	Hausman-test for random effects (F)	Fit of the model F (df)
One-way random effects	4.58**	1.80	2.05 (5, 51)

Regression coefficient	Standard error	t-value	Pr > t 	
Intercept	33.38	15.02	2.22*	0.03
E	-0.09	0.05	-1.79	0.08
S	0.05	0.03	1.36	0.18
G	-0.07	0.06	-1.15	0.25
Leverage	1.50	2.46	0.61	0.55
Size	-2.48	1.70	-1.46	0.15

Breusch-Pagan test for heteroskedasticity (BP)		t-value adjusted for heteroskedasticity
Intercept	56.14**	0.36**
E		-2.04*
S		1.68
G		-1.37
Leverage		0.64
Size		-2.28*

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.17

The quality of fit of the preferred one-way random effects regression model was not significant.

Similar to the findings reported in Table 6.14, a negative regression coefficient is also observed for the E-disclosure score in Table 6.15. The fit of the regression model is not significant; nonetheless the negative association is expected. The EY ratio is calculated by comparing a firm's EPS value to its market price per share. If an increase in the disclosure of environmental practices has a negative relationship with the EPS of a firm, it is likely to also result in a negative association with the EY ratio.

Next, the relationships between the individual E-, S- and G-disclosure scores and the value-based measures were investigated. The results for ROIC and MVA are reported in Tables 6.16 and 6.17.

Table 6.16: Regression analysis results for the individual E-, S- and G-disclosure scores and ROIC (CG)

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
One-way random effects		32.89**	10.79	4.09** (5, 51)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	-51.61	40.75	-1.27	0.21	
E	-0.26	0.13	-1.91	0.06	
S	0.02	0.09	0.19	0.85	
G	0.47	0.16	3.05**	0.00	
Leverage	-11.59	6.15	-1.88	0.07	
Size	6.29	4.66	1.35	0.18	
Breusch-Pagan test for heteroskedasticity (BP)			18.64		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.29

The quality of fit of the preferred one-way random effects regression model was significant.

No adjustment was made for heteroskedasticity, since the Breusch-Pagan test statistic was not significant.

Table 6.17: Regression analysis results for the individual E-, S- and G-disclosure scores and MVA (CG)

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
One-way random effects		80.41**	2.00	15.93** (5, 51)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	-3119.23	536.81	-5.81**	0.00	
E	-1.86	1.59	-1.17	0.25	
S	1.34	0.97	1.38	0.17	
G	6.52	1.79	3.64**	0.00	
Leverage	-240.58	69.31	-3.47**	0.00	
Size	349.63	62.29	5.61**	0.00	
Breusch-Pagan test for heteroskedasticity (BP)			16.92		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.61

The quality of fit of the preferred one-way random effects regression model was significant.

No adjustment was made for heteroskedasticity, since the Breusch-Pagan test statistic was not significant.

A significant positive regression coefficient is observed for the G-disclosure score in Table 6.16. Based on this finding, it can be deduced that those firms that had sound corporate governance practices in place, tended to have higher ROIC values, in comparison to their counterparts with low G-disclosure scores.

A statistically significant positive regression coefficient is also shown for the G-disclosure score in Table 6.17. The observed positive relationship reveals that better

governed firms also appear to have an increased capacity to create aggregated shareholder value, compared to those firms that lack sound corporate governance.

6.3.2.2 Consumer Services

Whereas Consumer Goods firms are involved in the production of tangible products for public consumption, the Consumer Services (CS) sector includes firms that provide various intangible services to the public and other firms. These services include, among others, private education, publishing and hospitality. Based on the analysis of this sector, the regression analyses for EPS and EY were found to yield statistically significant results and are reported in Tables 6.18 and 6.19.

Table 6.18: Regression analysis results for the individual E-, S- and G-disclosure scores and EPS (CS)

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way random effects	28.65**	1.19	8.08** (5, 123)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	-2538.35	651.81	-3.89**	0.00
E	-2.50	2.14	-1.17	0.24
S	3.41	1.37	2.49**	0.01
G	2.09	3.22	0.65	0.52
Leverage	-38.89	128.78	-0.30	0.76
Size	308.43	72.27	4.27**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	262.48**	-2.99**
E		-1.22
S		2.61**
G		0.55
Leverage		-0.33
Size		3.32**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.25

The quality of fit of the preferred one-way random effects regression model was significant.

Table 6.19: Regression analysis results for the individual E-, S- and G-disclosure scores and EY (CS)

Model summary			
Preferred model	Test for fixed effects (F)	Hausman-test for random effects (F)	Fit of the model F (df)
One-way random effects	11.28**	0.70	3.67** (5, 123)

Regression coefficient	Standard error	t-value	Pr > t	
Intercept	23.41	6.84	3.43**	0.00
E	-0.02	0.03	-0.70	0.48
S	0.05	0.02	2.91**	0.00
G	0.00	0.04	0.06	0.95
Leverage	-1.34	1.47	-0.91	0.36
Size	-2.04	0.75	-2.71**	0.01

Breusch-Pagan test for heteroskedasticity (BP)		t-value adjusted for heteroskedasticity
Intercept	216.30**	4.14**
E		-0.47
S		2.63**
G		0.05
Leverage		-1.09
Size		-3.07**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.13

The quality of fit of the preferred one-way random effects regression model was significant.

Both Tables 6.18 and 6.19 show statistically significant positive regression coefficients for the S-disclosure score. These results suggest that Consumer Services firms with high S-disclosure scores generated high accounting-based earnings and market-based EY. Given the nature of this industry, it is understandable that aspects related to, amongst others, community relations, human rights, diversity and consumer protection would have an important role to play in the manner these firms conduct their business and their capacity to generate earnings.

The positive relationship between EPS and S-disclosure is comparable to the findings reported in Table 6.14. The considered Consumer Goods and Consumer Services firms thus seemed to have benefited financially from the increased disclosure of their social considerations over the research period. In contrast, Chetty *et al.* (2015) reported a significant (although at a 10 per cent level) negative relationship between CSR and EPS for Consumer Services firms in South Africa.

Tables 6.20 and 6.21 display the association between the individual E-, S- and G-disclosure scores and the value-based ROIC and CROIC measures.

Table 6.20: Regression analysis results for the individual E-, S- and G-disclosure scores and ROIC (CS)

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way random effects	23.91**	2.96	5.21** (5, 123)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	-0.97	28.98	0.97
E	0.00	0.10	0.97
S	0.01	0.06	0.85
G	-0.45	0.15	-2.97**
Leverage	-22.42	5.92	-3.79**
Size	6.40	3.21	2.00*

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	228.22**	-0.06
E		0.03
S		0.24
G		-2.71**
Leverage		-2.29*
Size		3.90**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.17

The quality of fit of the preferred one-way random effects regression model was significant.

Table 6.21: Regression analysis results for the individual E-, S- and G-disclosure scores and CROIC (CS)

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way fixed effects	6.57**	30.59**	6.90** (5, 101)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
E	-0.03	0.27	0.92
S	-0.02	0.17	0.92
G	-0.78	0.40	-1.96*
Leverage	-87.55	16.85	-5.19**
Size	-4.44	11.39	-0.39

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	54.63**	-0.09
S		-0.13
G		-2.38*
Leverage		-5.64**
Size		-0.36

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.25

The quality of fit of the preferred one-way fixed effects regression model was significant.

As can be seen in both Tables 6.20 and 6.21, a significant negative regression coefficient was reported for the G-disclosure score. It seems as if the considered Consumer Services firms with higher G-disclosure scores generated lower ROIC and CROIC than those firms with lower G-disclosure levels over the study period. As pointed out earlier, corporate governance compliance is often costly for firms (Mans-Kemp, 2014: 235). These costs relate to the implementation of corporate governance practices such as costs of compliance, opportunity costs, disclosure (proprietary) costs and reputational costs (Aguilera, Filatotchev, Gospel & Jackson, 2008: 480). The additional expenses incurred to comply with corporate governance standards could be a possible reason for the negative relationship observed for ROIC and CROIC. The higher the costs a firm incur to implement initiatives and disclose information related to corporate governance practices, the lower the NOPAT and consequently also the FCF generated by a firm. A decrease in these values, by implication, would result in lower ROIC and CROIC values.

The relationships between the individual E-, S- and G-disclosure scores and the value-based MVA and the spread measures, based on the considered Consumer Services firms are reported in Tables 6.22 and 6.23.

Table 6.22: Regression analysis results for the individual E-, S- and G-disclosure scores and MVA (CS)

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way fixed effects		13.00**	3.55**	4.92** (5, 97)

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E	1.64	2.34	0.70	0.48
S	0.70	1.57	0.45	0.66
G	8.10	3.55	2.29*	0.02
Leverage	-79.90	156.57	-0.51	0.61
Size	285.17	109.58	2.60**	0.01

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	255.88**	0.96
S		0.60
G		1.94*
Leverage		-0.73
Size		1.71

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.20

The quality of fit of the preferred two-way fixed effects regression model was significant.

When investigating the relationship between the E-, S- and G-disclosure scores and the Consumer Services firms' ability to create long-term shareholder value, Table 6.22 reveals a significant positive regression coefficient for the G-disclosure score. This finding is in contrast to the significant negative associations previously observed for the G-disclosure score and the value-based measures reported in Tables 6.20 and 6.21.

This positive association observed in Table 6.22 implies that the considered Consumer Services firms with high G-disclosure scores exhibited high MVA values. A similar finding is observed in Table 6.17. The considered Consumer Goods and Consumer Services firms that were better governed therefore appear to have an improved ability to create sustainable shareholder wealth over the lifetime of the firm.

Table 6.23: Regression analysis results for the individual E-, S- and G-disclosure scores and the spread (CS)

Model summary				
Preferred model		Test for fixed effects (F)	Test for time effect (F)	Fit of the model F (df)
Two-way fixed effects		27.55**	2.67*	6.62** (5, 97)

Regression coefficient		Standard error	t-value	Pr > t
E	-0.06	0.09	-0.65	0.52
S	0.10	0.06	1.71	0.09
G	-0.16	0.14	-1.18	0.24
Leverage	-24.61	6.03	-4.08**	0.00
Size	10.60	4.22	2.51**	0.01

Breusch-Pagan test for heteroskedasticity (BP)		t-value adjusted for heteroskedasticity
E	139.02**	-0.51
S		2.34*
G		-1.06
Leverage		-2.72**
Size		3.02**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.25

The quality of fit of the preferred two-way fixed effects regression model was significant.

Perusal of Table 6.20 reveals an insignificant relationship between the S-disclosure score and ROIC. When considering the spread in Table 6.23, however, a significant positive regression coefficient is reported for the S-disclosure score. As such, it can be inferred that the considered Consumer Services firms that performed better in

disclosing their social considerations, earned higher returns in excess of their cost of capital compared to those firms that disclosed less detail of their social considerations.

Firms with higher S-disclosure scores than their counterparts could be benefiting from a lower cost of debt and/or equity capital. The majority of global banks, including a few South African banks, are signatories to various voluntary principles, such as the Equator Principles, that require them to assess and manage environmental and social risks in project financing (Equator Principles, 2017; Marco, 2011: 453). As a result, firms that are disclosing their social considerations might be receiving a lower cost of debt when borrowing funds.

Similarly, responsible investors are particularly interested in firms that perform well in disclosing social aspects and as such might have a lower required rate of return. Derwall and Verwijmeren (2007) argue that the impact of ESG on the cost of capital depends on a firm's choice among the individual ESG aspects. Limkriankrai *et al.* (2017) found a positive regression coefficient between firms with high ESG disclosure scores and book leverage. This finding indicates that firms with high ESG disclosure scores were able to take advantage of a lower cost of debt. When Limkriankrai *et al.* investigated the individual components of ESG, however, they found that the S-disclosure scores appeared to have no impact on how firms selected their financial policies, based on the cost of debt.

The next section provides the regression analyses results for the Industrials sector.

6.3.2.3 Industrials

The Industrials (IND) sector includes firms that produce and distribute capital goods for industries, such as the aerospace, defence, construction, engineering, electrical equipment and machinery. The results obtained for the regression analyses conducted for EPS based on the Industrials sector are reported in Table 6.24.

Table 6.24: Regression analysis results for the individual E-, S- and G-disclosure scores and EPS (IND)

Model summary					
Preferred model		Test for fixed effects (F)	Test for time effect (F)	Fit of the model F (df)	
Two-way fixed effects		46.95**	2.43*	2.87* (5, 84)	

Regression coefficient		Standard error	t-value	Pr > t
E	-3.27	4.45	-0.74	0.46
S	0.59	2.28	0.26	0.80
G	5.35	4.13	1.29	0.20
Leverage	-287.59	335.13	-0.86	0.39
Size	1175.15	393.82	2.98**	0.00

Breusch-Pagan test for heteroskedasticity (BP)		t-value adjusted for heteroskedasticity
E	92.79**	-0.69
S		0.32
G		2.06*
Leverage		-0.75
Size		1.87

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.15

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 6.24 depicts a significant positive regression coefficient for G-disclosure. Based on this finding, it can be deduced that Industrial firms that were well governed reported higher accounting-based earnings than those firms characterised by poor corporate governance practices over the study period. This outcome is in line with Mans-Kemp (2014), who found a statistically significant positive association between corporate governance and EPS for a sample of JSE-listed companies that included several Industrial firms for the period 2002 to 2010.

An insignificant positive regression coefficient for the S-disclosure is reported in Table 6.24. Chetty *et al.* (2015) also found an insignificant positive relationship between CSR and EPS for listed Industrial firms in South Africa. Although the relationship between the composite ESG disclosure score and EPS was insignificant in the current study (refer to Table 6.9), Balatbat *et al.* (2012) reported a significant positive association between ESG scores and EPS for selected companies doing business in the Industrials and Construction sectors in Australia.

The regression analysis results for the relationship between the individual E-, S- and G-disclosure scores and the market-based TSR measure, based on the Industrials sector firms are reported in Table 6.25.

Table 6.25: Regression analysis results for the individual E-, S- and G-disclosure scores and TSR (IND)

Model summary		
Preferred model	Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS	1.48	2.09 (5, 108)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	83.546	53.05	1.58	0.12
E	-0.23	0.43	-0.53	0.60
S	-0.42	0.24	-1.79	0.08
G	0.29	0.62	0.47	0.64
Leverage	-57.60	25.81	-2.23*	0.03
Size	-6.51	5.71	-1.14	0.26

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	45.78**	2.37*
E		-0.83
S		-2.14*
G		0.76
Leverage		-2.38*
Size		-1.81

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.09

The quality of fit of the preferred pooled OLS regression model was not significant.

Similar to the findings reported in Table 6.12 for the overall sample, a significant negative S-disclosure score regression coefficient is evident in Table 6.25 for the considered Industrial firms. The fit of the model is, however, insignificant. The result still highlights that those Industrial firms that had high S-disclosure scores tended to have low market-based TSR performance. The financial market therefore seemed to have reacted negatively to Industrial firms disclosing more information on their social considerations. In contrast, Weber (2014) found a positive, but insignificant relationship between ESG reporting and financial market returns for Industrial sector firms in China.

The regression analysis results for the value-based CROIC measure, based on the considered Industrials sector firms are provided in Table 6.26.

Table 6.26: Regression analysis results for the individual E-, S- and G-disclosure scores and CROIC (IND)

Model summary		
Preferred model	Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS	0.52	4.93** (5, 108)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	5.97	29.30	0.20
E	-0.50	0.24	-2.08*
S	0.46	0.13	3.50**
G	0.47	0.34	1.39
Leverage	-5.00	14.25	-0.35
Size	-4.77	3.15	-1.52

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	42.49**	0.29
E		-2.84**
S		4.90**
G		2.08*
Leverage		-0.52
Size		-2.66**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.19

The quality of fit of the preferred pooled OLS regression model was significant.

A statistically significant negative regression coefficient is reported for the E-disclosure score in Table 6.26. This finding implies that Industrial firms with high E-disclosure scores yielded low CROIC values. Perusal of Table 6.26 furthermore reveals significant positive regression coefficients for both the S- and G-disclosure scores. Considering these findings, it can be inferred that Industrial firms that provided a more detailed disclosure of their social and corporate governance practices had higher CROIC values compared to firms with less detailed disclosure in this respect. According to Bauer, Guenster and Otten (2004), sound corporate governance practices lead to higher investor trust. As a result, investors view well-governed firms as less risky. Therefore, these investors might require a lower expected rate of return, resulting in a higher firm value. Furthermore, well-governed firms might have high operating performance and therefore high expected future FCFs, which in turn, may lead to higher firm value over the long term (Breuer & Nau, 2014: 20). The improvement in the FCFs of well-governed firms could be a reason for the observed positive association between G-disclosure and the CROIC measure.

The lagged regression analyses results are reported in Section 6.3.3.

6.3.3 Regression analyses results for the lagged individual E-, S- and G-disclosure scores as independent variables

The inclusion of one-year lagged E-, S- and G-disclosure variables (denoted as 'lag1') were considered to ascertain whether the considered firms' E-, S- and G-disclosure scores in the preceding year were related to their CFP in the given year. The results of the regression analyses conducted on the lagged individual E-, S- and G-disclosure scores and EPS and CROIC were statistically significant and are reported in Tables 6.27 and 6.28. No significant relationships were noted between the lagged individual E-, S- and G-disclosure scores and the other considered CFP measures.

Table 6.27: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and EPS

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way random effects		25.61**	2.74*	4.25** (5, 210)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
E_lag1	-2.63	2.17	-1.21	0.23
S_lag1	2.30	1.34	1.71	0.09
G_lag1	5.52	2.91	1.90	0.06
Leverage_lag1	106.71	136.51	0.78	0.44
Size_lag1	360.44	122.02	2.95**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E_lag1	718.25**	-0.79
S_lag1		1.94*
G_lag1		1.11
Leverage_lag1		1.18
Size_lag1		2.53**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.09

The quality of fit of the preferred two-way random effects regression model was significant.

Table 6.28: Regression analysis results for the lagged individual E-, S- and G disclosure scores and CROIC

Model summary			
Preferred model	Test for fixed effects (F)	Hausman-test for random effects (F)	Fit of the model F (df)
One-way random effects	2.50**	8.07	0.77 (5, 269)

Regression coefficient	Standard error	t-value	Pr > t
Intercept	6.22	17.58	0.35
E_lag1	-1.11	0.15	-0.69
S_lag1	0.18	0.10	1.85
G_lag1	-0.17	0.24	-0.70
Leverage_lag1	0.22	7.84	0.03
Size_lag1	0.48	1.36	0.36

Breusch-Pagan test for heteroskedasticity (BP)	t-value adjusted for heteroskedasticity
Intercept	0.56
E_lag1	-0.70
S_lag1	2.01*
G_lag1	-0.86
Leverage_lag1	0.03
Size_lag1	0.47

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.01

The quality of fit of the preferred one-way random effects regression model was not significant.

A statistically significant positive regression coefficient for the lagged S-disclosure score can be observed in both Tables 6.27 and 6.28. Based on these findings, it can be deduced that the higher a sample firm's previous year's S-disclosure score, the higher the firm's accounting-based EPS and value-based CROIC value in the current year. However, it should be noted that the fit of the model in Table 6.28 is not significant.

Given that JSE-listed firms are required to publish annual integrated reports in which they disclose details pertaining to their financial and non-financial (ESG) considerations, it is encouraging to note that firms that disclosed social considerations had a significant positive relationship with EPS, both in the given year and one year later. When considering one-year lagged composite ESG disclosure scores, Balatbat *et al.* (2012) found a statistically significant positive association for the ROIC measure for listed Australian firms. However, the association between the lagged composite ESG disclosure score and the value-based ROIC measure was found to be insignificant in the current study.

Given the differences in the regression analyses results across the considered sectors discussed in Section 6.3.2, the researcher also investigated one-year lags at a sector level. The statistically significant results are discussed in the following three sub-sections.

6.3.3.1 One-year lagged regression results for the Consumer Goods sector

Table 6.29 reflects the regression analysis results for the lagged individual E-, S- and G-disclosure scores and EY, conducted for firms listed in the Consumer Goods sector.

Table 6.29: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and EY (CG)

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way fixed effects		2.50**	31.72**	0.32 (5, 30)

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E_lag1	0.06	0.09	0.66	0.51
S_lag1	-0.04	0.05	-0.71	0.48
G_lag1	-0.06	0.10	-0.63	0.53
Leverage_lag1	-2.57	3.81	-0.68	0.51
Size_lag1	1.46	3.50	0.42	0.68

Breusch–Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E_lag1	49.24**	1.75
S_lag1		-2.25*
G_lag1		-1.58
Leverage_lag1		-0.64
Size_lag1		0.37

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.05

The quality of fit of the preferred one-way fixed effects regression model was not significant

A significant negative association was reported for the lagged S-disclosure score and EY in Table 6.29. The fit of the model is, however, insignificant. Nevertheless, it can still be deduced that Consumer Goods firms with a high S-disclosure score in year_{*t*-1} generated a lower EY in year_{*t*}. This finding is in contrast to the insignificant positive association reported in Table 6.15 between the S-disclosure score and EY for the considered Consumer Goods firms.

6.3.3.2 One-year lagged regression results for the Consumer Services sector

The regression analyses results for the lagged E-, S- and G-disclosure scores as the independent variable and EPS and EY are reflected in Tables 6.30 and 6.31.

Table 6.30: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and EPS (CS)

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way random effects	27.66**	2.53	7.14** (5, 97)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	-2640.83	746.78	-3.54**	0.00
E_lag1	-5.57	2.31	-2.41*	0.02
S_lag1	2.29	1.49	1.54	0.13
G_lag1	11.93	3.55	3.36**	0.00
Leverage_lag1	-11.21	160.15	-0.07	0.94
Size_lag1	272.50	82.97	3.28**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	220.74**	-3.01**
E_lag1		-1.48
S_lag1		2.23*
G_lag1		1.16
Leverage_lag1		-0.10
Size_lag1		2.71**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.23

The quality of fit of the preferred one-way random effects regression model was significant.

Table 6.31: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and EY (CS)

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way random effects	8.71**	0.88	1.58 (5, 97)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	20.35	2.48**	0.01
E_lag1	-0.03	-0.84	0.41
S_lag1	0.02	1.07	0.29
G_lag1	0.05	1.07	0.29
Leverage_lag1	-0.28	-0.14	0.89
Size_lag1	-1.96	-2.17*	0.03

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	196.06**	2.50**
E_lag1		-0.51
S_lag1		2.37*
G_lag1		0.54
Leverage_lag1		-0.18
Size_lag1		-2.39*

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.08

The quality of fit of the preferred one-way random effects regression model was not significant.

Significant positive regression coefficients were reported for the S-disclosure score as depicted in both Tables 6.30 and 6.31. As can be seen in Table 6.31, the fit of the regression model, however, is insignificant. Nonetheless, the considered Consumer Services firms that had high S-disclosure scores in year_{*t*-1} seemed to have high EPS and EY ratios in year_{*t*}. If these results are compared with the findings reported in Section 6.3.2.2, it is apparent that Consumer Services firms with high S-disclosure scores had a significant positive association with EPS and EY, both in the given year and one year later.

The associations between the individual E-, S- and G-disclosure scores and the value-based ROIC and CROIC performance measures for the considered Consumer Services' firms are reported in Tables 6.32 and 6.33.

Table 6.32: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and ROIC (CS)

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way fixed effects		21.37**	40.12**	6.13** (5, 77)

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E_lag1	0.31	0.11	2.78**	0.01
S_lag1	-0.03	0.07	-0.43	0.67
G_lag1	-0.75	0.17	-4.44**	0.00
Leverage_lag1	-16.52	8.23	-2.01*	0.05
Size_lag1	-0.44	4.78	-0.09	0.93

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E_lag1	93.49**	1.71
S_lag1		-0.65
G_lag1		-2.25*
Leverage_lag1		-1.15
Size_lag1		-0.08

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.28

The quality of fit of the preferred one-way fixed effects regression model was significant.

Table 6.33: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and CROIC (CS)

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way random effects		3.73**	4.57	0.73 (5, 97)

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	32.74	58.79	0.56	0.58
E_lag1	0.14	0.28	0.50	0.62
S_lag1	0.16	0.18	0.90	0.37
G_lag1	-0.76	0.46	-1.64	0.11
Leverage_lag1	7.12	15.23	0.47	0.64
Size_lag1	0.48	6.34	0.08	0.94

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	58.55**	0.61
E_lag1		0.64
S_lag1		1.14
G_lag1		-2.58**
Leverage_lag1		0.54
Size_lag1		0.09

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.04

The quality of fit of the preferred one-way random effects regression model was not significant.

When the E-, S- and G-disclosure scores were lagged for one year, significant negative regression coefficients emerged for the G-disclosure score, as depicted in both Tables 6.32 and 6.33. The fit of the regression model shown in Table 6.33, however, is not significant. These observations are in line with the significant negative relationships with the same measures that were observed for the Consumer Services sector as reflected in Tables 6.20 and 6.21. The observed negative relationships were therefore reported in the given year and one year later.

6.3.3.3 One-year lagged regression analyses results for the Industrials sector

The results for the regression analyses conducted for the lagged individual E-, S- and G-disclosure scores as independent variables and ROA, EY, CROIC and ROIC as independent variables are presented in Tables 6.34 to 6.37.

Table 6.34: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and ROA (IND)

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way fixed effects		3.41**	3.32*	0.71 (5, 57)

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E_lag1	0.00	0.18	0.00	1.00
S_lag1	0.13	0.08	1.64	0.11
G_lag1	-0.13	0.15	-0.84	0.41
Leverage_lag1	10.06	14.64	0.69	0.49
Size_lag1	2.02	16.53	0.12	0.90

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E_lag1	85.16**	0.00
S_lag1		2.46*
G_lag1		-1.15
Leverage_lag1		0.84
Size_lag1		0.14

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.06

The quality of fit of the preferred two-way fixed effects regression model was not significant.

Table 6.35: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and EY (IND)

Model summary		
Preferred model	Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS	1.51	1.61 (5, 77)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	11.02	8.26	1.33	0.19
E_lag1	-0.09	0.06	-1.35	0.18
S_lag1	0.05	0.04	1.52	0.13
G_lag1	-0.08	0.09	-0.90	0.37
Leverage_lag1	2.30	3.72	0.62	0.54
Size_lag1	-0.13	0.87	-0.15	0.88

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	65.28**	2.20*
E_lag1		-1.47
S_lag1		2.08*
G_lag1		-1.28
Leverage_lag1		0.88
Size_lag1		-0.33

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.09

The quality of fit of the preferred pooled OLS regression model was not significant.

Table 6.36: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and CROIC (IND)

Model summary		
Preferred model	Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS	0.45	2.50* (5, 77)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	29.49	33.69	0.88	0.38
E_lag1	-0.30	0.26	-1.15	0.25
S_lag1	0.39	0.14	2.69**	0.01
G_lag1	-0.08	0.35	-0.23	0.82
Leverage_lag1	-6.80	15.18	-0.45	0.66
Size_lag1	-3.88	3.54	-1.10	0.28

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)	24.56
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** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.14

The quality of fit of the preferred pooled OLS regression model was significant.

No adjustment was made for heteroskedasticity, since the Breusch-Pagan test statistic was not significant.

Significant positive regression coefficients for the S-disclosure score are reported in Tables 6.34, 6.35 and 6.36 for ROA, EY and CROIC respectively. However, the fit of the regression models in Tables 6.34 and 6.35 are not statistically significant.

Nonetheless, from these findings it can be concluded that in the case of Industrial firms, higher S-disclosure scores in year_{t-1} resulted in higher accounting-based profitability, market-based EY and value-based CROIC in year_t. The one-year lagged regression results highlighted two additional CFP measures that are significantly related to the S-disclosure scores which were not reported in Section 6.3.2.3, namely ROA and EY.

Table 6.37: Regression analysis results for the lagged individual E-, S- and G-disclosure scores and ROIC (IND)

Model summary		
Preferred model	Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS	1.66	2.11 (5, 77)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	46.42	2.29*	0.02
E_lag1	-0.33	-2.15*	0.03
S_lag1	0.05	0.60	0.55
G_lag1	0.24	1.15	0.26
Leverage_lag1	-12.30	-1.35	0.18
Size_lag1	-5.60	-2.64**	0.01

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	82.56**	4.08**
E_lag1		-2.15*
S_lag1		0.53
G_lag1		1.20
Leverage_lag1		-1.76
Size_lag1		-3.45**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.12

The quality of fit of the preferred pooled OLS regression model was not significant.

When the individual E-, S- and G-disclosure scores were lagged for one year a significant negative regression coefficient for the E-disclosure score is reported in Table 6.37. The fit of the regression model is insignificant. Nonetheless, based on this finding, a high E-disclosure score in year_{t-1} appears to result in a lower ROIC in year_t. No significant relationship was reported between E-disclosure scores and ROIC in Section 6.3.2.3. The returns realised on investments in environmental projects are often delayed. In other words, should a firm invest in a new environmental project, the returns could possibly only be realised over a longer term (Battle, 2012).

6.1 CONCLUSION

In Table 6.38, the research hypotheses and questions are linked to the most significant outcomes of the statistical analyses.

Table 6.38: Summary of the most significant outcomes of the statistical analyses

Hypotheses	Outcome
H ₀₁ : There is no relationship between the environmental, social and corporate governance disclosure scores and the accounting-based financial performance of selected JSE-listed firms.	Reject H ₀₁ A significant positive relationship was observed between the S-disclosure scores and EPS for the sample. A significant negative relationship was identified between the E-disclosure scores and EPS for the sample.
H ₀₂ : There is no relationship between the environmental, social and corporate governance disclosure scores and the market-based financial performance of selected JSE-listed firms.	Reject H ₀₂ A significant negative relationship was established between the S-disclosure scores and TSR for the sample.
H ₀₃ : There is no relationship between the environmental, social and corporate governance disclosure scores and the value-based financial performance of selected JSE-listed firms.	Fail to reject H ₀₃ No significant associations were observed between the individual E-, S- and G-disclosure scores and value-based measures for the sample.
Research questions	Outcome
Are there significant differences in the ESG disclosure of the sample firms over the entire research period?	The mixed-model ANOVA conducted on the mean composite ESG disclosure scores and E- and S-disclosure scores revealed statistically significant differences over the entire research period.
Are there significant differences in the ESG disclosure of the sample firms on an annual basis?	The Fisher's LSD test revealed several significant annual differences in the mean composite ESG disclosure scores. Significant annual differences were also noted for the E- and S-disclosure scores.
Does a company's sector classification play a role when assessing the relationship between ESG and accounting-based CFP?	A significant positive association was observed between the G-disclosure scores and ROA for the considered Consumer Goods firms. A significant positive relationship was established between the S-disclosure scores and EPS for the considered Consumer Goods and Consumer Services firms. A significant negative association was found between the E-disclosure scores and EPS for the considered Consumer Goods firms. A significant positive relationship was established between the G-disclosure scores and EPS for the considered Industrial firms.

Research questions	Outcome
Does a company's sector classification play a role when assessing the relationship between ESG and market-based CFP?	<p>A significant negative relationship was observed between the E-disclosure scores and EY for the considered Consumer Goods firms.</p> <p>A significant positive association was found between the S-disclosure scores and EY for the considered Consumer Services firms.</p> <p>A significant negative relationship was established between the S-disclosure scores and TSR for the considered Industrial firms.</p>
Does a company's sector classification play a role when assessing the relationship between ESG and value-based CFP?	<p>A significant positive relationship was reported between the G-disclosure score and ROIC for the considered Consumer Goods firms.</p> <p>A significant positive association was established between the G-disclosure scores and MVA for the considered Consumer Goods and Consumer Services firms.</p> <p>Significant negative relationships were observed between the G-disclosure scores and ROIC and CROIC for the considered Consumer Services firms.</p> <p>A statistically significant positive relationship was found between the S-disclosure scores and the spread for the considered Consumer Services firms.</p> <p>A significant negative relationship was established between the E-disclosure scores and CROIC for the considered Industrial firms. Furthermore, significant positive associations were noted for the S- and G-disclosure scores and CROIC for the considered Industrial firms.</p>
Was the relationship between ESG disclosure and CFP lagged?	<p>Statistically significant positive regression coefficients were reported for the lagged S-disclosure score and both EPS and CROIC.</p>
Was the relationship between ESG disclosure and CFP lagged for the considered sectors?	<p>A significant negative association was reported for the lagged S-disclosure score and EY for the considered Consumer Goods firms.</p> <p>Significant positive regression coefficients were reported for the lagged S-disclosure score and both the EPS and EY ratios for the considered Consumer Services firms.</p> <p>Significant negative regression coefficients were reported for the lagged G-disclosure score and both ROIC and CROIC for the considered Consumer Services firms.</p> <p>Significant positive regression coefficients were reported for the relationship between the lagged S-disclosure score and ROA, EY and CROIC for the considered Industrial firms.</p> <p>Lastly, a significant negative regression coefficient for the lagged E-disclosure score and ROIC was observed for the considered Industrial firms.</p>

As can be seen in Table 6.38, when the complete sample was considered, H_{03} could not be rejected, given that no significant relationships could be established between

the composite ESG score or the individual E-, S- and G-disclosure scores and the value-based CFP measures over the study period. When the researcher, however, considered individual sectors (more specifically, the Consumer Goods, Consumer Services and Industrial sectors), significant relationships were established for accounting-based, market-based and value-based CFP measures.

Based on the discussed findings, it can be concluded that the disclosure of environmental practices have a negative association with the accounting-based EPS and market-based EY measures for firms listed in the Consumer Goods sector. Given the extensive production processes employed in this industry, it is understandable that the consideration of sustainable environmental practices is an important part of this sector's business operations. Environmental initiatives are, however, often expensive to implement, which could partly explain the decrease in earnings realised in the given year. The resulting lower EPS values could have an impact on the EY ratios of these firms.

For the Consumer Services sector, the increased disclosure of their social considerations was positively related to EPS, EY and the spread. Given that this industry largely deals with the provision of services to other firms and consumers, it is plausible that social considerations would have a substantial impact on the way in which Consumer Services firms operate and consequently also their CFP.

A significant negative association between the S-disclosure score and TSR was reported for Industrial firms. This finding could imply that the market reacted negatively to the disclosure of social aspects. Furthermore, the S- and G-disclosure scores for this industry were positively related to the value-based CROIC measure. Well-governed firms might have high operating performance and as a result high expected future FCFs (Breuer & Nau, 2014: 20). The improvement in the FCFs could be a reason for the observed positive association between G-disclosure and the CROIC measure.

An overview of the study's main findings is provided in the following chapter. Conclusions are reported and recommendations are made for future research, based on the identified limitations.

CHAPTER 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

Stakeholders are increasingly becoming aware of the sustainability-related challenges that firms are confronted with. These challenges include, amongst others, climate change, natural resource depletion and water and energy security. To address these concerns, corporate managers and directors from around the world have introduced CSR and CSP initiatives. As the key motivation of these initiatives is to engage with and improve the well-being of society at large, focus has been placed on environmental and social considerations.

Although the majority of investors are mainly concerned with the possible financial return that can be earned from an investment, sustainability-related challenges are of particular importance to responsible investors. These investors incorporate not only environmental and social aspects into their investment decision-making and ownership practices, but also consider corporate governance practices. Responsible investors aspire to earn sustainable returns and recognise the possible long-term effects of sound ESG risk management on CFP. The failure of firms to properly manage ESG risks could have a negative impact on their financial performance (Viviers *et al.*, 2012: 124).

CSR and RI are closely linked in that both concepts support the notion that although firms generate wealth from limited resources, they need to remain cognisant of the relevant legal, social and environmental frameworks in which they function and conduct business. There has been a growing interest in research on RI and sound ESG practices globally. South African researchers, however, have mainly conducted research on the G aspect of ESG, given the well-developed framework of corporate governance provided by the King Reports. In the current study, the business case for ESG and CFP was therefore assessed within the South African context.

The remainder of this chapter consists of seven sections. The first section provides a brief overview of the study. In the subsequent two sections the main findings from the

literature review and empirical investigation are presented. Recommendations are then made for different stakeholder groups in Section 7.5, followed by the limitations of the study and suggestions for future research. Finally, the researcher offers a few concluding remarks.

7.2 OVERVIEW OF THE STUDY

In this section, the purpose of the research is recapped. Furthermore, the research methodology is summarised.

7.2.1 Purpose of the research

If it could be established that a significant positive association exists between ESG and CFP in the South African context, managers and directors of JSE-listed firms might be motivated to allocate more time and money to ESG-related aspects to enhance long-term sustainable performance. The perceived positive impact of ESG disclosure on a firm's corporate reputation could be a further motivation for listed firms to disclose their ESG practices (Van der Ahee & Schulschenk, 2013: 6). The financial materiality of ESG-related aspects is likely to be a prominent driver for enhanced shareholder engagement in future (Eccles *et al.*, 2007: 8). It has also been argued that if RI is actively pursued by local investors, positive contributions can be made to socio-economic development in South Africa (Viviers *et al.*, 2009: 13).

The current study was undertaken to assess the business case for ESG practices of selected JSE-listed firms from 2011 to 2016. The start of the research period concurred with the advent of integrated reporting locally. This form of reporting highlights the need for firms to change from a siloed to a more inclusive manner of disclosure. Comprehensive ESG disclosure scores and selected accounting-based, market-based and value-based CFP measures were employed. Previously, both international and local authors mainly employed accounting-based and market-based performance measures when they considered the relationship between various sustainability-related aspects and CFP. The inclusion of comprehensive ESG disclosure scores and value-based measures in the current study therefore addresses a gap in the current body of knowledge on ESG and CFP in the emerging market context.

7.2.2 Research design and methodology

As outlined in Section 1.5, a nine-step research process was adopted. A positivistic paradigm was employed. A combination of convenience and judgement sampling techniques was selected to collect the required quantitative data. The researcher used her judgement to draw a sample from six JSE sectors, namely the Consumer Goods, Consumer Services, Health Care, Technology, Telecommunications and Industrial sectors. Firms that were listed in the Basic Materials and Financial sectors were excluded from the sample, as the format of their annual financial statements, nature of activities and degree of regulation differs from those of the firms listed in the considered sectors. During the study period, no firms were listed in the Utilities sector. The complete sample consisted of 66 firms.

The composite ESG disclosure scores and individual E-, S- and G-disclosure scores were readily available on the Bloomberg (2017) database. No companies that delisted during the period under review could be considered, as Bloomberg did not provide ESG disclosure scores for such companies at the time when the data were collected. The study employed several CFP measures. The ROA and EPS ratios were included as measures of accounting-based performance. In addition, the market-based EY and TSR measures were considered. Given the enhanced focus on sustainable value creation, the researcher expanded on prior work of emerging market researchers by including four value-based performance measures, namely ROIC, MVA, the spread and CROIC. The financial data were sourced from the IRESS (2017) database. Section 4.8 provided a detailed discussion of the independent and dependent variables.

The secondary data were analysed by utilising descriptive statistics to describe the dataset. Several inferential statistics were also employed. A mixed-model ANOVA was used to determine the significance of the observed trends in the composite ESG disclosure score, as well as for the individual E-, S-, and G-disclosure scores, over the research period. The Fisher's LSD test was then conducted to determine whether the annual mean composite ESG disclosure score and individual E-, S- and G-disclosure scores differed significantly from one year to the next.

Several panel regressions (including random effects, fixed effects and pooled OLS) were conducted to investigate the relationship between ESG and CFP. Panel

regression analyses were conducted with the composite ESG disclosure score as the independent variable, followed by the analyses of the individual E-, S- and G-disclosure scores as the independent variables. The various CFP measures were entered into the preferred regression models as the dependent variable. Firm size, leverage and industry were used as control variables. Where necessary, adjustments were made for heteroskedasticity.

Given the differences in the associations observed among the individual E-, S- and G-disclosure scores and the various CFP measures, it was also conceivable that firms operating in different sectors could exhibit varying relationships between variables. As such, regression analyses were also conducted for the considered sectors. Regression analyses could, however, only be conducted for those sectors with sufficient data available to do meaningful analysis, namely the Consumer Goods, Consumer Services and the Industrial sectors. Thereafter, one-year lag periods were built into the preferred regression models to determine whether the relationship between E-, S- and G-disclosure and CFP takes time to reflect, given that investment in ESG requires a long-term perspective.

7.3 MAIN FINDINGS FROM THE LITERATURE REVIEW

The following two sections provide a summarised discussion of the main constructs considered in the current study, namely RI, ESG and CFP. An overview of previous studies on various ESG-related aspects and financial performance is provided in Section 7.3.3.

7.3.1 Responsible investing and ESG considerations

Sustainability encompasses the effect that the present generation's actions could have on the ecosystems, societies and the environments of the future (Ameer & Othman, 2012: 61). Sustainability challenges, such as climate change and natural resource depletion faced by firms in the 21st century require a fundamental change in the way in which they operate. Companies started engaging in CSR initiatives in the 1990s to address sustainability challenges (Nkomani, 2013: 1; Carroll & Shabana, 2010: 88).

CSR could be considered as a building block for CSP. As the driving force behind CSR and CSP is to improve society at large, both CSR and CSP focus mainly on

environmental and social aspects. The author is of the opinion that although corporate managers should analyse the costs and effects of social and environmental initiatives on overall CFP, pertinent corporate governance aspects should not be ignored.

As highlighted at the outset of the current study, RI is defined as an investment strategy that integrates ESG aspects with financial objectives in investment analysis and decision-making processes (Hassel & Semenova, 2013: 7). The inclusion of a range of pertinent non-financial information broadens the scope of investment analysis and decision-making (Pasquini-Descomps & Sahut, 2013: 1). It is essential that corporate managers and directors understand that ESG risks should be actively managed, as it could have an impact on a firm's CFP.

South African investors have been slow to engage with the boards of investee firms on ESG aspects. Local investors are gradually starting to acknowledge and integrate ESG aspects into their investment activities and decision-making (Bertrand, 2011a: 1). Interest in locally listed firms' ESG considerations mainly stem from the institutional investor community. Given that South Africa is one of Africa's largest institutional investment markets, institutional investors play a crucial role in influencing local corporate behaviour. They could encourage positive (ESG-related) reforms in the investment community (Marozva, 2014: 145).

Corporate managers and directors should be cognisant of the increased awareness of ESG aspects in the institutional investor community. Not only could the inclusion of ESG aspects have an impact on a firm's CFP, it could also provide access to additional capital sources. Failure to consider ESG aspects could threaten the long-term sustainability of firms and increase its cost of capital.

7.3.2 Corporate financial performance

To be able to make informed decisions, corporate managers and directors need to evaluate a firm's ESG dimensions and CFP (Van der Poll *et al.*, 2011: 123). Firms have several stakeholders with divergent interests. Corporate managers and directors are entrusted with the responsibility of making trade-offs between conflicting constituent demands. These decision-makers should consider several financial objectives that focus on specific stakeholder(s). The measurement of CFP largely depends on the

objective pursued by a firm. The most well-known financial objectives include profit maximisation, stakeholder wealth maximisation and VBM.

Profit maximisation requires financial managers to only pursue those actions which would result in increased revenue and greater profit. The blatant pursuit of profit-only has, however, often been criticised by various stakeholders. As a result, alternative financial objectives that focus on wealth creation for shareholders and other key stakeholders have been developed.

Shareholder wealth maximisation implies that corporate managers should only engage in those activities that are likely to have a positive impact on a firm's share price. Given that shareholder wealth maximisation narrowly focuses on shareholders, this objective is often criticised for having a short-term focus and not being compatible with the social obligations of a firm (Yahanpath, 2011: 70). In contrast, stakeholder wealth maximisation considers a broad range of aspects which are likely to have an impact on long-term financial performance. A firm that focuses on stakeholder wealth maximisation is likely to deliberately avoid making decisions which would have a negative impact on its stakeholders. The goal is not to maximise the interests of stakeholders per se, but rather to preserve their interests (Martin *et al.*, 2009: 18).

An approach that combines the shareholder-centric approach with that of a stakeholder-centric orientation is VBM. This approach entails that the two concepts are not regarded as mutually exclusive, but rather as complementary to each other (Martin *et al.*, 2009: 11). The premise of VBM is that although the ultimate goal of a firm should be to maximise its value over the long term, the goal should not be pursued without acting in a socially responsible manner.

The specific measures a firm decides to employ when assessing its CFP largely depends on the financial objective being pursued. CFP metrics are therefore quantitative tools that can be utilised to measure a firm's performance in relation to a specific objective. CFP can be measured by employing, amongst others, accounting-based, market-based and value-based measures. ROA and EPS are two examples of commonly used accounting-based measures. ROA measures the overall profitability and effectiveness of employing assets in a firm, whereas EPS reflects the amount of attributable earnings that were earned per ordinary share in a specific year (Els *et al.*,

2014: 87). Accounting-based performance measures, however, focus on historical performance and could be subjected to earnings management.

Market-based measures include the EY and TSR ratios. These measures are sometimes used to reflect on expectations about future performance. The EY ratio provides an indication of the return that is earned on the market price of a share (Erasmus & Van den Berg, 2011: 46). The TSR ratio is the most commonly used market-based CFP measure. This ratio measures the return earned in the form of dividend payments and capital appreciation/depreciation, expressed as a percentage relative to the original purchase price (Collier & Agyei-Ampomah, 2009: 23; Megginson *et al.*, 2008: 194).

A researcher can use value-based performance measures, such as FCF, EVA and MVA if the researcher aims to remove some of the accounting distortions that are associated with the more conventional financial performance measures, and wants to ensure that the firm's cost of capital is taken into account in the evaluation (Erasmus, 2008: 66). FCF represents the cash flow that is available to be distributed to all external capital providers after a firm has made the necessary fixed and working capital investments required to support future growth (Brigham & Daves, 2010: 230). The value of a firm depends on the present value of its expected future FCFs (Martin *et al.*, 2009: 56). Given that growing firms often generate negative FCFs, it is important to distinguish between profitable and unprofitable growth. The ROIC was used to determine whether a firm's growth was profitable. The CROIC measure can be utilised to determine whether a firm will generate positive or negative future FCFs. This value-based CFP measure represents the amount of the current FCF that is being generated in a firm compared to the capital in operation. The EVA measure reflects managerial effectiveness at creating value in a given year. Given that firms of dissimilar sizes are likely to realise considerable differences in their operating capital, the spread (ROIC – WACC) was used to standardise the measure of EVA. The MVA of a firm refers to the difference between the market value of a firm and the invested capital. The measure can be used to calculate the accumulated value created since the inception of a firm (Brigham & Daves, 2010: 235). Previous researchers have, however, often decided to only consider accounting and/or market-based metrics to reflect on CFP (Rowe & Morrow, 1999: 58).

7.3.3 Previous studies conducted on ESG-related aspects and CFP

Previous studies on the relationship between several ESG aspects and CFP have been mainly conducted in the developed market context (Breuer & Nau, 2014; Pasquini-Descomps & Sahut, 2013; Balatbat *et al.*, 2012; Orlitzky *et al.*, 2003). These researchers have mostly employed accounting-based measures such as ROA and ROE. Limited attention has been given to value-based financial performance measures. It should also be noted that prior studies have reported divergent results on the relationship between ESG and CFP.

In the local context, limited ESG-related research has been conducted. The majority of local researchers focused on only one aspect of ESG, namely corporate governance (Mans-Kemp, 2014; Waweru, 2014; Ntim *et al.*, 2012; Mangena & Chamisa, 2008; Rossouw *et al.*, 2002). Implementing sound corporate governance practices is often the first level of ESG integration for South African firms. However, to ensure corporate sustainability, it is important for managers and directors to engage with all three ESG aspects.

Some research that has been conducted in the local context gave pertinent attention to RI, mainly as it pertains to institutional investors. Van der Ahee and Schulschenk (2013) and Eccles *et al.* (2007) conducted surveys to determine the consideration given to ESG aspects by local institutional investors. They reported a number of encouraging ESG-related developments, as well as concerns. Herringer *et al.* (2009) and Viviers *et al.* (2008) also reported on various challenges, drivers, barriers and enablers of RI within the country.

When comparing the considered local studies that are referred to in Table 3.2, it was evident that no researcher included ESG scores or value-based CFP measures when considering the relationship between sustainability-related performance and CFP.

7.4 MAIN FINDINGS OF THE EMPIRICAL INVESTIGATION

In this section, the key empirical findings of the study are summarised.

7.4.1 ESG disclosure of the overall sample

ESG disclosure was regarded as the independent variable in the current study, as represented by annual composite ESG disclosure scores. The sample firms' disclosure of ESG aspects reflected an increasing trend over the research period. In 2011, the annual mean composite ESG disclosure score was 31 out of a maximum of 100. By 2016, the annual mean composite ESG disclosure score was 35. Since the advent of integrated reporting in 2011, JSE-listed firms have been encouraged to disclose pertinent non-financial (ESG) information. Although the composite ESG disclosure score was still below 50 at the end of the study period, the increasing trend can be regarded as a positive development.

Focusing on a composite ESG disclosure score, however, could conceal varying levels of disclosure of the diverse, individual ESG aspects applicable to different firms. Given the increase observed in the composite ESG disclosure scores over time, it was important to identify the source of the increase by considering the individual ESG aspects.

When comparing the individual E-, S- and G-disclosure scores to the composite ESG disclosure score, it is evident that E- and S-disclosure scores made the largest contribution to the observed increase in ESG disclosure over time. Although the disclosure of environmental aspects increased over the study period, it was at a slow pace. It seemed as if the S-disclosure score was the key contributing factor to the overall increase in ESG disclosure. At the start of the research period, the annual mean S-disclosure score was 34 out of a maximum of 100, increasing to an annual mean score of 42 in 2016. Given the country's legacy of social injustices that has hampered socio-economic development, there seems to be an increased awareness among some of the considered firms to address the social imbalances of the past. Although corporate governance remained the highest disclosed ESG aspect, the level of G-disclosure remained relatively constant over the research period.

7.4.2 ESG disclosure among different sectors

In addition to the differences reported in the individual E-, S- and G-disclosure scores, it was conceivable that firms from different sectors could exhibit varying levels of ESG disclosure. At the sector level, the considered Consumer Goods and Consumer

Services firms showed encouraging improvements in their annual mean composite ESG disclosure scores from 2013 onwards. A possible reason for this improvement is that consumer-focused firms are increasingly recognising the importance of sustainable business practices to address the changing expectations of consumers and investors (Battle, 2012).

When considering the individual E-, S- and G-disclosure scores at the sector level, it was evident that the disclosure of social considerations among firms in the different sectors improved considerably over the research period. More attention was given to the disclosure of social considerations than environmental aspects. The level of E-disclosure scores across all sectors remained relatively low over the study period. However, the Consumer Goods sector displayed considerable improvement in the disclosure of environmental practices. In line with the overall findings, the disclosure of corporate governance practices remained the most disclosed ESG component.

7.4.3 Panel regressions on the relationship between ESG and CFP

Regression analyses were firstly conducted based on the sample's composite ESG disclosure scores. The various CFP measures were included as the dependent variable. No statistically significant relationships were, however, identified between the sample's composite ESG disclosure scores and CFP over the study period. In contrast, Ferrero-Ferrero *et al.* (2014) found a significant positive relationship between the level of ESG performance and economic performance (as measured by the economic performance score provided by Thomson Reuters Asset4). Given that the aggregated results revealed no significant associations, the researcher proceeded to investigate whether relationships existed between the individual ESG components and the various measures of CFP for the entire sample.

When examining the relationships between the individual E-, S- and G-disclosure scores and CFP, statistically significant associations were identified for the accounting-based EPS and market-based TSR measures. A significant negative relationship was found between the E-disclosure score and accounting-based earnings. The initial high costs to implement environmental initiatives could have a negative effect on a firm's earnings. When the E-disclosure was lagged for one year, no significant relationship was noted with any of the CFP variables. This finding highlights that the E-disclosure

of the previous year had no significant impact on the following year's accounting-based earnings for the sample companies.

In contrast to the aforementioned negative association between E-disclosure and EPS, a significant positive association was observed between the sample companies' S-disclosure scores and EPS. In other words, firms that disclosed more details on their social considerations generated higher accounting-based earnings. Furthermore, when the S-disclosure scores were lagged, the significant positive relationship persisted. It was encouraging to note that firms that disclosed their social considerations had a significant positive relationship with EPS, both in the given year and one year later.

A statistically significant negative relationship was reported between S-disclosure and TSR. Richardson and Walker (2001) explain that such a negative relationship might be due to the fact that social responsibility investments by firms mostly represent negative net present value projects contributing to overall risk. As a result, market participants might perceive spending on social projects as superfluous.

At the sector level, regression analyses could be conducted for only three sectors. The Consumer Goods, Consumer Services and Industrial sectors had sufficient data available to conduct meaningful regression analyses. Statistically significant positive associations were observed between the G-disclosure score of the considered Consumer Goods firms and their accounting-based ROA and value-based MVA ratios. Well-governed Consumer Goods firms thus appeared to be more effective in using their assets to generate income and exhibit greater profitability. This result concurs with Munisi and Randøy (2013), who also found a significant positive relationship between corporate governance and ROA. Furthermore, these well-governed Consumer Goods firms also had an increased capacity to create aggregated shareholder value over their corporate lifetime. As with the entire sample, Consumer Goods firms reflected a significant negative relationship between E-disclosure and EPS and EY. As pointed out earlier, the high costs associated with implementing environmental practices could have contributed to the negative impact on earnings.

The Consumer Goods and Consumer Services firms exhibited significant positive relationships between their S-disclosure scores and the EPS they generated. This

result concurs with the findings of Mutezo (2014), who reported a significant positive relationship between SRI and EPS. Firms conducting business in the Consumer Services sector also showed a significant positive association between their S-disclosure scores and the EY earned on their shares. Given that the EY ratio is calculated by comparing a firm's EPS value to the market price of its shares, this result was somewhat expected, given the positive link with EPS already observed.

Results showing that those Consumer Services firms that were better governed experienced lower value-based ROIC and CROIC ratios than their poorly governed counterparts were somewhat unexpected. It has been argued by Mans-Kemp (2014: 235) that corporate governance compliance is often costly for firms. The implementation costs of corporate governance practices include compliance, opportunity and reputational costs (Aguilera *et al.*, 2008: 480). The additional costs incurred to comply with corporate governance standards is a possible reason for the negative relationship observed between E-disclosure and the two value-based measures ROIC and CROIC.

Well-governed Consumer Services firms, however, showed a significant positive association with MVA. This finding illustrates these firms' ability to create sustainable shareholder wealth. Lastly, a significant positive relationship was identified between S-disclosure and the spread for Consumer Services firms. Therefore, those Consumer Services firms that performed better at disclosing their social considerations also earned higher returns in excess of their cost of capital.

A significant positive association was observed between G-disclosure scores and the EPS generated by Industrial firms. This result is in line with Mans-Kemp (2014), who observed a statistically significant positive association between corporate governance and EPS for her sample, which included Industrial sector firms. In line with the current study's overall sample's findings a significant negative relationship was observed between the S-disclosure scores and TSR of Industrial companies. For this sector, all three individual ESG components had a significant relationship with the value-based CROIC performance measure. A significant negative relationship was identified between the E-disclosure scores and CROIC. In contrast, the S- and G-disclosure scores revealed a statistically significant positive association with the CROIC measure for the considered Industrial companies. According to Bauer, Guenster and Otten

(2004), good corporate governance practices might result in higher investor trust. Furthermore, well-governed firms could have efficient operating performance and as a result, expected future FCFs, which in turn, could contribute towards higher firm value over the long term (Breuer & Nau, 2014: 20). The improvement in the FCFs of well-governed firms could therefore be a reason for the positive association between the level of corporate governance disclosure and the value-based CROIC measure.

7.5 RECOMMENDATIONS

Based on the key findings of the study, a number of recommendations are presented to various stakeholder groups, including policy makers and lobby groups, managers, directors, investors, educators and ESG data providers.

7.5.1 Recommendations for policy makers and lobby groups

Selected South African firms seemed to have responded positively to the well-developed framework for corporate governance provided by the King Reports. Over the research period, the majority of the firms considered in the current study achieved G-disclosure scores of above 50 out of a maximum score of 100. A detailed framework for disclosure of the individual E- and S-aspects could therefore be provided to firms to improve their E- and S-disclosures. Similarly to the King IV Report, firms could then follow an 'apply-and-explain' approach to indicate how they have responded to the respective E- and S-aspects. A standardised reporting format could contribute towards improving both the disclosure and consideration of E- and S-aspects. The IoDSA could consider formulating a supplementary report to the King IV Report suggesting guidelines to codify E- and S-recommendations.

The researcher is not convinced that ESG should be regulated, given that some firms will in all likelihood find ways around restrictive legislation. An alternative approach is that the JSE could consider setting environmental and social compliance targets for firms. The researcher found that firms from the different sectors responded differently to the individual ESG aspects. To incorporate these differences, the proposed targets by the JSE could be used to address the manner in which the firms should be responding to the most pressing corporate sustainability challenges in their specific sector.

Furthermore, lobby groups such as the Association for Savings and Investment South Africa (ASISA), could exert more pressure on asset owners and pension fund trustees to include an evaluation of the ESG aspects of JSE-listed firms in their investment analysis and decision-making.

7.5.2 Recommendations for corporate managers and directors

Managers should recognise that there is an increasing awareness among investors to incorporate ESG considerations into their investment analysis and decision-making. Stated differently, managers should not only focus on the traditional financial performance approach, but should also understand the pertinent ESG aspects that are being considered by investors. By understanding and addressing these aspects, firms could attract additional equity capital.

Furthermore, corporate managers need to acknowledge that ESG risk management forms part of the core business functions of a firm. ESG considerations are a combination of diverse aspects that often requires a differentiated managerial approach to address the potential risks. In addition, it is important for managers and directors to be aware of the fact that firms from different sectors are likely to experience dissimilar ESG risks.

To generate sustainable returns, it is important for corporate managers to embrace a long-term focus when engaging with ESG aspects. For instance, an investment in an ESG initiative might not necessarily realise the expected returns in a given year, but will most likely result in future returns or cost reductions.

Under the Companies Act (No. 71 of 2008), directors are held personally liable for debts and losses where they have conducted the business of a firm recklessly or fraudulently. For this reason, it has become critically important for directors to be effective and ethical leaders. The King IV Report recommends that every board meeting should have an agenda item that specifically pays attention to the impact that a firm's operations has on society and the environment in which it operates (IoDSA, 2016). Board members should make a concerted effort to comply with King IV.

The social and ethics board committee is responsible for overseeing and reporting on organisational ethics, responsible corporate citizenship, sustainable development and

stakeholder relationships (IoDSA, 2016). Given the important responsibility of this committee, it is vital that non-executive members are selected to ensure independent judgement. Members of such social and ethics committees who have limited experience in managing ESG risks and challenges should be encouraged to participate in development and training initiatives. It is important that the committee includes directors with relevant experience. In instances where experience is lacking, the introduction of RI training programmes could act as an enabler of local RI (Herringer *et al.*, 2009: 16).

Directors could include ESG indicators to assess the competencies of management and the successful implementation of risk management mechanisms (Galbreath, 2012: 2). Furthermore, in line with Viviers *et al.*'s (2008) recommendation, directors should ensure that a firm's values and mission statements include the concept of sustainability as it is likely to influence investment decision-making to encourage RI.

7.5.3 Recommendations for investors

Similar to corporate managers, investors should consider more aspects than purely financial returns when conducting investment analysis. Investors should recognise that ESG aspects have an important role to play in the ability of a firm to generate sustainable returns. In addition to securing financial returns, investors also have the potential to generate non-financial returns from their investment activities.

Shareholders should become more actively involved and engage with firms on ESG concerns. Participation could be enhanced by filing shareholder resolutions, voting at annual general meetings and/or divesting from a particular firm if the firm does not give adequate consideration to ESG aspects. Given their scope of influence, institutional investors also have an important role to play. They should implement the recommendations and guidance provided by CRISA and the King IV Report when engaging with investee firms. King IV pertinently states that institutional investors should ensure that RI is practised throughout the organisation in which they invest (IoDSA, 2016). As shareholders are the owners of firms, they have a responsibility to hold managers and directors accountable for their decisions and actions.

7.5.4 Recommendations for educators

Educators in the field of management sciences at tertiary education institutions are able to influence the next generation of corporate managers, asset managers, pension fund trustees, investors and entrepreneurs in South Africa. Traditionally, these educators have mainly taught commerce students core financial concepts. Although some tertiary educators have started to incorporate ESG aspects into their curricula, there remains room for improvement. More attention should be given to the topic of RI and the various strategies that could be employed for investment analysis and decision-making. In doing so, commerce students will gain a deeper understanding of the strategies, which in turn will enable them to apply these strategies once they enter the market place. It is of utmost importance that these students are thoroughly educated on financial, ESG and ethical considerations. Therefore, educators can include ESG-simulated situations and/or case studies during lectures so that students can analyse the scenarios and offer their suggestions and possible solutions.

7.5.5 Recommendations for ESG data providers

Although there are a few comprehensive ESG data providers such as Bloomberg and MSCI, the costs associated with retrieving ESG data remain high. As a result, individual investors often struggle to obtain access to these ESG databases. The researcher therefore recommends that ESG data providers should investigate the provision of more affordable ESG data of JSE-listed firms to individual investors.

7.6 LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FUTURE RESEARCH

A number of limitations emerged during the research process. These limitations are discussed first, followed by suggestions for future research.

7.6.1 Limitations of the research

Firstly, the study's sample only included firms from six JSE sectors. Two sectors, namely the Basic Materials and Financials sectors, were excluded because of the differences in the nature of their financial reporting compared to those of the considered sectors. The Basic Materials and Financials sectors are essential sectors

in the local economy. It is possible that results from listed firms operating in these omitted sectors may vary from those of the considered sectors.

Secondly, investing in ESG initiatives by firms have been argued to only realise returns over the long term. Given the limited six-year study period, the impact of ESG on CFP might not be observed in the given year or the one-year lag period.

Finally, the considered ESG disclosure scores might not reflect the true ESG practices of firms. These scores were compiled based on the reporting by the firms, and it can be argued that it is unlikely that firms would disclose details on their negative experiences pertaining to ESG. Reporting has an important influence on not only a firm's ESG disclosure score, but also on the opinions of several stakeholders and the firm's reputation. Even though firms are required to disclose 'the good, the bad and the ugly', given the repercussions that this might have on their business, it is debatable whether they will do so.

Despite these limitations, the research findings of the study still contribute considerably to the body of knowledge regarding the relationship between ESG and CFP in the South African context.

7.6.2 Suggestions for future research

By extending the study period, future researchers might observe more significant relationships between ESG and CFP. When considering non-financial aspects, it is important that a long-term perspective is adopted by stakeholders.

In the current study, the majority of the significant relationships identified between variables were only observed once the researcher disaggregated the composite ESG disclosure score, and secondly, distinguished among the different sectors. It is therefore important for future researchers to remain cognisant of the fact that a composite ESG disclosure score combines diverse aspects to which firms often respond to differently. Given the subjectivity involved in reporting that could influence ESG disclosure scores, future researchers should perhaps shift their emphasis from considering disclosure to measuring actual performance. Stated otherwise, future researchers should contemplate ways to measure actual E-, S- and G- performance based on the initiatives implemented.

The current study utilised secondary quantitative data to investigate the relationship between ESG and CFP. Future researchers could conduct interviews with directors and corporate managers to obtain more information on what firms are doing to address ESG risks. In addition, surveys could also be sent to managers to investigate the ESG aspects that are being considered by firms.

Finally, future researchers could conduct a comparative study between South Africa and other emerging and/or developing countries in and beyond the African continent. A further suggestion is to do a comparative study of the BRICS countries, i.e. Brazil, Russia, India, China and South Africa. The difference between ESG and CFP in the developing and the developed market contexts could also be explored.

7.7 RECONCILIATION OF THE RESEARCH OBJECTIVES

The primary research objective was addressed through the formulation of four secondary objectives. The reconciliation of the secondary objectives are outlined in Table 7.1.

Table 7.1: Reconciliation of the secondary research objectives

Secondary objectives	How objectives were addressed	Reference in study
To conduct an in-depth review of the literature on RI, ESG and CFP.	The researcher conducted an in-depth review of the literature on RI, ESG and CFP, by consulting various academic journals, books and relevant websites.	Chapters 2 and 3
To select an appropriate research design and methodology.	The current study employed a positivistic paradigm to conduct quantitative research. Given that ESG and CFP for 66 JSE-listed firms were considered over the period 2011 to 2016, a panel research design was selected.	Chapter 4, Sections 4.4 and 4.5
To collect and analyse secondary ESG and CFP data.	Composite ESG disclosure scores, as well as the individual E-, S- and G-disclosure scores, were obtained from the Bloomberg (2017) database. The CFP data were acquired from the IRESS (2017) database. The data were analysed by employing various descriptive and inferential statistics.	Chapter 4, Sections 4.8 and 4.9
To provide valuable conclusions and recommendations to relevant stakeholders.	The key findings of the literature review and empirical investigation are presented in the final chapter. Recommendations to various stakeholder groups are also offered.	Chapter 7, Section 7.3, 7.4 and 7.5

7.8 CONCLUDING REMARKS

Sustainability-related challenges will continue to threaten the longevity of firms and society as the competition for resources constantly intensifies. As a result, it has now become more important than ever that firms acknowledge corporate sustainability challenges and actively manage their ESG risks. As revealed in Chapter 6, ESG risks are not homogenous across sectors. Corporate leaders should hence employ a differentiated approach to address the most important risks relevant to their operating environments.

The researcher expresses the hope that the significant positive associations reported between various ESG aspects and CFP would motivate managers and directors of JSE-listed firms to allocate more time and financial resources to the consideration and active management of ESG risks. Greater effort should be made to properly disclose their actual performance. Attention should also be given to whether their currently employed measures really reflect the different dimensions of performance. Stakeholders, such as shareholders, suppliers and customers should 'come on board' by acknowledging that ESG aspects should be considered and accounted for over the long run to create value in a sustainable manner. By focusing on sustainable financial and ESG returns, companies, and investors, can do well by doing good.

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APPENDIX 1: COMPANIES CONSIDERED IN THE STUDY

Companies considered ^{a)}	Industry ^{b)}	Years considered
AVI	1	2011-2016
ABInBev	1	2011-2016
ADCOCK	4	2011-2016
ADVTECH	2	2011-2016
ASPEN	4	2011-2016
ASTRAL	1	2011-2016
AVENG	6	2011-2016
BARWORLD	6	2011-2016
BASREAD	6	2012-2016
BATS	1	2013-2016
BIDCORP	2	2015-2016
BIDVEST	6	2011-2013; 2015-2016
BLUETEL	3	2011-2016
CALGRO M3	6	2013-2016
CAXTON	2	2011-2016
CITYLDG	2	2011-2016
CLICKS	2	2011-2016
COMAIR	2	2011-2016
CURRO	2	2011-2016
DATATEC	5	2011-2016
DAWN	6	2011-2016
DISTELL	1	2011-2016
EOH	5	2013-2016
EXTRACT	6	2011-2016
FAMBRANDS	2	2011-2016
GRINDROD	6	2011-2016
GROUP 5	6	2011-2016
IMPERIAL	6	2011-2016
INVICTA	6	2011-2016
ITLTILE	2	2012-2016
KAP	6	2012-2016
LEWIS	2	2011-2016
LIFEHC	4	2011-2016
M&R HLD	6	2011-2016
MASSMART	2	2011-2016
MEDCLIN	4	2013-2016
MR PRICE	2	2011-2016
MTN GROUP	3	2011-2016
NAMPAK	6	2011-2016
NASPERS	2	2011-2016
NETCARE	4	2011-2016
OCEANA	1	2011-2016
PHUMELELA	2	2011-2016
PICKNPAY	2	2011-2016
PNR FOODS	1	2012-2016
PPC	6	2011-2016
RCL	1	2011-2016
REMGRO	6	2011-2016
REUNERT	6	2011-2016
SHOPRIT	2	2011-2016
SPAR	2	2011-2016

Companies considered^{a)}	Industry^{b)}	Years considered
STEIN NV	1	2011-2016
SUNINT	2	2011-2016
SUPRGRP	6	2011-2016
TELKOM	3	2011-2016
TFG	2	2011-2016
TIGBRANDS	1	2011-2016
TONGAAT	1	2011-2016
TRENCOR	6	2011-2016
TRUWTHS	2	2011-2013; 2015-2016
TSOGO SUN	2	2012-2016
VALUE	6	2013; 2015-2016
VODACOM	3	2011-2016
WBHO	6	2011; 2013-2016
WILDRNESS	2	2011-2016
WOOLIES	2	2011-2016

a) 'Short name' as indicated by Bloomberg (2017)

b) Industry classification: Consumer Goods (1); Consumer Services (2); Telecommunications (3); Healthcare (4); Technology (5) and Industrials (6).

APPENDIX 2: REGRESSION ANALYSIS RESULTS FOR COMPOSITE ESG DISCLOSURE SCORES AS THE INDEPENDENT VARIABLE

Table 1: Regression analysis results for the composite ESG disclosure scores and ROA

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		21.95**	6.40**	23.67** (3, 288)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
ESG	-0.03	0.05	-0.55	0.58	
Leverage	-20.15	2.87	-7.02**	0.00	
Size	12.13	2.58	4.70**	0.00	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
ESG	504.61**		-0.41		
Leverage			-5.10**		
Size			4.60**		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.20

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 2: Regression analysis results for the composite ESG disclosure scores and EY

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		3.82**	2.66*	1.86 (3, 288)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
ESG	0.02	0.03	0.71	0.48	
Leverage	-3.94	1.76	-2.24*	0.03	
Size	-0.04	1.58	0.71	0.48	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
ESG	590.63**		0.56		
Leverage			-1.66		
Size			-0.03		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.02

The quality of fit of the preferred two-way fixed effects regression model was not significant.

Table 3: Regression analysis results for the composite ESG disclosure scores and ROIC

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		12.34**	2.32*	16.27** (3, 288)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
ESG	-0.12	0.08	-1.42	0.16	
Leverage	-31.31	4.98	-6.28**	0.00	
Size	13.82	4.48	3.09**	0.00	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
ESG	434.30**		-1.24		
Leverage			-4.59**		
Size			3.55**		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.14

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 4: Regression analysis results for the composite ESG disclosure scores and MVA

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		19.51**	3.86**	12.01** (3, 288)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
ESG	2.41	1.07	2.25*	0.03	
Leverage	-9.52	63.92	-0.15	0.88	
Size	277.62	57.43	4.83**	0.00	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
ESG	1688.11**		1.82		
Leverage			-0.08		
Size			3.06**		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.11

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 5: Regression analysis results for the composite ESG disclosure scores and the spread

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		12.30**	3.22**	14.59** (3, 288)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
ESG	-0.06	0.08	-0.71	0.48	
Leverage	-28.85	4.82	-5.98**	0.00	
Size	12.58	4.33	2.90**	0.00	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
ESG	445.62**		-0.59		
Leverage			-4.28**		
Size			3.30**		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.13

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 6: Regression analysis results for the composite ESG disclosure scores and CROIC

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
One-way fixed effects		4.20**	33.62**	13.91** (3, 292)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
ESG	-0.18	0.18	-1.05	0.30	
Leverage	-64.31	10.69	-6.02**	0.00	
Size	-6.96	9.21	-0.76	0.45	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
ESG	185.10**		-1.06		
Leverage			-6.40**		
Size			-0.75		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.13

The quality of fit of the preferred one-way fixed effects regression model was significant.

APPENDIX 3: REGRESSION ANALYSIS RESULTS FOR E-, S- AND G- DISCLOSURE SCORES AS THE INDEPENDENT VARIABLES

Table 1: Regression analysis results for the individual E-, S-, and G-disclosure scores and ROA

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		21.68**	5.57**	14.16** (5, 286)	

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E	-0.03	0.50	-0.68	0.50
S	0.00	0.03	0.12	0.91
G	0.01	0.06	0.19	0.85
Leverage	-20.10	2.94	-6.84**	0.00
Size	12.07	2.63	4.58**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	494.19**	-0.50
S		0.09
G		0.18
Leverage		-5.05**
Size		4.96**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.20

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 2: Regression analysis results for the individual E-, S-, and G-disclosure scores and EY

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way fixed effects	3.65**	2.91*	1.71 (5, 286)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-0.03	0.03	-1.10	0.27
S	0.03	0.02	1.77	0.08
G	0.01	0.04	0.17	0.87
Leverage	-3.54	1.79	-1.94*	0.05
Size	0.21	1.61	0.13	0.89

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	607.87**	-1.12
S		1.91
G		0.20
Leverage		-1.55
Size		0.15

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.03

The quality of fit of the preferred two-way fixed effects regression model was not significant.

Table 3: Regression analysis results for the individual E-, S-, and G-disclosure scores and ROIC

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way fixed effects	12.08**	42.55**	10.60** (5, 291)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-0.01	0.09	-0.13	0.90
S	-0.09	0.05	-1.79	0.07
G	-0.04	0.11	-0.38	0.71
Leverage	-34.28	5.00	-6.86**	0.00
Size	8.15	4.05	2.01*	0.05

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	421.09**	-0.11
S		-1.59
G		-0.32
Leverage		-5.08**
Size		2.69**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.15

The quality of fit of the preferred one-way fixed effects regression model was significant.

Table 4: Regression analysis results for the individual E-, S-, and G-disclosure scores and MVA

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way fixed effects	19.29**	3.71**	8.43** (5, 286)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-0.62	1.11	-0.56	0.57
S	1.23	0.69	1.78	0.08
G	2.90	1.37	2.12*	0.04
Leverage	-11.24	64.76	-0.17	0.86
Size	269.09	58.08	4.63**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	1602.54**	-0.52
S		1.68
G		1.65
Leverage		-0.09
Size		2.84**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.13

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 5: Regression analysis results for the individual E-, S-, and G-disclosure scores and the spread

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way fixed effects	12.07**	3.11**	8.71** (5, 286)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-0.37	0.08	-0.44	0.66
S	0.00	0.05	0.02	0.98
G	-0.04	0.10	-0.43	0.67
Leverage	-28.51	4.93	-5.78**	0.00
Size	12.84	4.43	2.90**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	436.92**	-0.35
S		0.02
G		-0.41
Leverage		-4.19**
Size		3.61**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.13

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 6: Regression analysis results for the individual E-, S-, and G-disclosure scores and CROIC

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way fixed effects	3.93**	45.98**	8.30** (5, 290)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-0.55	0.19	-0.29	0.77
S	-0.07	0.11	-0.68	0.49
G	-0.12	0.23	-0.08	0.94
Leverage	-64.67	10.79	-5.99**	0.00
Size	-7.04	9.23	-0.76	0.45

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	191.51**	-0.26
S		-0.85
G		-0.09
Leverage		-6.44**
Size		-0.77

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.13

The quality of fit of the preferred one-way fixed effects regression model was significant.

APPENDIX 4: REGRESSION ANALYSIS RESULTS FOR E-, S- AND G- DISCLOSURE SCORES AS THE INDEPENDENT VARIABLES FOR THE CONSUMER GOODS SECTOR

Table 1: Regression analysis results for the individual E-, S- and G-disclosure scores and TSR

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)		Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS		0.95		0.19 (5, 51)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>	
Intercept	-53.05	109.19	-0.49	0.63
E	-0.14	0.49	-0.28	0.78
S	-0.08	0.28	-0.29	0.77
G	0.15	0.55	0.27	0.79
Leverage	-4.01	23.01	-0.17	0.86
Size	7.51	11.67	0.64	0.52

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)	15.00
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** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.02

The quality of fit of the preferred pooled OLS regression model was not significant.

No adjustment was made for heteroskedasticity, since the Breusch-Pagan test statistic was not significant.

Table 2: Regression analysis results for the individual E-, S- and G-disclosure scores and the spread

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
One-way fixed effects		28.60**	11.75*	3.76** (5, 42)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-0.24	0.13	-1.87	0.07	
S	0.02	0.08	0.26	0.80	
G	0.30	0.14	2.14*	0.04	
Leverage	-15.15	5.42	-2.80**	0.01	
Size	8.43	5.17	1.63	0.11	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
E	38.65**		-1.58		
S			0.23		
G			1.40		
Leverage			-4.33**		
Size			1.41		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.31

The quality of fit of the preferred one-way fixed effects regression model was significant.

Table 3: Regression analysis results for the individual E-, S- and G-disclosure scores and CROIC

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		6.76**	2.94*	4.14** (5, 37)	
Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>	
E	-0.42	0.43	-0.99	0.33	
S	-0.25	0.25	-1.01	0.32	
G	0.13	0.48	0.27	0.79	
Leverage	-61.24	16.99	-3.60**	0.00	
Size	9.90	22.46	0.44	0.66	
Breusch-Pagan test for heteroskedasticity (<i>BP</i>)			<i>t</i> -value adjusted for heteroskedasticity		
E	26.74*		-1.17		
S			-1.11		
G			0.32		
Leverage			-3.91**		
Size			0.44		

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.36

The quality of fit of the preferred two-way fixed effects regression model was significant.

APPENDIX 5: REGRESSION ANALYSIS RESULTS FOR E-, S- AND G- DISCLOSURE SCORES AS THE INDEPENDENT VARIABLES FOR THE CONSUMER SERVICES SECTOR

Table 1: Regression analysis results for the individual E-, S- and G-disclosure scores and ROA

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		68.39**	3.75**	8.03** (5, 97)	

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E	-0.04	0.05	-0.88	0.38
S	0.02	0.03	0.79	0.43
G	-0.03	0.07	-0.42	0.67
Leverage	-12.55	3.10	-4.05**	0.00
Size	8.48	2.17	3.91**	0.00

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	45.07**	-0.68
S		0.84
G		-0.45
Leverage		-3.16**
Size		4.31**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.29

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 2: Regression analysis results for the individual E-, S- and G-disclosure scores and TSR

Model summary		
Preferred model	Test for fixed effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Pooled OLS	1.03	0.60 (5, 123)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	6.46	49.22	0.13
E	0.42	0.31	1.36
S	-0.32	0.20	-1.62
G	0.18	0.56	0.33
Leverage	-8.17	12.51	-0.65
Size	0.71	4.89	0.15

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	62.50**	0.20
E		1.27
S		-1.88
G		0.48
Leverage		-0.73
Size		0.23

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.02

The quality of fit of the preferred pooled OLS regression model was not significant.

APPENDIX 6: REGRESSION ANALYSIS RESULTS FOR E-, S- AND G- DISCLOSURE SCORES AS THE INDEPENDENT VARIABLES FOR THE INDUSTRIALS SECTOR

Table 1: Regression analysis results for the individual E-, S- and G-disclosure scores and ROA

Model summary				
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way fixed effects		6.30**	2.48*	2.48* (5, 84)

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E	0.07	0.13	0.54	0.59
S	0.02	0.07	0.29	0.77
G	-0.03	0.12	-0.25	0.80
Leverage	-27.89	9.62	-2.90**	0.00
Size	12.04	11.30	1.07	0.29

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	144.51**	0.34
S		0.26
G		-0.28
Leverage		-2.52**
Size		1.81

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.13

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 2: Regression analysis results for the individual E-, S- and G-disclosure scores and EY

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
Two-way fixed effects		2.18**	2.65*	2.65* (5, 84)	

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
E	-0.05	0.10	-0.52	0.61
S	-0.01	0.05	-0.25	0.80
G	0.05	0.10	0.48	0.63
Leverage	-22.45	7.74	-2.90**	0.00
Size	12.48	9.10	1.37	0.17

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	90.16**	-0.61
S		-0.33
G		0.47
Leverage		-2.30*
Size		1.90

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.14

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 3: Regression analysis results for the individual E-, S- and G-disclosure scores and ROIC

Model summary					
Preferred model		Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)	
One-way random effects		2.85**	11.00	1.90 (5, 108)	

Regression coefficient		Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	57.48	22.09	2.60**	0.01
E	-0.27	0.16	-1.65	0.10
S	0.02	0.09	0.17	0.86
G	0.11	0.21	0.52	0.60
Leverage	-26.46	10.56	-2.51**	0.01
Size	-4.89	2.59	-1.89	0.06

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	99.77**	4.08**
E		-1.60
S		0.20
G		0.47
Leverage		-2.81**
Size		-2.62**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.08

The quality of fit of the preferred one-way random effects regression model was not significant.

Table 4: Regression analysis results for the individual E-, S- and G-disclosure scores and MVA

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Test for time effect (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
Two-way fixed effects	14.11**	3.24**	10.08** (5, 84)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
E	0.05	0.22	0.24
S	-0.05	0.11	-0.41
G	-0.07	0.20	-0.33
Leverage	-3.83	16.48	-0.23
Size	130.40	19.37	6.73**

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
E	740.49**	0.49
S		-0.56
G		-0.63
Leverage		-0.27
Size		2.83**

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.37

The quality of fit of the preferred two-way fixed effects regression model was significant.

Table 5: Regression analysis results for the individual E-, S- and G-disclosure scores and the spread

Model summary			
Preferred model	Test for fixed effects (<i>F</i>)	Hausman-test for random effects (<i>F</i>)	Fit of the model <i>F</i> (<i>df</i>)
One-way random effects	2.96**	10.95	1.42 (5, 108)

Regression coefficient	Standard error	<i>t</i> -value	Pr > <i>t</i>
Intercept	30.71	22.15	1.39
E	-0.25	0.16	-1.56
S	-0.04	0.09	-0.41
G	0.08	0.21	0.39
Leverage	-23.17	10.57	-2.19*
Size	-2.13	2.60	-0.82

Breusch-Pagan test for heteroskedasticity (<i>BP</i>)		<i>t</i> -value adjusted for heteroskedasticity
Intercept	112.33**	2.33*
E		-1.43
S		-0.53
G		0.31
Leverage		-2.32*
Size		-1.26

** Significant at the 1% level

* Significant at the 5% level

R-squared = 0.06

The quality of fit of the preferred one-way random effects regression model was not significant.