

SPIVA[®] South Africa

Contributors

Joseph Nelesen, PhD
Senior Director
Index Investment Strategy
joseph.nelesen@spglobal.com

Maya Beyhan, PhD
Senior Director
Index Investment Strategy
maya.beyhan@spglobal.com

Davide Di Gioia, MBA
Chief SPIVA Engineer
Index Investment Strategy
david.di.gioia@spglobal.com

Experience the active vs. passive debate on a global scale.

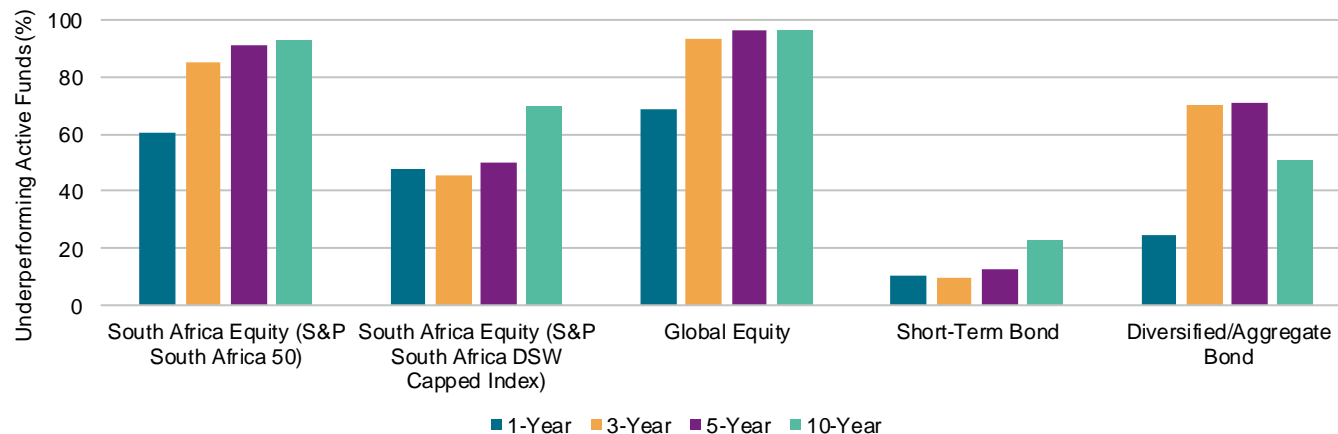
S&P Dow Jones Indices has been the de facto scorekeeper of the ongoing active versus passive debate since the first publication of the S&P Indices Versus Active (SPIVA) U.S. Scorecard in 2002.

The SPIVA South Africa Scorecard measures the performance of actively managed South African equity, global equity and fixed income funds denominated in South African rand (ZAR) against their respective benchmark indices over various time horizons.

Summary

Uncertainty plagued global markets in 2022, creating conditions that allowed some active managers to thrive and others to struggle. Among active South African funds, 61% underperformed the large-cap benchmark, while 48% underperformed the broad market. Underperformance rates were lower in the Short-Term Bond (10%) and Diversified/Aggregate Bond (24%) categories, while 69% of managers underperformed in the Global Equity category (see Exhibit 1 and Report 1). Underperformance rates generally increased with measurement horizons, with a cross-category average of 67% of active funds underperforming over the past 10 years.

Exhibit 1: Percentage of Underperforming Active South African Funds



Source: S&P Dow Jones Indices LLC, Morningstar. Data as of Dec. 31, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

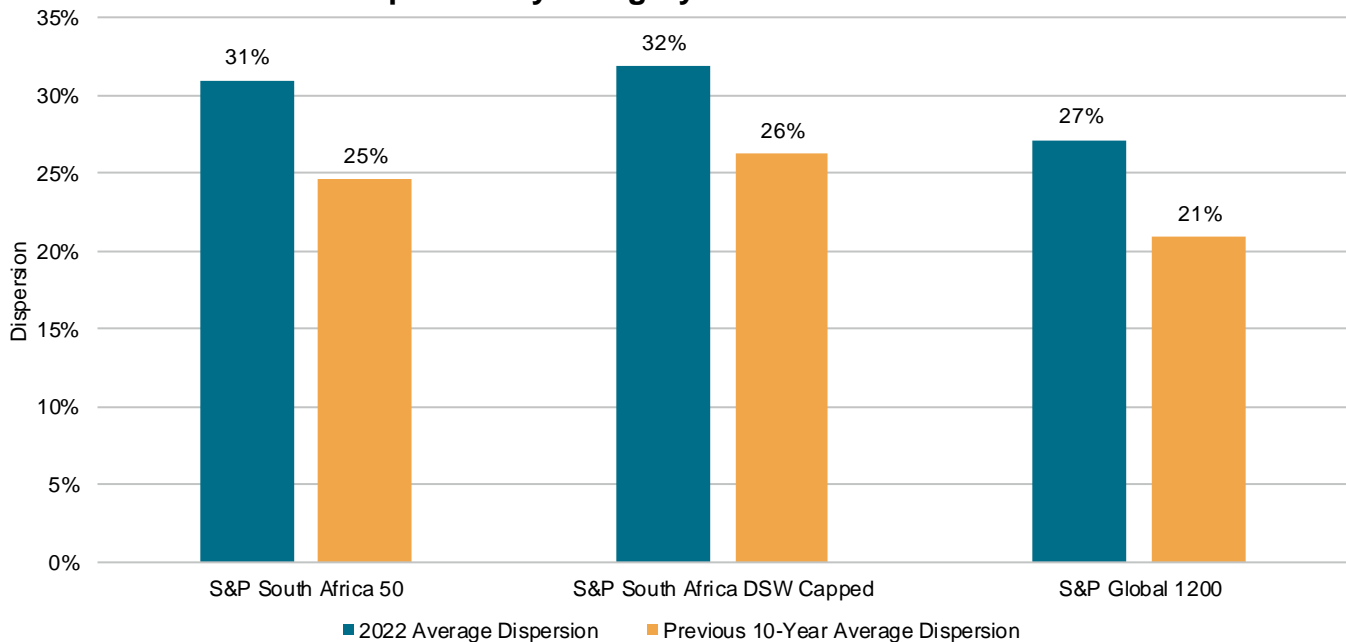
Register to receive our latest research, education, and commentary at
on.spdji.com/SignUp.

- **South Africa Equity Funds:** The [S&P South Africa 50 Index](#) finished 2022 up 5.0%, while South Africa Equity funds posted 3.4% and 5.5% on equal- and asset-weighted bases, respectively, and 61% of funds underperformed the benchmark. Underperformance rates rose to 85%, 91% and 93% over the 3-, 5- and 10-year horizons, respectively. Compared to the [S&P South Africa Domestic Shareholder Weighted \(DSW\) Capped Index](#), which rose 3.6% in 2022, 48% of South Africa Equity funds underperformed. Over the 3-, 5- and 10-year horizons, underperformance rates reached 45%, 50% and 70%, respectively.
- **Global Equity Funds:** The [S&P Global 1200 Index](#) declined 11.4% during 2022, and Global Equity funds dropped 13.8% and 13.5% on equal- and asset-weighted bases, respectively. Over the full year, 69% of funds in the category underperformed the benchmark. Over the 3-, 5- and 10-year periods, 94%, 96% and 96% of funds underperformed, respectively.
- **Short-Term Bond Funds:** As the STeFI Composite increased 5.2% in 2022, 10% of Short-Term Bond funds finished the year underperforming the index. Bond funds in this category gained 5.8% and 5.9% on equal- and asset-weighted bases, respectively. Over the 3-, 5- and 10-year periods, 9%, 13% and 23% of funds underperformed, respectively. On a risk-adjusted basis, however, underperformance rates rose to 83%, 83% and 98% over the 3-, 5- and 10-year periods, respectively.
- **Diversified/Aggregate Bond Funds:** The [S&P South Africa Sovereign Bond 1+ Year Index](#) posted 4.3% in 2022, and 24% of Diversified/Aggregate Bond funds underperformed the index. Over the long term, 70%, 71% and 51% of funds underperformed over 3-, 5- and 10-year horizons, respectively.
- **Fund Survivorship:** Liquidation rates for all categories were in single digits for the one-year period ending Dec. 31, 2022. The Global Equity fund category had the highest attrition rate at 2.4%. Over the 10-year period, 38% of South Africa Equity funds merged or liquidated, and 30% of funds disappeared across all categories (see Report 2).

Market Context

Whipsawing commodity prices, rising interest rates and unbridled inflation created a challenging landscape for investors around the world in 2022. South Africa was no exception: equities followed a plummeting path downward, bottoming out once in the end of H1 and again in the third quarter before staging a late recovery and finishing the year up. Bonds similarly exhibited heightened volatility in the face of rising inflation, yet ultimately posted positive performance. Volatility and dispersion—a measure of the difference in performance between index constituents and an indication of the opportunity set for stock picking—both jumped higher relative to previous long-term averages in South African and global equities (see Exhibit 2).

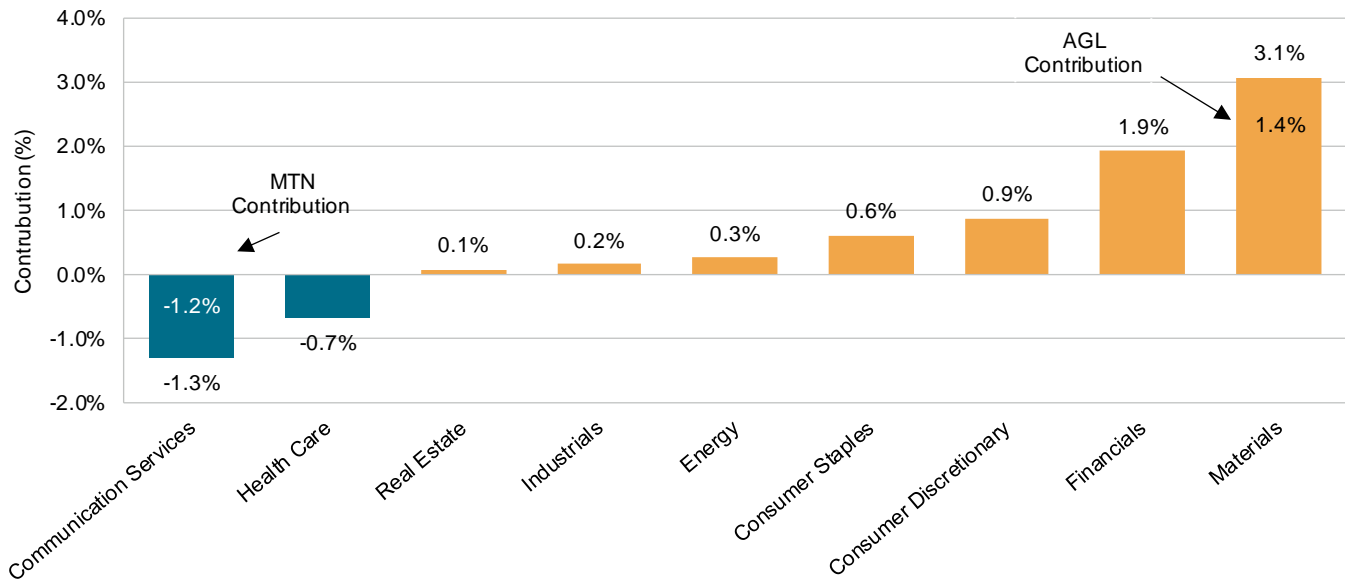
Exhibit 2: Benchmark Dispersion by Category



Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Avoidance of a few significant decliners presented one avenue for outperformance in H1 2022. Among constituents in the S&P South Africa 50, 57% of stocks underperformed the benchmark and 43% outperformed in 2022. A small number of stocks made disproportionate contributions, both negative and positive, to 2022 performance. Communication Services company MTN Group had the most negative effect, contributing -1.2% to the 5.0% full-year return of the S&P South Africa 50. On the other end of the spectrum, Anglo American PLC had a 1.4% positive contribution (see Exhibit 3). **The impact of including or excluding these two stocks in active portfolios could have had significant ramifications for active funds, as the average absolute contributions of all other index constituents was 0.2%.**

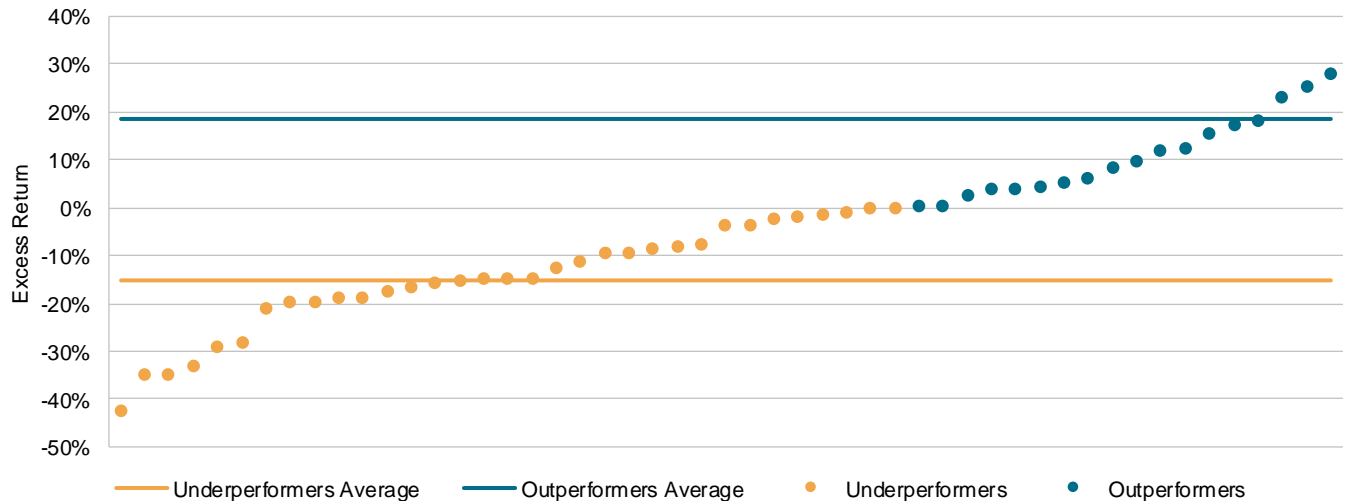
Exhibit 3: S&P South Africa 50 Contribution by Sector



Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2022. Index performance based on S&P South Africa 50 sector total returns in ZAR. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

There was a **positive skew visible in the cross section of stock returns**. During the first six months of 2022, the median S&P South Africa 50 stock was 3.1%, while the average stock return was 4.4%. The distribution of stock returns underscored the presence of skew, as 57% of constituents underperformed the index and 43% outperformed. Outperformers averaged 19% excess return, while underperformers, on average, posted -15% (see Exhibit 4). **A manager’s chances of picking an underperforming stock were higher than chances of picking an outperforming stock, but outperforming stocks were disproportionately rewarding for performance.**

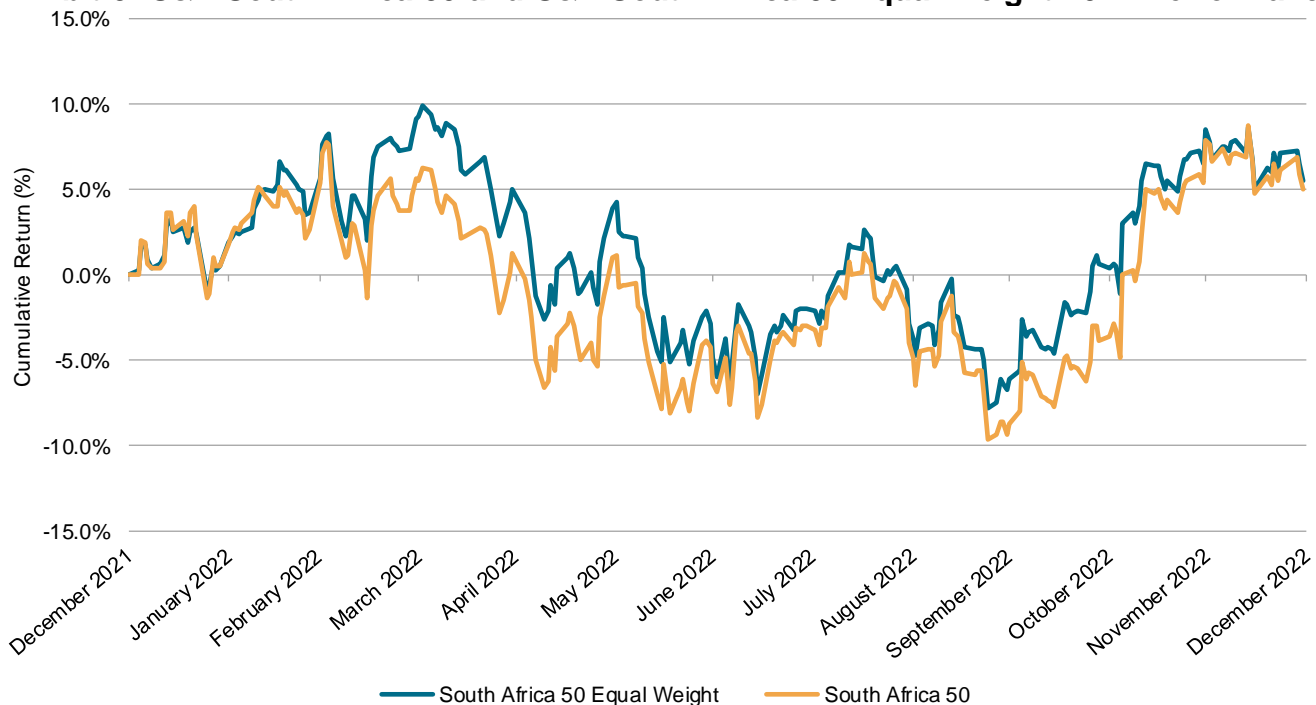
Exhibit 4: S&P South Africa 50 Constituent 2022 Excess Returns



Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2022. Points represent single-stock excess returns relative to the S&P South Africa 50 in ZAR during the first six months of 2022. Constituents number more than 50 due to additions to and deletions from the index during 2022. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Reducing the weights of the largest stocks in the benchmark remains a prevalent active management strategy. Tilting away from mega-cap names may have been a successful approach during much of the first half of 2022, based on the relative performance of the [S&P South Africa 50 Equal Weight Index](#), which generated cumulative performance up to 4.5% higher than the S&P South Africa 50 Index in April (see Exhibit 5). However, much of this differential diminished in the latter half of the year, as the early impact of certain large-cap negative outliers and massive outperformance of some smaller-cap positive outliers both reverted closer to the other constituent returns. By the end of the year, the S&P South Africa 50 Equal Weight Index outperformed its cap-weighted counterpart by just 0.4%.

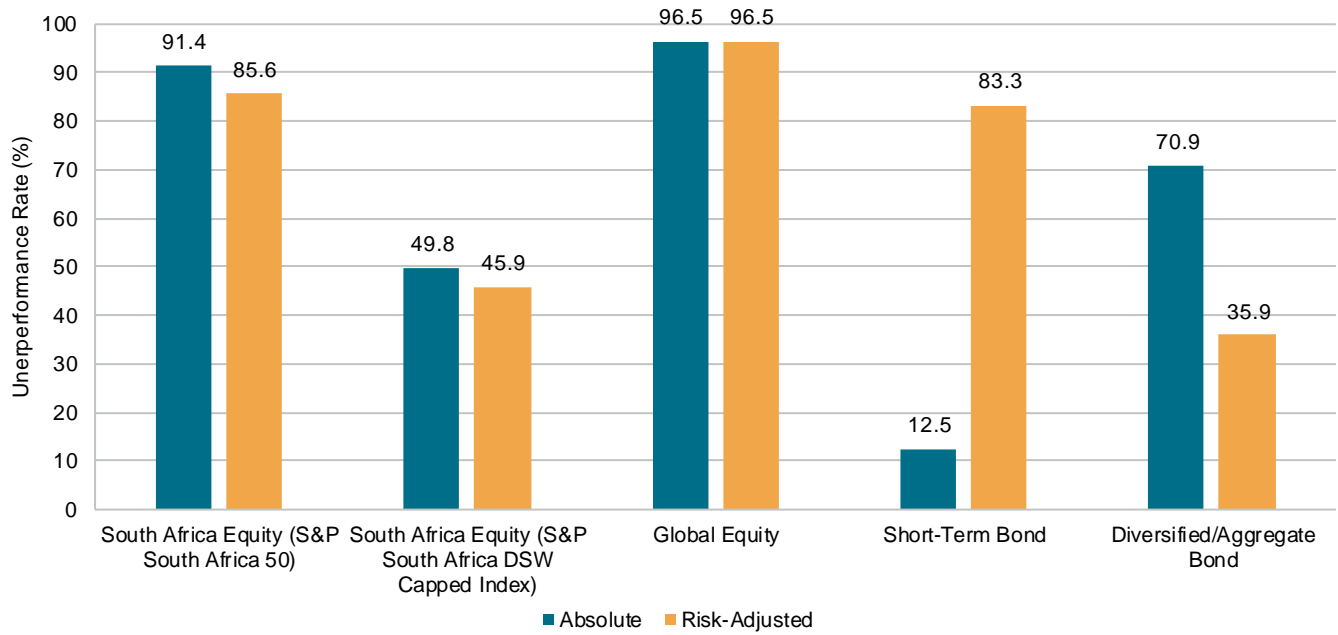
Exhibit 5: S&P South Africa 50 and S&P South Africa 50 Equal Weight 2022 Performance



Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2022. Index performance based on excess total return in ZAR. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Examining active category underperformance through the lens of risk-adjusted returns highlights a few varying results. Over the past five years, for example, risk-adjusted underperformance rates were slightly lower in the South Africa Equity category and substantially lower in the Diversified/Aggregate Bond category when compared with absolute returns. In contrast, the underperformance rate based on risk-adjusted returns was dramatically higher in the Short-Term Bond category (see Exhibit 6). The underperformance rate of 13% based on absolute returns jumped to 83% on a risk-adjusted basis, indicating Short-Term Bond funds took on significantly more risk per unit of return in their efforts to outperform the benchmark.

Exhibit 6: Five-Year Underperformance Rates – Absolute and Risk-Adjusted Returns



Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2022. Index performance based on excess total returns in ZAR. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

A Unique Scorecard for the Active Versus Passive Debate

Since its first publication 20 years ago, the SPIVA Scorecard has served as the de facto scorekeeper of the active versus passive debate. For two decades, we have heard passionate arguments from believers in both camps when headline numbers have deviated from their beliefs.

Beyond the SPIVA Scorecard's widely cited headline numbers is a rich data set that addresses issues related to measurement techniques, universe composition and fund survivorship that are far less frequently discussed but are often much more fascinating. These data sets are rooted in the following fundamental principles of the SPIVA Scorecard, with which regular readers will be familiar.

- **Survivorship Bias Correction:** Many funds might be liquidated or merged during a period of study. However, for someone making an investment decision at the beginning of the period, these funds are part of the opportunity set. Unlike other commonly available comparison reports, SPIVA Scorecards account for the entire opportunity set—not just the survivors—thereby eliminating survivorship bias.
- **Apples-to-Apples Comparison:** Fund returns are often compared with a popular benchmark regardless of their investment category. The SPIVA South Africa Scorecard makes an appropriate comparison by measuring a fund's returns against the returns of a benchmark that reflects the fund's investment category.
- **Asset-Weighted Returns:** Average returns for a fund group are often calculated using only equal weighting, which means the returns of a ZAR 10 billion fund affect the average in the same manner as the returns of a ZAR 10 million fund. An accurate representation of how market participants fared in a particular period can be ascertained by calculating weighted average returns, where each fund's return is weighted by net assets. SPIVA Scorecards show both equal- and asset-weighted averages.
- **Data Cleaning:** SPIVA Scorecards avoid double-counting multiple share classes in all count-based calculations by using only the share class with greater assets. Index, leveraged and inverse funds, along with other index-linked products, are excluded because this is meant to be a scorecard for active managers.

Reports

Report 1a: Percentage of Funds Underperforming Their Benchmarks (Based on Absolute Return)

Fund Category	Comparison Index	1-Year (%)	3-Year (%)	5-Year (%)	10-Year (%)
South Africa Equity	S&P South Africa 50	60.50	85.37	91.39	92.81
	S&P South Africa DSW Capped Index	47.50	45.37	49.76	69.78
Global Equity	S&P Global 1200	68.67	93.65	96.49	96.43
Short-Term Bond	STeFI Composite	10.34	9.43	12.50	22.73
Diversified/Aggregate Bond	S&P South Africa Sovereign Bond 1+ Year Index	24.44	69.83	70.87	50.79

Source: S&P Dow Jones Indices LLC, Morningstar. Data for periods ending Dec. 31, 2022. Outperformance is based on equal-weighted fund counts. Index performance based on total returns in ZAR. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 1b: Percentage of Funds Underperforming Their Benchmarks (Based on Risk-Adjusted Return)

Fund Category	Comparison Index	3-Year (%)	5-Year (%)	10-Year (%)
South Africa Equity	S&P South Africa 50	80.00	85.65	87.77
	S&P South Africa DSW Capped Index	38.05	45.93	62.59
Global Equity	S&P Global 1200	95.24	96.49	100.00
Short-Term Bond	STeFI Composite	83.02	83.33	97.73
Diversified/Aggregate Bond	S&P South Africa Sovereign Bond 1+ Year Index	29.31	35.92	31.75

Source: S&P Dow Jones Indices LLC, Morningstar. Results shown for all time horizons over which the comparison index total return was positive. Data for periods ending Dec. 31, 2022. Index performance based on total returns in ZAR. Risk-adjusted return is computed as the annualized average monthly return divided by the annualized standard deviation of the monthly return for the measured periods. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 2: Survivorship of Funds

Fund Category	Number of Funds at Start	Survivorship (%)
1-Year		
South Africa Equity	200	98.00
Global Equity	83	97.59
Short-Term Bond	58	100.00
Diversified/Aggregate Bond	135	100.00
All Categories	476	98.74
3-Year		
South Africa Equity	205	86.34
Global Equity	63	95.24
Short-Term Bond	53	94.34
Diversified/Aggregate Bond	116	95.69
All Categories	437	91.08
5-Year		
South Africa Equity	209	75.12
Global Equity	57	84.21
Short-Term Bond	48	91.67
Diversified/Aggregate Bond	103	82.52
All Categories	417	80.10
10-Year		
South Africa Equity	139	61.87
Global Equity	28	75.00
Short-Term Bond	44	81.82
Diversified/Aggregate Bond	63	76.19
All Categories	274	69.71

Source: S&P Dow Jones Indices LLC, Morningstar. Data for periods ending Dec. 31, 2022. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 3: Average Fund Performance (Equal-Weighted)

Index/Fund Category	1-Year (%)	3-Year (%)	5-Year (%)	10-Year (%)
S&P South Africa 50	5.04	13.84	9.05	10.73
South Africa Equity	3.40	10.47	5.62	7.55
S&P South Africa DSW Capped Index	3.61	9.63	4.74	8.21
South Africa Equity	3.40	10.47	5.62	7.55
S&P Global 1200	-11.43	12.40	13.55	17.20
Global Equity	-13.84	8.33	9.42	12.99
STeFI Composite	5.21	4.81	5.78	6.14
Short-Term Bond	5.83	5.71	6.68	6.81
S&P South Africa Sovereign Bond 1+ Year Index	4.26	7.13	7.82	7.02
Diversified/Aggregate Bond	4.85	6.49	6.96	6.91

Source: S&P Dow Jones Indices LLC, Morningstar. Data for periods ending Dec. 31, 2022. Returns for periods greater than one year are annualized. Index performance based on total returns in ZAR. Funds are equal weighted, but indices are not. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 4: Average Fund Performance (Asset-Weighted)

Index/Fund Category	1-Year (%)	3-Year (%)	5-Year (%)	10-Year (%)
S&P South Africa 50	5.04	13.84	9.05	10.73
South Africa Equity	5.51	11.69	6.71	8.67
S&P South Africa DSW Capped Index	3.61	9.63	4.74	8.21
South Africa Equity	5.51	11.69	6.71	8.67
S&P Global 1200	-11.43	12.40	13.55	17.20
Global Equity	-13.52	9.21	9.94	14.92
STeFI Composite	5.21	4.81	5.78	6.14
Short-Term Bond	5.86	5.70	6.77	7.02
S&P South Africa Sovereign Bond 1+ Year Index	4.26	7.13	7.82	7.02
Diversified/Aggregate Bond	5.19	6.95	7.71	7.42

Source: S&P Dow Jones Indices LLC, Morningstar. Data for periods ending Dec. 31, 2022. Index performance based on total returns in ZAR. Returns for periods greater than one year are annualized. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Report 5: Quartile Breakpoints of Fund Performance

Fund Category	Third Quartile	Second Quartile	First Quartile
1-Year			
South Africa Equity	0.99	4.02	6.86
Global Equity	-16.39	-13.04	-9.67
Short-Term Bond	5.53	5.78	6.24
Diversified/Aggregate Bond	4.28	5.37	5.99
3-Year			
South Africa Equity	8.75	10.98	13.12
Global Equity	7.16	8.66	10.48
Short-Term Bond	5.43	5.76	5.99
Diversified/Aggregate Bond	5.89	6.53	7.34
5-Year			
South Africa Equity	4.21	6.16	8.02
Global Equity	8.61	10.36	11.21
Short-Term Bond	6.56	6.78	7.16
Diversified/Aggregate Bond	6.87	7.45	8.07
10-Year			
South Africa Equity	6.74	8.17	9.83
Global Equity	13.32	13.94	14.85
Short-Term Bond	6.58	6.87	7.16
Diversified/Aggregate Bond	6.79	7.31	7.67

Source: S&P Dow Jones Indices LLC, Morningstar. Data for periods ending Dec. 31, 2022. Index performance based on total returns in ZAR. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Appendix A: SPIVA Methodology

Data

Data from Morningstar are obtained for all managed funds domiciled in South Africa for which month-end data are available during the performance period. The data include the most comprehensive South African fund data on active and finalized (merged or liquidated) funds over the chosen period. Funds are classified based on the Morningstar fund classification system, and the SPIVA South Africa Scorecard covers South African and international equity and fixed income categories.

Benchmarks

The chosen benchmarks are shown in Exhibit 7. All index returns are total returns (i.e., include dividend reinvestment) in South African rand (ZAR). There has been no deduction from index returns to account for fund investment expenses. It is important to note that active fund returns are after expenses, but they do not include loads and entry fees. To ensure the study is robust and fair, representative benchmarks were selected for each fund category, but not all funds adopt the benchmarks stipulated. However, a vast majority do set their performance hurdle based on either the assigned benchmarks in this report or a similar alternative.

Exhibit 7: SPIVA Categories and Their Benchmarks

Morningstar Category	SPIVA Category	Comparison Index
EAA Fund South Africa & Namibia Equity	South Africa Equity	S&P South Africa DSW Capped Index Gross Total Return (ZAR)
EAA Fund South Africa & Namibia Small-Cap Equity		S&P South Africa 50 Gross TR ZAR
EAA Fund Global Large-Cap Blend Equity	Global Equity	S&P Global 1200 Gross Total Return (ZAR)
EAA Fund Global Large-Cap Growth Equity		
EAA Fund Global Large-Cap Value Equity		
EAA Fund Global Flex-Cap Equity	Short-Term Bond	South Africa Short Term Fixed Interest (STeFI) Composite Total Return (ZAR)
EAA Fund ZAR/NAD-Short Term Bonds		
EAA Fund ZAR/NAD-Ultra Short Term Bonds	Diversified/Aggregate Bond	S&P South Africa Sovereign Bond 1+ Year Total Return Index (ZAR)
EAA Fund ZAR/NAD-Diversified Bonds		
EAA Fund ZAR/NAD-Flexible Bonds		

Source: S&P Dow Jones Indices LLC, Morningstar. Table is provided for illustrative purposes.

Appendix B: Glossary

Percentage of Funds Outperformed by the Index

To correct for survivorship bias, we use the opportunity set available at the beginning of the period as the denominator. We determine the count of funds that have survived and beat the index. We then report the percentage of funds that did not survive and beat the index.

Survivorship (%)

The survivorship measure represents the percentage of funds in existence at the beginning of the time period that are still active at the end of the time period.

Equal-Weighted Fund Performance

Equal-weighted returns for a particular style category and time horizon are determined by compounding the simple average of the monthly returns of all active funds that were available at the start of the period.

Asset-Weighted Fund Performance

Asset-weighted returns for a particular style category are calculated similarly, except based on a weighted average return of fund returns each month, with each fund's return weighted by its total net assets. Asset-weighted returns can be a better indicator of category performances because they reflect the returns of the total money invested across the sample of funds.

Quartile Breakpoints

The p^{th} percentile for a set of data is the value that is greater than or equal to $p\%$ of the data but is less than or equal to $(100-p)\%$ of the data. In other words, it is a value that divides the data into two parts: the lower $p\%$ of the values and the upper $(100-p)\%$ of the values. The first quartile is the 75th percentile, which is the value separating the elements of a population into the lower 75% and the upper 25%. The second quartile is the 50th percentile, and the third quartile is the 25th percentile. For fund category quartiles in a particular time horizon, the data used is the return of the largest surviving share class of the fund net of fees, excluding loads.

Survivorship Bias

Many funds might liquidate or merge during a period of study. This usually occurs due to continued poor performance by the fund. Therefore, if index returns were compared to fund returns using only surviving funds, the comparison would be biased in favor of the fund category. The SPIVA reports remove this bias in three ways. The first method to remove the bias is to use the entire investment opportunity set, made up of all funds in that particular category at the outset of the period, as the denominator for outperformance calculations. The second is explicitly to show the survivorship rate in each category. The final way is to construct a peer average return series for each category based on all available funds at the outset of the period.

Fees

The fund returns used are net of fees, excluding loads.

Indices

A benchmark index provides an investment vehicle against which fund performance can be measured.

S&P South Africa Domestic Shareholder Weighted (DSW) Capped Index

The S&P South Africa DSW Capped Index modifies the [S&P South Africa DSW Index](#) to ensure that no single stock weighs more than 10% of the index at each rebalancing. The S&P South Africa DSW Index adjusts the weights of companies in the [S&P South Africa Composite](#) in order to reflect the level of ownership by South African investors. The S&P South Africa Composite is a float-adjusted, market-cap-weighted index that measures the performance of large-, mid- and small-cap companies listed on the Johannesburg Stock Exchange.

S&P South Africa 50

The S&P South Africa 50 comprises the largest 50 companies by float-adjusted market cap from the S&P South Africa Composite. Eligibility includes all companies listed on the Johannesburg Stock Exchange, including both South African and foreign-domiciled companies as defined by S&P Dow Jones Indices.

S&P Global 1200

Capturing approximately 70% of the world's capital markets, the S&P Global 1200 is a composite of seven headline indices, many of which are accepted leaders in their regions. It includes the [S&P 500®](#) (U.S.), [S&P Europe 350®](#) (Europe), [S&P/TOPIX 150](#) (Japan),

[S&P/TSX 60](#) (Canada), [S&P/ASX All Australian 50](#) (Australia), [S&P Asia 50](#) (Asia Ex-Japan) and [S&P Latin America 40](#) (Latin America).

South Africa Short Term Fixed Interest (STeFI) Composite

The South Africa Short Term Fixed Interest (STeFI) Composite Index approximates the performance of money market instruments in the market. Instruments such as call deposits and negotiable certificates of deposits (NCDs) represent common, liquid instruments and provide a good proxy of short-term markets.

S&P South Africa Sovereign Bond 1+ Year Index

The S&P South Africa Sovereign Bond 1+ Year Index seeks to track the performance of local-currency-denominated sovereign debt publicly issued by the government of South Africa in its domestic market, with maturities of one year or more.

General Disclaimer

© 2023 S&P Dow Jones Indices. All rights reserved. S&P, S&P 500, SPX, SPY, The 500, US500, US 30, S&P 100, S&PCOMPOSITE 1500, S&P 400, S&P MIDCAP 400, S&P 600, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, Select Sector, S&P MAESTRO, S&P PRISM, S&P STRIDE, GICS, SPIVA, SPDR, INDEXOLOGY, iTraxx, iBoxx, ABX, ADBI, CDX, CMBX, MBX, MCDX, PRIMEX, HHPI and SOVX are trademarks of S&P Global, Inc. ("S&P Global") or its affiliates. DOW JONES, DJIA, THE DOW and DOW JONES INDUSTRIAL AVERAGE are trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, S&P Global, Dow Jones or their respective affiliates (collectively "S&P Dow Jones Indices") do not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. S&P Dow Jones Indices is not an investment adviser, commodity trading advisor, commodity pool operator, broker dealer, fiduciary, promoter" (as defined in the Investment Company Act of 1940, as amended), "expert" as enumerated within 15 U.S.C. § 77k(a) or tax advisor. Inclusion of a security, commodity, crypto currency or other asset within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, commodity, crypto currency or other asset, nor is it considered to be investment advice or commodity trading advice. Closing prices for S&P Dow Jones Indices' US benchmark indices are calculated by S&P Dow Jones Indices based on the closing price of the individual constituents of the index as set by their primary exchange. Closing prices are received by S&P Dow Jones Indices from one of its third party vendors and verified by comparing them with prices from an alternative vendor. The vendors receive the closing price from the primary exchanges. Real-time intraday prices are calculated similarly without a second verification.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

S&P Global keeps certain activities of its various divisions and business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate or otherwise address.

The Global Industry Classification Standard (GICS®) was developed by and is the exclusive property and a trademark of S&P and MSCI. Neither MSCI, S&P nor any other party involved in making or compiling any GICS classifications makes any express or implied warranties or representations with respect to such standard or classification (or the results to be obtained by the use thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of such standard or classification. Without limiting any of the foregoing, in no event shall MSCI, S&P, any of their affiliates or any third party involved in making or compiling any GICS classifications have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.]