The performance of South African Socially Responsible Investments: a comparative analysis of listed equity

by

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Preface and Acknowledgements

To Masetle, for showing me how to care for others and Bab, for letting me practice.

Key Terms

Socially/Sustainable (and) Responsible Investment (SRI); Environmental, Social and Governance factors (ESG); COVID-19 pandemic; ESG Ratings, Johannesburg Stock Exchange; Fama and French Three-Factor and Five-Factor asset pricing models.

Abstract

In recent years, Sustainable and Responsible Investments (SRI) have undergone significant advancements in terms of both assets under management and investor attention. Concomitantly, the metrics which inform SRI methods, Environmental, Social and Governance (ESG) factors, have increasingly been incorporated within global investment approaches. This shift in approach suggests a permanent alteration to investing practices for some authors and investment houses. For South Africa, however, there is not yet consensus regarding the long-term comparative financial performance of securities focussing on SRI, considering the purported benefits of SRI's incorporation within dominant investment approaches.

In an attempt to address this *lacuna*, the following research dissertation unpacks the South African understanding of SRI and evaluates the comparative performance of portfolios constructed from rated ESG securities on the Johannesburg Stock Exchange. This research piece commences with an overview of recent global SRI developments followed by an evaluation of SRI as applied within South Africa alongside the country's legislative framework. Provided with the relevant background, this research dissertation constructs a set of nine portfolios of equities listed on the Johannesburg Stock Exchange, based on both the security's Bloomberg ESG Disclosure score and market capitalisation. Utilising the Fama and French Three- and Five-Factor asset pricing models, this research dissertation then gauges the financial performance of the constructed portfolios from May 2009 until April 2021 in terms of portfolio alpha values.

Finally, this research dissertation reports that portfolios constructed from highly rated ESG companies with small and medium market capitalisation provide statistically significant positive alpha values at the 5% limit. For highly rated ESG companies with a large market capitalisation, statistically significant positive alpha values are identified at the 10% limit while a portfolio of medium rated ESG securities with the same market capitalisation report positive alpha values with significance at the 5% limit. A number of factor tests are further undertaken in order to determine the pricing accuracy of the two models in consideration. It is concluded

that both the asset pricing models considered fail to explain the excess returns of the constructed portfolios at the 5% level of statistical significance.

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List of Abbreviations

B/M	Book-to-market
Bloomberg	Bloomberg Limited Partnership
BRICS	Brazil, Russia, India, China, and South Africa
CRIII	Committee on Responsible Investing by Institutional Investors in South Africa
CRISA	Code for Responsible Investing in South Africa
CSR	Corporate Social Responsibility
ESG	Environmental, Social and Governance Factors
Eurosif	European Sustainable Investment Forum
FF3	Fama and French (1993) Three-Factor Model
FF5	Fama and French (2015) Five-Factor Model
FSC	Financial Sector Charter
FSCA	South African Financial Services Conduct Authority
FTSE	Financial Times Stock Exchange
GEPF	South African Government Employees' Pension Fund
GGA	South African Good Governance Academy Non-Profit Organisation
GHG	Greenhouse Gasses
GRS	Gibbons, Ross and Shanken (1989)
HML	High Minus Low
INV	Investment
JSE	Johannesburg Stock Exchange
JSE ALSI	Johannesburg Stock Exchange All-Share Index
King I	King report on Corporate Governance (King Committee on Corporate Governance in South Africa, 1994)

King II	King report on Corporate Governance (King Committee on Corporate Governance in South Africa, 2002)
King III	King report on Corporate Governance (King Committee on Corporate Governance in South Africa, 2009)
King IV	King report on Corporate Governance (King Committee on Corporate Governance in South Africa, 2015)
KLD	Kinder, Lydenberg, Domini & Co. ratings
LHS	Left-Hand Side
MSCI	Morgan Stanley Capital International
OLS	Ordinary Least Squares
OP	Operating Profitability
P1	Portfolio 1
P2	Portfolio 2
P3	Portfolio 3
P4	Portfolio 4
P5	Portfolio 5
P6	Portfolio 6
P7	Portfolio 7
P8	Portfolio 8
P9	Portfolio 9
UN-PRI	United Nations' Principles of Responsible Investment
RHS	Right-Hand Side
RobecoSAM	Robeco Sustainable Asset Management
SRI	Socially Responsible Investment
SEC	Securities and Exchange Commission of the United States of America

SMB	Small Minus Big
SUR	Seemingly Unrelated Regression
UNEP-FI	United Nations Environment Programme – Finance Initiative
U.S.A.	United States of America
USD	United States Dollar
WML	Winners Minus Losers

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Chapter One: Introduction

1.1. Introduction

From the initial months of 2020,[1] the way in which the world did business was severely disrupted, and business practices were forced to change. As the latter months of 2020 ensued, asset managers, investors, and businesses suffered the effects of volatile and erratic market values globally, possibly most poignantly illustrated by the lowest oil prices in history during March and April (IMF, 2020). Resulting economic projections saw the World Bank (2020) estimate a global recession equivalent to that of the Second World War. Markets reacted in concert and global investors faced the loss of billions of Dollars, Euros, Pounds, Rands, Yen, and Yuan while global market prices plummeted (Löwen et al., 2021).

However, despite the hostile investment environment faced in 2020, there was an increase in the demand for financial products with Socially Responsible Investment (SRI) approaches and characteristics, or investment products that integrate Environmental, Social and Governance (ESG) factors within their investment processes (Adams & Abhayawansa, 2021; Broadstock et al., 2021; Jessop & Howcroft, 2021; Mans-Kemp & van Zyl, 2021; Mascotto, 2020).[2] Globally, 2020 was a remarkable year for SRI-orientated assets and SRI assets headquartered in the United States of America surpassed 35.3 trillion United States Dollars in 2020, a more than 30% increase from 2016 (GSIA, 2021).[3] Growth was not limited to the U.S.A. as SRI assets saw growth across the majority of regions, with Canada experiencing the most growth in assets during 2019 and 2020, totalling 48% (GSIA, 2021). Second to Canada, a 42% growth in the ESG related assets was reported for the U.S.A., a 34% growth for Japan as well as a 25% growth in the Australasia region (GSIA, 2021). Beyond the latest growth trend, Socially Responsible Investment approaches have received growing amounts of investor attention (Adams & Abhayawansa, 2021; Yan et al., 2018).

SRI includes a number of divergent investment approaches and the field is known for its erratic terminology as no unified global definition exists (Richardson, 2008; Sherwood & Pollard,

[1] COVID-19, or SARS-COV-2, was first recognised by the World Health Organisation during the final months of 2019 (Engelhardt et al., 2021). Following the zoonotic virus' discovery, it quickly spread globally and caused considerable market instability in its wake (Engelhardt et al., 2021).

[2] Hereinafter, Environmental, Social and Governance factors are also referred to by the commonly utilised acronym "ESG" depending on the context of the piece. Socially Responsible Investments are hereinafter also referred to according to its commonly utilised acronym "SRI" depending on the context of the piece. Both topics are detailed in subchapter 2.2 of this research.

[3] Hereinafter, the United States of America is referred to by the acronym "U.S.A." and the United States Dollar is referred to by the acronym "USD".

2018). Nevertheless, as subchapter 2.4 unpacks, this research utilises of the South African and European interpretation of SRI. Thereby, SRI refers to the incorporation of ESG factors within investment approaches and is utilised as an instrument for SRI approaches (Eurosif, 2014; Louche & Lydenberg, 2006).

The escalation in SRI investing has extended ESG Factors' role in investing practices while undoubtedly making the matter more commonplace during 2020 (Zhan & Santos-Paulino, 2021). This spectacle is further evidenced by the ESG integration trend of most of the largest asset management funds (Madhavan et al., 2021; Soler-Domínguez et al., 2019). Some examples of recent ESG factor integration include BlackRock Financial Management, the Vanguard Group Incorporated, Amundi Group, AXA Group S.A., Credit Suisse Group AG, and Fidelity Investments Incorporated (CFA Institute, 2020a).

SRI asset growth has continued into 2021, yet 2020 seems to have solidified the field within mainstream investing and has established ESG investing attention globally (Mans-Kemp & van Zyl, 2021; Quinsee, 2021; Ricketts, 2020). In contrast to the recent growth, ESG factors' inclusion in mainstream investment approaches have been criticised widely before the pandemic as an isolated phenomenon prompted by the U.S.A.'s bull market (Stevens, 2020).[4] Equally, SRI have been critiqued for being a 'feel-good' investment that sacrifices returns and, therefore, are contrary to fiduciary responsibilities (Payne, 2021). In the pandemic's wake, however, ESG factors seem to increasingly demonstrate a permanent alteration in investing practice that may not necessarily detract from fund performance (Broadstock et al., 2021; Stevens, 2020).

The existing growth in SRI follows a long-term trend evidenced by the U.S.A. and Europe, which both saw significant increases in ESG assets under management, totalling 618 billion USD from 2010 to 2019 (Zhan & Santos-Paulino, 2021). During this period, the amount of global sustainability orientated funds also increased from 1304 to 2704 (Zhan & Santos-Paulino, 2021). The U.S.A. had particularly noticeable increases in the number of funds with an SRI focus increasing from 55 in 1995 to more than 333 in 2012 (Munoz et al., 2014). However, 2020 magnified the prior trend as sustainable investment funds enjoyed a doubling of inflows in 2020 in comparison to 2019, a ten-fold increase in comparison to 2018 in the

[4] For an overview of the Islamic, Jewish, and Christian influences and origins on SRI, see Sherwood & Pollard (2018). For an overview of later resurgences, including how SRI developed as part of the Quakers' unwillingness to invest in so-called "sin stocks" see Heese (2005).

U.S.A's markets (Hale, 2021). In total, sustainable investment inflows amounted to one-quarter of net investment inflows in the U.S.A. during 2020 (Hale, 2021).

The recent surge in the variation of mainstream investment practice is particularly noteworthy as it suggests a redirection of investment behaviour that is no longer determined solely by investment risk and returns (Sherwood & Pollard, 2018). SRI achieves this extension by broadening the considerations of investors to include non-financial criteria (Renneboog et al., 2008). To evaluate the appropriate non-financial criteria, ESG factors are utilised to determine the viability of an investment within an investor's portfolio (Renneboog et al., 2008). Such approaches have been termed widely and some expressions include Socially- or Sustainable and Responsible Investing, Impact Investing, Social Investment, Social Finance, Ethical Investing, Green Investing, and ESG Investing (Sherwood & Pollard, 2018; Viviers & Eccles, 2012). While there are some variations in the aforesaid approaches, South African studies most commonly make reference to the term Socially Responsible Investing (Viviers & Eccles, 2012).[5] In this context, SRI is characterised as an approach to investment that incorporates ESG factors as part of the investment process (Viviers & Eccles, 2012).

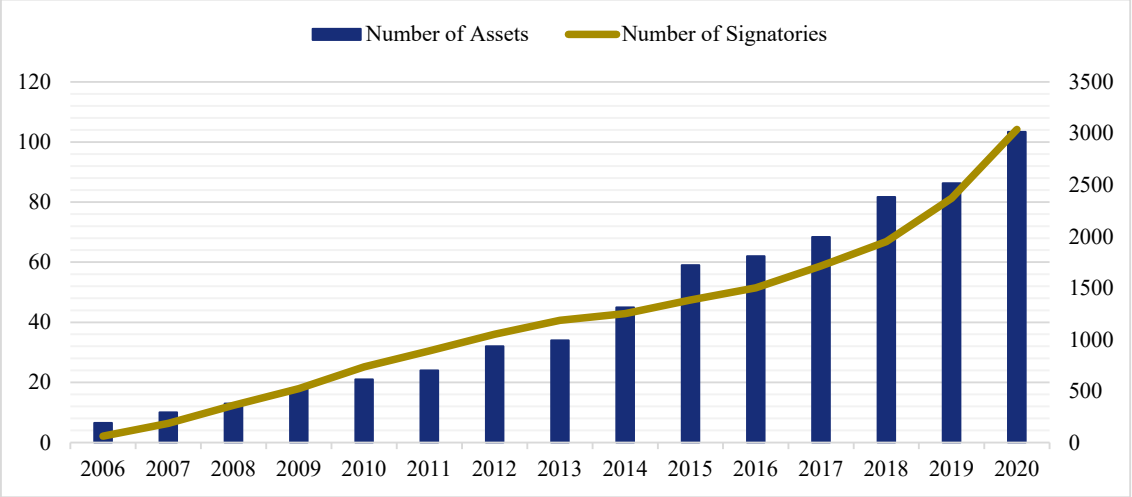
Some proponents of SRI suggest that the abovementioned investment approaches can consider factors beyond purely financial metrics in achieving investment objectives and without sacrificing returns (Heese, 2005). Accordingly, ESG factors serve to measure the extent to which firms can evaluate their investment choices, since SRI approaches are concerned with the sustainability of investments and therewith the eligibility of a potential investment (Bhana, 2018; Bollen, 2007; Giamporcaro, 2011; Sherwood & Pollard, 2018).[6] Supporters argue that sustainable business practices are rewarded on the market because the accompanying costs and business risks that sustainable organisations face are less, leading to more profitable returns and lower levels of comparative volatility, all while investors still meet their requisite fiduciary responsibilities (Broadstock et al., 2021; Mascotto, 2020; Payne, 2021; Schoenmaker & Schramade, 2019).[7] Beyond the growth of SRI in recent years, ESG practices are also argued to intensify returns and minimise the overall risk of a managed portfolio (Adams & Abhayawansa, 2021; Broadstock et al., 2021; Quinsee, 2021). However, despite the proposed

[5] In the interest of clarity, the two terms "Socially Responsible Investment" and "Environmental, Social and Governance Factors" are detailed further in subchapter 2.2 below.
[6] Hereinafter, Socially Responsible Investment is also referred to by the acronym "SRI" alongside the full reference.
[7] An overview of the suggested benefits that SRI companies have in comparison to their alternatives is discussed in subchapter 2.2 below.

benefits, there is not yet any consensus regarding the comparative performance of ESG-orientated investment strategies, creating uncertainty for potential SRI investors. Moreover, the Chartered Financial Analyst Institute (2020a)[8] suggests that there exists "an active debate on the performance of funds focussed on SRI/ESG investing" which is further developed below.

The global trend towards incorporating SRI can further be inferred from the increasing number of signatories and total assets under management within the United Nations – Principles of Responsible Investment or UN-PRI (PRI Association, 2021a).[9] Established in 2006, the UN-PRI includes six principles committing signatories to integrate ESG factors within their investment practices (PRI Association, 2020). While the UN-PRI does not represent all global SRI, it accounted for 80 trillion USD in SRI assets under management in 2019 (CFA Institute, 2020a). From Figure 1, the significant growth in both signatories and assets under management can be recognised. 2020 is particularly notable as the UN-PRI experienced an increase of 29% in signatories, while assets under the management of signatories increased by 21% to more than 100 trillion USD in total. More recently, the association has confirmed its 4000th signatory with 110 trillion in assets under management during June 2021 (Segal, 2021).

Figure 1 Total signatories of the UN-PRI and USD assets under management

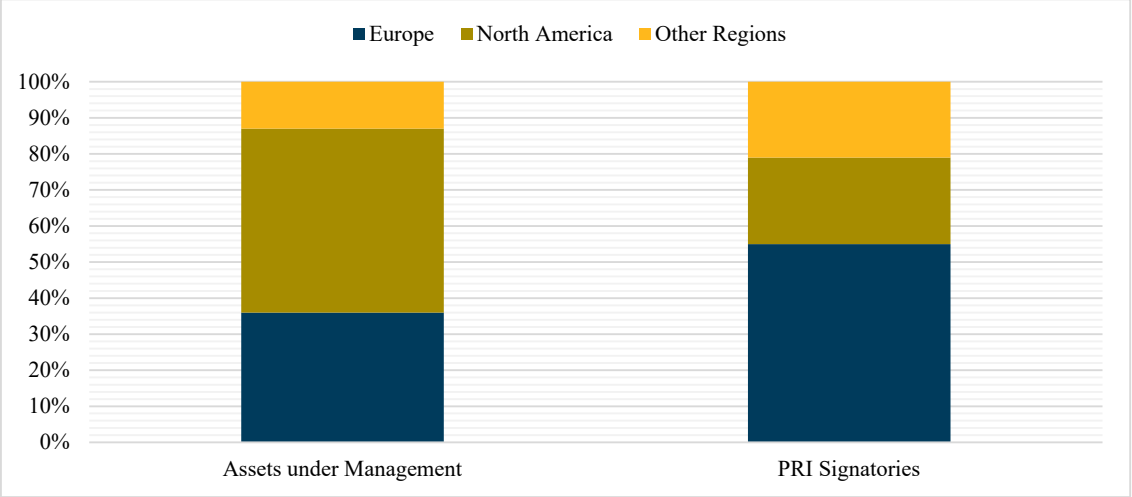


The growth in ESG is also not limited exclusively to the West. In 2019, China reported a total of seven billion USD in assets managed by 95 sustainability centred funds, most of which had been launched less than five years prior (Zhan & Santos-Paulino, 2021). Figure 2 below illustrates the division of assets and signatories to the UN-PRI by region. It illustrates that while

[8] Hereinafter referred to as the CFA Institute.
[9] Hereinafter, the United Nations Principles of Responsible Investment are also referred by its common acronym "UN-PRI" or "PRI". Further detail thereon is provided in subchapter 1.2 below.

there has been growth in other regions, the UN-PRI signatories are more noticeable in Europe and North America.

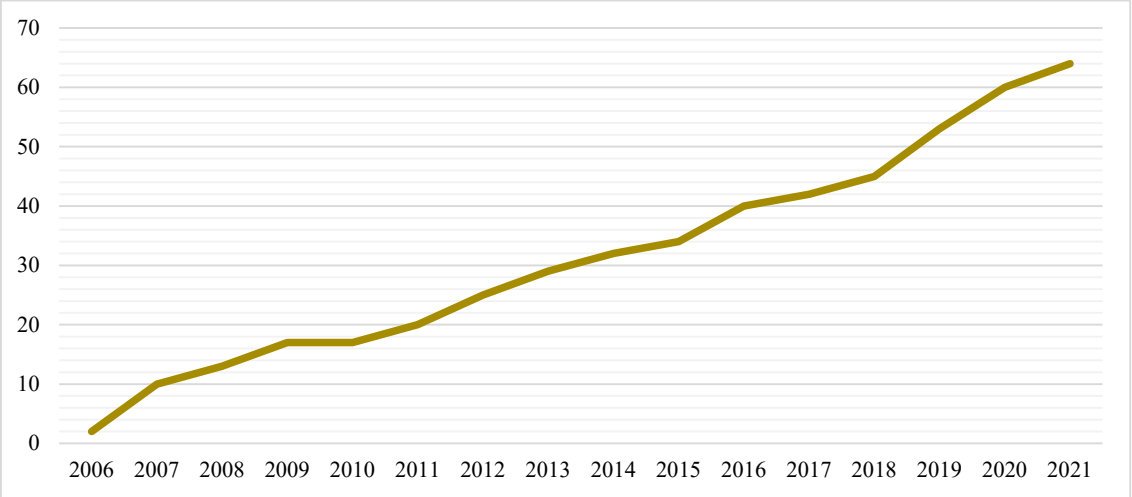
Figure 2 UN-PRI Signatories per assets under management and geographic area



Despite many funds being western controlled, South Africa has not been isolated from the trend. From the establishment of the UN-PRI in 2006, South Africa featured two signatories, The South African Government Employees Pension Fund, and Momentum Metropolitan Life Limited.[10] Figure 2 illustrates the comparative growth in UN-PRI signatories in the South African context (PRI Association, 2021b). As of June 2021, the UN-PRI has a total of 64 signatories headquartered in South Africa and, parallel to the global trend, there has been a noticeable increase in signatories from 2018 onwards (PRI Association, 2021b). From 2018 to 2020, signatories of the UN-PRI which are headquartered in South Africa grew from 45 to 60 as illustrated in Figure 3 (PRI Association, 2021b). In addition to UN-PRI signatory growth, South Africa has been a "pioneer in promoting corporate governance reform" in its own capacity as well as the country's history of economic exclusion provides specific urgency to redress social inequalities, further pressing the need for the application of SRI (Ducastel & Anseeuw, 2020; Solomon & Maroun, 2012).

[10] The Government Employees Pension Fund would later contribute significantly to the establishment of South African SRI, and the matter is further detailed in subsection 2.3.2 below. Hereinafter the fund is referenced using the acronym "GEPF".

Figure 3 UN-PRI Signatories headquartered in South Africa



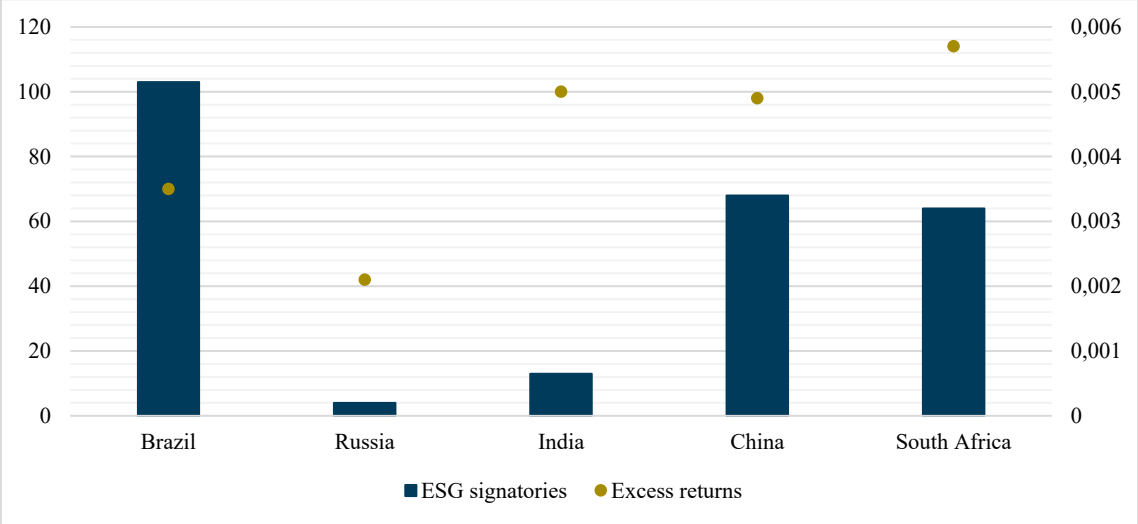
As Figure 3 illustrates, the increase in South African SRI funds mirrors the global developments evidenced by Figure 1. Further sources suggest that South Africa hosts 53 funds with a 'high' sustainability rating according to Morningstar as South African funds incorporate ESG factors into their investment practice. Examples include Coronation (2020), Ninety One (2021), Old Mutual (2021b), Prudential Investment Managers (2021), and Stanlib (2021). Yet, a smaller number of funds are specifically dedicated to ESG investing (Citywire, 2020). Some specific funds include a Morgan Stanley Capital International, or MSCI, indexed fund specialising in South Africa ESG Capital Leaders, as well as the Mergence (2021) SRI Fund, and the Novare (2021) South Africa Impact Fund (Citywire, 2021; Du Plessis, 2019).[11] Other South African ESG oriented funds have also been introduced from the inception of the COVID-19 pandemic, such as the Sygnia S&P Global 1200 ESG ETF and the Old Mutual ESG equity fund (Madjarova, 2021; Old Mutual, 2021a).

In the context of BRICS,[12] South Africa is also a notable UN-PRI signatory, particularly when comparing the performance of UN-PRI funds in the BRICS environment (Tripathi & Kaur, 2020). While considering BRICS UN-PRI signatory performance from 1 September 2007 until March 2019, Tripathi and Kaur (2020) find that South African signatories outperformed the market to the greatest extent when measured by excess return alpha values. Among the BRICS countries, South Africa also boasts some of the highest overall ESG performance and more than three times that of China's performance (Garcia et al., 2019). Figure 4 below illustrates

[11] Hereinafter, Morgan Stanley Capital International is abbreviated as "MSCI".
[12] An emerging economies association, BRICS is a commonly used acronym for: "Brazil, Russia, India, China, and South Africa" (Garcia et al., 2019, p. 298).

the BRICS UN-PRI signatories and the excess returns identified by Tripathi and Kaur (2020) (PRI Association, 2021b).

Figure 4 BRICS UN-PRI signatories and excess returns



In addition to the UN-PRI, other asset managers increasingly pressure firm boards to consider ESG factors. For example, Coronation Fund Managers distributed requests to 89 South African listed firms to increase their consideration of ESG factors in board decisions, followed by meetings regarding firm ESG performance (Buthelezi, 2021). The approach of putting pressure on South African listed company boards to consider ESG factors in their business practices is further sanctioned by an extensive legislative framework in South Africa (Kitsikopoulos et al., 2018; Mans-Kemp & van Zyl, 2021). Mirroring the increasing investor affinity towards ESG approaches, companies are internally integrating ESG aspects in business strategies (Raman et al., 2020). Companies with sustainable business practices are also reported to enjoy increased consumer spending, especially in the business-to-consumer sectors (Raman et al., 2020).

Despite the growing South African interest in SRI, findings regarding the impact of ESG integration on risk-adjusted returns is less clear in the country, delaying possible further investment. Principally, Schoenmaker and Scharamade (2019) posit that companies which have sustainable and responsible business practices are less prone to financial volatility and have higher levels of sales growth over the long term. Contrariwise, Renneboog, Ter Horst and Zhang (2011) propose that portfolios with an SRI focus provide less volatile negative returns with the same performance as conventional funds. Several international studies have also found a positive correlation in the comparative ESG issuer's impact on performance during the early 2000s, while other studies suggest that this impact has disappeared following the global

financial crisis of 2008 (Gerard, 2019). As of 30 November 2020, evidence from 1175 U.S.A. large-cap strategies tend to propose alternative findings (Payne, 2021). Over a period of one year and three years, the U.S.A.'s Large capitalisation, highly rated ESG companies have outperformed their non-ESG counterparts while providing similar returns over the five year period (Payne, 2021). Further, when considering the Sharpe (1994) ratios over the same periods, ESG integrated funds outperformed all periods, indicating better risk-adjusted returns (Payne, 2021).

Yet, these findings do not suggest consensus in academic literature, since wide disparities in findings prevail regarding the performance of ESG related investments. In the global context, a greater portion of research has proposed positive interactions for company financial- and ESG performance, yet the matter is far from settled (Viviers & Eccles, 2012).

Meta-analyses of global ESG funds' financial performance have been performed by Dixon-Fowler *et al.*(2013) as well as Friede *et al*. (2015). Both findings suggest that the majority of studies indicate SRI market outperformance. Contrariwise, a similar literature review by Revelli and Viviani (2015) finds that SRI portfolios provide no comparative benefits or detriments to ordinary investments. While still contested internationally, there exist numerous studies considering the financial performance of ESG investments for developed markets (Dixon-Fowler et al., 2013). Comparative studies on the performance of ESG investments in the South African context, on the other hand, are particularly lacking (Chetty et al., 2015; Johnson et al., 2019; Viviers & Eccles, 2012). The incongruent and insufficient findings regarding ESG performance on the JSE introduce the purpose of this research. Of the studies performed on South Africa, Table 1 indicates some of the varied findings regarding ESG and financial performance.

Table 1 Studies on South African ESG financial performance

ESG Outperformance	Inconclusive or ESG underperformance
Duncan (2018), Johnson et al. (2019), Demetriades and Auret (2014), Mutezo (2014, p. 210), and Tripathi and Kaur (2020)	Chetty, Naidoo and Seetharam (2015), Chawana (2014), Horn, de Klerk, and de Villiers (2018), Hamilton, Jo and Statman (1993), Gladysek and Chipeta (2012), and Viviers et al. (2008)

As illustrated in Table 1, Johnson *et al.* (2019), Demetriades and Auret (2014), Duncan (2018), Mutezo (2014), and Tripathi and Kaur (2020) find positive correlations between firm financial and ESG rating performance. Equally, other studies like Horn, de Klerk and de Villiers (2018), Chetty, Naidoo and Seetharam (2015), and Gladysek and Chipeta (2012) find no correlation. Hamilton, Jo and Statman (1993) find that South African Sustainable and Responsible mutual funds do not provide any statistical benefit to their conventional counterparts. Similarly, Du Toit and Lekoloane (2018) find no relationship between the JSE SRI index and firm financial performance while Chawana (2014) reports that the JSE SRI Index underperforms conventional South African market indexes. Considering these divergences, Johnson *et al.* (2019) suggest that research over periods that extend beyond six years may yield more definitive results as the benefits of ESG-orientated approaches purportedly come to the fore over lengthier periods.

Considering the lack of conclusive findings in the existing literature and the recent growth in the field, a study that examines the comparative profitability of SRI is particularly relevant to determine the viability of SRI, especially so following recent capital inflows and market developments (Folger-Laronde et al., 2020). Examining periods of market crisis also tend to uncover challenges that remain hidden during boom periods (Díaz et al., 2021; Herringer et al., 2009). Subsequent to the initial influence of the COVID-19 pandemic, a revaluation of ESG performance could explain whether ESG is posed to play an increased part in the future of South African markets (Díaz et al., 2021).

While ESG performance has been subjected to numerous studies globally, a conclusive result on such funds' comparative performance in South Africa over the long term is still outstanding and this research aims to fill this *lacuna* (Folger-Laronde et al., 2020; Friede et al., 2015). The identified research gap provides newfound opportunities for analysis to consider the maturation of the field, especially given the case in comparison to prior years' research and recent developments. As the role of ESG factors has provided mixed results regarding fund returns in the past, this study is well poised to investigate developments following the capital inflows of 2020. The inclusion of 2020 within the period of evaluation may shed new light on the performance of highly rated ESG stocks in the South African market, gauging the principles underpinning their suggested returns (Madhavan et al., 2021). Accordingly, this research makes use of an extended period of evaluation, consisting of 12 years from 2009 to 2021, to address existing divergences in findings.

As implied above, the divergence of existing findings regarding the South African market further motivates this study and, considering the context of recent market developments following the impact of COVID-19, it provides a directive to consider market changes in the study's evaluation which are yet to be considered in an academic study. The lack of consensus also pinpoints the absence of sufficient literature on the topic and motivates an overview of performance.

The disparities in findings regarding existing South African literature further provides an opportunity to address existing criticisms of prior studies.[13] Specifically, this research is one of the first in the South African context to consider the CFA Institute (2020a), Johnson et al. (2019) and Garcia, Mendes-Da-Silva and Orsato's (2019) suggestion that ESG performance studies make use of extended periods of evaluation. Schoenmaker and Scharamade (2019) suggest that over the short run there is little variation in the comparative profits of ESG-orientated businesses. As supported by Johnson *et al.* (2019), extending the period of investigation may therefore unlock unrecognised benefits of ESG-orientated approaches as the effects may manifest over longer periods, given the focus on long-term value creation of ESG-orientated firms. The approach echoes the conclusions of Viviers *et al.* (2008) who compare South African Responsible Investment fund performance to that of the market and find that while local Responsible Investment funds underperformed, they demonstrate continually increasing performance over the period examined. The finding is further advanced by Tripathi and Kaur (2020), who suggest that positive results are yet to be uncovered in further studies, given the recent growth in the field and the increasing availability of data. Correspondingly, Akiniolire and Smit (2003) and Ortiz-de-Mandojana and Bansal (2016) further suggest that longer periods of evaluation provide for more adequate measurements of ESG fund performance as the benefits of long-term, value-orientated, approaches are only visible over extended periods.

Accordingly, this research undertakes a comparative overview of listed firm ESG and financial performance for the period 2009 to 2021. This period is primarily relevant due to the two collective surges experienced in ESG investing in South Africa in late 2008 and 2020, as well as the general trend in its growth during this period (Mans-Kemp & van Zyl, 2021). The first surge in ESG investing followed after the global financial crisis of 2008 to 2009 followed by the subsequent surge in 2020, which is discussed above (Adams & Abhayawansa, 2021; Payne,

[13] An analysis of existing literature regarding South Africa's SRI performance follows in Chapter Two.

2021). The inclusion of a significant period under evaluation starting also recognises the period constraints of existing studies, as identified by the CFA Institute (2020a). This extended period of evaluation therefore uniquely satisfies the research requests for longer periods of scrutiny by Akiniolire and Smit (2003), Garcia *et al.* (2019), and Ortiz-de-Mandojana and Bansal (2016).

An extended period of evaluation also poises the study to include the two most significant periods of growth of SRI funds and the transition of SRI to more mainstream investment practice, which is another consideration suggested by the CFA Institute (2020a). In the South African context, having the portfolio formation date in 2009 is also particularly relevant. From 2009, the Johannesburg Stock Exchange[14] required companies listed with the exchange to adhere to the requirements of the King report on Corporate Governance which includes integrated reporting, allowing for comprehensive ESG rating analysis (King Committee on Corporate Governance in South Africa, 2009; Herringer et al., 2009).[15] Additionally, the suggested timeline for the research allows for historic comparisons into ESG research performance in the South African market over the long term as the evaluation considers 12 years.

The outcome of the research contributes towards the ongoing debate regarding the financial performance of portfolios constructed from highly rated ESG equities subsequent to the introduction of the reporting requirements mandated within King III and their specific performance during the market turmoil experienced during 2020. The findings of prior South African studies and foreign ESG studies are utilised throughout the research piece to articulate SRI conceptually and to deepen the logic behind its usage. Collectively, the inclusion of both the extensive period under consideration, covering both the aftereffects of the financial crises in 2009 and 2020, uniquely positions this research to contribute towards clarifying the existing uncertainty regarding the contemporary financial performance of SRIs in South Africa.

1.2. Research problem and purpose

Subchapter 1.1 examines the growth which ESG-orientated investments have shown in recent years and especially following the initial months of 2020, despite the continued uncertainties regarding comparative performance. In light of the existing inconclusive literature on the topic,

[14] Hereinafter the Johannesburg Stock Exchange is referred to as the "JSE".
[15] Hereinafter, the King reports on Corporate Governance are referenced in the order in which the reports are published. The first King report on Corporate Governance is therefore referred as 'King I' while the remaining reports are designated in the same order.

the motivation for the study flows from the consideration of the increase in SRI-orientated assets under management globally and within South Africa.

The inconclusive findings of the existing literature are critiqued for several reasons. Some main criticisms include the fact that contributing studies tend only to consider aspects of ESG or consider ESG fully over brief periods, both of which undermine the possible benefits of SRI (CFA Institute, 2020a; Garcia et al., 2019). For example, Chetty, Naidoo and Seetharam (2015) consider Corporate Social Responsibility and firm performance while Demetriades and Auret (2014) consider social performance and return on equity. In both studies, the Environmental and Governance factors of ESG are excluded.

Insofar as it relates to risk-adjusted performance, South African ESG research tends to only evaluate performance over a short duration on the JSE (Johnson et al., 2019). Duncan (2018) and Mutenzo (2014), for example, both find ESG outperformance, but only consider 2013 until 2017 and 2004 until 2010 respectively. Johnson *et al.* (2019) find no outperformance of highly rated ESG firms but also only consider 2011 to 2016. Existing literature is also yet to consider the impact of the market developments experienced during 2020 on the performance of highly rated ESG equities in South Africa. Additionally, existing studies are critiqued for not accounting for firm size in ESG scoring. While larger firms tend to have higher ESG performance in line with greater reporting resources, some studies on ESG and financial performance have been criticised for not recognising this size bias (Boubaker et al., 2018; Demetriades & Auret, 2014; Du Toit & Lekoloane, 2018).

Therefore, to address the existing *lacuna*, this study undertakes a long-term evaluation of highly rated SRI equities' performance, including both the aftereffects of the global financial crisis and 2020 within its period of analysis. To address this gap, this study considers twelve years from May 2009 until April 2021 within its analysis, totalling 144 months of evaluation. It is suggested that the extended period of evaluation better allows for the long term benefits of ESG to come to the fore, as purported by Akiniolire and Smit (2003), Ortiz-de-Mandojana and Bansal (2016) and Schoenmaker and Schramade (2019). Further, the study also extends the consideration of specific aspects of ESG to ESG scoring entirely, where many existing studies merely consider one aspect of ESG scoring.

Bridging the knowledge gap, this research, therefore, transcends the evaluation of individual ESG components and considers the matter more holistically, over a significantly lengthier period which includes both the influence of COVID-19 and the aftereffects of the 2008 and

2009 global financial crisis. The study further also accounts for firm size in its portfolio formation process.

Accordingly, this research's purpose is to analyse the performance of JSE listed equities based on their ESG scoring. In this research, the ESG scores of equities are measured according to Bloomberg ESG Disclosure scores. Bloomberg ESG Disclosure scores are utilised for two main reasons which are detailed in Chapter Three of this research. Briefly, the Bloomberg ESG Disclosure score database is a commercially available scoring metric that has some of the most extensive South African company data available for the entire period under review for this study. Additionally, the Bloomberg (2020a) ESG Disclosure score makes use of publicly available information, which ensures transparency in the findings of this research and allows for this research to be compared with further research as the approach is determinable, unlike privately utilised datasets.

Utilising the scoring provided by Bloomberg, this research investigates the comparative performance of highly-rated South African ESG equities and their risk-based returns to that of their lesser rated counterparts. The study further contributes towards existing literature by including the market developments of 2020 on ESG funds in comparison to the market and provides a long-term risk-adjusted evaluation that includes this impact. In evaluating the outcome of the investigation, this study juxtaposes the validity of the reasoning of rated, ESG-orientated equities in producing superior market performance. Therefore, this study uniquely provides a long-term comparison of ESG-orientated equities' financial performance in order to appraise whether the investment approach provides any comparative financial benefits, as ESG proponents suggest.

1.3. Key research question

This research's key research question relates to the comparative performance of a set of portfolios of highly rated ESG equities to that of non-highly rated ESG equity portfolios listed on the JSE, and is detailed below:

How have South African highly rated ESG equities performed relative to non-highly rated ESG equities on the JSE for the period 2009 to 2021, when accounting for firm size in terms of market capitalisation?

1.4. Hypotheses

For statistical tests, the hypotheses make use of alpha values generated from the Fama and French ([1993]2015) Three and Five-Factor models as discussed within Chapter Three below.[16]Acknowledging the aforementioned, the hypotheses of this research are formulated as follows:

H_N: Highly rated ESG portfolios constructed from the considered JSE-listed companies perform as well as medium and low rated ESG portfolios constructed for the period 2009 to 2021.

H_A: Highly rated ESG portfolios constructed from the considered JSE-listed companies show higher abnormal returns relative to medium and low rated ESG portfolios constructed for the period 2009 to 2021.

1.5. Research significance and study contribution

An elaboration on the reasoning behind SRI investments alongside a combined evaluation of SRI fund performance provides a necessary assessment of the merits of the field in light of recent market developments. The study, therefore, provides fresh and current perspectives regarding security ESG ratings and risk-adjusted returns for a period of 144 months. The inconclusiveness of existing studies, coupled with the lack of sufficient literature on the topic within the South African context, motivates this research analysis of ESG-fund performance, especially so considering recent capital inflows following the initial months of the COVID-19 pandemic.

More specifically, this research contributes to the existing field in three distinctive aspects. Firstly, this study furthers existing findings by including an analysis of recent market developments faced during and subsequent to the initial impacts of the COVID-19 pandemic. Secondly, this study subjects SRI assets to an extended period of evaluation as requested by the CFA Institute (2020a), amongst other studies, to allow for the anticipated long-term benefits of SRI-orientated companies to come to the fore (Akiniolire & Smit, 2003; Garcia et al., 2019; Ortiz-de-Mandojana & Bansal, 2016). Finally, this study also accounts for firm size in its portfolio formation process to recognise the possibility of size bias in evaluating firm ESG and financial performance (Boubaker et al., 2018; Demetriades & Auret, 2014; Du Toit & Lekoloane, 2018).

[16] Hereinafter, the Fama and French ([1993] 2015) Three- and Five-Factor models are referred to as FF3 and FF5 respectively.

1.6. Chapter division

This research is set out in a chapter format. The first chapter introduces the study and is concluded within this subsection (1.7). Chapter Two furthers the introduction of Chapter One by presenting SRI in South Africa. Chapter Two briefly develops SRI conceptually and situates the matter within the market context. Further, Chapter Two considers the *status quo* of ESG in South Africa, the South African position in comparison to global markets and the findings of existing firm ESG and financial performance studies in South Africa. The subsequent chapter (Chapter Three) develops and introduces the methodological approach that this research utilises in evaluating ESG scoring and equity performance. Chapter Three then provides an overview of the measures utilised within the study to evaluate the performance of a security in terms of the security's ESG rating and risk-adjusted returns. Thereafter, Chapter Three details the application of the measures to the datasets and explains the portfolio formation process the study utilises. Provided with the results gleaned from applying Chapter Three's methodological approach, the penultimate chapter (Chapter Four) examines the information flowing from the methodology detailed in Chapter Three. Chapter Four provides a descriptive analysis of the data introduced in Chapter Three followed by the results gleaned from the portfolio regressions. Chapter Four also provides a set of factor spanning tests in evaluating the factor models' ability to price the portfolios. Finally, Chapter Five summarises the findings from the study and concludes the research piece. Chapter Two follows directly below.

Chapter Two: Literature review

2.1. Introduction

Chapter Two broadly considers SRI's development, the scope of its application and existing literature on its comparative performance. Commencing with the theoretical considerations which Chapter One introduced, the following subchapter (2.2) provides an overview of the financial theories which support SRI, followed by an explication of the theoretical benefits and detriments of ESG-orientated firms. The subsequent subchapter (2.3) develops South Africa's Sustainable and Responsible Investment background from the country's context. Subchapter 2.3 focuses on the most notable regulatory documents applicable within the South African context, as informed by their international counterparts in some instances. Subchapter 2.3 highlights the important role which the four King codes and the UN-PRI have in maturing the South African SRI market (Viviers & Els, 2017). The subchapter (2.3) further contextualises the role of sustainable development as one of South Africa's SRI underpinnings as established by the King reports (King IV, 2015; Locke, 2019).

Given the overarching framework, subchapter 2.4 then examines the South African interpretation by determining the scope of SRI and unpacking four common approaches in its application. The subchapter (2.4) then details the ratings utilised to determine ESG factor company performance and current challenges regarding its application.

Provided with the nature of SRI in its application, subchapter 2.5 explains the ESG ratings metrics and methods which can be employed to evaluate and integrate a security's ESG performance within investment approaches. Subchapter 2.6 then considers the recent momentum SRI has been experiencing. Alongside the increase in SRI funds, a parallel increase in the role of ESG in the financial market can also be observed (Escrig-Olmedo et al., 2019). Therefore, subchapter 2.6 considers findings on SRI fund performance and literature thereon. As introduced within Chapter One, it is established that although company ESG score and company performance have been subjected to several studies from 1970, there still exists no consensus on performance in South Africa (Friede et al., 2015; Jain et al., 2019). Collectively, these subchapters lay the foundation for the empirical portion of the study which is introduced with the methodology in Chapter Three of this research. Still, to adequately appreciate the empirical findings of the following chapter, the following subchapters must first develop the topic.

2.2. The theoretical underpinnings of SRI and financial performance

2.2.1. Overview

As Chapter One introduces, there are several different proposals and approaches which suggest that firms with higher ESG ratings provide financial outperformance (Dixon-Fowler et al., 2013). Duncan (2018) suggests that companies committed to ESG practices have distinguishable characteristics and benefits, including better use of resources and lower staff turnover levels, greater access to markets and lower costs of capital. Contrariwise, Becchetti *et al.* (2015) posit that an increased role afforded to stakeholders in ESG companies lead to inflexibilities when faced with negative productivity shocks, increasing stock return volatility and divergence from market dynamics. Since SRI approaches are adaptable, individual investors can tailor SRI approaches to suit a specific investment strategy. This flexible approach would, in turn, also impact the possible benefits of SRI (Sherwood & Pollard, 2018). Accordingly, this subchapter considers the theoretical underpinnings of SRI (Sherwood & Pollard, 2018).

Sherwood and Pollard (2018) identify the impact of SRI approaches in four schools of thought: the Shareholder and Stakeholder Theories, the Material Information Theory, and the Universal Owner Theory. In what follows below, a brief overview of the role of ESG in these theories is provided. Given the focus of this research, the theories are only developed insofar as they relate to SRI practices broadly. Nevertheless, it is relevant to mention that there exists significant variance among the individual theories which do not find specific attention within this research (Dahlberg & Wiklund, 2018). Provided with the positioning of SRI approaches within existing investment theories, an overview of the guiding framework and application follows in the next two subchapters (2.3 and 2.4).

Possibly the most appropriate theories to consider first in this research would be the Shareholder and Stakeholder Theories. Both theories have received significant attention in financial and economic literature and corporate governance debates tend to be framed within the ambit of either of the two theories (Tirole, 2006). In the context of SRI literature, the theories have also been used widely as a theoretical departure point (Eccles et al., 2014).

The Shareholder Theory is often characterised in referencing Milton Friedman's (2007) *The Social Responsibility of Business Is to Increase Its Profits*. As the title suggests, a business' social responsibility only extends to the business' shareholders, or those holding a claim to the ownership of the corporation (Friedman, 2007). Applied within the context of SRI, shareholder

theory would support the integration of SRI approaches should SRI ultimately yield an increase in the value of a security (Dahlberg & Wiklund, 2018; Sherwood & Pollard, 2018).

Contrariwise, the Stakeholder Theory develops in antithesis (Freeman, 2008). The Stakeholder Theory characterises 'stakeholders' as any entities which are impacted by the operations of a firm (Dahlberg & Wiklund, 2018; Wijnberg, 2000). Fundamentally, the theory suggests that corporations are best suited to consider all stakeholders in their operations and the approach maximises the value of all stakeholders in the process, rather than benefiting shareholders exclusively (Dahlberg & Wiklund, 2018; Freeman, 2008). For SRI, the Stakeholder Theory supports the consideration of all stakeholders who are impacted by the decisions of a business, regardless of the impact the decision may have on the share value (Sherwood & Pollard, 2018). ESG approaches that consider wider objectives that benefit stakeholders, rather than exclusively shareholders, would find support in this theory (Dahlberg & Wiklund, 2018). Additionally, approaches that standardise the weigh-up of various stakeholders' interests in corporate action would also find support in the Stakeholder Theory (Sherwood & Pollard, 2018).

Another crucial theory that influences the adoption of ESG factors in investing is the Material Information Theory (Sherwood & Pollard, 2018). Material information is regarded as any information which could influence the value of an investment, a firm's financial statements is one example (Amel-Zadeh & Serafeim, 2018; Saad & Strauss, 2020). Since increasing numbers of investors require disclosure regarding ESG factors in their investment processes, ESG factor information is becoming progressively more material (Saad & Strauss, 2020; Sherwood & Pollard, 2018). Typifying this development in the understanding of materiality is the U.S.A's Securities and Exchange Commission (Sherwood & Pollard, 2018).[17] As ESG factors' prominence in research and investment practice increased, so did the need for access to ESG related information. In the U.S.A., this increase resulted in lobbyists prompting the SEC to regulate the disclosure of ESG information as part of existing material information requirements for investment decision making (Saad & Strauss, 2020). Accordingly, the SEC (2010) published the "*Commission Guidance Regarding Disclosure Related to Climate Change*".

Three years following the SEC's publication, the European Union enacted a similar disclosure requirement: "*Directive 2013/34/EU as regards disclosure of non-financial and diversity*

[17] Hereinafter referred to by the acronym 'SEC'.

information by certain large undertakings and groups". However, as subchapter 2.3 develops below, South Africa's mandated reporting framework had been established before both the European Union and the U.S.A. during 2009.

The legislative recognition of the value of ESG factors by the European Union, South Africa and the U.S.A. has a notable impact on today's financial marketplaces. Sherwood and Pollard (2018) recognise two key effects of non-financial company information disclosure. First thereof is the benefit of the information in guiding investor choices (Sherwood & Pollard, 2018). Second, and as an effect of information disclosure, the policies requiring company compliance also incentivise corporations to reconsider their approaches to ESG factors in their business operations (Sherwood & Pollard, 2018).

The final theory which this research considers is the Universal Owner Theory. The Universal Owner Theory is typified by a factual scenario in which sizeable investors find themselves diversified to such an extent that the investors are incentivised to address systemic risks (Hawley & Williams, 2007). Typically, large institutional investors hold highly diversified portfolios in most asset classes, spanning sectors, markets and geographies (Hawley & Williams, 2007). As such, some institutional investors, like Norges Bank Investment Management, USS Investment Management Limited and Federated Hermes Investment Management propose that investment performance becomes centred on the performance of the economy at large (Hawley & Williams, 2007). In this environment, investors are tied to wide arrays of social and environmental factors and are hard placed to diversify away from systemic risks. Such investors would, therefore, be better placed to mitigate risk through changes to the real economy (Hawley & Williams, 2007; Quigley, 2020). This is particularly relevant within the context of SRI, as it suggests that SRI investment is economically driven through the consideration of externalities (Quigley, 2020).

In addition to the theories supporting ESG factors, there are several proposed benefits and challenges in terms of individual SRI orientated assets. The following two subsections unpack the theoretical outperformance provided by ESG-orientated firms, followed by the theoretical underperformance of ESG-orientated firms thereafter. Subchapter 2.3 then unpacks the South African application of SRI.

2.2.2. Theories supporting the outperformance of highly rated ESG firms

There exist a few proposals which suggest that firms with higher ESG ratings should have financial benefits in comparison to their alternatives. Dixon-Fowler *et al.* (2013), condenses

the alleged benefits into four common arguments, each of which then supports companies' adherence to ESG principles. The four main arguments relate to green innovation, value generation, social legitimacy, and stakeholder groups. In the remainder of this subchapter, these benefits and detriments are unpacked, followed by the South African application thereof in the ensuing subchapter (2.3).

Innovation is widely recognised as a distinctive factor in enabling a firm to gain a competitive advantage within a market and increase its profitability (Bain & Kleinknecht, 2016; Klomp & Van Leeuwen, 2001). As a first proposition, Dixon-Fowler et al. (2013) argue that companies exhibiting positive environmental strategies and performance tend to display greater levels of innovation and operational efficiency. Essentially, as pollution is considered a waste of potential resources, greater levels of pollution translate into greater costs to firms, therefore, firms with greater levels of innovation tend to utilise resources more efficiently and thereby decrease operational costs and pollution (Christmann, 2000).

Examples of innovation that consider ESG factors include energy consumption improvements, more efficient waste recycling and more environmentally friendly product design and packaging (Chouaibi & Chouaibi, 2021). Each of these examples contributes towards the reduction of a corporation's environmental pollution or make more efficient use of production resources (Porter & Van der Linde, 1995). The increased efficiency of resource use and the innovation which led to its development, in turn, provides a corporation with a competitive and financial advantage (Chouaibi & Chouaibi, 2021; Dangelico, 2016).

The second point raised by Dixon-Fowler et al. (2013) considers how a company's focus on ESG factors may serve as an indicator of a long-term orientation towards value generation, organisational risk mitigation and strategic leadership (Hart, 1995; Sharma, 2000; Sharma & Vredenburg, 1998). Schoenmaker and Schramade (2019), from a converse perspective, suggest that ESG factors assist investors to consider company prospects, pivoting away from short-term metrics and towards sustainable value creation. Equally, the reasoning of both Dixon-Fowler et al. (2013) and Schoenmaker and Schramade (2019) suggest that an emphasis on ESG factors indicate that a firm enjoys managerial focus on organisational risk management, which translates into a long-term perspective in company management and more effective firm leadership. Aragón-Correa (1998) evaluates this reasoning when considering the strategic proactivity of 105 firms insofar as it relates to environmental factors. The outcome of the study suggests that firms with strong organisational and management capabilities tend to exhibit a

strategic, proactive focus on environmental factors and enjoy competitive advantages in organisational structure and characteristics (Aragón-Correa, 1998).

Thirdly, firms that integrate ESG factors may enjoy higher levels of social legitimacy and benefits to their reputation (Dixon-Fowler et al., 2013; Hart, 1995). In a broad sense, ethical corporate behaviour increases firm reputation for both investors and the public, this position similarly holds for ESG-factors (Maung et al., 2020). Gregory et al. (2014) evaluates firm Corporate Social Responsibility or CSR activity, and find a positive relationship with firm reputation, in concert with the findings of Brammer et al. (2006) as well as others, including Antunovich et al. (2000).[18] Reputational benefits and social legitimacy, in turn, may lead to competitive advantages for a corporation. Three notable advantages which this research considers are the lower cost of obtaining capital, increased firm attractiveness to potential employees, and higher firm sales (Russo & Fouts, 1997; Turban & Greening, 1997; Zhang et al., 2020).

Although considered indirectly in most studies, explicit evaluations of the cost of capital and a firm's reputation have documented notable results (Maung et al., 2020). One recent evaluation is performed by Cao et al. (2015) whereby large firm reputation in the U.S.A. is positively related to a company's cost of equity. Gregory et al. (2014) similarly find that improved CSR performance leads to better growth prospects over the long term and decreased cost of capital. Cheng et al. (2014) find that both social and environmental factor disclosure contributes towards reducing capital access limitations.

The established social legitimacy of a firm also affords it the benefit of attracting more quality employees and higher employee retention (Cao et al., 2015; Turban & Greening, 1997). Greening and Turban (2000) consider the phenomenon in light of Social Identity Theory. The theory posits that the social alignments of a person, including employment, influences a person's concept of self (Dutton et al., 1994). Regarding ESG factor considerations, organisational approaches to social and environmental matters can particularly influence a corporation's image and the attractiveness of the corporation to potential applicants (Turban & Greening, 1997). In turn, the perception of the norms and values that a corporation espouses affect an organisation's attractiveness for potential employees and influence potential

[18] Some additional studies which support the finding include Bear et al. (2010) as well as Zhu et al. (2014). Hereinafter Corporate Social Responsibility is referred to by the acronym "CSR".

employees to be proportionally more likely to search for employment opportunities at socially responsible firms (Turban & Greening, 1997).

The third significant impact of social legitimisation which this research considers is increased firm sales (Dixon-Fowler et al., 2013; Hart, 1995). Literature on the topic suggests that firms with better reputations regarding ESG performance tend to enjoy greater consumer support (Russo & Fouts, 1997). However, more recent findings suggest that beyond additional consumer support, firms with high ESG performance tend to enjoy less volatility in sales (Patel et al., 2021).

The last point raised by Dixon-Fowler et al. (2013) regarding ESG-orientated firm benefits also relates to greater consumer support. While bearing in mind Instrumental Stakeholder Theory, the consideration of ESG factors allows corporations to recognise and address the requests of wider stakeholder groups more directly (Jones et al., 2018). Thereby including wider stakeholder groups and increasing levels of trust and further performance benefits (Jones et al., 2018).

As the theoretical benefits of ESG-orientated firms have been developed in this subsection, the following subsection considers the theoretical detractors to ESG firm financial performance, whereafter subchapter 2.2 concludes.

2.2.3. Theories supporting the underperformance of highly rated ESG firms

In contrast to the above subsection (2.2.2), there are also challenges raised to proponents of ESG-orientated firms relating to financial performance. Contests regarding the benefits above relate firstly to the expense of incorporating environmental and social externalities onto firm balance sheets (Dixon-Fowler et al., 2013). In such instances, incorporating environmental and social externalities are either higher than its purported benefit or the action internalises negative externalities, harming a firm's balance sheet (Haigh, 2012; Todaro & Smith, 2011).

Additionally, ESG-orientated firms are critiqued for being vulnerable to negative production shocks, which increase stock return volatility because increased stakeholder orientation by management limits management's responses to production shocks (Becchetti et al., 2015). Others suggest that SRI orientated fund results are linked to specific sectors and that returns tend to be sector-specific rather than related to ESG factor performance (Soler-Domínguez et al., 2019). Still, further literature suggests that ESG factor interpretation is connected to specific cultural and social considerations which attenuate ESG factors' indications, or the capabilities

of SRI portfolio managers rather than ESG fund outperformance (Rehman et al., 2016; Silva et al., 2018).

Contrariwise, Payne (2021) argues that ESG-focused firms are considered to be more adaptable to business shifts and that this perception motivated ESG fund inflows during 2020. Collectively these disparities in the existing literature on SRI mandate the evaluation of SRI in practice and give rise to the foundational motivation of this research.

Chapter Three of this research develops an approach that empirically evaluates the potential financial benefits of ESG integration. However, to test the validity of the theories mentioned above, the application of SRI must first be surveyed. South Africa has developed an advanced framework for ESG investing with the implementation of the Code for Responsible Investing in South Africa and the existing King reports (King IV, 2015; Locke, 2019; Mans-Kemp & van Zyl, 2021; Viviers & Els, 2017).[19] The King III report is particularly relevant for the development of SRI in South Africa as its requirements are mandated by the JSE, necessitating listed companies to issue annual integrated reports which detail companies' ESG factors (Solomon & Maroun, 2012). These legislative pieces underscore the South African approach to SRI and are introduced in the following subchapter (2.3). Provided with the relevant legislative framework, the subchapter thereafter (2.4) considers SRI's application.

2.3. The Socially Responsible Investment framework of South Africa

2.3.1. Developments before the UN-PRI

Before further unpacking the contemporary South African approach to SRI, it is crucial to briefly develop the concept from its historic origins. Accordingly, subsection 2.3.1 develops a chronological synopsis of some of the most relevant global and local developments which shaped South Africa's understanding of SRI. As such, this subsection (2.3.1) commences with an analysis of the Sullivan Principles, followed by the King codes and the relevant legislative and other provisions applicable to the South African investment environment.[20] The pieces considered in this subchapter (2.3) collectively shape the South African understanding of SRI and form the foundation for SRI's application. Provided with this subchapter's (2.3) overview,

[19] Hereinafter, the Code for Responsible Investing in South Africa will also be referred to as "CRISA". The code is introduced and unpacked within subsection 2.3.2 below.
[20] While it is commonplace to refer to each of the King Committee reports on Corporate Governance in South Africa simply as the "King codes", for this research each of the relevant codes are referenced by full name on their introduction and within the List of Abbreviations, followed by the shortened name thereafter (King IV, 2015).

the following subchapter (2.4) plots temporal trends in South African SRI and details its application. Thereafter, subchapter 2.4 motivates the reasoning for the study before subchapter 2.5 provides an overview of ESG performance measures. Subchapter 2.6 considers recent developments following 2020 and Chapter Three sets out this research's methodology thereafter.

This subsection (2.3.1) approaches South Africa's interpretation of SRI by unpacking the main regulatory documents forming South Africa's SRI framework. The subsection (2.3.1) commences with South Africa's initial influence on SRI globally, followed by the King reports on Corporate Governance in South Africa (King IV, 2015). Particular focus is provided to the King III report on Corporate Governance in South Africa and the CRISA since these measures are recognised as being the most significant contributions in developing SRI in the country (Viviers & Els, 2017).

The significant impact of the King reports is chiefly because the reports developed South Africa's corporate social responsibility environment, which includes sustainable governance (Kloppers, 2018). The King Committee on Corporate Governance in South Africa (2015), which is the body that created the King codes, suggests that there are three fundamental consequences from the King reports which have reorientated South African corporate thinking. Firstly, the King reports reinforce a drive towards shareholder orientated, inclusive capitalism, which focuses on "holistic value creation" (King IV, 2015). Secondly, the reports promote integrated reporting and collective value creation, a concept founded in ESG reporting (King IV, 2015). Thirdly, and in support of the first two outcomes, the reports mandated a change of direction towards the creation of long-term sustainable value in capital markets (King IV, 2015). Nonetheless, the impact of the reports becomes clear as the development of SRI in South Africa is unpacked.

Insofar as South Africa is particularly relevant to the development of Sustainable and Responsible Investing, an adequate introduction would be the Sullivan Principles (Coffey & Fryxell, 1991; Kloppers, 2018; Sherwood & Pollard, 2018). As signalled above, South Africa played a notable role in developing Sustainable and Responsible Investment practices internationally (Giamporcaro & Viviers, 2014; Kloppers, 2018). Particularly so in the U.S.A. following the introduction of the Sullivan Principles of 1977 (Heese, 2005; Sherwood &

Pollard, 2018).[21] The Sullivan Principles developed as a collection of six principles which companies and banks in the U.S.A. were encouraged to recognise, should they have business operations in South Africa (Sullivan, 1984). The principles were aimed at pressuring South Africa's apartheid government to implement just and equitable racial policies within the country's economy (Sullivan, 1984). Funds that committed to the principles were required to divest from South African institutions which did not adhere to the Sullivan Principles' requirements for fair and equal treatment of all employees, amongst other requirements (Grossman & Sharpe, 1986; Sherwood & Pollard, 2018). The Sullivan Principles had significant application in the U.S.A. and had a global impact since several companies from the United Kingdom and Scandinavia also withdrew business from South Africa (Giamporcaro & Viviers, 2014). In total, more than 100 Multinational Corporations divested from the South African market until after apartheid (Alexis, 2010; Coffey & Fryxell, 1991; Giamporcaro & Viviers, 2014).

The implementation of the Sullivan Principles also accounts for one of the first instances of negative screening in an investment portfolio (Sherwood & Pollard, 2018). From the inception of the practice, negative screening has been recognised as limiting the integration of stocks in a portfolio and the accompanying benefits of diversification, both of which are a clear restriction to portfolio optimisation for investors, considering the advice of Markowitz (1952) (Grossman & Sharpe, 1986). While negative screening is considered in detail in the following subchapter (2.4), it is noteworthy to recognise at this stage that the comparison of investment performance would shortly follow the introduction of the Sullivan Principles. Lashgari and Gant (1989), for example, find that Sullivan groups of investments outperformed the Dow Jones Industrial average over the period 1977 to 1983. Interestingly, research regarding the measurement of SRI fund comparative performance seems to be approximately as old as some of the funds themselves.

Shortly after South Africa's first democratic elections during April 1994, the first King report was issued and titled the King report on Corporate Governance[22], or King I (1994). The first King report served as South Africa's preliminary domestic report on companies' non-financial

[21] Taking their cue from the United Nations' Universal Declaration of Human Rights, the Global Sullivan Principles further developed SRI's background in 1999 (Alexis, 2010). The principles aimed at directing multinational companies to subscribe to socially responsible business practices on the global market (Alexis, 2010).

[22] The "King report on Corporate Governance" is commonly termed "King I" and is referred to as such in what follows below (King Committee on Corporate Governance in South Africa, 1994).

and regulatory practices (Foster, 2020; King I, 1994). King I established the acceptable governance standards for listed companies on the JSE, as well as for South African banks, and some parastatals (Viviers & Els, 2017). The most significant contribution of King I, for this research, is that it emphasised that good governance required an integrated approach with wide considerations, including both social and environmental factors (Foster, 2020, p. 147). Subsequently, the Reconstruction and Development Programme categorised a framework of socio-economic policies in response to apartheid (Parliament of the Republic of South Africa, 1994). Collectively, the King I report and the Reconstruction and Development Programme provide investors with the first set of criteria to consider in their investment analyses which are not related to financial information (Viviers & Els, 2017).

The South African SRI framework matured further in 2002 with a follow-up King Report, or King II, and the country hosting a World Summit on Sustainable Development (King II, 2002; United Nations, 2002). As the name suggests, the summit highlighted the role of sustainable companies and resolved to develop investment policies to increase and incentivise investments in cleaner production programmes with greater environmental efficiency (United Nations, 2002). The King II (2002) report included provisions regarding risk management and company sustainability by linking corporate social responsibility to good governance (Kloppers, 2018). The King II (2002) report further introduced the triple bottom line concept to corporate governance by incorporating both environmental and social factors into company measurements, alongside existing financial metrics (King II, 2002). Insofar as the matter relates to this research, the King II report focuses on an inclusive reporting approach for business activities, extending beyond financial performance to environmental and social aspects (King II, 2002; Kloppers, 2018). King II would become the *de facto* benchmark for South African corporate governance and would form part of the listing requirements of companies on the JSE (Eccles et al., 2008). A number of the requirements set out in King II (2002) are further codified in the Companies Act, 71 of 2008 (Kloppers, 2018; Viviers & Els, 2017).

Shortly after the introduction of King II, the publication of the *Broad-Based Black Economic Empowerment Act, 53 of 2003* would take place and the Act is also considered a contributing piece of legislation regarding SRI (Eccles et al., 2008). Act 53 of 2003's contribution is not aimed particularly towards Responsible Investment practice, yet the Act provides guidelines to investors on promoting South African economic empowerment and socio-economic development (Eccles et al., 2008; Viviers & Els, 2017). Act 53 of 2003 also catalysed the development of the Financial Sector Charter, which has a noteworthy influence on South

African Responsible Investment (Moyo & Rohan, 2006). The charter provides investors with guidance on transformation targets in the financial services sector, concerning corporate social investment, as well as black ownership, procurement and human resources (Moyo & Rohan, 2006; Viviers & Els, 2017).

Later, during May 2004, the JSE introduced the Sustainable and Responsible Investment Index to serve as a measure for investors to identify companies that had integrated Sustainable and Responsible Investment principles into their business practices (Heese, 2005). The basis of the qualifying criteria for the index was modelled on the triple bottom line requirements of King II and provided a comparative benchmark between socially responsible companies and their alternatives (Gladysek & Chipeta, 2012; King II, 2002; Viviers & Els, 2017). The availability of the published information also assisted analysts in considering integrated reports (Herringer et al., 2009). The greater ESG information on the South African market and the comparative decrease in its cost had contributed significantly to the factors' inclusion in investment analysis and the development of the South African approach to SRI (Viviers et al., 2008).

The fact that the JSE (2021) itself established the index is also particularly notable. In comparison, the majority of markets have their indexes managed and their listed firms rated by rating agencies (Sonnenberg & Hamann, 2006). The JSE SRI Index, on the other hand, assesses participating companies' performance itself, primarily by using the companies' sustainability and integrated reports (Sonnenberg & Hamann, 2006). Given the longstanding bond between the JSE and the Financial Times Stock Exchange, or FTSE, the JSE SRI Index was an adaptation of the FTSE4Good Index to the South African market (Sonnenberg & Hamann, 2006).[23] However, the JSE SRI Index did not exclude any sectors from its eligibility criteria and was guided by an advisory committee that revised and directed its methodology for constituent companies (Sonnenberg & Hamann, 2006). The non-exclusionary approach was intended to motivate participation in the index (Sonnenberg & Hamann, 2006). Therefore, to form part of the JSE SRI Index, companies were requested to comply with a list of criteria based on different ESG related factors, should a company meet the minimum requirements of each field, then the company would be ranked among other constituents (Du Toit & Lekoloane, 2018). Utilising the FTSE Russel ESG rating methodology, the FTSE/JSE Responsible Investment Index replaced the JSE SRI Index in 2015 (JSE, 2021). The revised index instituted

[23] Hereinafter the Financial Times Stock Exchange is referred to by the acronym "FTSE".

a set of minimum requirements for listing which were revised in 2018 to form the current JSE Responsible Investment Index (JSE, 2021).

Globally, the United Nations launched the Environmental Programme Finance Initiative Report in 2004, which defined the phrase "Environmental, Social, Corporate Governance analysis" (Gilbert, 2010; UNEP-FI, 2004). Shortly thereafter in April 2006, the United Nations' Environmental Programme Finance Initiative, or UNEP-FI, and Global Compact collectively established the UN-PRI (Gilbert, 2010; PRI Association, 2020; UNEP-FI, 2020). As discussed briefly in the first chapter, the six principles of the UN-PRI were developed by investor groups, governmental organisations, and representatives of civil society following the United Nations' Secretary-General's call for the creation of a sustainable financial system (PRI Association, 2020). Institutions that become signatories of the UN-PRI are required to adopt ESG issues into their investment approaches and support sustainable finance (PRI Association, 2020). The PRI's contribution is particularly significant as it developed a global foundation and forum for initial consensus on best practice, collaborative action and institutional engagement (Louche et al., 2015). The UN-PRI acted as a consolidating force towards a standardised definition of Responsible Investment and crucially assisted investors by regularising ESG characteristics in investment analysis (Louche et al., 2015; PRI Association, 2020). The UN-PRI is further detailed in the following subsection (2.3.2) followed by the subsequent King reports. Subchapter 2.4 then considers the application of ESG factors in contemporary investment practice.

2.3.2. Subsequent developments following the introduction of the UN-PRI

South Africa's GEPF (2010) was one of the first 60 UN-PRI (2020) signatories in 2006. In contrast, the total number of signatory funds extended beyond 3000 in 2020 (PRI Association, 2020). For South Africa, the GEPF's support is particularly important as it is the largest institutional investor on the African continent (Giamporcaro & Viviers, 2014; Wildsmith, 2006).[24] After becoming a signatory, the GEPF (2010) also established the South African PRI network. The South African PRI network promoted the PRI regionally and contributed towards the creation of uniform ESG policies in the South African investment environment – most notably thereof the CRISA (GEPF, 2010; Locke, 2019). Given the GEPF's significant holdings, the fund weighed in to have reforms within the investment environment (Locke,

[24] A number of other South African Pension Funds have followed the lead of the GEPF and require asset managers to be PRI signatories before allowing any engagement (Locke, 2019). During the first half of 2020, global PRI signatories increased by 28% (CFA Institute, 2020, p. 3).

2019; Viviers & Els, 2017). The efforts led to 19 South African investment managers becoming signatories of the PRI in 2006 and numbers have more than tripled subsequently to 60 South African signatories at the beginning of the second quarter of 2021 (Giamporcaro, 2011; PRI Association, 2021b).

Viviers and Els (2017) posit that alongside the King reports, the PRI has had the most significant impact on the South African SRI environment. The PRI has had similar international success and more than 500 signatories notably joined the PRI during 2018 (Rust, 2019). The King III report, or the 2009 King Report on Corporate Governance for South Africa, is the successor and necessary development from the second report's recommendations (King III, 2009; Kloppers, 2018). As with components of the second report, the JSE mandated that listed companies comply with recommendations of the third King (2009) report, among them the publishing of detailed ESG factors as part of a company's integrated reporting requirements (Solomon & Maroun, 2012). The requirements led to significant increases in the value and amount of reporting on ESG related matters of JSE listed companies (Solomon & Maroun, 2012). The greater availability of SRI information also assisted investors by decreasing the challenge of sourcing ESG information from companies, laying a foundation for more uniform and understandable ESG reporting (Herringer et al., 2009). Therefore, 2009 forms the year of commencement for this study's empirical portion due to the contributions of additional listing requirements by the JSE in standardising ESG reporting, and the increased availability of ESG data. The provision ensures that adequate data on available funds are incorporated from the commencement of this research's analysis and onwards.

The third King (2009) report further led to the development of the Code for Responsible Investing in South Africa, or CRISA, which is aimed at assisting investors in analysing investments that promote sustainable development (Foster, 2020; Giamporcaro & Viviers, 2014; King III, 2009; Locke, 2019).[25] The CRISA is modelled on the UN-PRI and is also backed by the GEPF (CRIII, 2011; Giamporcaro & Viviers, 2014; Locke, 2019; Moikwatlhai et al., 2019). At the time of the CRISA's launch, 30 other South African institutions were already signatories of the PRI (Locke, 2019).

The CRISA would support investors by detailing how to analyse investment strategies that promoted ESG factors (Foster, 2020). The CRISA is founded on a set of five principles which are articulated further into 17 practical recommendations (CRIII, 2011). Expressing ESG factor

[25] For an analysis of each of the CRISA Principles, see Locke (2019).

importance, the foremost principle requires that an "institutional investor should incorporate sustainability considerations, including ESG, into its investment analysis and investment activities" (CRIII, 2011, p. 10). Collectively, the principles attempt to shift investor attention away from short-term profit-seeking and increase the role of ESG in investment analysis (Foster, 2020; Locke, 2019). Even so, the inclusion of ESG factors within investment analysis does not imply a shift away from returns towards a philanthropic role, but rather a movement "From short-term capital markets to long-term, sustainable capital markets" (Eccles et al., 2008; King IV, 2015).

While the CRISA parallels the approach of King III, CRISA is non-binding and does not form part of the reporting requirements mandated by the JSE's application of the King III report (Foster, 2020, p. 150). The CRISA does nonetheless impact South African investment law, possibly the most notable amendment is to Section 28 the Pension Funds Act, 24 of 1956.[26] Section 28(2)(c)(ix) of the Pension Funds Act has been amended to require a fund's board to "consider any factor which may materially affect the sustainable long-term performance of the asset including but not limited to, those of an environmental, social and governance nature". *Mutatis mutandis,* the recognition of ESG factors within the Pension Funds Act reflects the requirements set out in principle one of the CRISA (Foster, 2020; Moikwatlhai et al., 2019). Additional calls for further legislation encouraging the use of SRI by investment funds also persists, yet no further legislative guidance has been published at the time of this research (Herringer et al., 2009). Nevertheless, by the inclusions made to Section 28 of the Pension Funds Act, South Africa's retirement fund regulation remains at the forefront of encouraging ESG investing (Geral, 2019). The weight of the requirement set out within Section 28 of the Pension Funds Act has also recently been increased as the South African Financial Services Conduct Authority, or FSCA (2019), which has published a guidance note requiring pension funds that do not apply ESG factors to either rectify their approach or provide reasons for the lack of ESG factors' inclusion.

The King IV (2015) report, or the fourth King report on Corporate Governance in South Africa also necessitated a noteworthy approach towards compliance. The fourth report extends the scope of King III and incorporates more recent international developments (King IV, 2015). While King III focuses formally on for-profit companies, King IV (2015) harmonises the principles of King III and extends the principles' application to non-profit seeking companies

[26] Hereinafter, the Pension Funds Act, 24 of 1956 is referred to as the "Pension Funds Act".

(Esser & Delport, 2018). The streamlined approach of King IV, in turn, also supports a shift towards an "apply and explain" approach, further promoting a movement away from mere formal compliance. King IV is designed to complement the CRISA and makes direct reference to the CRISA's principles to ensure a cohesive framework for institutional investors (King IV, 2015). For Pension Funds, King IV further provides sector-specific guidance in concert with the Pension Funds Act (King IV, 2015).

However, despite the extensive global and local frameworks that this research has discussed above, SRI has some theoretical and conceptual concerns which remain unanswered (Capelle-Blancard & Monjon, 2012). Cadman (2011), for example, identifies three key conceptual challenges facing SRI globally. Firstly, there exists a lack of an overall analytical framework to evaluate institutional quality, leading to divergence in approaches and ratings (Cadman, 2011). Secondly, the lack of a standardised approach from which stakeholders can contribute towards company governance further complicates comparative rating allocations (Cadman, 2011). Finally, a divergence exists between internal and external interest groups' participation in SRI decision-making and their weigh-up is yet to be formalised (Cadman, 2011).

For South Africa, initial challenges in incorporating ESG criteria include the affordability of ratings, the lack of relevant SRI skills in the country and fewer SRI asset classes and funds (Heese, 2005; Herringer et al., 2009; Viviers, 2007). Collectively these challenges give rise to lesser opportunities in SRI within the country and inhibit the potential growth of SRI approaches (Heese, 2005; Herringer et al., 2009; Viviers, 2007). Further, Herringer (2009) recognises similar challenges in South Africa to that of its global counterparts including the lack of an overarching definition of SRI or an adequate benchmark for its measurement. These challenges are further developed in the following subchapter (2.4). As a result of inadequate benchmarks, Giamporcaro (2011) suggests that institutions are unwilling to commodify environmental aspects into the local investment market. Additionally, short-term performance benchmarks have been identified as inadequately recognising ESG aspects and undermining long-term financial performance (Moikwatlhai et al., 2019). Empirically, the unwillingness of shareholders to invest long-term in highly rated ESG companies is observed by Moikwatlhai *et al.* (2019), who suggests that the outcomes of the PRI and the CRISA are yet to be fully realised.

In summary, this subchapter (2.3) develops the South African approach to SRI led by the King Reports on Corporate Governance in South Africa, the CRISA and the UN-PRI (King IV, 2015,

p. 33; Viviers & Els, 2017). Following the fall of Apartheid, the first King report sets the foundation for corporate governance which King II develops by introducing the triple bottom line and integrated reporting (Esser & Delport, 2018; King I, 1994; King II, 2002). Subsequently, King III refines the work of King II and sets out the ESG reporting requirements of South African companies (King III, 2009; Solomon & Maroun, 2012). Due to King III's importance in establishing ESG reporting, its introduction forms the base year for this research's evaluation of highly rated ESG securities' comparative performance. The CRISA follows shortly after King III and provides practical guidance on ESG factors and disclosure (Foster, 2020, p. 150; King III, 2009). Finally, King IV parallels the requirements set out by the CRISA to concretise the South African approach to Responsible Investment (King IV, 2015). Collectively, the King reports and the CRISA propose that sustainability and ESG be considered in light of good corporate governance, focussing on sustainable development (CRIII, 2011).

These legislative considerations contribute towards South Africa having both the largest SRI market on the continent and the longest track record among emerging markets (Viviers & Els, 2017). Yet, despite the size and important contributions of South Africa to the development of responsible investing approaches, the field has received insufficient academic attention (Viviers & Els, 2017). Accordingly, the following subchapter (2.4) unpacks South Africa's application of SRI, followed by the principles supporting SRI through an investigation of the existing trends and literature in the field.

2.4. ESG Factors, as applied in contemporary South Africa

As alluded to within Chapter One, "SRI reflects a potpourri of investment philosophies and methods" and the approach is recognised for its imprecise terminology (Richardson, 2008; Sherwood & Pollard, 2018). The matter is further complicated by a lack of adequate formal definitions, the interchangeable use of terms, and the overlap between terms (Busch et al., 2016; PRI Association, 2019).[27] Accordingly, it is meaningful to first set the scope of Socially Responsible Investment in this subchapter (2.4) to ensure clarity. Given that the previous subchapter (2.3) unpacks SRI's local development, this subchapter (2.4) can now define and consider SRI's application. Given the South African focus, the country's position is primarily

[27] For an overview and comparison of SRI investment terminology, see Eurosif (2014, p. 8) or Cadman (2011) for example.

set out, but international trends are referenced insofar as they contribute towards the South African position.

This subchapter (2.4) commences with an overview of the definition of SRI, which is then situated within the South African context. Thereafter, the most commonplace SRI approaches are developed, followed by an overview of noteworthy ESG rating methodologies in the following subchapter (2.5).

As demonstrated above, it is commonplace for a range of terms to be used to refer to investment processes which include ESG factors in achieving their financial objectives (Giamporcaro & Pretorius, 2012). For example, the United Kingdom and Canada commonly refer to "ethical investment" whereas "Socially Responsible Investing" is common in mainland Europe and the U.S.A. (Louche & Lydenberg, 2006). Although terminology will likely continue to develop and while there is some variation in the aforesaid approaches, the most common reference utilised for South African studies is the term "Socially Responsible Investments" (Viviers & Eccles, 2012). The term 'Socially Responsible Investing' is also the most widely used globally, still, it does have some regional variation. For example, while Socially Responsible Investment is the most common terminology for both the U.S.A. and the across mainland Europe, the terms' applications differ somewhat (Louche & Lydenberg, 2006).

Thus, it is noteworthy to recognise while there is no unified global definition of SRI, SRI is considered to be an investment process that incorporates ESG considerations alongside financial objectives in the South African context (Busch et al., 2016; CRIII, 2011; Eurosif, 2014). The European interpretation of SRI is almost parallel to the South African interpretation since both highlight the financial, but also social and environmental factors in investment approaches by relating corporate governance to the triple bottom line (Eurosif, 2014; Louche & Lydenberg, 2006). Given the King reports' incorporation of international corporate governance standards, the alignment between the mainland European and South African definitions of SRI is to be expected (Andreasson, 2011). The requirement for integrated reporting also features centrally in the European environment (Haigh, 2012). Similar to the European approach, the CRISA also considers sustainability and ESG as relating to a wider understanding of governance which includes sustainable development (CRIII, 2011). On the other hand, the U.S.A.'s interpretation does not include SRI's financial aspects and focuses on a more values-based approach (Louche & Lydenberg, 2006).

Within the South African framework, it is further relevant to differentiate Socially Responsible Investment from Responsible Investment, given the divergence in terms. Sustainable and Responsible Investment is characterised as an investment approach aimed at maximising long term financial returns which consider ESG factors in South Africa (CRIII, 2011; Sherwood & Pollard, 2018). SRI is therefore applicable to specific investment strategies, approaches and products, an investment fund would therefore typically be designated as an SRI fund (Pretorius et al., 2010). SRI approaches, in turn, generally take place according to Responsible Investment principles (Pretorius et al., 2010). Responsible Investment relates to the "broad integration of ESG issues into investment decision making to optimize financial performance" (Eccles et al., 2008; Giamporcaro & Pretorius, 2012; Pretorius et al., 2010). Hence, Responsible Investment strategies are applied to SRI funds (Pretorius et al., 2010).[28]

SRI funds tend to use a combination of techniques when investing, the most common thereof is screening and active ownership, but integration-based investing and impact investing is also utilised widely (Demetriades & Auret, 2014; Louche et al., 2015; Sherwood & Pollard, 2018) The European Sustainable Investment Forum, or Eurosif (2018, p. 111), extends the four basic approaches above to a total of seven main categories of SRI-themed investing.[29] The four basic approaches are screening, impact investing, best-in-class investing and active share ownership or engagement based investing. Each of the four methods receives brief attention in this subchapter (2.4) whereafter ESG factors are further detailed in the following subchapter (2.5). Topical trends and the current role of SRI is then developed in the subchapter thereafter (2.6).

The first of the four basic SRI approaches is screening. Socially Responsible Investing which is based on screening is mutually exclusive from other SRI approaches and is characteristically stringent (Sherwood & Pollard, 2018). SRI screening applies an investment approach that is typically bound by a specific policy mandate and thereby allows investors to incorporate ESG factors into their investment process (Demetriades & Auret, 2014; Dorfleitner et al., 2015; Sherwood & Pollard, 2018). The most rudimentary strategy in Responsible Investment is negative screening, also referred to as exclusion based ESG investing or the 'avoidance' strategy (Louche et al., 2015; Pretorius et al., 2010; Sherwood & Pollard, 2018). Negative screening simply has funds decline to invest in certain companies based on their production and the sale of certain products, or their actions and policies (Dorfleitner et al., 2015, p. 451;

[28] The South African definition, expectedly, matches that of the UN-PRI (2019).
[29] The seven SRI strategies identified by Eurosif (2018) are as follows: Best-In-Class, Thematic Funds, Norms-based Screening, ESG Integration, Engagement and Voting, Exclusions, and Impact Investing.

Viviers et al., 2008). One clear example of negative screening is the Sullivan Principles discussed above or Shari'ah funds which decline investments in arms manufacturers and other industries based on Shari'ah principles, like the sale of alcohol and gambling (Pretorius et al., 2010; Sherwood & Pollard, 2018).

Logically, the contrary approach to negative screening is positive screening. Positive screening allows investment managers to incentivise operations that coincide with their social and environmental interests or to focus on portfolios of companies with superior corporate citizenship, as determined by their relative ESG scoring criteria (Demetriades & Auret, 2014; LaMore et al., 2006; Pretorius et al., 2010). For South Africa, the most notable example of positive screening would be investments that consider specific topics, companies with particular employment policies, or community development (LaMore et al., 2006; Pretorius et al., 2010).

Fundamentally, screening strategies limit the scope of companies available for investment and the approach is widely criticised for this reason (Pretorius et al., 2010). An alternative is active share ownership or engagement-based investment. This strategy has investors exercise their rights and pressure management to increase the position afforded to ESG factors in the company (Sherwood & Pollard, 2018). The strategy focuses on collaborative engagement between investors and companies through direct or proxy voting and investors, therefore, require a significant stake in a company to ensure effectiveness (Piani & Gond, 2014; Pretorius et al., 2010). Typically, investors form coalitions to engage management either privately or publicly. Should collaborative engagement not be possible, hostile engagement may attempt to force change or, if unsuccessful, investors could disinvest from the company (Piani & Gond, 2014; Sherwood & Pollard, 2018). A recent example of successful engagement based investment is Exxon Mobil Corporation's shift towards a sustainable energy transition (Herbst-Bayliss, 2021). Therein, a group of 135 pension funds, investors and money managers in the Exxon Mobil Corporation collectively forced changes in the corporation's board and called for the corporation to transition more rapidly towards clean energy (Herbst-Bayliss, 2021). The news was considered positively by the market and Exxon Mobil Corporation's share price subsequently increased by 12% (Herbst-Bayliss, 2021). One South African example would be Coronation's demands on 89 listed companies to consider ESG factors, as considered in Chapter One of this research (Buthelezi, 2021).

A third approach to incorporating ESG factors into investment practice is through "Impact-based ESG investing" or simply impact investing (Sherwood & Pollard, 2018). Impact investing is generally purpose-based and connected to a specific theme, cause or issue (Sherwood & Pollard, 2018). Due to impact investing's focus, it also tends to focus on the effect of the investment made, both in financial and non-financial terms (Sherwood & Pollard, 2018). While impact investing has existed in various forms for several years, positive screening, negative screening and shareholder activism are the most common forms of SRI strategies in South Africa (Viviers & Eccles, 2012).

A growing alternative to the existing South African SRI practice which does not exclude any market segments is best-in-class or best-in-sector screening (LaMore et al., 2006; Viviers & Eccles, 2012). Best-in-sector investing is an offshoot of positive screening in the South African context but its approach is most coherent with integration-based ESG investing (Sherwood & Pollard, 2018; Viviers & Eccles, 2012). The best-in-sector strategy applies ESG ratings to companies based on their distinct sectors and alongside the company's financial information, let investors analyse companies based on a collective set of criteria (Pretorius et al., 2010; Viviers & Eccles, 2012). An investor can then recognise the highest performing securities for each sector and invest therein (Louche et al., 2015). By applying a best-in-class ESG strategy, Duncan (2018) finds that the approach outperforms the JSE shareholder-weighted index from 31 January 2013 to 31 January 2018. Selected other examples hereof are considered in Chapter One and include some of the largest commercial investment houses in the country, including Old Mutual (2021b), Ninety One (2021), and Coronation (2020).

More broadly, integration-based ESG investing analyses ESG factors that impact company securities to optimise a portfolio's risk and return profile (Sherwood & Pollard, 2018). Rather than focussing on specific policy mandates, integration-based investing attempts to reduce a portfolio's risk and volatility levels, or to increase a portfolio's overall performance and returns, or add value to the portfolio's effect on social or environmental factors (Johnson et al., 2019; Sherwood & Pollard, 2018). Other investors utilise ESG rankings as a basis for their policy mandates leading to various specific investing approaches (Munoz et al., 2014). The approach provides investor flexibility and does not constrain investment practices but concurrently extends a company's measurements beyond traditional financial valuations (Sherwood & Pollard, 2018). The JSE's (2018) SRI index is one approach that directs integration-based ESG investing, since the index measures company performance based on adherence to a series of ESG factors.

The continued interest and growth in SRI investing and ESG ratings have led to significantly more sophisticated reporting by firms, requiring specialised rating agencies to measure ESG factor performance (Avetisyan & Hockerts, 2017). These factors are considered in the following subchapter (2.5). This subchapter (2.4), on the other hand, considers the practical application of SRI in South Africa by defining the practice and considering the most common approaches to SRI integration in existing investment approaches. To achieve this overview, this subchapter (2.4) firstly details the South African definition of SRI and provides some global alternatives. Given the variation in meanings, the South African and European interpretation of SRI is established as an approach to investing which considers ESG factors in addition to existing financial objectives in maximising returns (CRIII, 2011; Eurosif, 2018). After delineating the scope of the practice, four common South African SRI techniques are developed within this subchapter (2.4). The following subchapter (2.5) further develops the application of ESG ratings by unpacking rating methodologies.

2.5. Measures of ESG performance

As the previous subchapter (2.4) alludes, to allocate an ESG score to companies, specialised research is conducted by rating institutions (Escrig-Olmedo et al., 2019). Fundamentally, ESG scoring extends the ordinary financial rating of companies as solely economic actors to also include social and environmental actions (Escrig-Olmedo et al., 2019). The scoring provided then directs managers and investors' decision making processes regarding their specific ESG factor strategies and approaches to be utilised in investing (Dorfleitner et al., 2015). As divergence in SRI approaches exists, the variation naturally impacts a fund's financial performance and some studies have been criticised for considering SRI approaches as a homogenous group (Munoz et al., 2014). Providing consistent ratings is also widely considered a very demanding task (Aupperle et al., 1985; Waddock & Graves, 1997). As such, this subchapter (2.5) provides an overview of existing ESG rating firms and methodologies, as well as the chief critiques raised against ESG rating agencies. In Chapter Three, the specific rating method and portfolio formation approach of this study is unpacked.

To commence, it is noteworthy to highlight that company ESG scoring itself may have an impact on a firm's actions (Chatterji & Toffel, 2010; Dorfleitner et al., 2015). For example, companies with weaker MSCI Kinder, Lydenberg, Domini & Co. or KLD ratings, tend to prompt managerial action following their publishing and low scoring companies tend to

improve their environmental performance more rapidly than their highly-rated competitors following scoring (Chatterji & Toffel, 2010).

The quantification of these benefits, however, need to be meticulously included within existing financial business models to accurately outline their value (Schoenmaker & Schramade, 2019). Contrariwise, others suggest that there exist inherent limitations in calculating the impact of ESG factors (Olën, 2020). Despite strides made by the PRI (2019) and the CRISA, the aspects which are included within ESG ratings are still developing and there is not yet a consensus on a standardised ESG format for analysis or a universal set of metrics to measure ESG performance (Cort & Esty, 2020; CRIII, 2011; Dixon-Fowler et al., 2013; McCallum & Viviers, 2020; Sharma, 2000). The use of existing ESG assessment criteria and its role in operationalising and ensuring sustainable development in companies is also undecided (Escrig-Olmedo et al., 2019).[30] The wide range of possible ESG criteria makes such an undertaking particularly problematic and the variety of investment strategies and investor types each support a unique variation (Cort & Esty, 2020; Dixon-Fowler et al., 2013). Additionally, the matter is further complicated by the range of disciplines and theoretical frameworks which SRI covers (Cort & Esty, 2020; Dixon-Fowler et al., 2013).

Despite the challenges, specialist ESG rating agencies evaluate businesses' ESG performance to provide companies and the market with sustainability assessments (Escrig-Olmedo et al., 2019). ESG factors differ based on the analysing group and approaches are wide-ranging (Sherwood & Pollard, 2018). Some factors which are considered by rating agencies include auditing practices, biodiversity and the company board, corporate governance, company carbon footprint, climate risk and emissions management, cyber security, diversity and employee development, green building use and green products, health and safety, human rights, marketing practices, privacy, product safety, supply chain and labour management, raw materials use, water use and waste management, among a plethora of other sets of criteria (Berg et al., 2019; Sherwood & Pollard, 2018). One example which illustrates the divergence in rating criteria is RobecoSAM, or Robeco Sustainable Asset Management (2020), which utilises 80 indicators for its rankings. Comparatively the MSCI (2020) ESG ratings methodology applies 68 indicators to determine an ESG rating.

[30] Escrig-Olmedo *et al.* (2019, p. 8) identify five challenges facing ESG ratings: A lack of transparency in approach, commensurability between ratings, criteria trade-offs, inconsistencies with overall ESG scoring, and stakeholder preferences. Also see Cort and Esty (2020, pp.496 – 503) who provide a range of detailed challenges facing ESG scoring.

Methodologies are recognised for diverging on three main sets of criteria: scope, weighting, and measurement (Berg et al., 2019). Scope differences exist in instances where agencies utilise differing attributes to form part of their ESG framework (Berg et al., 2019). Weighting differences occur where the relative importance of attributes is considered differently by rating agencies (Berg et al., 2019). Finally, measurement differences take place in instances where the indicators utilised by the ESG rating agencies vary (Berg et al., 2019). However, significant areas of overlap also exist and the principal rating agencies all consider measurement in terms of ESG categories (Escrig-Olmedo et al., 2019). Among some of the most prominent ESG rating organisations, 53% of their scoring divergence is due to measurement variation while scoping divergence accounts for 44% and weighting the remaining 3% (Berg et al., 2019).[31]

While the current heteronormative position shows some initial indicators of converging into three distinct ESG data standards, at the time of this study there are several rating agencies with established and dissimilar practices (Cort & Esty, 2020). During 2017, more than 650 organisations undertook ESG research globally and approximately 150 thereof provided ESG ratings (Mercer, 2017). The number of ESG rating agencies has grown considerably following the 2008 global financial crisis but subsequently underwent a period of mergers and acquisitions, the MSCI ESG rating agency is one example hereof (Avetisyan & Hockerts, 2017; Escrig-Olmedo et al., 2019). Subsequent ESG rating agency growth strategies have been focused around either organic growth, networks, partnerships and alliances, or mergers and acquisitions (Avetisyan & Hockerts, 2017). The current trend towards consolidation within the ESG analyst environment also creates a transition towards more standardised and commoditised ESG factor data (Avetisyan & Hockerts, 2017). Nevertheless, the field's movement towards consolidation does not imply that only a handful of large institutional players exist. Some notable ESG research institutions include Eurosif, the Global Impacting Investing Network, the International Corporate Governance Network, the Responsible Investor, the European Centre for Corporate Engagement, the UN-PRI and the UN Global Compact (Sherwood & Pollard, 2018). The most significant international ESG ratings organisations include Asset4;[32] RobecoSAM;[33] Sustainalytics,[34] the Moody's subsidiary Vigeo-Eiris and both the MSCI ESG ratings and the MSCI Kinder Lydenberg Domini & Co.

[31] According to Berg *et al*. (2019), the six most prominent ESG ratings organisations are Asset4, RobecoSAM, Sustainalytics, Vigeo-Eiris, MSCI ESG and MSCI KLD ratings, as is further discussed below.
[32] Asset4 is a subsidiary of Refinitiv which formed part of the Thomson Reuters company since 2010 but acquired by the London Stock Exchange Group during 2021 (Ribando & Bonne, 2010).
[33] Robeco acquired Sustainable Asset Management to form RobecoSAM (Dorfleitner et al., 2015).
[34] Sustainalitics is a Morningstar subsidiary which was acquired by the firm during 2020.

or KLD ratings (Berg et al., 2019; Elder, 2021; Ribando & Bonne, 2010). The number of indicators utilised by these ratings agencies also varies significantly (Berg et al., 2019). On the one hand, Vigeo-Eiris utilises 38 indicators to form an ESG rating, Asset4, on the other hand, makes use of 282 indicators (Berg et al., 2019).

Since this research is particularly interested in the performance of highly rated ESG equities, ongoing deliberations vis-à-vis the intricacies of ESG qualifying criteria are not developed in detail.[35] Nonetheless, by recognising the ongoing developments and divergences in ESG measurements, this research can engage critically with the rating approach utilised within this study (Dorfleitner et al., 2015). In light of recent research and given the vast array of rating systems available, this study would ideally have utilised the averaged ratings of several rating agencies to represent a consensus in the market, an approach suggested by Berg *et al.* (2019). However, due to the lengthy period under consideration and rating agency variations evidenced in this subchapter (2.5), the only unaffected, commercially available ESG ratings agency that can viably be utilised on the JSE is the Bloomberg ESG Disclosure score. Nonetheless, this does not imply that the utilisation of only the Bloomberg (2020a) ESG Disclosure score is ineffective. In considering the most common ESG rating agencies, Dorfleitner et al. (2015) find that despite distribution and computation variances, the scores provided by KLD, Asset4 and Bloomberg for ESG ratings are all highly relevant to investors and fund managers and act as a satisfactory proxy and, as such, this research uses the same research design as that of Dorfleitner et al. (2015). The selection of the Bloomberg ESG Disclosure score is detailed in Chapter Three of this study but an overview of the approach utilised follows in the remainder of this subchapter (2.5).

As the designation suggests, the Bloomberg (2020a) ESG Disclosure score primarily utilises disclosed corporate information to provide datasets on a wide range of measures which each collectively contribute towards a firm's ESG score. A set of pillars constitute each of the

[35] For an overview of the comparative development of ESG ratings and qualifying criteria, see Escrig-Olmedo et al. (2019), Berg et al. (2019) or Dorfleitner et al. (2015) for example.

Environmental,[36] Social[37] and Governance[38] factors that Bloomberg (2020a) considers within its scoring. The ESG factors are grouped within sustainability themes and the priority thereof is determined by risks specific to individual industries (Bloomberg, 2020a, 2020b). Accordingly, the weighting of individual metrics is varied to recognise differences in business sectors (Bloomberg, 2020a). Each of the scores is then factored into an overall ESG score which is weighted based on industry (Bloomberg, 2020a). The weightings are allocated according to factor priority, which considers probability, timing and the magnitude of each issue (Bloomberg, 2020a). Scoring is based on both qualitative and quantitative analysis and parameters are adjusted over a period to ensure coherent datasets (Bloomberg, 2020a). The data are mostly captured from company produced reporting, which resides within the public domain, as well as external research, press releases and other sources which are publicly available (Bloomberg, 2020a, 2020b). Examples hereof include annual fillings, corporate governance reports, news sources and the company website (Bloomberg, 2020b). The benefit of utilising information in the public domain is it allows for Bloomberg's (2020a) data to be transparent and easily compared to other frameworks. Utilising this rating approach, this research allows for future comparisons to be drawn utilising other ratings agencies and privately held ESG ratings data.

However, the scoring is not provided exclusively from company disclosed information. Beyond disclosures, Bloomberg (2020a) also incorporates a rated firm's regulatory environment and operating activities, industry key risks and academic studies on industry exposure. Weighting to each of the factors is based on firm business activity and sustainability exposure (Bloomberg, 2020a). Further detail regarding the ESG scoring methodology is provided in Chapter Three. The following subchapter (2.6) provides a further evaluation of recent developments regarding SRI while subchapter 2.7 concludes Chapter Two.

[36] Regarding Environmental factors, Bloomberg identifies nine pillars which constitute the Environmental factor rating, each of which have a list of issues and sub-issues. The nine pillars for Bloomberg's (2020b) Environmental factors are as follows: "Air Quality, Climate Exposure, Ecological Impact, Energy Management, Environmental Supply Chain Management, Greenhouse gas Emissions Management, Sustainable Products, Waste Management, and Water management".

[37] Bloomberg's (2020b) Social factors have a set of seven pillars which consider a broad scope of matters, each of which is provided in what follows: "Community Rights and Relations, Ethics and Compliance, Labour and Employment Practices, Occupational Health and Safety Management, Operational Risk Management, Product Quality Management, and Social Supply Chain Management".

[38] Finally, the seven pillars constituting Bloomberg's (2020c) Governance factors are as follows: "Director Roles, Diversity, Independence, Refreshment, Incentive Structure, Pay Governance, and Pay for Performance".

2.6. Consideration of existing Socially Responsible Investment literature and the social movements driving the approach's growth

2.6.1. Overview

As considered within the first chapter of this research, SRI approaches suggest a divergence from traditional investment practices which focus exclusively on risk and returns (Sherwood & Pollard, 2018). This subchapter (2.6) develops SRI's distinction in comparison to traditional investment practice and its existing critique. Following this, the growing social pressure supporting SRI is unpacked and the relative benefits of SRI within this context are considered. Finally, this subchapter considers recent global literature and findings regarding SRI performance followed by more localised, South African examples. The following subchapter (2.7) then concludes Chapter Two and introduces the methodology which Chapter Three introduces.

Conventional Neoclassical Finance has two chief assumptions: market efficiency; and risk-neutral pricing with no arbitrage opportunities (Ross, 2002). In brief, the efficient markets hypothesis suggests that the market is a reflection of all the relevant and available information in the pricing of assets thereon (Ross, 2002). Rational sets of homogenous investors then make use of the available information to value companies and invest. The validity of the investment product is then based on the information available in making investment decisions (Cadman, 2011). Traditional investing then delivers value by transforming capital into investment opportunities and returns, alongside a commensurate level of risk (CFA Institute, 2020b). Within this framework, inefficiencies are created as an effect of external forces on the market, for example, government policies and changes to the repurchase rate (Lipartito, 2013).

Nonetheless, markets are not perfectly efficient, and investor rationality is doubtful, as developments in Behavioural Finance argue (Lipartito, 2013; MacKenzie, 2008; Schoenmaker & Schramade, 2019). Relevant information is also not always included within share prices and these anomalies can collectively lead to under- and over-valuation in the market as value and price are considered equivalent (Bodie et al., 2012; Schoenmaker & Schramade, 2019). For example, the Capital Asset Pricing Model highlights the inherent role of risk in modern portfolio management and the trade-off between increases in risk and expected levels of return but only does so in financial terms (Hillier et al., 2016; Schoenmaker & Schramade, 2019).[39]

[39] The Capital Asset Pricing Model is further introduced in subsection 3.3.1. of this research.

Developments in the 21st century extensively witnessed a shift away from shareholder primacy and solely financially orientated approaches to others which encourage sustainable value creation (GGA, 2020). In South Africa, this movement was supported by the King reports discussed in subchapter 2.2 hereabove. The King IV (2015) report suggests that the transition came about following empirical evidence that humans' use of natural assets proved to be taking place more rapidly than what the resources could be replaced, hence the use of the term 'unsustainable' (GGA, 2020). Considering the disconnect between the global climate threat and exclusively financial metrics, it is understandable that civic demands would support the greater consideration of environmental and social factors in the financial industry (Escrig-Olmedo et al., 2019; Huang, 2021; Latour, 2017; Munoz et al., 2014). As proposed by the King reports, companies are therefore increasingly required to develop sustainable corporate and business practices (Escrig-Olmedo et al., 2019; King IV, 2015).

More widely, to map the global environmental changes induced by humans, and to determine the limits thereof, the planetary boundaries framework was introduced as one measure of safe human existence (Rockström et al., 2009). The framework utilises nine sustainability measures that serve to indicate safe zones of human operation, yet as greater boundaries continue to be transgressed, larger risks of adverse environmental changes come to the fore (Linnenluecke et al., 2016). The economic impacts of transgressions are already present in various forms globally and have proven to be more sombre in recent years (Sterner, 2015). Leading models have also tended to underestimate the economic losses following climate change, leading to marked increases in the projected damages thereof from 2015 onwards (Sterner, 2015). Although not necessarily recognised within the financial analysis, the environmental impacts on firms can be significant. Heatwaves, for example, can have considerable impacts on business operations, from absenteeism and health costs increasing, losses in agricultural yields, to increased levels of inequality and forced migration (Piguet et al., 2011; Roberts, 2001; Sterner, 2015). These shifts and their adverse effects on human development stress the interconnections between humans and our environment and the need for the consideration thereof within financial analysis (Adams & Abhayawansa, 2021). The following subsection (2.6.2) considers these findings within the context of COVID-19 and the subsection thereafter (2.6.3) develops additional empirical evidence.

2.6.2. COVID-19 and ESG factors

Alongside global environmental challenges, the COVID-19 pandemic required jurisdictions globally to launch momentous economic stimulus plans to mitigate unemployment and salvage industries like hospitality and travel from financial ruin (Markard & Rosenbloom, 2020). Interestingly, emerging research suggests that the disruption following the COVID-19 pandemic is leading to a more rapid response to climate challenges (Markard & Rosenbloom, 2020; Sovacool et al., 2020). Following this logic, COVID-19 has served to re-emphasise the climate and sustainability challenges facing the planet (Hörisch, 2021). Within the context of SRI, the pandemic has, therefore "put the 'S' in ESG […] under the microscope and provided a reason to re-assess the 'E'." (Adams & Abhayawansa, 2021).

In this social and ecological milieu, some investors have pivoted towards corporate fundamentals and sought protection against losses by utilising ESG approaches that focus on firm long-run sustainability (Munoz et al., 2014; Singh, 2020). Other investors have started to question unsustainable company practices which drive higher levels of pollution, labour inequalities, and the erosion of public trust (Duncan, 2018). Collectively, these demands of investors have mandated the balancing of financial and non-financial considerations, long-term and short-term goals and stakeholder interests in the investment process (CFA Institute, 2020b; Huang, 2021). This emerging position stands in contrast to its antecedents since, in addition to existing financial concepts, it includes insights into value creation which investors measure through ESG factor ratings (CFA Institute, 2020b; Escrig-Olmedo et al., 2019). By such approaches, increasing environmental risks are more adequately integrated into firms with superior ESG factors and, therefore, these firms should enjoy lower levels of systematic risk and be more agile to adapt to adverse ESG-related circumstances (Garcia et al., 2019).

It is from this background that ESG factors develop to recognise economically material impacts which financial indicators do not (Avetisyan & Hockerts, 2017; CFA Institute, 2020b). Should the market ignore the risks posed by climate change, their measure on the market is correspondingly disregarded (Garcia et al., 2019). However, while the sector has responded to public demand prior thereto, the COVID-19 pandemic emphasised existing vulnerabilities within the financial system as the pandemic caused significant volatility within global markets (CFA Institute, 2020b; Díaz et al., 2021). Consequently, the events of 2020 have illustrated the importance of ESG factors in investment decisions and divergence from purely financial analysis in investment practice (Broadstock et al., 2021; Díaz et al., 2021; Olën, 2020; Stevens, 2020).

Recent political shifts in the U.S.A. also indicate an amplified concentration on environmental legislation and the U.S.A.'s. markets seem to have priced-in effects thereof on companies not adequately positioned to adapt thereto (Payne, 2021). As discussed in Chapter One, markets have also supported ESG funds in the months after the onset of the pandemic. In total, ESG funds accounted for $71,1 billion in global inflows and approximately 33% of all European fund sales during the second quarter of 2020 (Díaz et al., 2021). A total of 85% of Chartered Financial Institute members also consider ESG factors as part of their investment methods during 2020 and the factors' incorporation is increasingly considered a "crucial value for success" in the investment environment (Avetisyan & Hockerts, 2017; CFA Institute, 2020b).

SRI is consequently envisioned to balance existing investing approaches with ESG factors and thereby increase long term value creation (Capelle-Blancard & Monjon, 2012; CFA Institute, 2020b). The majority of the literature on SRI concerns its performance with fewer pieces considering its definition and delineating what qualifies as an SRI investment (Capelle-Blancard & Monjon, 2012; Viviers & Eccles, 2012).[40] Studies considering SRI performance also tend to be the most influential, as based on citation numbers (Capelle-Blancard & Monjon, 2012). Most performance-based studies also tend to follow similar methods and provide analogous results, which begs the question as to why there is such a vast array of global studies on the topic with little focus on the emerging markets, including South Africa (Capelle-Blancard & Monjon, 2012). In the following subsection (2.6.3), a brief overview of recent global findings is provided followed by an evaluation of literature concerning the South African context.

2.6.3. Further empirical evidence

While some studies, like Chetty, Naidoo and Seetharam (2015) find neutral and negative results on firm performance and CSR, some research pieces identify positive relationships between ESG performance and profitability in the weigh-up of global literature (Garcia et al., 2019). Possibly the most extensive meta-analysis of global studies on ESG factors' role in financial performance thus far is performed by Friede, Busch and Bassen (2015) who find that existing literature generally suggests ESG outperformance in North American and emerging markets. Of the approximately 2000 empirical studies included within the meta-analysis, only 10% indicated that ESG factors and financial performance have a negative relationship, while the remaining 90% had either positive correlations or mixed and neutral results (Friede et al., 2015;

[40] For an overview of SRI's definition, please see subchapter 2.3 and 2.4 of this research.

Supported by Cort & Esty (2020)). Other global meta-analyses also tend to support a positive relationship between firms with high ESG scores and the firm's financial performance (Dixon-Fowler et al., 2013; Orlitzky et al., 2003). Further international studies have also considered the pandemic and provided supportive findings of highly rated ESG security market outperformance. For example, Diaz *et al.* (2021) recognise that ESG "significantly explains the returns of industry portfolios during this pandemic". While this study makes use of an artificially constructed portfolio, the effects on existing ESG funds is also notable as the constructed funds consider ESG-orientated firms within investment approaches. One example thereof is Folger-Laronde et al. (2020) who recognise that ESG funds have proven more resistant to the market downturn following COVID-19. Similarly, ESG funds have been found to outperform the market during periods of high volatility but underperform during the alternative (Nofsinger & Varma, 2014).

Since there exists a greater amount of consensus within the global and developed markets' context, questions concerning SRI relate more to the categorisation and benefits of individual ESG factors and the approaches utilised to measure performance in these regions (Folger-Laronde et al., 2020). For example, Garcia, Mendes-Da-Silva and Orsato (2019) propose that firm asset performance is impacted by only the Environmental component of ESG factors. Others, like Ortiz-de-Mandojana and Bansal (2016) suggest that ESG research regarding firm performance tends to focus on short-run profitability rather than long-term growth.[41] Because proponents of SRI envision that the benefits of sustainable business practices come to fruition over extended periods, long-term studies are proposed to provide more accurate accounts of performance by recognising shocks in the investment environment and providing a more adequate gauge of sustainable businesses' resilience (Ortiz-de-Mandojana & Bansal, 2016).[42]

Yet, despite existing developed market research, there is insufficient research on SRI in emerging economies, where matters have not developed into a broad area of consensus (Rehman et al., 2016; Viviers & Eccles, 2012). Nonetheless, SRI approaches may have crucial benefits for emerging economies which are required to weigh up numerous aspects around sustainability and growth (Heese, 2005).

[41] One example of such a study is that of Chetty et.al (2015) which considers the "short-term impact on capital market performance of firms' entrance into and exit from the JSE SRI Index".
[42] As detailed in Chapter Three, this suggestion is considered in the present study by extending the period under analysis to a more typical long-term time horizon.

Insofar as South African literature regarding SRI is concerned, the most common topic investigated relates to comparative performance, while there is a growing number of pieces that consider environmental issues, labour matters and corporate governance (Viviers & Eccles, 2012). Performing an overview of South African SRI literature, Viviers and Eccles (2012) explain that the majority of the studies on performance indicate that SRI strategies are neutral in comparison to the market. The review by Viviers and Eccles (2012) also shows that 23,4% of research indicates a positive correlation between SRI funds and comparative performance to conventional funds while 20,3% of studies find that SRI orientated approaches harm performance.

Before the introduction of the King III listing requirements, Viviers et al.(2008) compared the returns of local SRI funds to the funds' benchmarks as well as to the general performance of the South African equities market on the FTSE/JSE All Share Index, or ALSI, with mixed results.[43] Viviers et al. (2008) found that funds underperformed relative to their benchmarks from 1 June 1992 until 1 April 2002 but showed consistent improvement and outperformance from 1 April 2002 until 31 March 2006. Similarly, Demetriades and Auret (2014) find superior returns in South African SRI portfolios to that of conventional firms over the period 2004 to 2009 and a positive correlation between return on equity and social performance.

Pivoting from the consideration of existing fund performance towards this study's approach, De Klerk and de Villiers (2012) suggest that firms with greater integrated reporting, a factor which is considered by ESG rating agencies, tend to have higher share prices. Tripathi and Kaur (2020) find that the companies listed on the South African JSE ESG index collectively outperform the market. In contrast, Gladysek and Chipeta (2012) find no significant abnormal returns for firms' listed on the JSE SRI Index from 2004 to 2009. Chetty, Naidoo and Seetharam (2015) similarly find no financial outperformance of firms listed on the JSE SRI index for the period 2004 to 2012. However, Mutezo (2014) finds that companies listed on the JSE SRI Index provide better financial performance to their alternatives from 2004 to 2010. Equally, Demetriades and Auret (2014) find that while SRI listing announcements on the JSE have no impact on company share price, the said firms offer superior returns to their alternatives from 2004 to 2009. Marcia, Maroun and Callaghan (2015) argue similarly and find that share price is positively related to firm disclosures, which form part of the evaluation by ESG rating

[43] Hereinafter, the FTSE/JSE All Share Index will be referred to by the acronym JSE ALSI.

agencies. Yet, Horn, de Klerk and de Villiers (2018) argue that CSR disclosures have no impact on firm value and have no relation to future cash flows.

Considering the abovementioned literature, the South African debate regarding the performance of ESG-orientated approaches is still unresolved (Friede et al., 2015). However, provided with the context hereabove, the *lacuna* which this research attempts to address is clarified. Considering the South African literature, many studies only consider performance over a shortened period (Johnson et al., 2019). Other studies do not make use of risk-adjusted measures and use indexes to evaluate performance, which allows for management experience to play a role within outperformance. In comparison thereto, this research makes use of an extended period of investigation which stretches from 2009 to 2021. The study also removes the opportunity for management experience to play a role by constructing artificial portfolios rather than considering existing ESG-orientated fund performance. Given this significant period under consideration, some of the proposed benefits of long-term ESG evaluation can be evaluated should they come to the fore (Akiniolire & Smit, 2003; Ortiz-de-Mandojana & Bansal, 2016; Schoenmaker & Schramade, 2019). Additionally, this research piece further includes the initial influence of COVID-19 on South African SRI.

Accordingly, this study is aimed at contributing to the ongoing debate and knowledge gap within SRI research by evaluating whether highly rated ESG firms provide financial outperformance on the market over an extended period. As the relevant literature regarding South African SRI has now been put forward, the following chapter (3) proposes an approach to construct portfolios of companies based on ESG performance. Chapter Four then evaluates the performance of the constructed portfolios and contrasts the findings of the literature discussed in Chapter Two.

2.7. Conclusion

Chapter Two commences by developing the theoretical foundations of SRI. Following the introduction, subsections 2.2.2 and 2.2.3 unpack the theories that suggest that highly rated ESG companies should provide outperformance and the contrary. Thereafter, the third subchapter (2.3) provides a chronological development of South Africa's SRI regulatory framework. Subchapter 2.3 also sheds light on the guiding documents utilised in contemporary South African ESG investing approaches, as informed by the King reports and the CRISA (CRIII, 2011; King IV, 2015). Subchapter 2.3 further establishes the starting period for this study as determined by the JSE's listing requirement on the publication of integrated company reports

(Solomon & Maroun, 2012). The reasoning for this period serving as the commencement date of the empirical analysis is established as being due to the proliferation of ESG factor-related reporting, following the addition of the listing requirement and the ensuing global financial crisis (Solomon & Maroun, 2012). The additional information provided ensures that the market has adequate access to data in considering ESG investing approaches, and a more uniform standard for comparison (Herringer et al., 2009).

The fourth subchapter (2.4) further establishes South Africa's introduction of ESG index investing. Subchapter 2.4 considers global approaches to SRI and discerns the South African approach thereafter. Techniques utilised by SRI approaches are then considered, followed by deliberations on ESG ratings and metrics in Subchapter 2.5. Subchapter 2.5 additionally introduces existing challenges regarding ESG ratings which this research recognises.

Finally, subchapter 2.6 considers the social momentum in incorporating ESG factors within existing financial approaches and outlines global and local findings regarding SRI performance. It is highlighted that the COVID-19 pandemic has influenced investors to shift towards companies with higher ESG scores which tend to be less susceptible to systematic risks (Cerqueti et al., 2021). By this logic, the market perceives ESG-orientated firms to be more adaptable and innovative and therefore more poised to address challenges (Payne, 2021).

Notably, Subchapter 2.6 illustrates the timeliness of this research piece. Given the continued uncertainty of ESG fund performance and the lack of consensus within the existing South African literature, this study serves to fill an existing knowledge gap by evaluating ESG fund performance over a lengthy period. Beyond the period under consideration, this research utilises multiple risk-adjusted measures to compare investment performance, which the following chapter (3) develops. As the reasoning for the study has now been unpacked, Chapter Three sets out the approach utilised to evaluate the performance of the constructed portfolios in this study.

Chapter Three: Methodology

3.1. Introduction

Chapter Two develops a brief overview of existing SRI literature and then focuses on the South African position. As suggested by Baskin (2006), the second chapter recognises that South Africa's SRI framework is one of the most developed on the continent and particularly significant among other emerging economies. After unpacking the South African understanding of SRI, some existing findings on the South African SRI performance are considered in comparison to developed markets. The variation in study findings in the second chapter emphasises the discontinuity in literature and the *lacuna* in South African SRI research, which this study addresses (Chetty et al., 2015; Du Toit & Lekoloane, 2018; Garcia et al., 2019; Heese, 2005).

As discussed in Chapter Two, the existing literature on South African ESG factor financial performance has tended to make use of accounting-based metrics and, in instances of market-based metrics, most studies consider non-risk-adjusted metrics over shorter time horizons or do not recognise size bias. All three of these criticisms are considered within this research by including a lengthy period of performance under consideration (May 2009 to April 2021), as well as risk-adjusted methods and the recognition of firm size in portfolio formation in evaluating performance. Chapter Three details how these critiques are recognised within this research.

Pivoting towards analysis, Chapter Three develops the approach that this study makes use of to evaluate the comparative performance of highly rated, South African ESG equities to their counterparts. Chapter Three commences with a consideration of the measures of performance which this study applies. Firstly, subchapter 3.2 presents the ESG scoring approach which this study utilises. Secondly, subchapter 3.3 unpacks the multifactor asset pricing measures of this study. Thereafter, subchapter 3.4 considers the datasets of this research. Subchapter 3.5 then unpacks the specific methods which are employed in constructing portfolios based on ESG ratings and market capitalisation, as well as the relevant factor construction. After subchapter 3.6 concludes the methodological portion of this research, Chapter Four analyses the findings from this chapter's (3) methodology. Finally, Chapter Five summarises the findings made and concludes this research dissertation.

3.2. Measures of ESG performance

The second chapter of this research establishes the existing uncertainties in rating criteria, and the suggested approaches which could be utilised that do not weigh heavily on individual rating agencies (Escrig-Olmedo et al., 2019). Nevertheless, because extensive and coherent sets of comparative ESG rating data do not exist for the initial years of this study, this research makes use of an individual rating agency. While this approach allows for comparison to other studies, some limitations need consideration. One possible alternative approach to circumvent the data limitation would be the combination of two or more datasets over the period under evaluation. Nonetheless, such an approach would not allow for equivalent results to follow from the study as the specific combination of datasets would not facilitate easily comparable results for the JSE. It is therefore preferred that a coherent dataset be utilised. Accordingly, this subchapter (3.2) unpacks the specific ratings approach utilised within this research dissertation and weighs up the benefits and disadvantages of this approach. The following subchapter (3.3) then considers the relevant financial performance models.

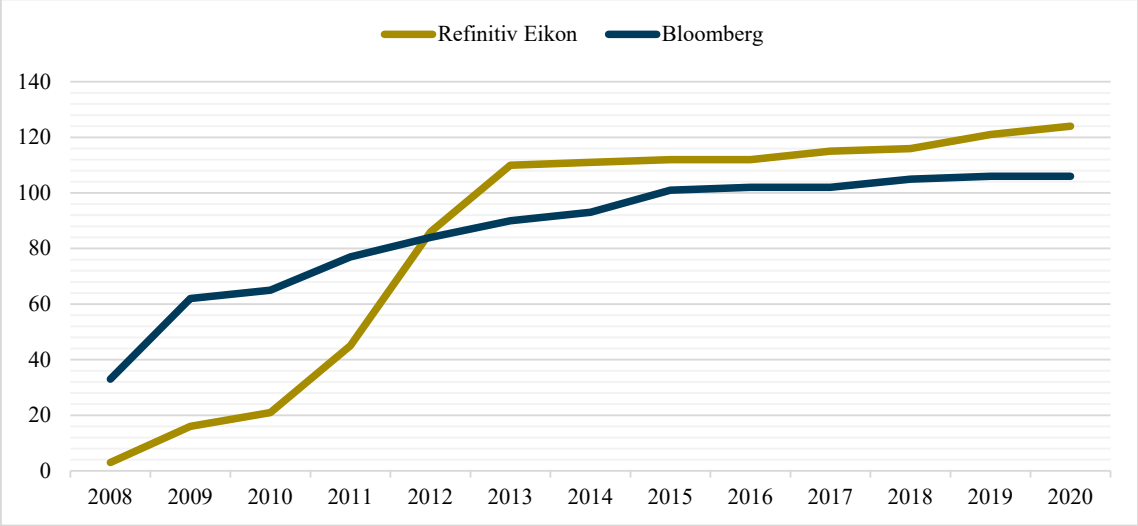
As Chapter Two introduces, this study utilises Bloomberg's ESG Disclosure Score to measure the ESG rating of an equity. As developed in subchapter 2.4, the South African interpretation of SRI relates to the incorporation of ESG ratings within an investment approach. The primary benefit of utilising the Bloomberg ESG Disclosure Score is the fact that a consistent dataset exists for the entire period under consideration, as well as the ESG Disclosure Score's transparency. Within the South African context, no other commercially available and consistently applied solution has been found for the lengthy period that this study evaluates. Bloomberg provides the largest group of companies to reliably form several portfolios especially during the initial years of this study. Given the available companies within the Bloomberg ESG Disclosure Score and the introduction of the King III reporting requirements, 2009 is recognised as the most viable period to commence with the study.

In comparing possible datasets, the alternative commonplace and commercially available ESG rating source is the Thompson Reuters Refinitiv Eikon Database.[44] Figure 5 illustrates the comparative number of ESG rated companies for both Bloomberg and Refinitiv below. While both Bloomberg and Refinitiv score comparable numbers of companies from 2015 onwards, Refinitiv only scores 16 equities for 2009, less than half that of Bloomberg. Notably, Refinitiv does later include more companies within its ratings than Bloomberg, but only from 2013. As this research is particularly interested in the long-term performance of rated ESG listed

[44] Hereinafter referred to as 'Refinitiv'.

companies, preference is accordingly afforded to the dataset which most adequately allows for lengthier evaluations of greater numbers of equities.

Figure 5 Bloomberg and Refinitiv ESG rated companies



The Bloomberg (2020a) ESG Disclosure Score provides company ratings based primarily on the company's disclosures. The rating is awarded from 0 to a maximum of 100 (Bloomberg, 2020a). Scores are updated annually following the publication of company annual reports and more than 100 metrics are computed in determining a company's rating (Bloomberg, 2020a). On the other hand, Refinitiv (2021) similarly makes use of companies' ESG disclosures and also generally updates company scoring annually. Refinitiv (2021) scoring also ranges from 0 to 100 but can additionally be provided in Grade terms, with D minus indicating the lowest score possible and A plus indicating the highest score possible.

A central consideration of this research relates to the transparency of ESG rating, which includes only information available in the public domain for both Bloomberg (2020a) and Refinitiv (2021). As such, both rating approaches are easily accessible and can be compared to other ratings metrics and approaches in future research. Nevertheless, utilising an average of both ratings agencies' scoring would significantly decrease the available universe of companies during the initial years of this research, as evidenced from Figure 5 hereabove. Provided that this research is particularly concerned with the long-term performance of highly rated ESG equities, utilising only one rating agency is preferred.

Although this research makes use of one rating agency, the freely available information on a firm's Bloomberg (2020a) ESG Disclosure Score ensures that future studies would be able to

compare findings by varying the approach applied in this research. Recent studies which have made use of the Bloomberg ESG Disclosure Score in determining firm financial performance include Lopez-de-Silanes et al. (2020), Grewal et al. (2021), Henriksson et al. (2019), Nollet et al. (2016), Xie et al. (2019), Yu et al. (2018) Zuraida et al. (2018), and in the South African market context, Bernardi and Stark (2018) and Donkor et al. (2021).

However, the Bloomberg (2020a) ESG Disclosure scores has three detracting factors: company coverage; greenwashing and the role of firm size on company reporting. Regarding company coverage, it is worthy to note that Bloomberg (2020a) only scores companies that are either listed on one of the identified indexes, which South Africa does not form part of, or equities displaying a market capitalisation of 30 million USD or greater. Accordingly, the Bloomberg (2020a) market capitalisation requirement excludes some small capitalisation companies in the South African context which are therefore not able to form part of the portfolios constructed within this study. Bloomberg's capitalisation requirement also explains the slightly higher number of companies that are rated by Refinitiv from 2013 onwards. Two additional factors may also impact the Bloomberg ESG Disclosure rating awarded to a company and by extension the results of this research. The points are developed in the remainder of this subchapter (3.2) while the following subchapter (3.3) develops the financial performance measures applied by this research dissertation.

Possibly most significant among the detractors of the Bloomberg (2020a) ESG Disclosure score is the scoring's focus on voluntary disclosure and its benefit to larger firms (Dorfleitner et al., 2015). While the analysis included within Chapter Four of this research further unpacks the topic, it is worth noting that larger firms, which have more sizable budgets and funds available to perform disclosure functions, tend to receive higher scores and less returns than smaller firms (Dorfleitner et al., 2015; Humphrey et al., 2012). The size of firms is further considered as part of the portfolio formation process within subchapter 3.4. In short, the constructed portfolios account for the possible role of the size of a firm on ESG scoring by grouping portfolios based on Bloomberg (2020a) ESG Disclosure scores as well as firm market capitalisations.

The other notable detractor of Bloomberg's approach is the opportunity for rated firms to 'greenwash' results (Yu et al., 2020). In comparison to a regulated, obligatory approach, voluntary disclosure allows firms to focus ratings on the most positive ESG impacts of a firm while tilting attention away from the firm's negative ESG effects. Deflecting attention from

lesser preferred firm practices, companies may influence their ESG ratings in theory (Hummel & Schlick, 2016). Additionally, neither an international set of standards on ESG reporting nor an ESG reporting governing body exist at the time of this research (PRI Association, 2017; Yu et al., 2020).

In a recent study on company greenwashing, Yu et al. (2020) suggest that the potential for greenwashing to take place within a company is greatly diminished through enhanced scrutiny and governance. Comparatively, Hummel and Schlick (2016) find that leading sustainable firms signal sustainability performance through greater amounts of disclosure and more detailed reporting. Specifically within the South African context, subchapter 2.3 highlights the role of the King reports in accounting for social and environmental performance within company reporting (King IV, 2015). For this research, it is therefore sufficient to recognise that the King reports act as a vehicle to provide investor assurance regarding ESG matters and the reports compare favourably to developed markets (Ackers, 2009; King IV, 2015; Kloppers, 2018). Nevertheless, the possibility for firm greenwashing to influence Bloomberg ESG Disclosure scores must be noted. Considering the potential for firm greenwashing concludes this study's application of ESG ratings. The following subchapter (3.3) develops the measures of financial performance which this research utilises, followed by an overview of the datasets utilised in the subchapter thereafter (3.4).

3.3. The selection of financial performance measures

This subsection (3.3) unpacks the risk-based financial performance measures that this research utilises. Subchapter 3.5 develops the portfolio formation approach thereafter. Some of the most commonplace approaches that measure risk-adjusted returns in existing ESG literature are the Sharpe (1966), Sortino (1991)[45] and Treynor (1965) ratios. Viviers *et al.* (2008), for example, makes use of the Sharpe ratio among others to compare 24 Sustainable and Responsible Investment Funds to the South African market. The Sharpe (1994) ratio is widely utilised as a performance measurement of mutual funds and suggests a "reward-to-variability ratio" from its calculation and is illustrated in Equation 1 below (Bodie et al., 2012):

[45] Although the ratio was made popular by Sortino and Van Der Meer (1991), its usage can be traced back to prior literature by Bawa (1975).

Equation 1 Sharpe ratio

$$Sh = \frac{R_{it} - R_{ft}}{\sigma R_{it}}$$

Where

Sh	Sharpe ratio
R_{it}	Expected return of asset *i* at time *t*
R_{ft}	Risk free rate *f*
σR_{it}	Standard deviation of the expected return

Nonetheless, while the Sharpe (1966) and other similar ratios may yield a preliminarily understanding of comparative risk-adjusted performance, for a deeper understanding of comparative performance this study employs a combination of the FF3 and FF5 to consider the generation of market alpha.

In this subchapter (3.3), the development and background of the applicable multifactor asset pricing models are unpacked by firstly providing an overview of the FF3 followed by the FF5 model. The FF3 and FF5 are two multifactor models that have received significant attention within asset pricing generally and ESG literature specifically. Given the models' wide utilisation in ESG firm performance literature, the two models are employed for the present study. The wide existing application and testing of these multifactor models also allow for comparative evaluations with other studies which have made use of the same asset pricing models (Gregory et al., 2013; Sha & Gao, 2019).

3.3.1. The FF3

As noted by Harvey et al. (2016), there exist numerous factors which may have some explanatory power in attempting to price assets. Nonetheless, the contemporary "standard by which performance is measured" is the FF3 (Statman & Glushkov, 2009). This standard further extends to studies considering SRI performance (Statman & Glushkov, 2009). In considering the various possible factors, Fama and French (1993) recognise that a firm's size and value has a significant impact on returns. From 1963 to 1990 the impact of the two factors is further proven empirically on the New York- and American Stock Exchanges as well as the Nasdaq Stock Market. While the Capital Asset Pricing Model[46] had previously dominated literature,

[46] Hereinafter referred to by the acronym 'CAPM'.

the FF3 expounded upon the CAPM by including Size and Value Factors (Bodie et al., 2012). Fama and French (1993) augment the CAPM to capture these two additional factors, developing the FF3.

Value, in this instance, is accounted for through an equity's market to book ratio while size is accounted for through the excess returns of a small stock portfolio, to that of the alternative (Bodie et al., 2012; French, 2021). Accordingly, the FF3 can be described mathematically as within Equation 2 below (Bodie et al., 2012):

Equation 2 FF3

$$R_{it} = \alpha_i + \beta_{iM}R_{Mt} + \beta_{i\text{SMB}}\text{SMB}_t + \beta_{i\text{HML}}\text{HML}_t + e_{it}$$

Where

R_{it}	Expected return of asset *i* at time *t*
α_i	Excess returns
R_{Mt}	Rate of return of a market portfolio *M*
SMB	Size Factor
HML	Value Factor
e_{it}	Residual/Firm specific return

Building on the platform of the CAPM, the FF3 equation attaches the Size and Value Factors to the CAPM. The Size Factor is indicated by the shortened SMB, indicative of "Small Minus Big" while the Value Factor is indicated by the shortened HML, or "High Minus Low" (French, 2021).

The Size Factor represents the findings of Fama and French (1993) that equities with lesser market capitalisations provide higher excess returns relative to their larger market capitalisation counterparts. The Size factor is defined as the difference in the averaged returns of small and large portfolios as evidenced in Equation 3 below (French, 2021).

Equation 3 Construction of the Small Minus Big FF3 Factor

$$\text{SML} = \textit{1/3 (small value + small neutral + small growth) – 1/2 (big value + big neutral + big growth)}$$

In addition to the Size Factor considered in the FF3, the model also considers the impact of value in determining stock returns. The Value Factor is represented by High Minus Low, or HML in Equation 4 below. The HML is defined based on the difference in the averaged returns of two portfolios constructed based on value and growth. The Value Factor is intended to recognise the expected return differences in stocks based on the security's book-to-market ratio. French (2021) signifies the high book-to-market ratio through the term "value" in Equation 4. Low book-to-market ratios are accordingly signified by the term "growth" in Equation 4 (French, 2021).

Equation 4 Construction of the High Minus Low Factor

$$HML = 1/2\ (small\ value + big\ value) - 1/2\ (small\ growth + big\ growth)$$

Accounting for both the Value Factor and Size Factor, the FF3 further develops the CAPM. The FF5, on the other hand, adds two additional factors which are considered in the remaining portion of this subchapter (3.3).

3.3.2. The FF5

Following the introduction of the FF3, criticism was levelled against the approach, giving rise to the FF5 (Fama & French, 2015). In forming the FF5, Fama and French (2015) extended the FF3 to recognise the impact of two additional factors. However, Fama and French (2015) also note critique of the FF5 as not being adequate in measuring low levels of average returns in small assets. Nonetheless, the limitation does not particularly apply to this study given the fact that the analysis hereof extends only to firms measured by the Bloomberg ESG Disclosure score and small market capitalisation firms do therefore not form part of this research's evaluation.

The inclusion of the two additional factors to the FF3 forms the FF5. The addition of profitability and investment as the two extra factors follows from existing challenges to the FF3. In a similar sense, Fama and French (2018) later develop a subsequent factor model which includes momentum in addition to the FF5. The Momentum Factor was initially proposed by Carhart (1997) and, alongside the FF3, forms the Carhart (1997) Four-Factor Model. Nonetheless, Fama and French (2015) describe the FF5 as follows within Equation 5:

Equation 5 FF5

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}R_{Mt} + \beta_{iSMB}SMB_t + \beta_{iMHL}HML_t + \beta_{iRMW}RMW_t + \beta_{iCMA}CMA_t + e_{it}$$

Where

RMW Profitability Factor

CMA Investment Factor

In addition to the Profitability Factor and the Investment Factor, the FF5 also augments the construction of the Size Factor (French, 2021). Therein the SMB factor is composed of a sorting method between small or large market capitalisation on the one hand and then grouped according to book-to-market equity, operating profitability, and investment on the other (French, 2021). In the context of the FF5, a negative SMB beta would be indicative of a portfolio weighted towards larger market capitalisation stocks and a positive SMB beta would indicate the inverse. The sorting and grouping process is further illustrated in Equation 6 below, as provided by French (2021):

Equation 6 Construction of the Small Minus Big FF5 Factor

$$SMB_{(B/M)} = 1/3\ (small\ value + small\ neutral + small\ growth) - 1/3\ (big\ value + big\ neutral + big\ growth)$$

$$SMB_{(OP)} = 1/3\ (small\ robust + small\ neutral + small\ weak) - 1/3\ (big\ robust + big\ neutral + big\ weak)$$

$$SMB_{(INV)} = 1/3\ (small\ conservative + small\ neutral + small\ aggressive) - 1/3\ (big\ conservative + big\ neutral + big\ aggressive)$$

$$SMB = 1/3\ (SMB_{(B/M)} + SMB_{(OP)} + SMB_{(INV)})$$

Where

$SMB_{(B/M)}$ Small Minus Big: Book-to-market

$SMB_{(OP)}$ Small Minus Big: Operating profitability

$SMB_{(INV)}$ Small Minus Big: Investment

As indicated by Equation 5, the FF5 includes a Profitability Factor, as denoted by "RMW" and an Investment Factor, denoted by "CMA". The Profitability Factor's denotation is a shorthand for "Robust Minus Weak" and is defined by halving the combination of two small and large portfolios, each with strong operating profitability, or weak operating profitability (French, 2021). Equation 7 further describes the construction of the Profitability Factor below (French, 2021).

Equation 7 Construction of the Robust Minus Weak Factor

$$RMW = 1/2\ (small\ robust + big\ robust) - 1/2\ (small\ weak + big\ weak)$$

Finally, the Investment Factor is denoted through "CMA" which is utilised by French (2021) to indicate "Conservative Minus Aggressive". The Investment Factor, as Equation 8 illustrates, is the average returns of two conservative and aggressive investment portfolios based on size.

Equation 8 Construction of the Conservative Minus Aggressive Factor

$$CMA = 1/2\ (small\ conservative + big\ conservative) - 1/2\ (small\ aggressive + big\ aggressive)$$

Unpacking the FF5 exhausts the models considered within this research. While other models are utilised to study ESG firm outperformance, the most commonplace models remain the FF3 and the FF5 which justify the two models' use in this study.

In conclusion, the previous subchapter (3.2) commences by unpacking the ESG rating approach which this study utilises, this subchapter (3.3) provides the development of the most commonly utilised multifactor asset pricing models in contemporary literature, the FF3 and the FF5. As the relevant financial performance metrics have been detailed, the following subchapter (3.4) evaluates the datasets which this study considers briefly, followed by the portfolio formation approach thereafter in subchapter 3.5. Chapter Three is then concluded in subchapter 3.6.

3.4. Datasets

As discussed in subchapter 3.2 above, this research makes use of the Bloomberg ESG Disclosure Scores for equities listed on the JSE from May 2009 until April 2021. Provided with the sample data, this research ranks equities according to ESG performance to form annual

investment portfolios for the period under consideration. The overall Bloomberg (2020a, 2020b) ESG Disclosure score considers several metrics, obtained from company reports, related to each ESG component in forming an overall company rating.[47] Given the methodology utilised, the Bloomberg ESG Disclosure score is applied to 58 companies during 2009, which constitutes the minimum number of securities considered as the amount increases to 105 companies subsequently. The evaluated equities represent the entire set of firms on the Bloomberg ESG Disclosure Score database for South Africa during the study period for which complete annual data is available.

Figure 6 Annual JSE companies with a Bloomberg ESG Disclosure Score and annual average Bloomberg ESG Disclosure Score for rated companies

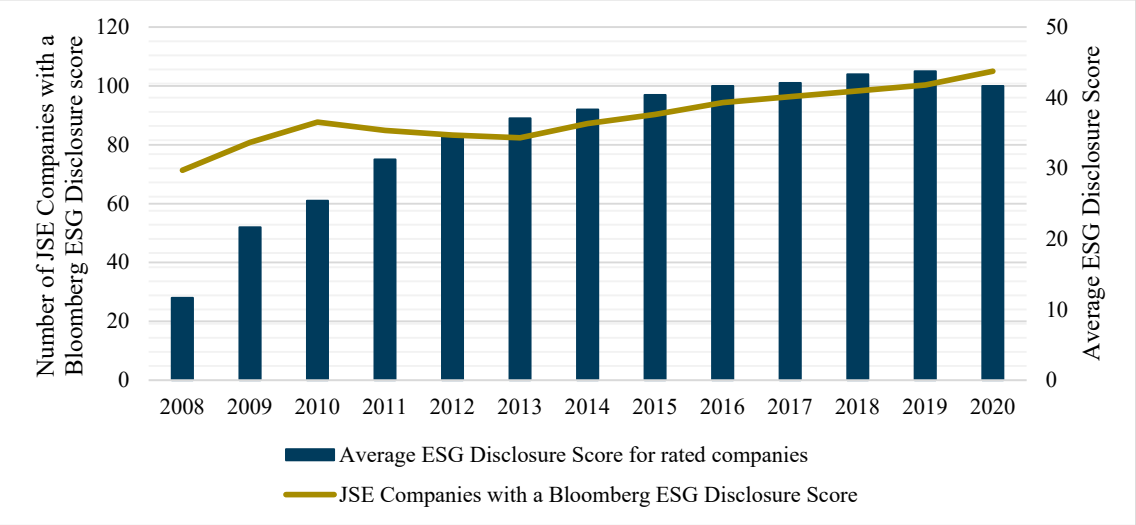


Figure 6 details the Bloomberg ESG Disclosure score universe for the period under consideration. The increase in both the number of firms as well as average scores is notable. While 2008 disclosed an average Bloomberg ESG Disclosure score of 33,3 for South African firms, the average Bloomberg ESG Disclosure score increases with 8,6 over the period to 41,9. Similarly, a total of 52 firms form part of the Bloomberg ESG Disclosure score during 2008 and the total number of firms more doubles to 105 in 2019. As noted in Chapter Two of this research, the Bloomberg (2020a) ESG Disclosure score only considers firms with a 30 million USD market capitalisation or greater. This limitation excludes some firms with smaller levels of capitalisation on the JSE from this research.

Given the available company ratings on the Bloomberg ESG Disclosure Data, a brief synopsis of the reasons for the data's utilisation is necessary as it impacts this research's approach.

[47] Please see subchapter 3.2 for further detail regarding the Bloomberg ESG Disclosure Score methodology.

Firstly, the business environment of ESG rating organisations has undergone a prolonged period of mergers, acquisitions, disruptions and consolidation which South Africa has not been excluded from (Avetisyan & Hockerts, 2017). As described in Chapter Two, examples hereof include the JSE SRI Index which was established in 2002 but substituted in 2015 for the Responsible Investment Index Series of the FTSE/JSE, or Morningstar's ESG rating division Sustainalytics, which was integrated into Morningstar's existing rating division during 2020 (Cohn & Reisch, 2020; JSE, 2021). Nevertheless, as the interest in ESG rating increases, so too the number of companies that disclose thereon and the quality of available SRI information (Louche et al., 2015) This increase in available data allows investors to better discern company ESG information in current and future portfolios but is not necessarily available for previous years, and may therefore not cover the entire period under consideration within this study (Louche et al., 2015).

Accordingly, to ensure the opportunity for comparison with other research pieces, it would not be viable to make use of, or transition from one rating agency to another during the research period or combine a few rating scores over differing periods. Using data that is not available at the time of the portfolio formation, a forward-looking bias may also be developed. When this fact is combined with the limited historical ESG data available on South Africa, the only commercially available data for the lengthy period of this study has been found to be provided by the Bloomberg ESG Disclosure scoring. For South African ESG Scoring, the Bloomberg ESG Disclosure score is the only unaltered ESG scoring system that provides time-series data on company ratings over the entire period in question.

Transitioning towards financial data, all relevant datasets are retrieved from the Thompson Reuters Refinitiv Eikon Database in light of the factors considered within the FF3 and the FF5. The factors are generated following the approaches suggested by Fama and French (1993) and Fama and French (2015) and are detailed in subsection 3.4.2 below. Regarding financial datasets, Refinitiv is specifically utilised for the following datasets over the total period under consideration, amounting to 144 months from May 2009 until April 2021. As is the convention with asset pricing tests, this study makes use of monthly data (Mosoeu & Kodongo, 2020). Accordingly, datasets are retrieved and analysed in a monthly format, using end-of-month data. The following specific datasets are retrieved to construct the relevant factors of the FF3 and FF5:

I. Three-month South African Treasury Bill rate; and

II. The total JSE All Share returns; and
III. The market capitalisation of the equities; and
IV. The book- and market values of the equities; and
V. The operating profit ratio of the equities is represented as the total annual revenue minus expenses; and
VI. The total growth of the individual companies' assets.

The book value, market value and operating profit are retrieved utilising last-twelve-month, monthly data while the total growth in assets is retrieved using current interim and previous interim data monthly. The datasets described are utilised to form the FF3 and the FF5 which are compiled following the equations presented in subchapter 3.3 hereabove. The sets of artificially constructed portfolios are constructed based on company ESG rating and company size. This formation process now follows in the following subchapter (3.5). Within subchapter 3.5 the portfolio formation process is detailed further, followed by subchapter 3.6 which concludes Chapter Three.

3.5. Portfolio formation and factor construction methodology

3.5.1. Portfolio formation

As Chapter Two develops, several methods allow for SRI to be incorporated into an investment portfolio. The methods utilised by investors in determining an appropriate SRI approach varies based on individual investor goals (Munoz et al., 2014). For example, an ecological or climate orientated fund may focus on a high Environmental Factor scoring and place less weight on the applicable Governance Factor. Similarly, a fund focussing on community development may weigh Social and Governance Factors more than Environmental Factors. When considering the analysis of ESG portfolio investments, Friede et al. (2015) suggest that three common approaches exist in contemporary literature. Firstly, existing literature considers the outperformance of SRI-orientated pooled investment funds.[48] Secondly, research is performed on SRI Index performance[49] and finally, artificial portfolios[50] are constructed based on specific strategies or factors (Friede et al., 2015).

[48] See, for example, Akiniolire and Smit (2003), Bauer et al. (2005), Bollen (2007), Hamilton et al. (1993), Madhavan et al. (2021) or Viviers et al. (2008).
[49] See, for example, Du Toit and Lekoloane (2018), Gladysek and Chipeta (2012), or Tripathi and Kaur (2020).
[50] See, for example, Díaz et al. (2021), Garcia et al. (2019), Statman and Glushkov (2009), or Yu et al. (2018).

Considering the first common approach suggested by Friede et al. (2015), the present research is particularly concerned with the financial performance of highly rated ESG firms and not with the formation of ESG-orientated funds. Should the study consider greater common factors among entities, such as pooled ESG investment vehicles, other challenges which may detract from the results of the study and the possible benefits of SRI come to the fore. For example, a pooled ESG investment would typically also carry manager experience, bias and transfer fees therein, complicating the results of the study and including investment manager preference therein (Munoz et al., 2014).[51] Considering the second common approach suggested by Friede et al. (2015), the performance of SRI Indexes over the long term is limited on the JSE. By making use of the FTSE/JSE Index for Responsible Investments, for example, the analysis would be restricted to the duration of the Index's existence from October 2015 onwards (JSE, 2021). Similarly, the predecessor of the current index, the JSE (2021) SRI Index, would constrain the periods under consideration from May 2004 to December 2015, excluding the recent surges in SRI interest and assets. Given the fact that both indexes make use of differing eligibility requirements, a combination of the two would also not provide uniform results (JSE, 2021).

Noting the limitations of the two other commonplace approaches, the third option suggested by Friede et al. (2015) is therefore utilised through the construction of an artificial set of portfolios. The portfolios are constructed with consideration for the overall Bloomberg ESG Disclosure scores of the companies listed on the JSE. Similar methodologies which form portfolios based on ESG scores are followed by Eccles et al. (2014), Statman and Glushkov (2009), Nollet et al. (2016), Yu et al. (2018), as well as Johnson et al. (2019) in South Africa.

The specific approach utilised to form the Left-Hand Side[52] portfolios corresponds with the work performed by Halbritter and Dorfleitner (2015) and Johnson et al. (2019) as portfolios are constructed from both the market capitalisation and the ESG score of each of the rated JSE listed equities. Both factors are incorporated within the portfolio formation process by utilising company market capitalisation as the first factor which divides equities according to the 30th and 70th percentile. Companies with a market capitalisation above the 70th percentile are ranked

[51] While more challenging, it is still possible to recognise manager performance in ESG fund performance. For example, Munoz *et al*. (2014) evaluate the comparative performance of US and European green funds utilising the combination of the four-factor Carhart (1997) and the Treynor and Mazuy (1966) model to account for fund manager timing.
[52] Hereinafter referred to as 'LHS'.

'big', while companies within the 30th and 70th percentile are ranked 'middle', and the remaining companies are ranked 'small'.

Ranking of companies according to their relevant Bloomberg ESG Disclosure Scores forms the second portion of the LHS portfolio formation process. Companies are ranked into three categories and are divided by breakpoints forming from the 30th and 70th percentile. Companies above an appropriate 70th percentile are referred to as ranking 'high', while companies within the 30th to 70th percentile band are ranked 'middle', and the remaining companies are ranked 'low'. This approach is commonly referred to as a 3 x 3 sort. The breakpoints serve to define the following characteristics of the nine portfolios as detailed in Table 2:

Table 2 Left-Hand Side portfolio characteristics

P 1	Large market capitalisation and high ESG Score
P 2	Large market capitalisation and middle ESG Score
P 3	Large market capitalisation and low ESG Score
P 4	Middle market capitalisation and high ESG Score
P 5	Middle market capitalisation and middle ESG Score
P 6	Middle market capitalisation and low ESG Score
P 7	Small market capitalisation and high ESG Score
P 8	Small market capitalisation and middle ESG Score
P 9	Small market capitalisation and low ESG Score

Grouped according to the abovementioned factors, a more appropriate set of results are anticipated in line with the portfolio's size. The artificial portfolios are value-weighted, with portfolio rebalancing taking place annually on 1 May since most of the Bloomberg ESG Disclosure Scores of the rated equities are updated from December to April annually. Accordingly, 1 May serves as the most appropriate date to rebalance portfolios to account for the latest scoring applicable for each of the rated equities.

The comparative benefit of equally weighting portfolios to that of value weighting, as this study performs, is that the approach allows for firms with a smaller market capitalisation to gain additional weight. However, speaking to the critique in Chapter Two that larger firms tend to benefit more from ESG disclosure, this research addresses the matter through the portfolio formation process which accounts for market capitalisation therein (Dorfleitner et al., 2015).

Accordingly, the addition of equally weighting portfolios is not considered in this study as the benefits thereof are included within the portfolio formation process.

The constructed portfolios are formed annually on 1 May based on the available Bloomberg ESG Disclosure score and company market capitalisation as accurate at that time when portfolio formation takes place to avoid a look-ahead bias. As additional companies receive Bloomberg ESG disclosure ratings, the companies are added to the group of portfolios based on the latest disclosure score available on 30 April annually alongside the relevant market capitalisation. Should an equity not have been allocated an ESG score, become delisted, or lack any other necessary data, it is excluded from all portfolios from the year in question. In so doing, it is necessary to note at this stage that due to the LHS portfolio formation process, no large market capitalisation companies scored a low ESG Disclosure Score during the 2013/2014 year. Therefore, the intersection between large market capitalisation (large size assets denoted as B within the portfolio formation process) and low ESG score (denoted as L within the portfolio formation process) yielded zero firms for 2013/2014. Portfolio 3 is therefore excluded from the regressions analysed in Chapter Four.

Fees and transfer costs are not considered within this study as it is primarily concerned with the comparative performance of rated ESG equities while the inclusion of such factors would impact on results. The suggested portfolio formation commences on 1 May 2009 with Bloomberg ESG Disclosure scores and equities' market capitalisation both accurate on 30 April 2009. The constructed portfolios are then rebalanced annually based on both the Bloomberg ESG Disclosure score and market capitalisation. The final year in which the portfolios are constructed commences on 1 May 2020 and concludes on 30 April 2021.

The FF3 and the FF5 are deployed to ascertain whether the highly rated ESG portfolios provide outperformance in terms of factor model alpha values. To form the FF3 and the FF5 in this research, the methodology is unpacked in subsection 3.5.2 below. Subsequent to considering the factor construction methodology, Chapter Three is concluded in subchapter 3.6.

3.5.2. Factor construction methodology and factor accuracy

Considering the nine portfolios described in the previous subsection, this study regresses the excess portfolio returns of each of the nine portfolios formed against both the factors of the FF3 and FF5 models utilising the Ordinary Least Squares method. The appropriate equities universe of this research dissertation is the JSE ALSI, and data from the entire period under consideration is utilised in constructing the factors. For each month evaluated, the factors are

defined according to the approaches utilised by Fama and French (1993) and Fama and French (2015). Table 3 below details the factor variables further.

Table 3 Factor variables' definitions

R_{ft}	The monthly rates of a three-month South African Treasury Bill are utilised as the risk-free rate.
R_M	The market portfolio's rate of return is defined as the total return of the JSE All Share Index.
SMB	The Size Factor is generated from the book values, the market values, the operating profit and investment as defined in Equations 3 and 6 (Fama & French, 1993).
HML	The Value Factor is constructed from the ratio of book values to market values. To form the ratio, the company's book value as lagged by six months is divided by the market value of the company (Fama & French, 1993). Equation 4 details the approach utilised in constructing the factor.
RMW	The Profitability Factor is defined from the operating profit (consisting of the total annual revenue minus expenses) to the book value of the company one year prior (Fama & French, 2015). The construction of the factor is detailed in Equation 7.
CMA	The growth in total company total assets six months prior to the end of the current month is utilised in creating the Investment Factor (Fama & French, 2015). Equation 8 further defines the Investment Factor's construction.

To create the factors described within the FF3, this study utilises a two-way portfolio sorting methodology (Fama & French, 1993). Thereby, all equities are ranked based on their size score, as determined by their appropriate market capitalisation. The 50th percentile then serves as the breakpoint between 'big' and 'small' equities. In addition, equities are ranked independently based on their appropriate factor scores. Each of the factor scores has breakpoints at the 30th and 70th percentiles and create three subsets. Combining the size and factor rankings provides six equal-weighted portfolios. The factors are rebalanced annually on 30 April in line with the annual portfolio formation.

Should the FF3 and the FF5 adequately explain the returns of the relevant portfolios, an intercept of 0 is expected, indicating no alpha value. Nevertheless, while the FF3 and the FF5

are the most widely applied factor pricing models, there exist some notable limitations, particularly in the South African environment (Charteris et al., 2018; Mosoeu & Kodongo, 2020). In the study by Mosoeu and Kodongo (2020), the FF5 failed to explain the cross-section of average excess returns in the South African market. The weak performance has also been found by Bermejo Climent et al. (2021) in considering *ESG Disclosure and Portfolio Performance* within European markets. Some alternative factors which may have significant valuation factors in the South African context include aggregate liquidity, political risk, as well as capital market flows, size, and volatility (Bekaert & Harvey, 2003; Hearn & Piesse, 2008)

To further test the ability of the FF3 and the FF5 within this research, the model pricing error approaches utilised by Fama and French (2018) in constructing their six-factor model are applied in this research. Hence, this study performs a total of five additional tests to evaluate the pricing errors of the FF3 and the FF5 in line with Fama and French (2018). Of the pricing error tests undertaken by Fama and French (2018), the first is Griffin's (2002) average absolute alpha value which is denoted as $A|a_i|$. The average absolute alpha value evaluates the extent of mispricing of a factor model as detailed in Equation 9 below (Sha & Gao, 2019).

Equation 9 Griffin's average absolute alpha value

$$A|a_i| = \frac{1}{N}\sum_{N=1}^{N}|a_i|$$

Where

N	Number of constructed portfolios
a_i	Alpha value of fund *i*

The second ratio utilised by Fama and French (2018) is the average squared alpha values, which is denoted as Aa_i^2, divided by the average squared return value between each of the constructed portfolios and the value-weighted market, which is denoted as $A\bar{r}_i^2$. Collectively the relation is represented by $Aa_i^2/A\bar{r}_i^2$ and is utilised by Fama and French (2018) to evaluate the dispersion of intercepts between the FF3 and the FF5 to the actual excess portfolio returns.

To account for sampling errors, the third metric is denoted as $As^2(a_i)/Aa_i^2$, or the alpha values' squared standard error average, $As^2(a_i)$, divided by the average alpha value squared Aa_i^2 (Fama & French, 2018). A higher $As^2(a_i)/Aa_i^2$ value would be indicative of better asset pricing model performance (Sha & Gao, 2019). To compute the two portions of this metric, the

approach of Sha and Gao (2019) is utilised to determine the average value of the portfolio alphas $\bar{a}_i$ as well as the $As^2(a_i)/Aa_i^2$ described in Equation 10 below.

Equation 10 Construction of $As^2(a_i)/Aa_i^2$

$$\bar{a}_i = \frac{1}{N}\sum_{N=1}^{N} a_i$$

$$As^2(a_i) = \frac{1}{N-1}\sum_{N=1}^{N}(a_i - \bar{a}_i)^2$$

$$Aa_i^2 = \frac{1}{N}\sum_{N=1}^{N} a_i^2$$

Fourthly, AR^2, or the average of the regression R^2 also serves as a measure of an asset pricing model's performance (Fama & French, 2018). In comparing the FF3 and the FF5, a larger AR^2 indicates better performance. Finally, the study also makes use of the test described by Gibbons, Ross and Shanken (1989), or GRS, to evaluate the pricing errors of the FF3 and the FF5.[53] The GRS test evaluates the extent to which the returns realised within each portfolio is accounted for by either the FF3 or the FF5. The GRS statistic is defined by Fama and French (2018) and is provided in Equation 11 below.

Equation 11 GRS statistic

$$\text{GRS} = \gamma\left(\frac{1+Sh^2(\omega,f)}{1+Sh^2(f)} - 1\right)$$

Where

γ	Function of total observations, factors and LHS portfolios
ω	The Sharpe ratio of all the LHS portfolios (see Equation 1)
f	The Factors of the model

The outcome of the five additional tests suggested by Fama and French (2018) are reported in subchapter 4.5. More generally, Chapter Four analyses the findings made from applying the methodology considered within Chapter Three. Chapter Four follows below subsequent to this chapter's conclusion in the following subchapter (3.6).

[53] Hereinafter, the Gibbons, Ross and Shanken (1989) test is denoted by the acronym GRS.

3.6. Conclusion

Within Chapter Two, existing South African literature on ESG factors and firm performance is provided. Chapter Two establishes that the majority of literature on company ESG scoring performance and financial performance in South Africa tend to consider ESG performance over a short period or utilise financial measures which do not consider risk. Additionally, studies are yet to include periods following the initial global outbreak of COVID-19 on SRI over longer periods extending beyond 10 years.

Accordingly, Chapter Two sets the framework and intention of this study in considering the period of both the influence of COVID-19 and the aftereffects of the global financial crisis through risk-adjusted financial performance measures. Chapter Three, in turn, commences by unpacking the measures that this study utilises in considering both ESG scoring performance and firm financial performance. It is highlighted that despite the existing uncertainties regarding ESG ratings, for this research's purposes, the Bloomberg ESG Disclosure rating is utilised as a rating metric. Chapter Three then develops the FF3 and the FF5 and details the datasets utilised within the study. Finally, the methodology utilised to form the portfolios and pricing factors for the study is unpacked. As the specific approach has been detailed within this chapter (3), Chapter Four unpacks the findings which flow therefrom in what follows.

Chapter Four: Data analysis and discussion

4.1. Introduction

Within the third chapter, this research's approach is unpacked. The findings gleaned from the methodology are reported in this chapter (4). The purpose of Chapter Four is to evaluate the hypotheses formulated within Chapter One, in line with Chapter Three's methodological approach and with consideration of the literature explored within Chapter Two. Chapter Four, therefore, serves as the culmination of the research question which arises within Chapter One. Chapter Five, in turn, concludes this research dissertation and summarises the findings presented within this chapter (4).

The analysis presented within Chapter Four commences with an evaluation of the statistics applicable to the datasets of this study in subchapter 4.2. The initial overview of subchapter 4.2 contextualises the findings of this research and highlights some notable characteristics of the portfolios constructed on the JSE. Provided with an outline of the shape and contents of the applicable datasets, subchapter 4.3 reports the findings of the FF3 and the FF5 regressions of the excess returns of each constructed portfolio. Subchapter 4.3 further analyses the regression outputs and situates the findings in light of the literature considered within Chapter Two. Insofar as this research's hypothesis and research question are concerned, subchapter 4.3 provides essential analysis in determining the potential outperformance of a portfolio of highly rated ESG assets to that of their middle-, and low rated counterparts in the South African context. Subchapter 4.4 then unpacks the portfolio regressions by presenting the portfolio factor loadings. As the results from the factor model regressions are then complete, the outcomes of the factor spanning tests utilised by Fama and French (2018) are presented in subchapter 4.5. Transitioning towards the conclusion, subchapter 4.6 summarises the collective results reported in Chapter Four and thereafter concludes the chapter (4). Chapter Five briefly recapitulates the findings of Chapter Four in light of the rest of the study. To commence with this chapter (4), on the other hand, the descriptive statistics of the datasets are first provided in subchapter 4.2 directly below.

4.2. Descriptive statistics on portfolio ESG and excess returns

Analysing the descriptive statistics of a dataset allows for a greater appreciation of the general characteristics of the data utilised for this research. In this subchapter (4.2), the descriptive statistics of the constructed portfolios are provided by considering the ESG scoring of the constructed portfolios, followed by the statistics of the risk-adjusted returns of each of the

portfolios. For both ESG scoring and excess returns, the descriptive statistics provide noteworthy findings which are developed and analysed alongside the statistical reports. The first dataset which this subchapter (4.2) considers, relates to the Bloomberg ESG scoring of the listed equities.

Table 4 details the descriptive statistics of the company Bloomberg ESG Disclosure Scores *per annum*. Performing a cursory evaluation of the descriptive statistics of Table 4 provides two clear patterns. Firstly, the number of companies that had been allocated Bloomberg ESG Disclosure Scores increased significantly over the period under consideration from 2009 to 2020. While 2009 had only 63 companies evaluated on the JSE, this total increased to 106 in 2020. The increase in the number of companies is in line with Bloomberg's (2020a) intention to evaluate greater numbers of companies with more extensive worldwide coverage. The findings regarding the number of companies evaluated also restate Figure 6's trend which subchapter 3.4 reports above. In summary, Figure 6 graphically details the increase in both the number of JSE listed securities that form part of the Bloomberg ESG Disclosure rating as well as the increase in the average scores of the rated securities. The increase also reflects the amplified attention afforded to ESG factors in the investment field, which subchapter 2.3 develops.

Table 4 ESG scoring per annum

	Minimum	Maximum	Median	Mean	Standard Deviation	Companies
2009	10,53	60,74	36,40	32,45	11,02	63
2010	10,05	59,92	39,67	32,61	13,09	65
2011	7,44	62,28	38,16	31,27	14,82	77
2012	5,37	63,22	34,17	30,15	16,14	84
2013	7,44	66,53	36,38	30,43	14,94	90
2014	7,44	59,92	38,76	33,34	14,26	93
2015	7,44	60,58	40,08	34,62	13,85	101
2016	7,44	64,05	40,79	36,48	13,45	102
2017	7,44	64,05	41,85	37,16	13,29	102
2018	9,21	65,29	41,32	38,62	12,71	105
2019	11,84	66,94	43,60	39,59	12,78	106
2020	11,84	66,94	44,63	40,15	13,06	106
Entire Period	5,37	66,94	39,71	34,74	13,96	63-106

Secondly, there is an increase in the ESG scores awarded to companies from 2009 to 2020. Where scores had a median value of 36,4 and a mean value of 32,45 in 2009, these scores increased over the period to 44,63 and 40,15 respectively in 2020. The minimum and maximum results suggest the same trend as the mean and median values. Over the entire period, the minimum score increased from 10,53 to 11,84, while the maximum score increased from 60,74 to 66,94. The increase in company scoring may be due to increased firm attention to ESG matters over the period under consideration, as considered in Chapter Two. Complementary to the increased attention to ESG matters, the Material Information Theory discussed within subsection 2.2.1 suggests that increased information regarding firm ESG scores may have come to develop as the market increasingly recognises the value of ESG factors in investment decision making, influencing firm reporting (Sherwood & Pollard, 2018). Alternatively, given the fact that greater numbers of securities are included as the period of evaluation develops, more ESG-orientated firms may have been subjected to the Bloomberg ESG Disclosure Scoring in later years through the increased sample.

Table 5 further considers the descriptive statistics of the Bloomberg ESG Disclosure Scores but does so in terms of each portfolio rather than *per annum* as performed in Table 4. For each of the constructed portfolios, Table 5 provides a set of descriptive statistics for the entire 12-year period apart from Portfolio 3. As reported in Chapter Three above, no intercept of large market capitalisation companies and low ESG ratings existed for 2013 and, as such, the portfolio is only formed for 11 years, in comparison to 12 years for each of the other portfolios.

Table 5 Portfolio ESG scoring

	Minimum	Maximum	Median	Mean	Standard Deviation	Annualised Securities
P 1	41,74	66,94	54,82	54,92	5,29	12,42
P 2	24,79	49,17	39,91	39,61	5,23	9,08
P 3	11,84	35,12	26,86	24,76	6,38	2,54[i]
P 4	41,63	62,81	51,24	51,65	4,60	8,33
P 5	24,79	49,17	39,26	38,84	5,69	15,58
P 6	9,92	37,19	22,31	21,06	7,44	8,42
P 7	41,74	60,09	49,17	50,15	4,76	2,83
P 8	26,03	49,17	40,50	39,87	5,56	8,58
P 9	5,79	37,19	21,49	20,03	7,06	13,42

[i] As no large market capitalisation, low ESG rating companies exist for the 2013 portfolio, Portfolio 3's value is divided by 11 rather than 12 to represent the average number of companies for each year in which the portfolio has been formed.

From Table 5, some notable trends are present. Firstly, while the highly-rated ESG portfolios (Portfolio 1, 4 and 7) have comparative mean values, the mean of the ratings decreases from 54,82 to 49,17 as the size of the market capitalisation decreases. The same holds for the median of the three highly rated ESG portfolios (Portfolio 1, 4 and 7). Relatively, the median and means of the middle ESG rated portfolios (Portfolio 2, 5 and 8) are closer with a variation of approximately 1,2 points in terms of the mean and 0,6 points in terms of the median. The low ESG rated portfolios (Portfolio 3, 6 and 9) on the other hand, reflect the same trend as the highly-rated ESG portfolios (Portfolio 1, 4 and 7) as the median and mean rating decreases from 26,86 and 24,76 to 21,49 and 20,03 as the market capitalisation decreases.

As evidenced from Table 5, the fact that ESG scoring decreases with market capitalisation implies that larger firms with higher market capitalisations tend to score greater in terms of the ESG factors. This finding echoes the research of Boubaker et al. (2018), Demetriades and Auret (2014), and Du Toit and Lekoloane (2018) in suggesting that a size bias exists within ESG scoring. The finding also highlights the importance of the portfolio formation process which this study undertakes by forming portfolios based both in terms of market capitalisation and ESG scoring. The portfolio sorting process provides for more adequate comparison as a portfolio with equities providing large market capitalisation and high ESG scores (Portfolio 1) is compared appropriately to other portfolios with large market capitalisations (Portfolio 2 and 3). Similarly, firms with medium and small market capitalisations can also be compared within their respective market capitalisation sizes.

The size variation of the portfolios is also notable. Within the large market capitalisation portfolios (Portfolio 1, 2 and 3), most firms fall within the highly rated ESG portfolio (Portfolio 1). The large market capitalisation portfolios contrast with the middle market capitalisation portfolios (Portfolio 4, 5, and 6) where the highly rated and low rated ESG portfolios are represented by a similar number of companies with the majority of companies scoring middle ESG ratings. On the other hand, the low market capitalisation portfolios (Portfolio 7, 8 and 9) are a near inverse of the large market capitalisation portfolios. While the average number of low rated ESG companies with a large market capitalisation is 2,33, the average number of highly rated ESG companies with a small market capitalisation is 2,83. Correspondingly, middle ESG score companies with large market capitalisation have an N value of 9,08 while middle ESG score, small market capitalisation companies have an N value of 8,58. Considering Tables 4 and 5, a clear trend exists for large market capitalisation companies to score higher ESG ratings while small market capitalisation companies score lower ESG ratings.

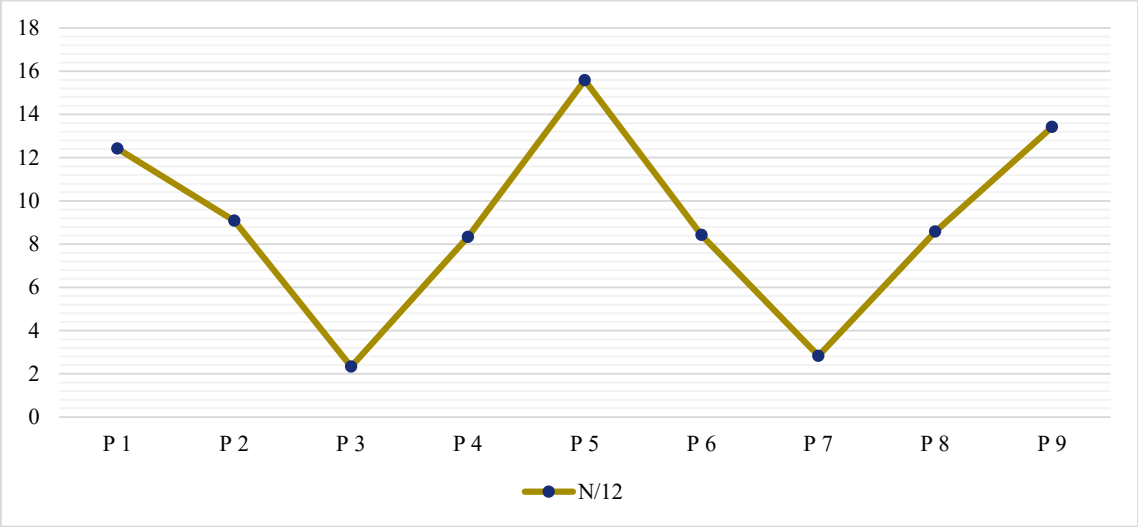
As subchapter 3.2 considers, the correlation between highly rated ESG equities and high market capitalisation may be indicative of the findings by Dorfleitner et al. (2015) that firms with greater market capitalisation tend to have greater available reporting resources performing disclosure functions, and therefore receive greater ESG Disclosure scores (Dorfleitner et al., 2015). In the context of the FF3, firms with larger market capitalisations tend to provide less excess returns on the market than that of their smaller counterparts, as the Size Factor considers within Equation 3 of subsection 3.3.1 hereabove. Collectively, these two considerations would suggest that highly rated ESG scoring portfolios with medium and small market capitalisations (portfolios 4 and 7) would provide superior outperformance to that of the high market

capitalisation, high ESG scoring portfolio (Portfolio 1). The findings also indicate a possible divergence for the South African market to that of the U.S.A. As Chapter One reports, Payne (2021) suggests that firms with high ESG scores and large market capitalisations tend to outperform their counterparts with lower ESG scores over a five-year period. Considering Dorfleitner et al. (2015) alongside the construction of the Size Factor by Fama and French (1993), this research would suggest that superior outperformance can be achieved within portfolios consisting of middle and smaller market capitalisation firms.

The average number of companies per portfolio is provided in Figure 7 below. Figure 7 reiterates the trends reported above in Table 4 and Table 5 because it illustrates the positive relationship between company market capitalisation and company ESG score for both large market capitalisation portfolios and small market capitalisation companies (portfolio 1, 2, 3, and portfolio 7, 8, 9). The illustration made within Figure 7 only further confirms the importance of creating portfolios based on both ESG score and market capitalisation in comparison to merely based on ESG score. Figure 7 also illustrates that medium market capitalisation firms are inclined to present medium ESG scores while small market capitalisation firms are inclined to present low ESG scores. For medium and small market capitalisation companies, the mean and median ESG scoring increase marginally over the 12-year period. Contrary to the findings of Chatterji and Toffel (2010) considered within subchapter 2.5, the static ESG scores of the medium and small market capitalisation companies suggest that firm management at their respective market capitalisation levels do not consider rapidly improving their scores in the South African market. On the Standard and Poor's indexes, Chatterji and Toffel (2010) find the contrary applies to the MidCap 400 and SmallCap 600. Accordingly, beyond the increased available resources already considered, the distribution within Figure 7[54] may suggest that ESG factors tend to receive increased emphasis in firm management as firm size increases, as Dixon-Fowler et al. (2013) and Schoenmaker and Schramade (2019) consider within subsection 2.2.2 above.

[54] Within Figure 7, the 'P' and the accompanying number refers to each constructed portfolio. For Portfolio 3, the total equities constituting the portfolio are divided by 11 rather than 12 to correctly indicate the number of years in which the portfolio has been formed.

Figure 7 Average number of equities included per portfolio



Transitioning towards the returns of the constructed portfolios, Table 6 details the descriptive statistics from 2009 to 2021. In addition, Table 6 further provides the Sharpe (1994) ratios of each of the portfolios for the entire period.

Table 6 Portfolio excess returns

	Minimum	Maximum	Median	Mean	Standard Deviation	Skewness	Kurtosis	Sharpe Ratio	Total Observations
P 1	-0,3194	0,3649	0,0145	0,0100	0,1040	0,0565	1,5839	0,0966	144
P 2	-0,3392	0,3069	0,0162	0,0150	0,1043	-0,4697	2,1387	0,1442	144
P 3	-1,0189	0,6199	0,0225	0,0082	0,1675	-1,6150	11,7617	0,0490	132
P 4	-0,3349	0,3412	0,0077	0,0162	0,1108	0,0436	1,3260	0,1464	144
P 5	-0,3533	0,2696	0,0076	0,0099	0,1010	-0,5088	2,0247	0,0981	144
P 6	-0,3123	0,3441	0,0100	0,0122	0,1022	-0,3551	2,0219	0,1198	144
P 7	-0,3798	0,5155	0,0212	0,0222	0,1190	0,2309	3,4159	0,1865	144
P 8	-0,3470	0,2890	0,0137	0,0103	0,1033	-0,4630	2,0497	0,0993	144
P 9	-0,4489	0,2657	0,0166	0,0137	0,1012	-0,9655	3,5385	0,1356	144

From Table 6, the three constructed portfolios allocated with the largest excess returns are Portfolios 7, 4, 2. The three constructed portfolios with the smallest mean excess returns are

Portfolios 3, 5 and 1 respectively. Portfolio 5 also has the lowest standard deviation, followed shortly by Portfolio 9. Comparatively, Portfolios 3, 7 and 4 have the highest standard deviation.

Both Portfolio 7 and Portfolio 4 consist of highly rated ESG equities within their respective market capitalisation levels. The high standard deviation of the two highly rated ESG portfolios, in comparison to the middle and low rated ESG portfolios, may be indicative of the critique raised by Becchetti et al. (2015) within subsection 2.2.3 hereabove. Becchetti et al. (2015) suggest that ESG-orientated firms tend to be more vulnerable to negative production shocks, causing increased return volatility as firms are comparatively constrained in terms of their responses to production shocks. However, the standard deviation of Portfolio 1 does not replicate the volatility levels of Portfolio 7 and Portfolio 4. Portfolio 1's high market capitalisation, high ESG rated portfolio may therefore be an example of the contrary argument to that of Becchetti et al. (2015). As subsection 2.2.3 details above, Payne (2021) suggests that ESG-orientated firms tend to be more adaptable to shifts in business environments, a perception that stimulated ESG-orientated firm investment inflows during 2020. Alternatively, the lack of corresponding volatility in Portfolio 1 may exist due to the greater level of resources that larger market capitalisation companies may utilise in reporting functions, as subchapter 3.2 considers.

In addition to the descriptive statistics, Table 6 also provides the Sharpe (1966) ratios of each of the portfolios as defined within Equation 1 of subchapter 3.3. The highest Sharpe (1966) ratios are recorded by portfolios 7, 4 and 2. Both portfolios 7 and 4 include highly rated ESG companies grouped according to their respective market capitalisation. Although Portfolio 7 and Portfolio 4 have some of the highest reported standard deviation values, these portfolios still have the greatest ratio of risk premium to risk in terms of the portfolios' standard deviation (Bodie et al., 2012). Notably, Portfolio 3 has the lowest Sharpe (1966) ratio of all the constructed portfolios, followed by Portfolio 1 and Portfolio 5. Table 6 further repeats the fact that Portfolio 3 is only formed for 132 months, in comparison to 144 months for the other portfolios. Both the portfolios with the lowest and second-lowest Sharpe (1966) ratios are found within the large market capitalisation groupings.

The Sharpe (1966) ratio introduces the returns of each portfolio, adjusted for risk. Subchapter 4.3 further evaluates the risk-adjusted returns while the final figure which this subchapter (4.2) considers is the cumulative returns for each portfolio. Accordingly, Figure 8 provides a visual representation of the cumulative returns of 8 constructed portfolios for the entire period of 144 months, from May 2009 until April 2021. Portfolio 3 is excluded from Figure 8 since no high

market capitalisation, low ESG rated companies existed for the 2013 period, as Chapter Three explains above. Portfolio 3 is also not reported within the regression results in the following subchapter (4.3) for this reason.

As Figure 8[55] illustrates, Portfolio 7 has the highest cumulative returns of all the portfolios by some margin. The second-highest returns are achieved by Portfolio 4 and the third-highest returns are achieved by Portfolio 2. Contrariwise, portfolios 5, 1 and 8 provide the lowest returns over the period.

Markedly, the three portfolios providing the lowest returns (portfolios 1, 5 and 8) have comparative end values. Portfolio 1 provides the least returns from March 2012 until February 2020. This accounts for a complete 8-year period during which the high market capitalisation, highly rated ESG companies provided the lowest returns of any of the other constructed portfolios. From the end of February 2020, Portfolio 1 performs in line with portfolios 5 and 8. Finally, at the end of April 2021, Portfolio 8 offers returns of 147,63% while Portfolio 1 offers returns of 144,56% and Portfolio 5 offers returns of 142,56%. Accordingly, less than 6% in returns separates the three portfolios. Both Portfolio 5 and 8 consist of middle scoring ESG equities with Portfolio 8 considering small capitalisation securities and Portfolio 5 considering middle capitalisation securities.

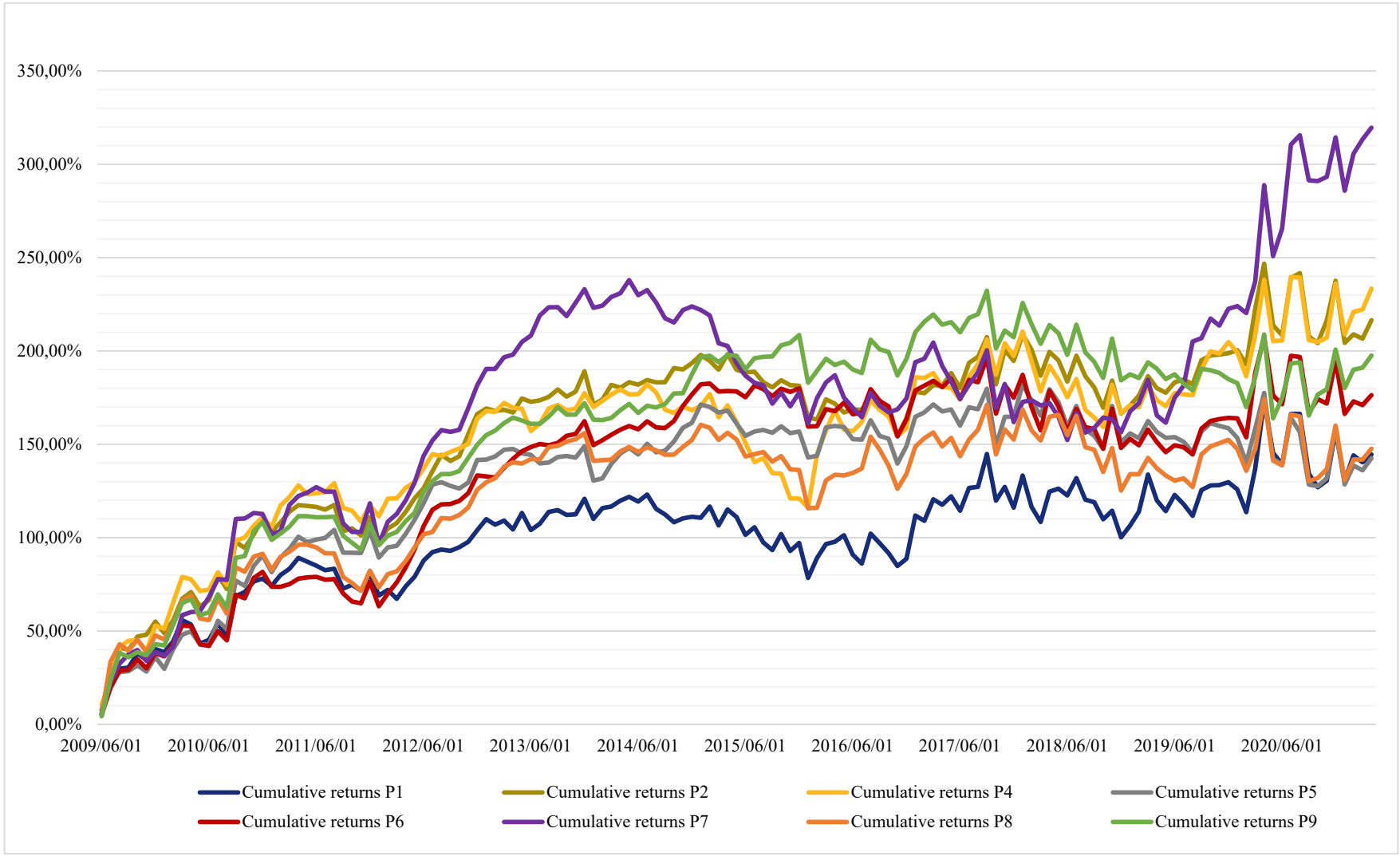
In comparison, the portfolio offering the highest returns over the period outperforms the second-highest performing portfolio by 86,12%. Consequently, Portfolio 7 offers returns amounting to 319,58% while Portfolio 4 offers returns amounting to 233,46%. While Portfolio 7 provides the highest returns of the portfolios considered from July 2019 onwards, the portfolio suffers the same notable downswing periods of the other portfolios from May 2020 onwards. However, Portfolio 7 also provides the highest returns of the constructed portfolios from the end of June 2012 until April 2015 at which stage Portfolio 9 provides the highest returns. Only from the end of July 2019 is Portfolio 9 again outperformed by Portfolio 7 and shortly thereafter, in August 2019, by Portfolio 4 and Portfolio 2. From the end of March 2020, Portfolio 9 and Portfolio 6 provide nearly identical returns until the end of January 2021, at which stage Portfolio 9 deviates from Portfolio 6.

The significant variation in returns over the entire period highlights the importance of evaluating ESG portfolios over an extended period as suggested by Schoenmaker and

[55] Figure 8 follows on the final page of this subsection below.

Scharamade (2019), Johnson *et al.* (2019), Tripathi and Kaur (2020), Akiniolire and Smit (2003) and Ortiz-de-Mandojana and Bansal (2016). This research dissertation evaluates a period beyond the common five- and ten-year horizons and also recognises the findings of the CFA Institute (2020a) in suggesting that ESG portfolios tend to only evidence outperformance over the long term. While this subchapter (4.2) considers the descriptive statistics of the constructed portfolios, subchapter 4.3 further articulates the analysis by evaluating the outcomes of the portfolio regressions below.

Figure 8 Cumulative returns of constructed portfolios



4.3. ESG portfolio regressions

Subchapter 4.2 contextualises the findings of this research dissertation by evaluating the descriptive statistics of this research. From the background provided, this subchapter (4.3) provides a greater evaluation of the returns of the constructed portfolios adjusted for risk. Subchapter 4.4 then considers the variables which impact portfolio excess returns and those which do not.

In the context of constructed portfolios broadly, the alpha value of a factor model regression is an indication of the attractiveness of a portfolio of securities (Bodie et al., 2012). Portfolios with positive alpha values provide outperformance beyond the outperformance attained from the portfolio's ability to track a relevant market index (Bodie et al., 2012). A positive alpha value, therefore, acts as an indicator of under-pricing while a negative alpha value indicates over-pricing. Applied to the FF3 and FF5, the alpha values represent the unexplained abnormal returns of each portfolio which are not accounted for by the respective models' factors (Fama & French, 1992). Table 7[56] presents the alpha values of each of the portfolios for the entire 144 months under consideration, from May 2009 until April 2021.

Table 7 Portfolio alpha results

	FF3			FF5		
	Alpha value	t-statistic	Probability value	Alpha value	t-statistic	Probability value
P 1	0,003294	1,694545	0,0924	0,003535	1,823981	0,0703
P 2	0,005930	2,185982	0,0305	0,006124	2,244253	0,0264
P 4	0,008407	2,4523304	0,0154	0,006926	2,239287	0,0267
P 5	-0,000258	-0,117724	0,9065	-0,000532	-0,243724	0,8078
P 6	0,002372	0,999344	0,3194	0,001936	0,824977	0,4108
P 7	0,013965	2,455778	0,0153	0,012675	2,276246	0,0244
P 8	0,000584	0,228122	0,8199	0,0000846	0,033396	0,9732
P 9	0,003612	1,324181	0,1876	0,002761	1,059732	0,2911

[56] Within Table 7, 't-statistic' is utilised to indicate the Hypothesis Test Statistic value. Portfolio 3 is excluded from this portion of the report for reasons detailed in subsection 3.5.1 *supra*.

Taken as a whole, the alpha values of all the constructed portfolios are rather small. For both the FF3 and the FF5. However, Portfolio 7 has the highest alpha value and has statistical significance at the 5% level. Portfolios 4 and 2 report the second and third highest alpha values, with statistical significance at the 5% level.

The three portfolios with the lowest alpha values are also identical for the FF3 and FF5. Portfolio 5 is the only portfolio of the 8 reported portfolios with a negative alpha value. However, the probability value of Portfolio 5 indicates statistical insignificance for both the FF3 and FF5. The portfolios with the second and third lowest alpha values, Portfolio 8, and Portfolio 6, similarly indicate statistical insignificance.

Notably, the only divergence in alpha value rankings between the FF3 and the FF5 is concerning Portfolio 1 and Portfolio 9. While the FF3 indicates that Portfolio 9 outperforms Portfolio 1 in terms of alpha values, the FF5 indicates the inverse. For the FF3, Portfolio 1 is allocated an alpha value of 0,00329 while Portfolio 9 is allocated an alpha value of 0,00361. However, Portfolio 1's probability value has statistical significance at the 10% level, whereas the probability value of Portfolio 9 is statistically insignificant. For the FF5, Portfolio 1 has an alpha value of 0,00354 while Portfolio 9 has an alpha value of 0,00276. The comparative alpha values of Portfolio 9 indicate that the FF5 has increased explanatory power to that of the FF3. Similar to the probability values of the FF3, Portfolio 1's alpha value has statistical significance at the 10% level and Portfolio 9's alpha value is statistically insignificant. Alongside Portfolio 9, the FF5 has greater explanatory power for portfolios 4, 6, 7, and 8 and less explanatory power for portfolios 1, 2 and 5 to the FF3.

Considering the results of both the FF3 and FF5, the excess returns of a portfolio of large market capitalisation, highly rated ESG securities cannot be fully explained by either model at a 10% level of significance. The probability value of Portfolio 1's alpha value equals 0.0924 for the FF3, and 0.0703 for the FF5. Sufficient evidence exists to reject the null hypothesis with statistical significance at the 10% level, but not at the 5% or 1% levels. For a portfolio of middle-market capitalisation, highly rated ESG securities and a portfolio of small market capitalisation, highly rated ESG securities, the FF3 and FF5 fail to explain returns at the 5% significance level.

Portfolio 4 provides probability values of 0,0154 and 0,0267 for the FF3 and FF5 while Portfolio 7 provides probability values of 0,0153 and 0,244. Accordingly, sufficient evidence

exists to reject the null hypothesis at both the 10% level and the 5% level of statistical significance, but not for a 1% level for Portfolio 4 and Portfolio 7.

For middle ESG scoring portfolios across all market capitalisation groupings, Portfolio 2 is the only portfolio with a statistically significant alpha value. Contrariwise, both Portfolio 5 and Portfolio 8 provide alpha values that are statistically insignificant regardless of whether the FF3 or the FF5 is utilised. The statistical insignificance of the alpha values of portfolios 5 and 8 indicate that the hypothesis of a true alpha value of zero cannot be rejected. Accordingly, for portfolios 5 and 8 insufficiently strong evidence exists to indicate that the included factors are sufficient to describe excess returns. Inversely, Portfolio 2 reports probability values of 0.0305 and 0.0264 for the FF3 and FF5 models respectively. At the 5% level of statistical significance, the null hypothesis can consequently be rejected for Portfolio 2 but not at the 1% level.

For the low ESG scoring portfolios, only two of the constructed portfolios are considered within the regression results. As reported within Chapter Three, no intersection of low ESG scoring, high market capitalisation companies exist for the 2013 portfolio and, as such, the results are excluded from the regression analysis. For the two remaining portfolios, both have statistically insignificant results. Portfolio 6 reports probability values of 0,3194 and 0,4108 for the FF3 and FF5 while Portfolio 9 reports probability values of 0,1876 and 0,2911 in the same order. Therefore, the null hypothesis cannot be rejected for either Portfolio 6 or Portfolio 9 at any level of significance.

Ordering the findings where the null hypothesis can be rejected, Portfolio 1 provides a positive alpha value which is statistically significant at a 10% level. Portfolio 4 and Portfolio 7 both provide positive alpha values which have statistical significance at the 5% level. All three of these portfolios are constructed from highly rated ESG equities. The only other portfolio which has a statistically significant positive alpha value is Portfolio 2, which is constructed from middle rated ESG securities with a large market capitalisation.

The reported results suggest that highly rated ESG portfolios consisting of medium and small market capitalisations yield positive abnormal returns with statistical significance at the 5% level. Large market capitalisation, highly rated ESG portfolios also provide abnormal positive returns but only at the 10% level. Additionally, large market capitalisation, middle rated ESG portfolios provide abnormal positive returns at a statistical significance level of 5%.

Medium and small capitalisation firms may enjoy superior financial returns from incorporating ESG factors within their business processes when interpreting the alpha value results through

an ESG-orientated approach exclusively. However, when considering large market capitalisation companies, it would seem that both high ESG scoring companies and middle scoring companies both benefit from ESG factor incorporation. Recalling the research hypothesis H_{1A1} formulated in subchapter 1.4 hereabove, the reported findings suggest that highly rated ESG portfolios constructed from the considered JSE-listed companies show abnormal returns relative to their counterparts for the period 2009 until 2021. However, the extent of the abnormal returns must be considered since small and medium capitalisation portfolios provided alpha values with statistical significance at the 5% level while the large market capitalisation portfolio only provided an alpha value with statistical significance at a 10% level. Portfolio 2, which is constructed from middle rated ESG, high market capitalisation securities also provided positive abnormal returns which exceeded that of Portfolio 1 both in terms of the alpha value and the accompanying statistical significance of the alpha value.

The results suggest that highly rated ESG securities (and middle rated ESG securities in the instance of large capitalisation companies) yield superior market performance to their low-rated counterparts (and middle ESG rated counterparts for medium and small capitalisation securities). This research dissertation's findings regarding the superior performance of portfolios constructed from highly rated ESG securities supports the research by Tripathi and Kaur (2020), which Chapter Two unpacks alongside the similar findings of de Klerk and de Villiers (2012) among others.[57]

Beyond considering the alpha values of the FF3 and FF5 exclusively, additional findings can be gleaned by evaluating the factor loadings of each of the portfolios. Subchapter 4.4 performs an analysis of the factor loadings in what follows directly below.

4.4. Portfolio factor loadings

While this research is particularly interested in the alpha values considered in subchapter 4.3 hereabove, further insights regarding the portfolios can also be gleaned from the factor loadings of each of the FF3 and FF5 regressions. Therefore, this subchapter (4.4) unpacks the factor loadings of both model regressions, whereafter the following subchapter (4.5) considers tests of accuracy applicable to the FF3 and the FF5.

[57] See, for example, Marcia Maroun and Callaghan (2015) or Duncan (2018).

Table 8[58] reports the applicable portfolio's factor loadings of the FF3 over the 12-year period under consideration. Table 9 then develops the factor loadings for the FF5. The results of the FF3 are considered first in what follows below.

Table 8 Factor loadings for the FF3

	Constant	Market Factor	SMB	HML	Adjusted R^2
P 1	0,0032*	0,9798***	-0,0044***	0,0024***	0,9504
P 2	0,0059**	1,0038***	0,0024***	0,0002	0,9042
P 4	0,0084**	1,0347***	0,0017	0,0055***	0,8643
P 5	-0,0002	0,9974***	0,0076***	0,0005	0,9331
P 6	0,0023	0,9804***	0,0042***	-0,0018***	0,9236
P 7	0,0139**	1,0014***	0,0035*	0,0043***	0,6765
P 8	0,0005	1,0155***	0,0064***	0,0018***	0,9130
P 9	0,0036	0,9803***	0,0080***	0,0005	0,8971

The first factor reported in Table 8 is the Market Factor. For all portfolios considered, the Market Factor is statistically significant at any level and therefore highly relevant in determining portfolio excess returns. Additionally, the Market Factor has the most significant values of all the factors, indicating the Market Factor's crucial relevance in explaining portfolio excess returns. Regarding explanatory power, the nearest comparative factor is the Size Factor, represented by SMB (French, 2021). The negative SMB factor for Portfolio 1 is an indication that the portfolio is invested in "Big" equities as defined in Equation 3. The positive SMB values for the other portfolios indicate the contrary, with Portfolio 9 providing the largest SMB factor. This result suggests that Portfolio 9 consisted of the smallest of the firms as defined in Equation 3. Proportionally, this is a reiteration of the higher comparative representation of "Big" companies in high scoring ESG portfolios. The Size Factor has statistical significance at a 1% level except for Portfolio 4 and Portfolio 7. For Portfolio 4 the Size factor is statistically insignificant regardless of level and only has statistical significance at the 10% level for Portfolio 7.

[58] For both Tables 8 and 9, statistical significance is indicated as follows: *** indicating 1%, ** indicating 5%, and * indicating 10%.

The Value Factor is represented by HML, which represents "High Minus Low" as reported in Equation 4 of subsection 3.3.1 hereabove (French, 2021). For all portfolios apart from Portfolio 6, the positive HML value is reported. The Value Factor has significance at the 1% level for portfolios 1, 4, 6, 7, and 8. For portfolios 2, 5, and 9 the Value Factor does not indicate statistical significance regardless of the level.

The comparative values of the constructed portfolios' reported Size Factors and Value Factors on the JSE is particularly notable when applying the FF3. For the Standard and Poor's 500 Index, Díaz et al. (2021) report that the Size Factor provides a statistical significance for less of the constructed portfolios than that of the Value Factor, with excess returns also more sensitive to the Value Factor than the Size Factor. In the context of the U.S.A.'s equity mutual funds, Madhavan et al. (2021) similarly report that the Value Factor provides a statistical significance for a greater number of portfolios to that of the Size Factor while evaluating funds based on ESG factor scoring. For South Africa, the contrary is reported by Demetriades and Auret (2014), Charteris et al. (2018) and this research dissertation. Within this study, the excess returns of the constructed portfolios are generally more sensitive to the Size Factor than the Value Factor as evidenced by the higher Size Factor values reported in Table 8 above.

The Adjusted R^2 values indicate the explanatory power of the FF3 relating to the excess returns' variation for each portfolio. For Portfolio 1, the FF3 explains 95,11% according to the Adjusted R^2 value. For portfolios 2, 5, 6, 8 and 9, the FF3 has explanatory power ranging from 89% to 94%. Finally, the explanatory power of the FF3 decreases in comparison to the other portfolios, for portfolios 4 and 7, to 86% and 67% respectively.

The factor loadings for the FF5 are reported in Table 9.[59] As with the FF3, the Market Factor has statistical significance at all levels for all portfolios and has the highest values of all the factors included within the model. Accordingly, the excess returns of the constructed portfolios are most sensitive to the Market Factor. The SMB factor remains positive for all portfolios apart from Portfolio 1, as reported in the FF3.

[59] As with Table 8, statistical significance for Table 9 is denoted as detailed in footnote 58 hereabove.

Table 9 Factor loadings for the FF5

	Constant	Market Factor	SMB	HML	RMW	CMA	Adjusted R^2
P 1	0,0035*	0,9797***	-0,0046***	0,0027***	0,0007*	0,0006	0,9511
P 2	0,0061**	1,0037***	0,0022**	0,0004	0,0006	0,0005	0,9037
P 4	0,0069**	1,0403***	0,0028***	0,0032***	-0,0040***	0,0005	0,8903
P 5	-0,0005	0,9995***	0,0078***	-0,0000	-0,0005	0,0010	0,9342
P 6	0,0019	0,9813***	0,0046***	-0,0024***	-0,0012**	-0,0004	0,9258
P 7	0,0126**	1,0047***	0,0045**	0,0025**	-0,0037***	-0,0008	0,6919
P 8	0,0000	1,0176***	0,0068***	0,0011*	-0,0013**	0,0003	0,9154
P 9	0,0027	0,9832***	0,0087***	-0,0007	-0,0023***	0,0001	0,9067

The Size Factor indicates a decrease in the statistical significance level from 1% to 5% for Portfolio 2 while indicating statistical significance at a 1% level for Portfolio 4 and a 5% level for Portfolio 7. The Size Factor reports statistical significance for all the other portfolios at a 1% level.

As reported with the FF3, the Value Factor has statistical significance at a 1% level for portfolios 1, 4 and 6. For Portfolio 7, the Value Factor's statistical significance decreases from the 1% level to the 5% level. Portfolio 8 reports a more dramatic decrease in the statistical significance of the Value Factor, which declines from 1% to 10%.

The two additional factors considered within the FF5 provide varied results. The Profitability Factor is indicated utilising the acronym "RMW" to signify "Robust Minus Weak" as defined in Equation 6 (French, 2021). Portfolios 4, 5, 6, 7, 8, and 9 all have negative values for the Profitability Factor and, therefore, are invested in weak stocks with low operating profits to book value. Contrariwise, portfolios 1 and 2 would accordingly be invested in securities with high operating profits to book values. However, the results are statistically significant at the 1% level for portfolios 4, 7, and 9 while being statistically significant at the 5% level for portfolios 6 and 8. Finally, Table 9 reports that Portfolio 1 has a statistically significant alpha value at the 10% level while and statistically insignificant alpha values are reported for portfolios 2 and 5.

The final factor considered within the FF5 is the Investment Factor. The Investment Factor is constructed from a group of "Conservative Minus Aggressive" portfolios and is abbreviated as CMA in Table 9. A positive Investment Factor would therefore be indicative of a portfolio of conservative securities as considered in Equation 6. As Table 9 details, the Investment Factor is positive for all portfolios considered except for Portfolio 6 and Portfolio 7. Accordingly, while portfolios 6 and 7 tend towards aggressive securities, the other constructed portfolios tend towards conservative securities. Nevertheless, the results indicate statistical insignificance for all the constructed portfolios at all levels of significance. For the JSE, the findings of this research dissertation echo that of Charteris et al. (2018) as the Profitability Factor reports greater coefficients and statistical significance to that of the Investment Factor.

Finally, when considering the Adjusted R^2 values of the FF5, some variations can also be identified in comparison to the values of the FF3. As is to be expected with the additional factors, marginal increases in the Adjusted R^2 values are reported for portfolios 1, 4, 5, 7, 8, 9. Portfolio 6, on the other hand, reports a marginal decrease in the Adjusted R^2 value while a marginal decrease in the Adjusted R^2 value is reported for Portfolio 2. To further consider the factors of the FF3 and the FF5, the following subchapter (4.5) undertakes a total of five additional tests to articulate the findings of the Adjusted R^2 values further, alongside factor spanning tests for both models. These findings follow in subchapter 4.5 below.

4.5. Factor spanning tests

Within subsection 3.5.2 it is established that the FF5 fails to accurately describe the excess returns of portfolios formed in some emerging markets, including South Africa (Mosoeu & Kodongo, 2020). To further appreciate the pricing ability of the FF3 and the FF5 within this study, a set of factor spanning tests are performed. In addition, the summary statistics for the regression intercepts are further utilised to evaluate the explanatory power of both the FF3 and the FF5.

Considering the factor spanning tests firstly, the report of a set of Seemingly Unrelated Regressions are presented in Table 10. Table 10 details the hypothesis test statistic as well as the coefficients of each of the three factors within the FF3, which are utilised to describe the average excess returns of each one of the factors. The same procedure is further reported for the FF5 in the second portion of Table 10. Before reflecting on the outcomes reported from the factor spanning tests, it is notable that the tests are market-specific with small samples which are not well diversified.

Considering the results of the factor spanning tests of the FF3 first, the relevance of each of the three factors within the FF3 in pricing the returns of each of the other factors can be evaluated, as Table 10 details. Most notably, the Market Factor reports the lowest intercept of the factors at 0,009. Accordingly, only 0.9% of the monthly average Market Factor cannot be explained by the Size Factor and Value Factor in the FF3 while 0,9% of the Market Factor is also not explained by the FF5. The additional explanatory power of the Market Factor, therefore, is the lowest of the factors considered to form part of the FF3 and the FF5. Accordingly, the Market Factor appears to be the most redundant of the factors forming the FF3 and the FF5. The other factors forming part of the FF3 and FF5 report notably higher intercept values with the second-lowest intercept value being recorded by the Investment Factor at 0,031 for the FF5.

Nevertheless, studies in ESG asset performance have both found various of the FF3 and FF5 factors to be either relevant or redundant. As cited within Chapter Three, Harvey et al. (2016) propose that up to 316 potential factors may have some explanatory power and could be included within asset pricing models. For this reason, Fama and French (2018) undertake factor spanning tests for the FF3, the FF5 and other asset pricing models. Regarding comparative South African studies, Mosoeu and Kodongo (2020) find the Value Factor to be redundant in contributing towards the explanation of the pricing of equities but not the Market-, Size-, Profitability-, and Investment factors which each have high levels of explanatory power. Contrariwise, Basiewicz and Auret (2010) find the Value Factor to have greater explanatory power than the Size Factor on the JSE from 1992 to 2005 when applying the FF3. However, Charteris et al. (2018) find that the FF5 provides superior explanatory power to the FF3 on the JSE, but that the FF5 fails to recognise the additional explanatory power of the Momentum Factor proposed by Carhart (1997).

Bekaert and Harvey (2003) propose several variables which may provide additional explanatory power in emerging market contexts, some thereof include foreign capital flows, emerging markets' performance, inequality, market integration and market liberalisation. Further examples include a Liquidity Factor, governmental policy uncertainty, as well as an alteration to the construction of the existing FF3 and FF5 models' factors (Brogaard & Detzel, 2015; Pástor & Stambaugh, 2003). Some SRI orientated research has also contributed to asset pricing models through the addition of further ESG related factors which may have explanatory power. Naffa and Fain (2021), for example, complement the FF5 by constructing a factor based on comparative ESG ratings. Lioui and Tarelli (2021), on the other hand, create an ESG sentiment factor as measured by media attention. To evaluate the impact of individual ESG

factors on security returns, Mănescu (2011) constructs several factors that form part of conventional ESG ratings. Alternatively, ESG factors can be integrated within the existing models' factor definitions, as performed by Chan et al. (2020) for the FF5.

For this research, the construction and inclusion of specific elements forming part of ESG factors may provide additional explanatory power to the FF3 and the FF5. The inclusion of a momentum factor, as proposed by Carhart (1997), may also yield additional explanatory power. Nevertheless, this research dissertation is primarily concerned with the long-term performance of highly rated ESG portfolios according to the two most widely utilised asset pricing models and not with the creation of an alternative asset pricing model. Therefore, while the consideration of additional factors is noteworthy, the construction and detailed evaluation of the explanatory power of alternative factors are not within the scope of this research piece. Table 10 further details the results of the factor spanning tests below.

Table 10 Factor spanning test results

FF3 Factor spanning tests

	Coefficient				t-statistic				R2
	Intercept	Market	Size	Value	Intercept	Market	Size	Value	
Market	0,009		-0,007	-0,002	1,168		-2,695	-1,756	0,062
Size	0,269	-6,782		-0,062	1,074	-2,695		-1,294	0,053
Value	-0,157	-7,724	-0,184		-0,363	-1,756	-1,294		0,026

FF5 Factor spanning tests

	Coefficient						t-statistic						
	Intercept	Market	Size	Value	Profitability	Investment	Intercept	Market	Size	Value	Profitability	Investment	R^2
Market	0,009		-0,007	-0,002	0,000	-0,001	1,193		-2,711	-1,192	0,261	-0,448	0,064
Size	0,304	-6,711		0,006	0,120	-0,008	1,231	-2,711		0,107	2,198	-0,111	0,085
Value	-0,297	-4,380	0,012		-0,447	0,275	-0,825	-1,192	0,107		-6,796	2,524	0,329
Profitability	-0,351	0,997	0,270	-0,508		-0,151	-0,946	0,261	2,198	-6,796		-1,323	0,322
Investment	0,031	-1,235	-0,010	0,153	-0,079		0,117	-0,448	-0,111	2,524	-1,323		0,109

As presented in subsection 3.5.2, Fama and French (2018) make use of a set of baseline tests to compare the asset pricing performance of the FF3 and the FF5. Table 11 details the findings from the tests as applied to the FF3 and the FF5 in this research dissertation.

Table 11 Summary statistics of regression intercepts

	$A\|a_i\|$	$Aa_i^2/A\bar{r}_i^2$	$As^2(a_i)$ $/Aa_i^2$	AR^2	GRS	p(GRS)
FF3	0,00480	0,87746	0.09140	0,88282	22,1498	0,0046
FF5	0,00432	0,71045	0.09613	0,88993	21.0675	0,0070

Considering the results reported in Table 11, the findings repeat the outcomes of Table 8 and Table 9's Adjusted R^2 values in subchapter 4.4 above. For each of the tests detailed in Table 11, the FF5 reports better performance than the FF3. The first baseline test is the average absolute alpha value which acts as a measure of an asset pricing model's mispricing of a portfolio. A lower value, therefore, indicates a lower level of mispricing (Sha & Gao, 2019). As Table 11 indicates, FF3 reports a value of 0,00480 while the FF5 has a smaller value amounting to 0,00432. For the $Aa_i^2/A\bar{r}_i^2$ the FF5 further specifies a lower level of alpha value dispersion, suggesting better asset pricing performance to that of the FF3. Contrariwise, the $As^2(a_i)/Aa_i^2$ value and AR^2 value indicate increased performance as the values increase. In both instances the FF5 reports higher values to that of the FF3.

Transitioning to the GRS test, the reported values for both the FF5 and the FF3 indicate the rejection of the null hypothesis at the 1% level of statistical significance. Accordingly, both models cannot accurately price the portfolios in question at a 1% statistical significance level. Nevertheless, the smaller GRS test result for the FF5 suggests that it is the preferred model of the two.

Notably, the outcome of the probability value of the GRS test favours the application of the FF3, as Table 11 indicates. Gibbons, Ross and Shanken (1989) also note that the test often rejects the FF5, as Huynh (2018) finds in the Australian market and Kubota and Takehara (2018) in the Japanese market. Mosoeu and Kodongo (2020) similarly find that the GRS test tends to be rejected in the majority of emerging markets. This research supports the aforementioned findings as the FF5 struggles to explain the average equity returns for the JSE.

Collectively, the findings reported in Table 11 indicate that the FF5 outperforms the FF3 in explaining the excess returns of the constructed portfolios of this research. In the context of this study, the finding is echoed by the results described in Tables 7 and 9 above. As the findings of this dissertation are reported in the prior subchapters of this chapter (4), the following subchapter concludes Chapter Four, whereafter Chapter Five concludes this research piece.

4.6. Conclusion

Chapter Four serves as the culmination of both the second and third chapters of this research. While Chapter Two sets the context of this research and Chapter Three furthers an approach to evaluate the approach of Chapter Two, Chapter Four presents the findings of this research.

Following a brief introduction, subchapter 4.2 unpacks the descriptive statistics of the data utilised within this study. Subchapter 4.2 firstly considers the Bloomberg ESG Disclosure scores allocated to each of the securities, followed by the security returns. The size bias of the Bloomberg ESG Disclosure scores is identified therein, and possible reasons for the bias are considered. Subchapter 4.3 builds on subchapter 4.2 by reporting the alpha values of the constructed portfolios. Of the 8 portfolios considered, statistical significance is found at the 10% level for the alpha values of Portfolio 1, while Portfolio 2, Portfolio 4, and Portfolio 7 exhibit statistically significant positive alpha values at the 5% level. Subchapter 4.4 unpacks the portfolio factor loadings for the FF3 and the FF5. The explanatory power of each of the factors are then considered within subchapter 4.4, and the factor spanning tests are reported in subchapter 4.5. In addition to the factor spanning tests, subchapter 4.5 also details the statistics of the regression intercepts, as performed by Fama and French (2018). The findings suggest preference for the FF5 while both the FF3 and FF5 fail to accurately describe the excess returns of the constructed portfolios at a 1% level of statistical significance. The culmination of this research dissertation now follows in Chapter Five below.

Chapter Five: Conclusion

5.1. Conclusion

This research dissertation is initiated following the marked uptick in investor attention afforded to SRI. As Chapter One establishes, SRI-orientated assets have seen significant capital inflows globally during 2020 and thereafter (GSIA, 2021). The growth trend, some have argued, is a suggestion that SRI practices may continue to be incorporated within investment approaches into the future (Adams & Abhayawansa, 2021; Broadstock et al., 2021). SRI approaches integrate ESG factors within investment processes and, as Chapter Two details, SRI has been critiqued for sacrificing returns and simultaneously other studies have suggested the approach provides outperformance (Payne, 2021). Within the South African context, existing literature regarding the performance of highly rated ESG assets is yet to reach consensus, as this research details extensively in Chapter One and Chapter Two. It is from this lack of consensus within the existing South African literature that a research question arises regarding whether or not highly rated ESG equity portfolios listed on the JSE exhibit any abnormal returns over the long-term in comparison to medium rated and low rated counterparts (Chetty et al., 2015; Gladysek & Chipeta, 2012; Johnson et al., 2019; Viviers & Eccles, 2012).

To set the context of this research question, the first chapter introduces the *status quo* of the SRI environment globally, before pivoting towards the South African context. Therein, the critique flowing from the diversity of findings of existing South African literature is unpacked alongside the significance of this long-term study. It is established within subchapters 1.1 and 1.6 that many studies which evaluate SRI financial performance on the JSE tend to do so over shorter time horizons. The benefit of a lengthier period of evaluation, on the other hand, relates to the increased possibility for long-term value creation to be identified (CFA Institute, 2020a; Johnson et al., 2019; Schoenmaker & Schramade, 2019). Additionally, subchapters 1.1 and 1.6 describe some common critiques of existing studies which fail to recognise the impact of company size in influencing ESG scoring. Finally, subchapters 1.1 and 1.6 also highlight that sufficient studies are yet to consider the performance of highly rated ESG firms during and subsequent to the market developments of 2020 and 2021 (Adams & Abhayawansa, 2021; Bermejo Climent et al., 2021). Collectively, these three shortcomings are considered within this research dissertation. Provided with a brief overview of the *status quo* within Chapter One, this research formulates the following hypotheses, which Chapter Four then evaluates while confirming the alternative hypothesis H_A:

H_N: Highly rated ESG portfolios constructed from the considered JSE-listed companies perform as well as medium and low rated ESG portfolios constructed for the period 2009 to 2021.

H_A: Highly rated ESG portfolios constructed from the considered JSE-listed companies show higher abnormal returns relative medium and low rated ESG portfolios constructed for the period 2009 to 2021.

To consider the context of the hypotheses in more detail, this research undertakes a review of existing SRI literature in Chapter Two. As the comparative financial performance of highly rated ESG firms is central to the hypothesis, Chapter Two commences with an elaboration of arguments supporting and detracting from the potential for financial outperformance by highly rated ESG firms in subchapter 2.2. However, the material considered extends beyond the contributory and pessimistic arguments of ESG factors and financial performance. Subchapter 2.3 provides a theoretical overview of the SRI environment in a broad sense followed by a South African market. The South African legislative SRI framework is also provided in subchapter 2.3. The reporting framework of the King III report is highlighted, and the contributions made by requiring ESG company reporting are developed alongside the benefits of reporting standardisation in subsections 2.3.1 and 2.3.2 (Herringer et al., 2009; King III, 2009; Kloppers, 2018). Critically, the regulations flowing from the King III report serve as a marker for the period of the commencement of the study (King III, 2009). The positive contributions of the King III report in requiring more uniform reporting suggest more accurate ESG ratings. Therefore 2009 serves as the year in which the portfolios of this research are first constructed until the finalisation of the latest complete 12 month period, totalling 144 months (Herringer et al., 2009).

Transitioning towards application within the South African market, subchapter 2.4 develops the interpretation of ESG factors as well as the practical integration thereof within investment processes. In subchapter 2.5, the measures of ESG performance are detailed alongside an overview of dominant rating methodologies. Further, subchapter 2.6 unpacks supplementary findings, as well as the social factors supporting ESG's continued integration within investment practices. The broad overview of SRI provided within Chapter Two is then situated within the context of this research in Chapter Three.

In overview, Chapter Three details the methodological considerations of this research and the approach utilised in forming the relevant portfolios, which Chapter Four then analyses. The

first topic of Chapter Three relates to the ESG performance measure which this research employs. It is highlighted within subchapter 3.2 that by utilising the Bloomberg (2020a) ESG Disclosure Score, this research is afforded the largest possible universe of ESG rated JSE securities for the initial period of the study. While subchapter 3.2 reports that the Bloomberg (2020a) ESG Disclosure Score includes fewer companies in the later years of this study, the long-term orientation of this research justifies the score's application to that of an alternative. The second topic considered within Chapter Three relates to the financial performance measures utilised within this research. In subchapter 3.3, an overview of some of the most commonplace risk-adjusted financial performance measures is provided alongside an elaboration on the FF3 and FF5 and their construction. As the FF3 is the most commonplace asset pricing model used in contemporary asset pricing literature, it is also utilised within this research alongside the more expansive FF5 (Fama & French, 2015; Statman & Glushkov, 2009). A cursory overview of this study's datasets is provided within subsection 3.4 and subsection 3.5 details the portfolio and factor construction methodology. The characteristics of the different factors and portfolios are also detailed in subsection 3.5 as well as the additional measures utilised to determine the pricing accuracy of the Fama and French ([1993]2015) FF3 and FF5.

In light of the literature considered within Chapter Two, Chapter Four of this research serves as the application of the methodology described within Chapter Three. As such, subchapter 4.2 presents the descriptive statistics applicable to the datasets considered in this research dissertation. Subchapter 4.2 also articulates the ESG scoring of the securities and the returns applicable for the period. From the initial results, subchapter 4.2 further reports the comparative Sharpe (1966) ratios of the portfolios, gauging the potential for outperformance. Subchapter 4.3 confirms the performance of the portfolios in reporting the applicable alpha values flowing from the FF3 and FF5 asset pricing models. The results of the ESG portfolio regressions suggest that portfolios constructed from highly rated ESG companies with small and medium market capitalisations provide statistically significant alpha values at the 5% limit. For highly rated ESG companies with a large market capitalisation, statistically significant alpha values are identified at the 10% limit. A portfolio constructed from middle rated ESG companies with large market capitalisations also reports positive alpha values at the 5% significance level.

With the research question and hypotheses formulated within subchapters 1.3 and 1.4 in mind, the alternative hypothesis is accepted as portfolios constructed from highly rated ESG securities present positive alpha values for all market capitalisation segments at the 10% level

of statistical significance. However, portfolios constructed from highly rated ESG securities with middle and small market capitalisation segments accept the alternative hypothesis at the 5% level of statistical significance. Accordingly, highly rated ESG portfolios constructed from the considered JSE-listed companies indicate abnormal returns relative to their counterparts constructed from lower-rated, listed companies at the 5% level of statistical significance, but only in the instance of medium and small market capitalisation companies. For large market capitalisation companies, the reported alpha values are only valid at the 10% level of statistical significance while a portfolio constructed from large market capitalisation, medium ESG scoring companies provided more significant alpha values with statistical significance at the 5% level.

Subsequent to evaluating the alpha values of the models, subchapter 4.4 considers the factor loadings of the FF3 and the FF5. The Market Factor is reported to be the most relevant factor for explaining the excess returns of each of the portfolios, followed by the Size Factor. The additional factors included within the FF5 are broadly determined to be statistically insignificant in the instance of the Investment Factor, while the Profitability Factor is statistically significant for the majority of the constructed portfolios. Factor spanning tests are further reported in subsection 4.5, which details each of the factors' contributions in pricing the excess returns of each constructed portfolio. Finally, subchapter 4.5 further details the regression intercepts of the models. The research findings presented suggests that the FF5 outperforms the FF3 because the FF5 more adequately explains the excess returns of the constructed portfolios in terms of the Adjusted R^2 values and the additional tests conducted in subchapter 4.5.

5.2. Further research

In concluding this research piece, some notable possibilities for further research come to the fore. Firstly, the opportunity to extend the number of factors which this study considers beyond the FF3 and the FF5 must be noted. While there is some divergence regarding the specific factors applicable to asset pricing models, further evaluation of the factors applicable within the South African market may provide more nuanced findings than reported within this research (Fama & French, 2018). Similarly, the variation of portfolio forming breakpoints in this study may also further articulate the findings of this report.

Secondly, the possibility to construct an artificial set of portfolios based on the data from several ESG rating organisations may add further detail to the findings in this study. By

grouping ESG ratings, a more representative dataset may be created to better reflect consensus on the market of a company's ESG rating. While such a study will not be able to consider as long a period due to the South African data limitations discussed within Chapter Three, it would nevertheless provide additional insights into the South African SRI environment.

Additionally, the South African SRI legislative environment provides a notable opportunity for comparison to other jurisdictions. An evaluation and comparison of some of the main existing SRI legislative environments and the characteristics of the SRI assets managed therein may provide an approach to navigate the effective implementation of SRI legislation in emerging markets that are yet to apply SRI principles within their environments.

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