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# Assessing the Relative Risk-adjusted performance of SRI funds before and during the COVID-19 pandemic: evidence from South Africa

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**Abstract:** Socially Responsible Investing (SRI), belongs to a category of investment strategies aiming to reduce the negative impacts associated with financial investments, while yielding competitive returns. The literature reveals inconsistent results when comparing the performance of SRI funds to traditional funds, limiting investor awareness on the performance of SRI funds as an investment substitute. The purpose of this research paper is to increase investor awareness on suitable investment substitutes, considering the changes made to "regulation 28 of the Pension Fund Act of 1956", and to increase SRI in South Africa. The objective is to determine if SRI funds, and their matched traditional counterpart funds provide a higher relative risk-adjusted (RA) return than the JSE ALSI before and during the COVID-19 pandemic. This is achieved by using the Fama-French 3-Factor Model and the Modigliani and Modigliani measure. The results reveal that, when controlling for systematic risk, SRI funds and traditional funds are unable to outperform the JSE ALSI before and during the COVID-19 pandemic. When controlling for unsystematic risk, a small number of SRI funds (30%; 20%) and traditional funds (30%; 30%) outperform the JSE ALSI, before and during the COVID-19 pandemic, respectively. The results imply that institutional and retail investors should include SRI funds in their investment strategy alongside traditional funds or as a substitute for traditional funds during economic crises.

**Keywords:** Socially Responsible Investing; risk-adjusted; COVID-19; Fama-French 3-factor model; Modigliani and Modigliani measure

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## 1. Introduction

The impacts of global economic and environmental crises continue to disrupt contemporary society. Abbass, Qasim, Song, Murshed, Mahmood and Younis (2022) suggests that the world's exponential population growth, coupled with climate change pressures, a reduction in food security and increased disease breakouts, continues to exacerbate negative environmental impacts. Santos, Ferreira and Pedersen (2022) state that pollution exposure, education deficits, corruption, and inadequate healthcare facilities negatively contribute toward societal constructs such as increased violence, unemployment, hunger and malnutrition, poverty, substance abuse and declining mortality rates. These social and environmental issues negatively impact supply and demand within economic and financial markets (Abass, et. al, 2022). They collectively contribute toward rising inflation, increased interest rates, increasing uncertainty and economic instability that enhances financial market volatility.

PricewaterhouseCoopers (2020) discovered that the intensification of these pre-existing social and environmental issues arose with the identification of the Coronavirus, coined as SARS-CoV-2. This prompted nations and their governments to initiate emergency and disaster strategies, implementing quarantines, social distancing, travel restrictions and eventually, national lockdowns. The acceleration of these negative social and environmental issues was underpinned by global economic decline, through supply and demand imbalances, disruptions in supply chains, equity market declines and unpredictable consumer behaviour). In corroboration with these claims, Bizuneh and Geremew (2021) stipulate that emerging markets, with excessive exposure to the economic shocks associated with the COVID-19 pandemic, are faced with increasing costs of healthcare and larger fiscal stimulus demand, on the backdrop of capital flow reversal. These effects are further exacerbated by the depreciation in currency value, the declining global demand and decreases in domestic revenue, which results in increases in risk premiums of sovereign bonds.

The COVID-19 pandemic has clearly increased the pre-existing deficit in attempts to achieve the "Sustainable Development Goals" (SDG's) of 2030. The SDG's were approved in 2015 by the United Nations, which provides an implicit framework for countries involved, to practice with an aim to end world poverty, and preserve the plants resources to ensure economic and social prosperity for all by the year 2030 (United Nations Development Programme, 2022). Pereznieto and Oehler (2021) support this assertion, by stating that world poverty reduction measures are set back by approximately three to five years, by the COVID-19 pandemic placing between 88 million and 115 million individuals into extreme forms of poverty. Ahinkorah, Hagan, Ameyaw, Seidu and Schack (2021) infer that the pandemic has exposed education gender inequalities, with a decline in school attendance of approximately

11 million women and young females, post pandemic, facilitated by their traditional economic and domestic roles in poor households. Women's workplace performance during the COVID-19 pandemic, underpinned by wider gender gaps, resulted in a reduction in their earnings and savings relative to men.

The detrimental impact of the COVID-19 pandemic has been experienced by both developed and developing nations. Cilliers, Oosthuizen, Kwasi, Alexander, Pooe, Yeboua and Moyer (2020) postulates that the African continent will experience slower progress toward achieving the SDG's, with a forecasted economy, valued at $294 billion smaller than pre-COVID-19 predictions. The optimistic forecast for Africa's GDP per capita, to attain levels achieved in 2019 are possibly attainable in 2024. A less optimistic outlook, however, forecasts 2019 per capita GDP levels to be attainable in 2030. In relation to the pre-pandemic. Cilliers (2024) stipulates that predictions between 38 million and 70 million African residents, will be classified as extremely poor in 2030, approximating Africa's poverty levels between 35% and 37% of the total population. Furthermore, the pandemic has reduced health expenditure and government revenue, undermining many African countries" debt sustainability. The long-term impact of the pandemic is forecasted to produce more deaths due to hunger and a reduction in health care expenditure by the year 2030, than the SARS-CoV-2 virus.

These progressive social, economic, and environmental issues, further exposes weaknesses in healthcare, infrastructure, policies, and governance. These issues require aggressive mitigation, through efficient and transparent capital solutions, to counter diminishing social, environmental, and economic prosperity. Viviers, Ractliffe and Hand (2011) state that philanthropic investors and governments have saddled with the responsibility of addressing increasing societal needs, with negative cash deficit investments. Fortunately, Investing for Impact (IFI) has entered mainstream sustainable finance, utilizing traditional entrepreneurial financing that facilitates capital deployment toward meeting the growing demand for addressing social and environmental challenges (Boffo & Patalano, 2020). AfricaSRI (2022) provides a response to Investing for Impact strategies in the form of sustainable investments, also known as Socially Responsible Investments (SRI). These investment strategies incorporate the practice of sustainable development in the investment decision, by considering social and environmental issues related to the investment. SRI Connect (2024) stipulates that investors with an SRI mandate are concerned with both the financial return and the impact of those investments on the environment and society by considering the relationship between these issues and their investment strategy. A myriad of abbreviations describing SRI are used to explain its application in the current investment era though its synonymity with Environmental Social Governance (ESG) has provided a foundation for explanation. SRI is the adoption of specific strategies that investors implement to align their

investment criteria with the Environmental Social and Corporate Governance (ESG) framework (AfricaSRI, 2022).

Entering the recent economic downturn caused by the COVID-19 pandemic, an increasing demand was experienced regarding SRI products (Trovato, 2023). The latest inclusion in the "Code for Responsible Investing" in South Africa's investment sector stemmed from an amendment made to the "regulation 28 of the Pension Fund Act of 1956". National Treasury (2011) suggests the change stipulates that prior to investing and while invested in an asset, both the pension fund and its board should consider factors impacting the asset's long-term sustainable performance, not limited to ESG only. An opportunity arises in contributing innovative solutions, through increased implementation of Investing for Impact (IFI) strategies. The intention is to attract capital that intentionally addresses social and environmental challenges that governments and philanthropic investors are unable to address alone, while producing financial returns for investors.

Various concerns arise when considering the effectiveness of this regulation change in improving investors returns as well as improving socio-economic conditions. To determine whether the changes made will positively or negatively impact investors, the financial performance of Investing for Impact strategies should be evaluated in relation to the financial performance of traditional investment strategies. Contrasting results exist in the literature that assess and compare the financial performance of IFI strategies like SRI to the financial performance of traditional investment strategies (see for example Hernaus, Zoricic & Dolinar, 2023, Cheung & Jerve, 2020; Latiff & Vanker, 2021; Hornuf & Yüksel, 2023; Peerbhai & Naidoo, 2022; Arefeen & Shimada, 2020). The research indicates that some SRI funds either provide higher or lower risk-adjusted (RA) returns than the benchmark index during both non-economic crises periods and economic crises periods. The aim of this research paper is to determine if SRI funds are able to outperform a benchmark index so as to use this investment vehicle as a substitute or in conjunction with traditional investments. A solution to reducing the negative social and financial impacts of the COVID-19 pandemic is to closely examine the performances of SRI, especially during economic crises, with the purpose of providing evidence that may support the investors" decision-making process when developing investment strategies. The results of the study may increase the transparency of SRI fund performances and if beneficial, may possibly increase the inclusion of SRI amongst institutional and private investors. The introduction to SRI is discussed followed by the unpacking of empirical literature on SRI fund performance relative to a respective benchmark index. The methodology is then outlined followed by the presentation of the research findings. A discussion on of the results ensues, followed by concluding remarks.

## 2. Literature Review

The literature review discusses a theoretical foundation for the research paper through rational versus irrational investor behavior, while the empirical literature review provides evidence on SRI fund performance.

### 2.1. Theoretical Literature Review

Cortes, Tolosa and Rojo (2023) postulate that in finance, the Expected Utility theory (EUT) forms the basis for discussing models for rational choice and individual decision making, based on traditional economic theory. At the centre of the EUT, lies a rational decision-maker, possessing complete knowledge of the environment, a system of preferences that are well-organized and well-established technical skills allowing them to select the most optimal solutions. Assuming an efficient market, operating within an ideal world, individuals make decisions based on a cost-benefit analysis of each of their available options. This ideology is challenged by advocates of behavioural economics. Kahneman (2011) unpacks behavioural economics, to understand human irrational behaviour and presents two distinct systems that guide the human decision-making process. System 1 may be viewed as the default system during busy periods where distractions are constant and system 2 thrives when highly important decisions are required and there is adequate time for analysis of alternative options. Since humans operate in attention deprived, time-poor and routinely multitasking environments, daily decisions are made through system one. This means more choices in contemporary living, skip the process of reviewing alternative options and disregard available information by adopting shortcuts.

Ondolos, Tuyon and Mohammed (2021) state that the assumption of perfect rationality is proposed by the bounded rationality theory, but in the boundary of available information that's assessed with mental capabilities. Complete rationality in and of itself is therefore "bounded" by knowledge insufficiencies. Humans are therefore bound by their perceived purpose which impacts their decision making, and since decision making requires cognitive capacity, humans are unable to be explicit rational beings due to complexity from their decision-making choices. Within the assumptions of bounded rationality, the first issue is that humans encounter a limit to their cognitive capacity, which therefore hinders their ability to solve problems (Sent, 2018). Amunarriz (2017) postulates that the second problem refers to the impossibility of access to all the information required for the decision-making process. Therefore, individuals attempt to "satisfice" (satisfy) rather than maximize the results, since they are unable to completely comprehend and extrapolate relevant information that would be the most beneficial for that situation. Bisati, Haque, Ganai, and Gulzar (2021) infer that "satisficing" is a type of compelled optimisation that considers an adequate result over the most beneficial

achievable result. Investors that are satisficing may be rational on an operational level, which means they aim to be reasonable however they may not be rational on a fundamental level which requires them to achieve the most ideal results.

Cortes, Tolosa and Rojo (2023) argues that at the centre of the EUT, a rational decision maker, equipped with sufficient knowledge of the environment, possessing a system of well-organized preferences and appropriate technical capabilities, will make the most optimal self-serving decisions. Traditional economic and financial theory is built on the premise that these rational decision makers are unaffected by their emotions or other external influencers. In a perfect world, investors assume markets are efficient, agents act in self-serving ways and higher returns are produced by taking higher levels of risk (Boffo & Patalano, 2020). However, Reisch and Zhao (2017) explains that from a behavioural economic perspective, individuals are faced with severe cognitive limitations surrounding the amount of information they are able to acquire and comprehend, which allow them to simply satisfy their needs rather than maximize their outcomes. Therefore, individuals are seen as irrational decision-makers since the impulsive and emotional system driving decision-making is more prevalent than the cognitive rational system (Carminati, 2020). Bisati, et. al, (2021) highlights that when choosing an alternative, individuals face a high degree of complexity and uncertainty, shifting their behaviour from rationality to bounded rationality. This is based on the fact that their internal standard for decision-making is not in sync with their objective standard of decision-making. This internal standard is built on an individual's beliefs, values, feelings, emotions, and intuition and are all inherently a part of human intelligence.

Behavioural economists have begun to nudge and persuade people into making decisions that have more favourable outcomes by offering potential methods to increase socially responsible investments (Beerbaum & Puaschunder, 2018). Thaler and Sunstein (2008) coined the term "nudge", which is used to describe the process behind influencing the behaviour of humans, without relying on commandments and prohibitions or increases to economic incentives. A nudge is a change made to the choice environment, producing predictable changes while correcting sub-optimal 30 decisions. Gajewski, Heimann and Meunier (2022) posit that within the financial industry, nudges have assisted with increasing retirement savings, improved portfolio holdings, and increased financial literacy. The core principle of nudging is focused on enhancing an individual's decision making while benefiting both the individual and society, which provides an opportunity to instil SRI values into investors. Eurosif (2018) highlights that investors display a strong desire to invest in sustainable assets. BNP Paribas (2018) surveyed 5000 retail investors in 5 different countries in Europe, which revealed that the willingness to invest, even a small portion of the portfolio in SRI, ranges from 52% to 80% but the real portion invested in SRI ranges between 5% and 7%. Gajewski, Heimann and Meunier (2022) stipulate that nudging will promote investing in SRI assets, and therefore enhance investor

satisfaction pertaining to investment allocation while maintaining individual's freedom of choice. Furthermore, nudging will improve socio-economic conditions through sustainable development practices. The framing of SRI decisions will impact the proclivity with which investors decide to pursue SRI strategies, and therefore SRI promoters are able to utilise choice architecture to increase the overall SRI prevalence (Barwick-Barrett, 2018).

### 2.2. Empirical Literature Review

The empirical literature review discusses the results of previous comparisons made between SRI funds and a benchmark index from a global perspective and from a South African perspective.

#### 2.2.1. The Comparative Performance of SRI Funds and Traditional Funds to A Benchmark Index from a Global Perspective

Bilbao-Tero, Álvarez-Otero, Bilbao-Tero, and Fernández (2017) explains that one of the fundamental factors driving growth in the SRI market is due to the favourable value placed on the SRI label within the mutual fund industry. Barreda-Tarrazona, Matallin-Saez and Balaguer-Franch (2011) argue that the primary objective of SRI funds is based on social preference rather than financial gain. Camilleri (2017) infers that the rationale underpinning SRI is based on consideration given to both responsible investment for improving society as well as financial return. The competitive RA performances of SRI funds are a recurring concept within the financial market space, however statistically insignificant results are observed when comparing SRI and traditional fund performance to a benchmark index.

A comparative analysis of SRI and conventional funds by Derwall (2007) was conducted across countries such as the United States, Canada, United Kingdom, The Netherlands, Australia, Switzerland, Germany, France, Italy, Austria, Spain, Belgium, and Sweden. Derwall (2007) adopted the Carhart four-factor model to compare the excess returns earned from SRI funds and conventional funds in relation to the excess returns earned from a benchmark index. The estimated alphas from the regression analysis indicated that neither conventional funds nor SRI funds outperformed the specified passive indexes, based on the abnormal average returns not being significantly different from zero.

Research carried out by Amenc and Le Sourd (2010), examined SRI fund performance in France, using the Fama-French 3-factor model (FF3FM,) across a 6-year evaluation period that ended in December 2007, and excluded the effects of the finance crises. The results indicated that SRI funds characterised by their ability to meet ESG criteria were unable to produce statistically significant or positive alpha's during the evaluation period. This prompted Noël Amenc and Véronique Le Sourd attempted to extend this research by including the financial crisis of 2008 and 2009

in their evaluation period. The results indicated the same results as the initial study, with most cases producing alphas, that were negative and not statistically significant. A closer inspection of the financial crisis period, regarding SRI fund returns resulted in the discovery of a lack of protection from SRI fund volatility during economic downturn.

The comparative performances of SRI, assessed by Managi, Okimoto and Matsuda (2012), stated that during the 2000's, conventional indices in the United Kingdom, the United States UK, U.S and Japan did not produce returns greater than SRI indices and concluded that investors should not turn away from ESG related investments since the trade-off between risk and return was not present. While the relative performance of indices may be encouraging, Royal Bank of Canada (2012) contradicts this assertion by indicating that 20 international SRI indices from a sample of 29 produced higher levels of volatility relative to their matched benchmarks, suggesting that SRI indices may not outperform conventional indices on a RA basis.

Kaufman (2017) highlighted the comparisons made by the Teachers Insurance and Annuity Association of America (TIAA) and College Retirement Equities Fund (CREF) comparing the performance history of five US equity SRI indexes over 10 years to the performance history of the S&P 500 and Russell 3000 indexes. The results indicated the absence of statistical differences in returns relative to the overall market benchmark. Furthermore, performance variability was present over the short term, though over the long term, investing for impact strategies perform in accordance with, as well as produce returns in excess of, the return on the overall market.

Das, Chatterje, Ruf and Sunder (2018) adopted the Fama-French 5-factor model to derive the relative RA SRI performances of United States domiciled SRI funds across a 12-year evaluation period. Socially responsible mutual funds (SRMF) were used, and the time frame constituted the period before and after the great recession. The results were also indicative of whether assigning ESG ratings to socially responsible mutual funds were a factor contributing to fund performance. The results suggested that SRMF returns did not exceed the market returns for the period 2005-2016, meaning there were no statistically significant differences in SRI performances relative to the benchmark during the recession period. Socially responsible mutual funds with higher ESG ratings performed better than the SRMF that produced lower ESG ratings.

### 2.2.2. The Comparative Performance of SRI Funds and Traditional Funds to a Benchmark Index from a South African Perspective

The South African empirical literature review on the relative performance of SRI funds and traditional funds to the Johannesburg Stock Exchange All Share Index (JSE ALSI) reveal a mix of results similar to the inconsistent results revealed in the

global analyses. Viviers and Firer (2013) attempted to fill the South African SRI research gap by assessing the performances of SRI unit trusts, applying RA ratios like the Sortino ratio, the Upside potential ratio and the Sharpe ratio to the returns of 16 SRI unit trust. These ratios were also applied to a matched sample of traditional funds and a set of benchmark indices for the period 1992 to 2011. The results revealed no differences between the total expense ratios of the benchmark indices and SRI funds and no differences between the matched traditional funds and SRI funds.

Chawana (2014) researched the comparative financial performance of the JSE SRI index to that of other South African market indices during 2004 to 2012. Adopting the Sharpe ratio as an absolute metric in the analysis, Chawana (2014) concluded that the JSE SRI index produced RA returns that were inferior to local conventional indices during both bear market and bull market conditions. A further analysis was initiated by Chawana (2014) to compare the performance of the SRI index to a Synthetic Convention Index which was self-constructed based on specialised criteria. The results revealed that upon the implementation of the CAPM, controlling for systematic risk, the JSE SRI Index was able to produce RA returns, similar to the self-constructed index indicated in the study (Chawana, 2014). This result was similar to the result from du Plessis (2015) which revealed that SRI funds neither underperformed nor outperformed their respective benchmark indices across the entire evaluation period.

Mvuba (2014) investigated SRI fund performance relative to their conventional counterpart funds during the period of 2006 to 2011. The study focused on four comparative analyses, with one particular method focusing on comparing the performance of proxy benchmark indices to the performance of SRI funds. From a sample size of 27, the unadjusted analysis denoted that the SRI funds performed better than their associated benchmarks. The results also revealed a better performance from the SRI funds in comparison to their proxied benchmark indices.

A study was completed by du Plessis (2015) investigating SRI fund performance relative to the performance of a set of conventional funds, the Financial Times Stock Exchange (FTSE)/ Johannesburg Stock Exchange All Share Index (JSE All Share Index) and the "FTSE/JSE SRI Index" over a 128-month period from 2004 to 2014. Performance measures like Jensen's Alpha, the Sharpe ratio, the Treynor Ratio, the Sortino ratio, and the Omega ratio were used together with linear regression models like the Carhart four-factor model, the Capital Asset Pricing Model (CAPM) and the FF3FM. The impact of the global financial crisis of 2007/08 was also controlled to determine the effect of large-scale economic downturn on the performance of SRI funds. The results indicate an improvement of SRI fund performance across the evaluation period however neither an underperformance nor outperformance of the SRI funds relative to the comparison benchmarks were witnessed over the evaluation

period. The linear regression models indicated that SRI funds exhibited lower levels of sensitivity to the fluctuations in the market and an overexposure to small cap portfolios. Furthermore, SRI funds were oriented toward growth stocks, and expressed significant momentum post the global financial crisis of 2007/08. SRI funds ultimately underperformed in comparison to their sampled conventional funds during the evaluation period.

Peerbhai and Naidoo (2022) evaluated the RA performances of SRI funds in South Africa relative to a set of matched non-SRI funds, and their respective benchmark indices. Adopting the FF3FM and Carhart 4-factor model, their study evaluated the performance of 12 SRI funds during two evaluation periods. The results indicated that SRI funds did not outperform their matched traditional counterpart funds, when comparing them to the performance of the JSE ALSI during the earlier periods. However, SRI funds later outperformed or displayed significant RA performance differences which was attributed to the "learning effect". When using the FF3M, a large percentage of sampled SRI funds (84%, 83%) and non-SRI (33%, 75%) funds exhibited statistically insignificant results during evaluation period one and evaluation period two, respectively.

Entering the recent economic downturn instigated by the negative impacts of the COVID-19 pandemic, an increase in demand for SRI products was observed in the South African market. Considering this period of uncertainty, Sgammini (2022) analysed the performance of South African SRI funds, during and post the COVID-19 pandemic period. The study was conducted to evaluate the SRI fund performance in comparison to the performance of the JSE ALSI and the "FTSE/JSE" Responsible Index. RA performance metrics were used, namely Jensen's Alpha, the Sharpe ratio, the Sortino ratio, the Treynor ratio, the Calmar ratio, and the Omega ratio. The study adopted a 4-year evaluation period from 2018 to 2022, with a sample of 14 South African unit trusts. The results indicated that even though an increase in returns were experienced by SRI funds during the pandemic period coupled with the identification of significant differences relative to both the JSE ALSI and the "FTSE/JSE" RI index, the SRI funds did not outperform the indices on a consistent basis. Therefore, higher RA returns may be achieved by investing in the SRI index but at the cost of benefiting from diversification.

It is evident that there is a lack of harmony and consistency in the results from the comparison of SRI funds to a benchmark index, and more especially the JSE. Some studies indicate the superior RA performance of SRI funds in comparison to a benchmark index, although some of the results observed are statistically insignificant. Other studies highlight opposing views, with some indicating superior SRI returns or inferior SRI returns. A neutral view on the comparative analysis of SRI funds are also noted, with studies indicating that SRI funds neither outperform nor underperform their benchmark indices. The literature review indicates

contrasting views on the comparative RA performance of SRI funds, during non-crises periods and economic crises periods from both a global and South African context. Therefore, there is a need in South Africa, to further investigate the comparative performance of SRI funds relative to the JSE ALSI as a benchmark index, before and during the COVID-19 pandemic, with the aim cultivating coherence in the results provided by SRI research.

## 3. Methodology

The closing prices are sourced from the IRESS Expert terminal database that offers online traders, retailers, and institutional investors, across the globe, access to data that monitors risk and multi-asset trading assistance to enhance their performance. The yield on the South African 10-year government bond is used to represent the risk-free rate during each evaluation period. The data is sourced from the ZA Investing.com, a website that provides historical risk-free rates for South African bonds and treasury bills.

### 3.1. Match Pair Analysis

AfricaSRI (2022) states that there are 23 SRI mutual funds in existence in South Africa. This collection of SRI mutual funds is used as the sample for this research paper. A search on the IRESS database alone, using key words such as ESG, sustainability, responsible, screening, investor engagement and impact investing yielded a total of 10 SRI funds, from the total of 23 SRI funds, that present available data for the designated study period from 01/01/2017 to 31/12/2022. In order to compare the performance of SRI mutual funds to the JSE ALSI, the study uses financial data in the form of closing prices for SRI mutual funds and the JSE ALSI, which are collected for the period 01/01/2017 to 31/12/2022, a total of 72 months. This is separated into evaluation period one (01/01/2017 to 31/12/2019) and evaluation period two (01/01/2020 to 31/12/2022). The separation of evaluation periods allows the comparison of SRI performance before and during the COVID-19 pandemic period. Log returns are first calculated from these closing prices and thereafter the computation of each funds Beta (β) and standard deviation ( $\sqrt{\sigma^2}$ ) for each holding period. The target population is 357 IFI funds in South Africa, and the sample population is 23 SRI funds in South Africa. A purposive sampling technique is used to create the updated sample of 10 SRI funds, which are the only funds that presents available data for both evaluation periods. 10 SRI funds are then matched to 10 traditional funds by a process called a match pair analysis.

The first step requires the identification of traditional funds representing the same fund style and age as the sampled SRI funds. The age characteristic is determined by

calculating the difference between the date of the funds first asset class or share which is regarded as the date of inception, and the last recorded date of 31/12/2022. Bollen (2007) introduced a methodology to be used to set an age parameter on the selection of matched traditional funds. Therefore, the age of each traditional fund selected may not be more than three years older than the matched SRI fund or younger by more than three years relative to the matched SRI fund.

For each SRI fund, any eligible traditional counterpart fund, which is previously matched by fund style and fund age, are scored on the distance between the SRI fund's size and β coefficients and the traditional fund's size and β coefficients. The distance representing how close the SRI fund (i) is to each of the traditional counterpart funds (j) is measured with the algorithm below:

Where:

**1.** $Distance_{ij} = \sum_{k=1}^{n} \left(\frac{\beta_{i,k} - \beta_{j,k}}{\sigma k}\right)^2 + \left(\frac{TNA_i - TNA_j}{\sigma TNA}\right)^2$

- N is the number of risk factors in both models;
- $\beta k$ denotes the risk coefficients;
- $\sigma k$ refers to the cross-sectional standard deviation (CSV) of the risk coefficients;
- TNA represents the maximum size reached by the fund;
- $\sigma TNA$ is the cross-sectional standard deviation of TNA.

In order to normalize the weights allocated to each matching criterion, scaling by standard deviation was required in the expression of the algorithm.

The cross-sectional standard deviation formula is given by:

**2**. $\sigma x = \sqrt{\sum_i W_i (r_i - R)^2}$

Where:

- $\sigma x$ refers to the cross-sectional volatility;
- R denotes the average return across all assets;
- $ri$ represents the return of asset;
- $wi$ indicates the weight of asset.

As was achieved by Bollen (2007), the algorithm is used to determine the appropriate matched traditional funds for each SRI fund. The new sample size, post the match pair analysis is 20 i.e., 10 SRI funds matched to 10 traditional funds.

### 3.1.1. Fama-French 3-Factor Model

The first model selected to achieve the research objective is a linear regression model, which is adopted to understand the relationship between the dependent variables and the independent variable.). The application of the FF3FM assists in determining SRI fund alpha's, while comparing the sensitivity of SRI fund returns to three factors i.e., market risk premium, size premium and value premium, expressed by the following formula:

**3.** $Rp - Rf = \alpha p + \beta 0p\ (Rm - Rf) + \beta 1p\ SMB + \beta 2p\ HML + \varepsilon p$

Where:

- $R_p$ denotes the return on the portfolio;
- $R_f$ expresses the risk-free rate;
- $\alpha_p$ implies the alpha of the portfolio;
- $R_M$ represents the return on the market portfolio;
- $B_{0p}$, $B_{1p}$ and $B_{2p}$ are time series regression coefficients;
- SMB refers to the small minus big factor;
- HML represents the high minus low factor;
- $\varepsilon_p$ denotes the error term in the regression.

Prior to the application of the FF3FM, the three factors for the model, i.e., MRP, SMB and HML, are first computed in the following manner. The monthly rate of return on the JSE ALSI is first computed by adopting the same method used for the mutual funds, which is by applying the rate of return formula to the closing prices for each evaluation period. The monthly market premium is then calculated by subtracting the monthly risk-free rate from the monthly returns of the JSE ALSI. The SMB factor is computed by subtracting the monthly returns of the JSE Top 40 Index from the monthly returns of JSE Small Cap Index for each evaluation period. The HML factor is computed by subtracting the monthly returns of the JSE Growth Index from the JSE Value Index for each evaluation period. A linear regression analysis is performed using the linear regression toolpak on Microsoft Excel to produce statistically significant or statistically insignificant alpha values for both SRI funds and the sampled traditional funds. To determine the relative RA performance statistics of SRI funds and their traditional counterpart fund returns, the statistical significance for the FF3FM regression is determined using a hypothesis test.

**Null H0: $\alpha p = 0$**

The null hypothesis, states that no relationship exists between the variables being analysed and that any relevant results indicating a relationship between these variables are based on chance alone.

**Alternate H1: $\alpha p \neq 0$**

The alternate hypothesis allows the researcher to analyse the results of a statistical test, by providing an opportunity to refute the idea of an observed relationship between variables, and by default, accept the alternate hypothesis. Therefore, the alternate hypothesis accepts the idea of an evidence-based observed relationship between the variables analysed (Corporate Finance Institute, 2020).

The FF3FM produces an alpha value which is used in the hypothesis test, as was done by Peerbhai and Naidoo (2022). The alpha represents the percentage of each fund's performance that is not attributed to any factors used in the model or any miscellaneous random stock market movements. The p-value extrapolated from the regression analysis is used to either reject the null hypothesis or accept the null hypothesis. The standard significance level of 0.05 (5%) is used to determine the statistically significant differences of each regression analysis, meaning that a p-value of 0.05 will indicate that there will be a 5% chance that the results will determine a statistically significant difference when a statistically significant difference does not exist.

The larger the p-values, the smaller the evidence is to support the alternate hypothesis, meaning the alpha value is indistinguishable from zero, while the smaller the p-value, the more evidence there is to support the alternate hypothesis meaning the alpha value is distinguishable from zero (Corporate Finance Institute, 2020). Hence, the more evidence to support the alternate hypothesis allows the researcher to reject the null hypothesis when a statistically significant result is produced or fail to reject the null hypothesis when a statistically insignificant result is produced. The results are used to indicate the number of funds that produced a statistically significant positive alpha, statistically significant negative alpha, and statistically insignificant alpha. An analysis pertaining to the possible reasons behind each fund's performance is conducted only on the statistically significant results and not the statistically insignificant results. The final results are used to determine whether SRI funds or traditional funds outperform or underperform with respect to the JSE ALSI, before and during a crisis period.

### 3.2.2. Modigliani and Modigliani ($M^2$) Measure

The $M^2$ measure is designed to provide a relative RA performance measure, considering the total volatility experienced by the portfolio rather than just controlling for the sensitivity of the portfolio returns to the changes in the market portfolio's returns (Damani & Vaidya, 2021). The $M^2$ risk-adjusted measure is an extension of the Sharpe ratio that allows for comparisons between a single mutual

funds" performance and a benchmark index (Damani & Vaidya, 2021). The percentage expressed by the $M^2$ improves the interpretation of the results and allows for a more efficient relative performance comparison for a mutual fund (Chowdhury, 2015). The $M^2$ value is interpreted as the alpha value produced since a positive value indicates the fund is producing returns that are greater than the benchmark index. An $M^2$ value of zero indicates the point at which the fund's performance is equal to the benchmark index performance. A negative $M^2$ value indicates that the fund underperformed relative to the benchmark index.

**4.** $M^2 = (Rp - Rf) \times \frac{\sigma_m}{\sigma_p} - (Rm - Rf)$

Where:

- $M^2$ denotes the alpha of the portfolio;
- $R_p$ implies the return of the portfolio;
- $R_f$ represents the risk-free rate;
- $\alpha_p$ implies the alpha of the portfolio;
- $R_M$ represents the return of the market portfolio;
- $\sigma_m$ refers to the standard deviation of the market portfolio;
- $\sigma_p$ represents the standard deviation of the portfolio.

The standard deviation of SRI and traditional fund returns represents the average dispersion amount of each monthly return from the mean return for the entire evaluation period, which captures the volatility associated with the investments return. The further away each return is from the mean return (larger dispersion) the higher the standard deviation and therefore a higher volatility associated with the returns of the fund. The closer each return is from the mean return (lower dispersion), indicates a lower standard deviation and therefore a lower volatility associated with the returns of the fund.

The $M^2$ measure is used to compute the RA return of each fund relative to the RA return of the JSE ALSI Index. $M^2$ presents the alpha value, which considers the total volatility of the investment represented by the standard deviation of fund returns. Fund returns are computed for both evaluation periods using the RoR formula which encompasses the division of the ending value by the starting value, subtracting a value of one. The annualized average risk-free rate for each evaluation period is calculated using the yield on South Africa's 10-year government bond.

The return on the market portfolio is computed by applying the RoR formula to the closing prices of the JSE ALSI for each evaluation period. The standard deviation of the market portfolio returns is computed using the sample standard deviation

function on Microsoft Excel. The standard deviation for each SRI and traditional fund is also computed using the sample standard deviation function on Microsoft Excel. The $M^2$ measure is applied to each evaluation period, producing an alpha value that considers the total volatility of each investment held for a three-year period. The results are used to determine whether SRI funds or traditional funds outperform or underperform with respect to the JSE ALSI, before and during a crisis period.

## 4. Results

**Table 1. Displays the FF3FM Alpha Values for each Fund During each Evaluation Period**

| SRI fund name | 2017-2019 | 2020-2022 | Traditional fund name | 2017-2019 | 2020-2022 |
|---|---|---|---|---|---|
| Element Earth Equity Sci Fund A | 0.001399707 | -0.006152505 | Prudential Equity Fund Class A | -0.002457664 | -0.00542073 |
| Element Real Income Sci Fund A | -0.00528709 | -0.007104363 | Absa Inflation Beater Fund | -0.006391792 | -0.00786138 |
| Element Islamic Equity Sci Fund A | 0.000075013 | -0.000293619 | Old Mutual Rafi 40 Index Fund | -0.000059556 | 0.001405739 |
| Oasis Crescent Balanced Progressive FoF | -0.003356761 | -0.004087461 | Prescient Positive Return QuantPlus Fund | -0.008841874 | -0.0090522 |
| Oasis Crescent Balanced Stable FoF | -0.00530973 | -0.005609784 | S-Bro Bci Defensive Fund of Fund A | -0.004444246 | -0.00520931 |
| Oasis Crescent Income Fund | -0.007522886 | -0.007525742 | Ashburton Multi Manager Income Fund | -0.006594403 | -0.0083468 |
| Oasis Crescent Equity Fund | -0.002054728 | -0.002201278 | Prudential Dividend maximiser Fund Class A | -0.002634549 | -0.00181144 |
| Oasis Crescent Int Property | -0.010979611 | -0.008336339 | Stanlib Global | -0.008904005 | -0.00809563 |

| | | | | | |
|---|---|---|---|---|---|
| Equity Feeder Fund | | | Property Feeder Fund | | |
| Oasis Crescent International Feeder Fund | -0.003151191 | -0.001259586 | Stanlib Multi-Manager Global Equity Feeder Fund | 0.00067487 | -0.00057763 |
| Old Mutual Albaraka Balanced Fund B1 | -0.003740366 | -0.004860829 | Ampersand Momentum CPI Plus 4 Fund of Fund | -0.004443675 | -0.00784551 |

From Table 1 above, the FF3FM provides varying results of the alpha values for both SRI funds and traditional funds during evaluation period one and evaluation period two. During evaluation period one, 80% of the sampled SRI funds produce statistically insignificant alpha values, while 20% of the sampled SRI funds produce statistically significant negative alpha values. The majority of SRI funds that produce statistically insignificant results means that their alpha values are indistinguishable from zero and we are presented with less evidence in support of our alternate hypothesis therefore, no relationship exists between the variables. The remaining 20% of the sampled SRI results that have shown statistical significance means that their alpha values were in fact distinguishable from zero, presenting more evidence in support of the alternate hypotheses. Therefore, we reject the null hypothesis in favour of the alternate hypothesis. The negative values suggest that 20% of sampled SRI funds, controlling for their sensitivity to the movement of the market portfolio, the difference between small cap and large cap securities and the difference between value and growth securities, underperform relative to the JSE All Share Index. During the same period, 60% of the sampled traditional funds produce statistically insignificant alpha values while 40% produce statistically significant negative alpha values. The negative values suggest that the 40% of sampled traditional funds produce statistically significant results controlling for systematic risk and their exposure to large cap, small cap, value, and growth securities, underperform relative to the JSE All Share Index.

Evaluation period two, during the COVID-19 pandemic period, results in 60% of the sampled SRI funds producing statistically insignificant alpha values, while 40% of the sampled SRI funds produce statistically significant negative alpha values. The negative values suggest that 40% of sampled SRI funds, controlling for their sensitivity to the movement of the market portfolio, the difference between small cap and large cap securities and the difference between value and growth securities, underperform relative to the JSE ALSI. During the same period, 40% of the sampled traditional funds produce statistically insignificant alpha values, while 60% produce statistically significant negative alpha values. The negative values suggest that 60% of sampled traditional funds that produce statistically significant results controlling

for systematic risk, exposure to large cap, small cap, value, and growth securities, over a three-year period, underperform relative to the JSE ALSI.

Adopting the FF3FM, evaluation period one produces a larger number (40%) of traditional funds from the sample that underperform relative to the JSE ALSI, compared to a smaller number (20%) of SRI funds from the sample. A larger number (80%) of SRI funds for evaluation period one also produced more statistically insignificant results compared to the smaller number (60%) of traditional funds that produce fewer statistically insignificant results. Evaluation period two produces a larger number (60%) of traditional funds from the sample, that underperform relative to the JSE All Share Index, compared to a smaller number (40%) of SRI funds from the sample. A larger number (60%) of SRI funds for evaluation period two, produce more statistically insignificant results compared to the smaller number (40%) of traditional funds that produce fewer statistically insignificant results.

Across both evaluation periods, controlling for systematic risk, exposure to large and small cap securities and value and growth securities, over short time periods, result in a larger number of traditional funds providing statistically significant negative alpha values. This means that during both evaluation periods, more traditional funds underperform relative to the JSE ALSI than their SRI fund counterparts i.e., fewer SRI funds from the sample underperform relative to the JSE ALSI than their traditional counterpart funds. Therefore, the SRI funds from the sample perform better than the traditional funds from the sample, based on their relative comparison to the JSE ALSI, before and during the COVID-19 pandemic.

**Table 2. Displays the Modigliani and Modigliani Measure's Alpha Values for each Fund During each Evaluation Period**

| **SRI fund name** | **2017-2019** | **2020-2022** | **Traditional fund name** | **2017-2019** | **2020-2022** |
|---|---|---|---|---|---|
| Element Earth Equity Sci Fund A | 0.013675821 | -0.182485316 | Prudential Equity Fund Class A | 0.040384652 | -0.2138302 |
| Element Real Income Sci Fund A | -0.089515857 | -0.328131305 | Absa Inflation Beater Fund | -0.119633904 | -0.74499678 |
| Element Islamic Equity Sci Fund A | 0.129761180 | 0.138027353 | Old Mutual Rafi 40 Index Fund | -0.012851315 | 0.059913519 |
| Oasis Crescent Balanced Progressive FoF | -0.028406263 | -0.071465509 | Prescient Positive Return QuantPlus Fund | -0.232623832 | -0.50514736 |
| Oasis Crescent Balanced Stable FoF | -0.037508498 | -0.208623618 | S-Bro Bci Defensive Fund of Fund A | -0.081379529 | -0.19241459 |

| | | | | | |
|---|---|---|---|---|---|
| Oasis Crescent Income Fund | -0.373313714 | -1.145920227 | Ashburton Multi-Manager Income Fund | -0.191088166 | -0.6877797 |
| Oasis Crescent Equity Fund | -0.04859109 | 0.039661612 | Prudential Dividend maximiser Fund Class A | -0.054848492 | 0.020144534 |
| Oasis Crescent Int Property Equity Feeder Fund | -0.013692544 | -0.369789111 | Stanlib Global Property Feeder Fund | 0.107870992 | -0.42123979 |
| Oasis Crescent International Feeder Fund | 0.112276221 | -0.086374209 | Stanlib Multi-Manager Global Equity Feeder Fund | 0.261019226 | 0.04336794 |
| Old Mutual Albaraka Balanced Fund B1 | -0.084323207 | -0.087818057 | Ampersand Momentum CPI Plus 4 Fund of Fund | -0.129751021 | -0.3535507 |

Table 2 illustrates the results of the $M^2$ measure which is used to compute the alpha values of SRI funds and their matched traditional funds, factoring in the total volatility of the investment. This differentiates from the FF3FM that only controls for systematic risk. The $M^2$ measure is used to assess the relative RA performance of SRI funds and traditional funds before and during the COVID-19 pandemic. During evaluation period one, the pre-COVID-19 pandemic period, 30% of the sampled SRI funds produce a positive alpha value while 70% produce a negative alpha value. The same result is produced when applying the equation to traditional funds, with 30% of the sampled traditional funds producing a positive alpha while 70% producing a negative alpha. Both SRI funds and traditional fund performance exceed the JSE All Share Index's performance 30% of the time and underperform compared to the JSE ALSI 70% of the time based on the generated results.

During evaluation period two, the COVID-19 pandemic period, 20% of the sampled SRI funds produce a positive alpha while 80% produce a negative alpha. The results differ in evaluation period two since 30% of the sampled traditional funds produce a positive alpha value while 70% produce a negative alpha. During the COVID-19 pandemic period, there are 10% more positive alpha values for traditional funds and 10% less negative alpha values for traditional funds compared to SRI funds. Therefore, during evaluation period two, SRI funds outperform the JSE ALSI 20% of the time while traditional funds outperform the JSE ALSI 30% of the time based on the generated results. More traditional funds outperform the benchmark relative to SRI funds during the COVID-19 pandemic. From the sampled data analysed, the results are the same for SRI funds and traditional funds before the COVID-19 pandemic period with 30% of the sampled funds from each category outperforming

the JSE ALSI. The results are different during the COVID-19 pandemic period, displaying that more traditional funds outperform the JSE ALSI than SRI funds when factoring in the total volatility associated for each investment. Therefore, traditional funds outperform the JSE ALSI more times than SRI funds, during the COVID-19 pandemic, controlling for total volatility of investments.

## 5. Discussion

The relative RA performance analysis using the FF3FM, reveals that 80% of SRI funds display statistical insignificance before the COVID-19 pandemic period. Similarly, 60% of these SRI funds display statistical insignificance during the COVID-19 pandemic period. These results correlate with the extant literature investigating SRI fund performance relative to a benchmark index, highlighting the dominance of statistically insignificant results when compared to a benchmark index (see for example, Hernaus, Zoricic & Dolinar, 2023; Shloma, 2009; Cheung & Jerve, 2020; Yue, et. al, 2020; Renneboog, Horst & Zhang, 2007; Bauer, Koedijk & Otten, 2005; Lima, 2017). The remaining statistically significant results for SRI funds and their matched traditional funds are all negative during both evaluation periods. This is a clear indication of the superior performance of the JSE ALSI during both the pre-pandemic period and post the COVID-19 pandemic period.

The second relative RA return measure, $M^2$, factoring in the total volatility of each investment, produces similar results to the FF3FM based on the domination of the JSE ALSI performance. Before a severe crises period, both SRI funds and traditional funds outperform the JSE ALSI 30% of the time, while during the COVID-19 pandemic 10% more traditional funds perform better than their SRI fund counterparts but are surpassed 60% of the time by the returns earned from investing in the JSE ALSI. This result is similar to the results from Sgammini (2022) who indicated that SRI funds were unable to consistently beat the JSE ALSI before, during and after the COVID-19 pandemic period. Mixed results were provided by (Gladysek & Chipeta, 2012; Latiff & Vanker, 2021; Hornuf & Yüksel, 2023) in which SRI funds neither outperformed nor underperformed relative to a benchmark index. However, Asvathitanont and Tangjitprom (2020) provide evidence of RA returns of SRI funds outperforming the benchmark index when computed using the Modigliani and Modigliani risk-adjusted measure.

The performance of the JSE ALSI varied during all three years in evaluation period one, but still managed to provide superior RA returns relative to the sample of SRI funds. Nedbank Private Wealth (2023) postulates that during 2017, the JSE ALSI provided a 20.9% return, with Naspers identified as a significant contributor when it returned 72% over the course of 2017. Klein (2019) explained that based on a sectoral analysis in 2019, the performance of basic resources increased by 17.8%

while the performance of the industrial sector increased by 7.4%. The value of the JSE ALSI then tapered downward during the lockdown period of 2020, and thereafter recovering and exceeding pre-pandemic levels.

Johannesburg Stock Exchange (2023) suggests that the JSE as an organization, contributed to improving the liquidity of South Africa's financial market by imposing relief measures to assist affected business during the COVID-19 pandemic in 2020. Interest-free extended payment terms were granted to companies in distress for a period of between three and six months and a clearing, trading, and settlement fee reduction of 50% was issued to companies listed on the BEE board and the JSE AltX in 2020. Johannesburg Stock Exchange (2023) stipulates that the JSE increased the amount of cash payments made to medium and small stockbrokers within the Enterprise Development programme during the second quarter of 2020. These initiatives designed to improve the depth and liquidity of South Africa's capital market, positively improved investor sentiments and provided companies with the financial confidence to operate within the volatile environment.

Furthermore, an increase in the Rand's strength since the beginning of 2021, by 13.9% against the dollar, outperformed other similar emerging market currencies (Meyer, 2021). Higher foreign inflows and an increase in trading activity like an increase in commodity demand, resulted in a 22% rise in headline earnings per share compared to the same period of 2019 (Thompson, 2020). Statistics from the International Monetary Fund (2021) reveal that the primary commodity index increased by 67.8% in quarter one of 2021. Meyer (2021) posits that the trade surplus has proved to be another contributing factor improving the performance of the JSE ALSI, with the largest recorded trade surplus of R52.77 billion in 2021. High export demand of minerals, precision metal and steel in 2021, have improved the net export surplus, improving the revenue of the basic resource sector, which is one of the foundational pillars of South Africa's capital market (Meyer, 2021).

In contrast to the superior performance by the JSE ALSI during both evaluation periods, a small percentage (30%) of SRI funds outperform the JSE ALSI during evaluation period one and a smaller percentage (20%) of SRI funds outperform the JSE ALSI during evaluation two, when considering unsystematic risk. These funds belong to the South African equity-general fund class identified by the Association for Savings and Investments in South Africa (ASISA). The equity-general fund class represents South African equity stocks, and reasons for the equity-general SRI fund's higher RA performance relative to the JSE ALSI for each evaluation period is discussed below.

The top 10 holdings of each SRI fund from the South African equity-general fund class consist of companies from South Africa's resource sector (see for example Element Investment Managers, 2022; Element Investment Managers, 2022; Oasis Crescent, 2022; Oasis Crescent, 2022; Oasis Crescent, 2022; Oasis Crescent, 2022;

Old Mutual, 2022). An analysis of fund fact sheets listed above (before the COVID-19 pandemic) reveal that most companies from the high performing SRI funds" top 10 listings, performed well relative to their industry competitors. Hogg (2019) states that during 2018, South African security prices climbed by 0.6% after reports emerged on trade talks between the United States and China. Lindeque (2020) posits that the basic materials sector performed the best in 2019, especially Platinum, Gold, and diversified mining companies that produced returns in excess of 100%.

An analysis of fund fact sheets (see for example Element Investment Managers, 2022; Element Investment Managers, 2022; Oasis Crescent, 2022; Oasis Crescent, 2022; Oasis Crescent, 2022; Oasis Crescent, 2022; Old Mutual, 2022) (during the COVID-19 pandemic), reveal that most companies from the high performing SRI funds" top 10 listings, performed well relative to other industries that were negatively impacted by the COVID-19 pandemic. Motsoere (2023) stipulates that South African currency exchange rates were significantly impacted by the COVID-19 pandemic. This impacted particular trading sectors in South Africa since the Rand lost value at a faster pace than the domestic prices rose (Motsoere, 2023). The exchange rate depreciation results in increased export sales, specifically locally manufactured products as well as an increase in the Rand-denominated turnover of South African exporters, which supports the share price stability of manufactures and commodity exporters (Stuart, 2018). This is supported by Iyke and Ho (2021), who discovered that many South African industries were positively impacted by currency exchange rate risk both before and during the COVID-19 pandemic. Certain sectors in South Africa benefited from their exposure to the currency exchange rate risk, like mining, tobacco, and personal goods, while industries like consumer goods, basic materials, and technology have also benefited (Iyke & Ho, 2021).

Vengesai (2022) highlighted the positive relationship between COVID-19 and the daily returns of the telecommunications sector and the precious metals and mining sector (also known as basic materials from the Industry Classification Benchmark). Vengesai (2022) suggested that this was due to the demand increases for services from these sectors. The positive relationship between the COVID-19 pandemic and the daily returns from precious metals and mining is explained by the desire of investors to seek safe haven in different sectors. Since precious metals like gold are considered as an investment hedge during economic crises, it reduced the impact of extreme volatility in their investments (Vengesai, 2022). Similar research results were found in Alam, Wei, and Wahid (2021) who highlighted the positive impacts of COVID-19 on the telecommunications, technology, and healthcare sectors in Australia.

Muthu and Wesson (2023) identified sectors that performed well in South Africa during the COVID-19 pandemic, namely the financial, industrials, and consumer

discretionary and staples sectors. The highest performance resulted from the financial sector, while sectors like energy, healthcare, technology, and telecommunications performed as expected. Positive returns were seen only in telecommunications, consumer discretionary and staples, technology, and healthcare. The results from their study also indicate that sectors such as telecommunications, technology, industrials, healthcare, energy were not negatively affected by the COVID-19 pandemic since these sectors provided a higher demand for services during the COVID-19 pandemic period (Muthu & Wesson, 2023). This evidence is further supported by Bhuiyan and Chowdhury (2020) and Rababah, et. al. (2020) who concluded that idiosyncratic country specific factors impact each sector differently within each country.

The discussion reveals that before the COVID-19 pandemic, the superior performance of the JSE ALSI was attributed to an increase in demand for products and services in sectors like industrials, basic materials, and the financial sector. The superior performance of SRI funds is also explained by an increase in demand for products and services in sectors like consumer goods, basic materials, industrials, financial, technology, telecommunications, and healthcare. However, during the COVID-19 pandemic, the liquidity improvement in South Africa's financial market influenced by the strengthening of the Rand post the 2020 lockdown period and the recovery measures implemented by the JSE, improved the performance of certain sectors. This is coupled with higher foreign capital inflows and the increase in demand for commodities, that resulted in the superior RA performance of the JSE ALSI relative to SRI funds. The discussion above further reveals that the superior RA performance of SRI funds during the COVID-19 pandemic is attributed to the fact that SRI funds hold investments in organizations that benefit from the liquidity improvement, foreign capital inflows, exchange rate depreciation and increased levels of demand from the consumer discretionary and staples, financial, and industrial, sectors. The demand for products and services in sectors like technology, telecommunications, healthcare, industrials, and energy were influenced by idiosyncratic factors that are country specific. These sectors were not negatively impacted the COVID-19 pandemic (highlighted in Bhuiyan and Chowdhury, 2020; Rababah, et. al, 2020) and so SRI funds invested in organizations from these sectors have performed well and provided a superior RA performance relative to the JSE ALSI, during the COVID-19 pandemic.

## 6. Conclusions

The purpose of this research paper was to increase investor awareness on suitable investment substitutes, considering the changes made to "regulation 28 of the Pension Fund Act of 1956", and to increase SRI in South Africa. The study determined if SRI funds, and their matched traditional counterpart funds provide a

higher RA return than the JSE ALSI before and during the COVID-19 pandemic. To achieve this, we adopted the Fama-French 3-Factor Model and the Modigliani and Modigliani measure. The results of this study reveal that, when controlling for systematic risk, SRI funds and traditional funds are unable to outperform the JSE ALSI before and during the COVID-19 pandemic. When controlling for unsystematic risk, a small number of SRI funds (30%; 20%) and traditional funds (30%; 30%) outperform the JSE ALSI, before and during the COVID-19 pandemic, respectively. The results imply that institutional and retail investors should include SRI funds in their investment strategy alongside traditional funds or as a substitute for traditional funds during economic crises.

The results are achieved with a restricted sample size of 10 SRI funds matched to 10 traditional funds identified on the IRESS database which presented access to available historical data from 01/01/2017 to 31/12/2022. The short observation period of six years (three years before and three years post the COVID-19 pandemic) occurred due experiencing only three years of the COVID-19 pandemic period at the date of the data collection process i.e. year 2022. Hence three years post the COVID-19 pandemic was compared to three years prior to the COVID19 pandemic. Recommendations for further research into SRI include increasing the sample size to include all 23 SRI funds when comparing their performance to a respective benchmark index. The observation periods should be extended so as to compare the performance of SRI funds to a benchmark index over a longer period of time. The use of the Fama-French 5-factor model and the Carhart 4-factor model should be considered to enhance the econometric analysis and provide more robust results.

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