momentum investments

Mindfields

Engineering certainty in an uncertain world

Turning investment complexity into clarity

THE RESEARCH HIVE

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investments

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THE RESEARCH
HIVE

Introduction

From complexity to confidence

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At its core, investment management is the science of improving the odds of success amid uncertainty. Investment success is often framed as the simple pursuit of returns. While returns often dominate headlines, what matters to clients is whether portfolios deliver the outcomes they need, when they need them, and with risks they can tolerate. Delivering that consistently requires more than intuition or historical convention: it demands evidence-based frameworks that link probabilities, risk management, understanding performance drivers, and skill to practical decision-making.

This collection of research articles explores that interplay through four focused lenses:

1. the odds of achieving defined investment outcomes,
2. the measurement and management of downside risk via Value-at-Risk (VaR),
3. the rigorous assessment of manager styles using Returns-Based Style Analysis (RBSA),
4. and finally, a quantitative evaluation of skill through the Portfolio Opportunity Distribution Set (PODS) approach.

Together, these perspectives offer a multidimensional view of how the Momentum Investments Multi-Management team designs, monitors, and refine strategies to improve the odds of success while managing the perils of uncertainty. Each perspective is designed and delivered in practical outputs, not just theory, to equip decision-makers with tools that make portfolio construction, monitoring, and adjustment faster, clearer, and more reliable.

The first article, "**The odds of investment outcomes: Aligning risk, return, and reality**" sets the philosophical and analytical foundation by highlighting the importance of framing investment risk not merely as volatility but in terms of the probability of achieving specific objectives. It challenges the conventional focus of chasing higher expected returns, showing that such an approach can inadvertently increase the probability of missing targets. By reframing risk in terms of outcome probabilities, the article shows how viewing risk through an outcome-based lens lets investors design more robust portfolios aligned with real-world goals rather than abstract benchmarks. This outcome-based lens transforms decision-making by clarifying trade-offs: not just between return and risk, but between the allure of higher growth and the discipline required to stay within acceptable odds of success.

Reframing risk this way enables investment committees to:

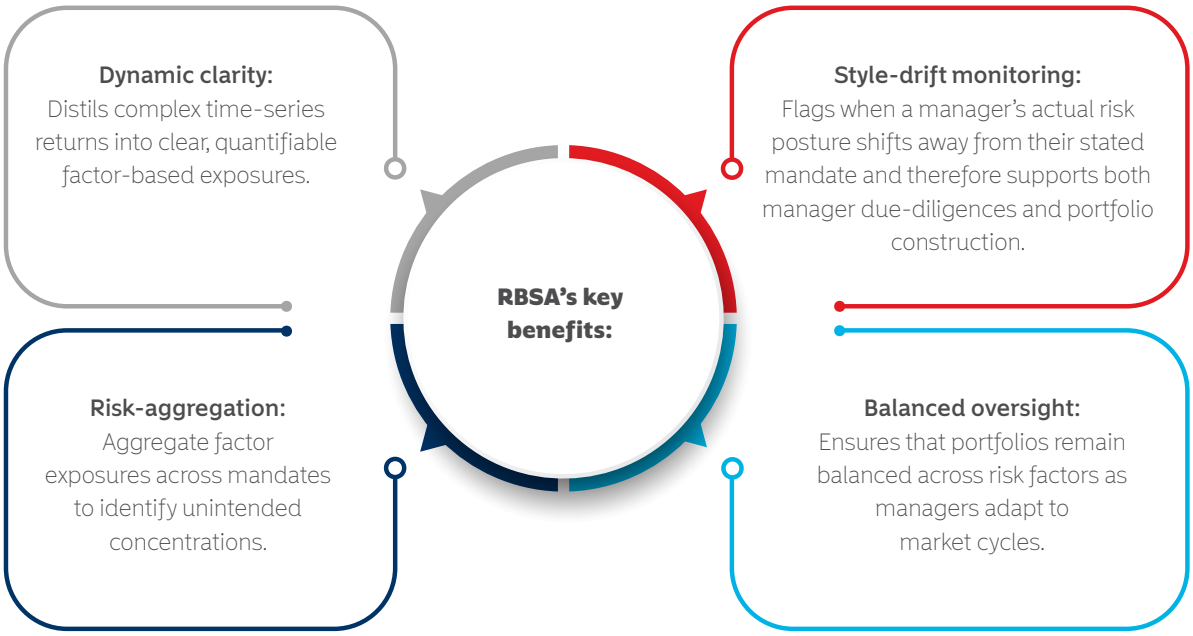
- Hold more structured discussions
- Compare strategies on a common scale of goal achievement
- Avoid the trap of pursuing returns untethered from client objectives

Ultimately, the article asks a fundamental question: Are we optimising for headline returns, or for the probability of delivering the results clients truly need.

Building on this focus of downside consequences, the second article, "**Turning drawdown risk into daily insight: A value-at-risk dashboard**" demonstrates how advanced risk analytics can transform abstract statistical measures into tangible, actionable insights. Value-at-Risk (VaR) and Conditional VaR (CVaR) have long been recognised as useful in theory but difficult to operationalise in practice. The development of a dedicated VaR dashboard solves this by integrating six decades of historical returns, Monte Carlo resampling of crisis periods, and forward-looking market assumptions. The dashboard continually tracks and reports the likelihood and severity of losses across time horizons.

The approach recognises the psychological reality that losses are felt far more acutely than equivalent gains – a core tenet of Prospect Theory. The VaR dashboard not only informs pre-trade sizing and tactical asset allocation decisions but also bridges the gap between statistical models and investor experience through the innovative Client-Experience VaR (CE-VaR) metric. This client-centred risk measure averages VaR estimates across three, six, and 12 months to reflect how investors perceive drawdowns relative to recent portfolio peaks. Ultimately, the VaR dashboard makes drawdown risk both visible and actionable, allowing portfolio managers to adapt portfolios to stay within risk corridors, and provide transparent, consistent reporting to oversight committees and clients alike.

While VaR shows how much risk a portfolio carries, it does not explain why returns behave as they do. Knowing why portfolios behave as they do require clarity about the styles and factor exposures driving returns. The third article, "**Seeing managers in 3-D: Returns-based style analysis**" fills that gap to a large degree. Here, the focus shifts to understanding how equity managers deploy risk relative to the major systematic factors – value, momentum, and quality – that account for most of the variation in equity returns. Unlike static, holdings-based tools or qualitative style declarations that can drift out of date, Returns-based style analysis (RBSA) uses a simple input – time series of returns – to quantify dynamically how much of a manager's behaviour is attributable to each factor.



By translating manager behaviour into an internally consistent factor taxonomy, RBSA acts as a bridge between rigorous quantitative models and the qualitative insights of manager research–offering a scalable, transparent method to track whether managers are delivering the exposures they promise, but also to ensure sound risk management principles are applied when looking through a lens of diversification.

Finally, the fourth article, "**Quantitatively evaluating fund manager skill**" confronts one of the most persistent challenges in asset management: distinguishing luck from true skill. Rather than relying on traditional peer and benchmark-relative comparisons that can obscure whether outperformance is due to a repeatable process or the randomness inherent in financial markets, MIPODS builds on the original PODS concept initiated by Ron Surz, by simulating thousands of hypothetical "no-skill" portfolios tailored to each manager's style constraints, liquidity limitations, and benchmark awareness. This creates a bespoke distribution of potential returns that any manager without skill could have achieved by random chance. By comparing actual performance to this distribution – rather than to arbitrary peers or a broad benchmark – the investment team can estimate how likely it is that the observed returns reflect genuine skill. The article describes in detail how MIPODS defines investable universes, models realistic constraints, controls for frequency and size of turnover to avoid stale factor environments, and incorporates

transaction costs to produce robust, relevant benchmarks. Real-world case studies then illustrate how MIPODS identifies which managers consistently rank in the top quartile relative to their simulated peers. In doing so, it empowers the team to allocate capital more effectively and to hold managers accountable for delivering value beyond randomness.

Taken together, these four perspectives demonstrate how advanced tools can turn investment complexity into clear, structured, and actionable insights. First reframing risk as the likelihood of meeting defined objectives, then quantifying potential downside risk with a client-centred VaR dashboard, next decomposing returns into dynamic factor exposures via RBSA factor mapping and finally isolating genuine manager skill with the MIPODS skill evaluation framework – makes decision-making not just more informed but significantly more efficient. Each model replaces time-consuming, ad hoc processes with disciplined, repeatable workflows that accelerate analysis, improve transparency, and increase confidence in each decision.

By moving beyond headline returns and conventional risk measures, we show that robust portfolio construction is not simply about selecting asset classes or managers, but about designing systems that quantify risk precisely, track style exposures continuously, and assess skill objectively.

By moving beyond headline returns and conventional risk measures, we show that robust portfolio construction is not simply about selecting asset classes or managers, but about designing systems that quantify risk precisely, track style exposures continuously, and assess skill objectively. Ultimately, while markets are unpredictable and no framework can eliminate uncertainty, these tools show that robust processes and rigorous measurement can tilt the odds decisively in favour of investors who embrace evidence-based decision-making. As we implement and refine these methodologies across our mandates, we look forward to sharing lessons learned and further innovations in future issues of Mindfields.

01 The odds of investment outcomes:

Aligning risk, return, and reality

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In a world where investment success is increasingly defined by the ability to meet specific financial objectives, the importance of understanding probabilities and managing risk cannot be overstated. Once the reserve of abstract mathematics and theoretical modelling, probability theory now serves as a practical tool for investors following an outcome-based investing philosophy seeking to optimise the likelihood of reaching targeted outcomes, such as retirement income or capital preservation, while minimising the probability of failure. In this article, we explore the importance of measuring probabilistic outcomes, combined with risk measures like Value at Risk (VaR) and how this enhances the decision-making process, helps manage the chances of success, and protects against shortfalls in goal-based investing portfolios.

Traditional investment strategies often measure success in relative terms - beating a benchmark, outperforming peers, or maximising return. Outcome-based investing (OBI) shifts the objective: success is not just about outperformance, but also about maximising the chances of achieving a specific, predefined financial goal. That goal could be an inflation-beating income in retirement, a certain capital amount by a future date, or preservation of long-term purchasing power in an inflationary world.

> *What is the probability that this investment will enable me to reach my goal?*

In this context, probability becomes the investor's compass, guiding decisions that improve the odds of meeting the desired outcome. Just as importantly, it becomes a tool to understand and manage the risk of not meeting that goal.

From uncertainty to outcome likelihood

Investing under uncertainty means every action has a range of possible consequences. Instead of only asking, "Will this asset outperform?" the outcome-based investor also asks, "What is the probability that this investment will enable me to reach my goal?"

This mindset turns the investment process into a calculation of likely outcomes, not just potential rewards. For example, an investor saving for a child's education in 10 years may evaluate whether their current asset mix provides a 50% probability of reaching the required capital and what steps could improve that to 70% or 80% or even certainty.

Maximisation of expected returns is often perceived as the one and only goal of any investment statement. This is not correct for every (or even most) situations – particularly those where the implications of not achieving the goal are significant. Take for example the goal of saving for a university education for your children. If you don't achieve this goal because you took too much risk and that risk materialised at the wrong time, then your child will probably not be able to study as planned (or potentially ever if the risk you took is too extreme). This is a risk that must be managed, and the investment strategy should be designed with this in mind. At the very least, these risks should be quantified, taken into consideration and managed – something that is ignored if you're only focussing on maximising returns.

Expected return helps, but what really matters is the full distribution of potential outcomes. How likely is success? How large is the risk of failure?

Success in outcome-based investing is therefore not binary; it's probabilistic. A retirement plan, for instance, may define success as providing an income of R20 000 per month in real terms for 30 years. Through simulation and modelling, an adviser might anticipate that a portfolio has a 78% chance of success. That also effectively means a 22% chance of a shortfall, and this is where risk management must intervene.

In traditional finance, risk is often equated with volatility. But volatility does not distinguish between the upside and the downside. It treats gains and losses equally. In OBI, downside risk matters a whole lot more - the risk of capital loss or risk of not reaching your goal.

Managing downside risk with VaR

This is where Value at Risk (VaR) becomes useful. VaR estimates the maximum expected loss over a specified time horizon with a given confidence level. For example, a 5% one-year VaR of R100 000 implies there is a 95% probability that losses will not exceed R100 000. This can also be translated into a percentage as opposed to absolute values. In other words, a 5% one-year VaR of 10% implies there's a 95% probability that the portfolio will not lose more than 10% of its value. This is all done in a probabilistic framework.

Under the outcome-based approach, VaR isn't about what the market might do, but rather about what the portfolio might fail to do. For example:

- Will this portfolio sustain retirement income through market shocks?
- What is the VaR of this portfolio over five years compared to the income needed?
- How often, in probabilistic terms, will the investor fall short?
- What is the likelihood of a capital loss beyond a certain threshold?

VaR and similar measures quantify the risk of falling outside the "acceptable outcome range", providing a concrete way to understand the trade-off between return-seeking and the risk of failure. In the next article in the publication by Josh Giese, "Turning drawdown risk into daily insight: Momentum's value-at-risk dashboard" , we explore the concept of VaR further, delve into greater detail on why measuring this particular risk is critical, and reference a dashboard we have developed internally to assist portfolio managers in measuring potential downside risk on an ongoing basis.

Probabilistic tools for outcome management

Monte Carlo simulation methods generate thousands of potential future outcomes by simulating random market movements. They are a powerful way to compute:

The **probability of reaching a target** (e.g., "82% of simulations meet the retirement goal")

The **range of possible shortfalls** should the target not be reached (e.g. if the retirement outcome is missed, how significant can the shortfall be?)

The **impact of different asset allocations** on outcome probabilities (sensitivity analyses based on asset allocation decisions)

This approach aligns well with our OBI approach because it quantifies success and failure in probabilistic terms. Being able to measure these metrics on an ongoing basis shifts the power to the hands of the decision maker, allowing the portfolio manager to make informed decisions based on probabilities and risk. For this reason, we have developed a practical probabilistic tool that provides the necessary insights before investment strategies are proposed, or active decisions are implemented.

As output from our probability and risk calculator tool, Table 1 illustrates an example of a balanced portfolio delivering on predefined inflationary objectives over set investment horizons. For each iteration, the inflationary objective increases, but so does the investment horizon. Looking at the probabilities, the fund has a 71.16% probability to deliver on a lower inflationary objective (CPI + 2%) over a short investment period (2 years). In contrast, the probabilities increase to 76.5% of delivering on a higher inflationary objective (CPI + 4%) over a 6-year investment horizon. This illustrates that lower inflationary objectives are not always easier to achieve, and, therefore, the investment horizon plays a significant role in defining probabilities.

		CPI + objective	Investment horizon	Probability of meeting target over investment horizon	Expected real return over investment horizon (70% probability)
Example 1	Balanced	CPI + 2%	2 Years	71.16%	2.25%
Example 1	Balanced	CPI + 3%	4 Years	75.62%	4.17%
Example 1	Balanced	CPI + 4%	6 Years	76.50%	4.72%

Table 1: Probability and expected real returns across investment horizons

In the same way, expected returns are not equal across all time horizons. Over the short term (2 years) the fund is only expected to deliver a real return of 2.25% vs 4.72% over a 6-year period at a 70% probability.

Looking at the risk element, the time factor does not play a role in the expected drawdown (maximum expected peak to through loss), the VaR at a 95% confidence interval or even the probability of a negative 12-month absolute returns. All of these calculations are in absolute terms and calculated from the same distribution of expected absolute outcomes. Given the above probabilities of delivering on the objective ranging between 71.16% and 76.5%, there is ultimately a likelihood of between 23.5% and 28.84% that the objective will not be achieved. The more important part of the risk calculations is therefore understanding the expected shortfall or the extent to which the goal can be missed. This is represented in the last column of Table 2 below, effectively highlighting the probability weighted underperformance relative to the objective. Or in simple terms, if the portfolio does not deliver on the intended CPI + 2% objective over 2 years (28.84% probability that this happens), the fund will likely underperform the CPI + 2% objective by 2.95%, thus only delivering CPI – 0.95%.

	CPI + objective	Investment horizon	Expected maximum drawdown	VaR (95%)	Probability of negative absolute return	Probability weighted shortfall relative to objective
Balanced	CPI + 2%	2 Years	-20.95%	-6.0%	2.25%	-2.95%
Balanced	CPI + 3%	4 Years	-20.95%	-6.0%	4.17%	-3.07%
Balanced	CPI + 4%	6 Years	-20.95%	-6.0%	4.72%	-3.66%

Table 2: Risk metrics and probability-weighted shortfalls

When comparing different risk-profile portfolios targeting the same CPI objective over identical investment horizons (Table 3), it becomes clear that risk profiles significantly influence both the probability of success and potential shortfall. If the inflation objective is ambitious enough, portfolios with lower exposure to risky assets typically struggle a bit to achieve those expectations, therefore accounting for lower probabilities.

Additionally, the average shortfall can also be higher compared to riskier (and perhaps more appropriate portfolios to deliver on the outcome). All risks therefore need to be considered in the probabilistic framework to align the most appropriate investment strategy in relation to the acceptable risks that might be unique and specific to each investor or client.

	CPI + Objective	Investment horizon	Probability of meeting target over investment horizon	Expected real return over investment horizon (70% probability)	Expected maximum drawdown	VaR (95%)	Probability of negative absolute return	Probability weighted shortfall relative to objective
Conservative	CPI + 4%	5 Years	54.68%	2.94%	-14.69%	-2.6%	5.75%	-3.85%
Moderate	CPI + 4%	5 Years	62.04%	3.25%	-17.85%	-4.6%	8.09%	-3.79%
Balanced	CPI + 4%	5 Years	71.43%	4.21%	-20.95%	-6.0%	9.18%	-3.73%

Table 3: Comparison of risk-profile portfolios for CPI + 4% objective over 5 Years

The purpose of measuring probabilities is not just awareness, it's actionable insight. If the chance of meeting a goal is too low, investors can:

- Adjust contributions (e.g., increase monthly savings)
- Modify time horizons (e.g., retire later)
- Reallocate assets (e.g., increase exposure to growth assets early on, then de-risk)
- Reframe the goal (e.g., reduce the income requirement)

Each adjustment has a probabilistic effect on success. This is where good investment professionals and advisors become 'risk navigators', not just asset allocators.

Figure 1 below visually demonstrates how the probability of achieving a CPI + 3% objective evolves over various investment horizons for a moderate-risk portfolio. Clearly, the longer the investment period, the higher the probability of successfully meeting or surpassing the investment goal. A portfolio might offer a 70% chance of reaching the target in four years, but 90% in 10 years. Time becomes an essential factor in probability calibration. Investors who understand this can delay gratification for higher certainty or reduce ambition for earlier outcomes. The fact that this awareness can be calculated, measured and understood before making any investment decisions is vital to managing risk and expectations through time and also allows for some level of comfort in aligning investment decisions to overall goals with the correct actions.

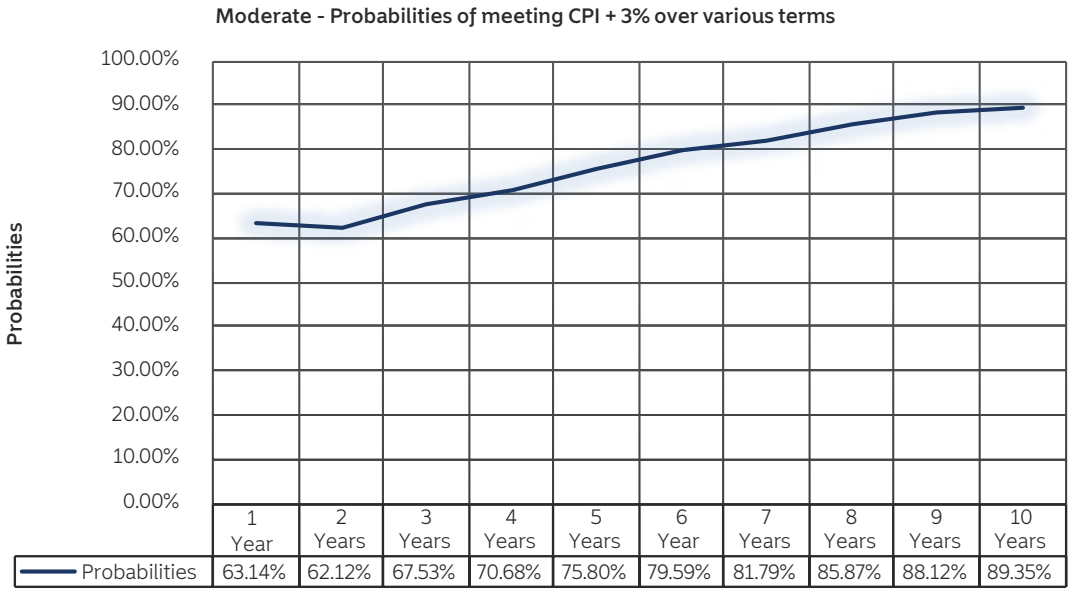

Figure 1: Probabilities of meeting CPI + 3% objective (Moderate Portfolio)

With the rise of computational power and technology, it is possible to now offer almost real-time probability models, scenario simulators, and outcome tracking tools. The technology and tools we developed shift probabilistic approaches and risk management from theory to practice, empowering our portfolio managers with clarity, confidence, and course-correction tools in their investment decisions on behalf of our clients on their journey to financial success.

Conclusion: Thinking in probabilities, planning for outcomes

Humans are wired for deterministic thinking. We prefer certainty, even when it's an illusion. But good investment decisions demand probabilistic awareness.

Investors today no longer just seek to "beat the market." They seek to fund retirement, educate children, or maintain a lifestyle. These are defined goals, not abstract performance targets.

To increase the probability of success, they must embrace the full toolkit of probability theory:

- Quantify the likelihood of achieving the outcome
- Use tools like VaR to manage downside risk
- Make data-informed adjustments to improve their odds
- Monitor probabilities continuously, not just historical performance

When dealing with numerical data, being approximately right is better than precisely wrong. To measure is to know and success, then, becomes a function of process: not avoiding uncertainty, but understanding it well enough to plan for it.

02

Turning drawdown risk into daily insight: A value-at-risk dashboard

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When Harry Markowitz revisited his pioneering work on portfolio optimisation[1], he admitted that the use of variance as the measure of risk in the model remained mainly because it was "cheaper, more familiar, and more convenient" than other more practically well-suited measures that focused only on downside moves.

However, ease of calculation does not ease the pain of loss. A portfolio that falls 50% must gain 100% just to break even, and experiments derived from Prospect Theory[2] confirm that the sting of a loss outweighs the pleasure of an equal-sized gain. This mix of arithmetic and psychology explains why every Momentum fund carries an explicit drawdown budget, and why Value-at-Risk (VaR) sits at the heart of our risk management process.

> *Value-at-Risk (VaR) estimates the worst loss a portfolio is expected to experience within a specified horizon at a chosen confidence level.*

A modern measure for modern risk

VaR estimates the worst loss a portfolio is expected to experience within a specified horizon at a chosen confidence level. Quoted as "X % VaR over Y months," it converts statistical theory into a plain-language threshold: a 12-month 95 % VaR of -8% says that only one in 20 rolling 12-month periods should see a return less than -8%.

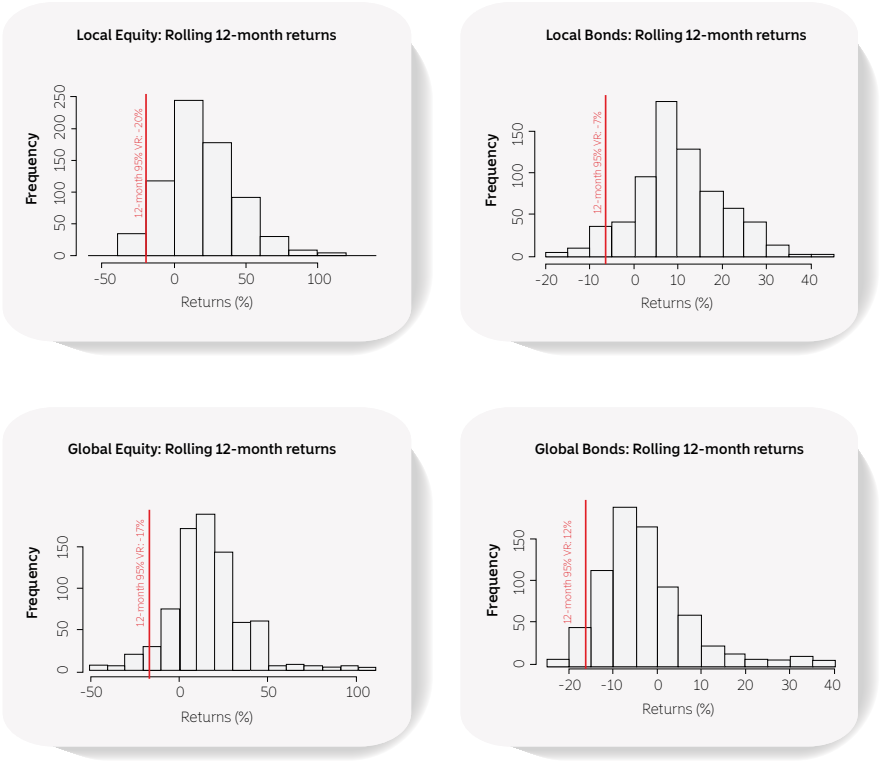

Figure 1: Return distribution: histogram showing the 95% 12-month value at risk for various asset classes.

[1] *Markowitz, Harry M. Portfolio Selection: Efficient Diversification of Investments. Yale University Press, 1959. JSTOR, http://www.jstor.org/stable/j.ctt1bh4c8h. Accessed 3 June 2025.*

[2] *Daniel Kahneman (2011). Thinking, Fast and Slow. Macmillan. ISBN 978-1-4299-6935-2.*

Traditional measures such as variance or standard deviation treat upside and downside moves as symmetrical "noise." Harry Markowitz kept variance in his original model for convenience, but he also warned that investors care far more about the direction and depth of losses than about prosperous swings. VaR tackles that asymmetry by looking only at the left-hand tail of the return distribution. Instead of describing risk as a spread around the mean, it sets a concrete downside line in the sand – an approach that resonates with drawdown-aware mandates and client conversations.

VaR's sharp focus, however, leaves blind spots. It shows where the cliff edge lies but not how far the fall might be once the threshold is crossed, and its accuracy hinges on how well the model captures extreme events. For that reason Momentum pairs VaR with Conditional VaR (also known as Expected Shortfall) so that portfolio teams see both the cliff's edge and the depth below.

Why does Momentum Investments track VaR?

Momentum's multi-manager solution structure spans model portfolios, pooled funds and bespoke mandates. That diversity is a strength, yet it also creates a reporting challenge. Drawdown limits must be monitored continuously and consistently, regardless of the return target, management team or favoured implementation styles (e.g. active vs passive).

Philosophy and fiduciary duty therefore converge on a single requirement: a shared measure of potential loss, calculated the same way for every portfolio and refreshed often enough to guide key allocation decisions. The result is the VaR dashboard, developed specifically for Momentum Investments.

"VaR's sharp focus, however, leaves blind spots. It shows where the cliff edge lies but not how far the fall might be once the threshold is crossed, and its accuracy hinges on how well the model captures extreme events."

It answers the four questions that drive most risk conversations:

1. How far could the portfolio fall over the next 3, 6 or 12 months at a certain confidence level?
2. How do the various asset classes and manager tilts contribute to that potential downside?
3. What would happen to the potential tail risk if asset allocations were changed by a few percentage points?
4. And, above all, is the fund still inside its mandated drawdown limit today?

By answering these questions in one place, the dashboard turns an abstract risk measure into a practical control panel through which our portfolio managers use to be cognisant of drawdown risk when designing their solutions and making their asset allocation decisions.

How the Momentum Investment VaR model works

There are a handful of ways to estimate VaR. The quickest is the "formula" approach, which assumes returns follow a neat bell curve: feed in an estimate of recent volatility and it spits out a VaR number. A step up in realism is the historical method, which simply ranks past moves and determines the fund's VaR based on these historical experiences. When analysts want to peek at futures the market hasn't yet delivered, they run Monte-Carlo simulations, generating thousands of hypothetical price paths based on current correlations and volatilities. Each technique trades speed, realism and data-hunger differently.

What is presented here is a bespoke approach which focuses on using history as a guide to likely outcomes in the future. We make certain adjustments to history, which exacerbates the likelihood of the worst possible outcomes and aligns to the Prospect Theory mentioned earlier. While this is a conservative approach, we believe it to be prudent given its importance in the solution design and management, without compensating on upside potential.

We begin with more than sixty years of returns history for various global and South African asset classes. We then "mean-shift" the series so its long-run real return lines up with the investment team's current forward-looking assumptions. That preserves the true pattern of correlations, volatility clusters and regime switches while grounding the numbers in today's economic expectations.

Historical returns trace just one of infinitely many possible paths and reveal nothing about the countless routes markets might have taken under different circumstances. We use Monte-Carlo resampling to stitch and re-order blocks of history to produce thousands of alternative market paths that are used to model possible future return series. It is important to note that we deliberately oversample crisis periods so fat-tail events remain prominent as these are the scenarios that would threaten a client's financial well-being most.

For every simulated path, rolling windows are applied to track portfolio losses over three, six and twelve months. The model records the worst losses across various percentiles in each window, and then repeats the process across all simulated and historical paths. The result is a distribution of losses from which we can extract predicted VaR numbers for a multitude of time periods and confidence levels. This same 'machinery' that will generate VaR estimates is also used to provide conditional VaR (or Expected Shortfall) estimates when a deeper view of tail risk is required.

In short, the process blends lived history with forward-looking expectations, widens it with thousands of unseen market paths, and distils it into a full suite of downside-risk metrics that feed the dashboard in real time.

By blending multiple horizons, CE-VaR keeps fresh peaks and troughs in focus and lets advisers discuss risk in language that matches what clients live to experience.

Client experience VaR: Bridging statistics and emotions

Let's use an investor who deposits R800 000 as an example. Three months later their account balance peaks at R1 000 000 – a gain of R200 000 that sets a powerful anchor in the client's mind. Over the next nine months, markets retreat and the account closes the year at R750 000. On a strict twelve-month window the loss is only R50 000 (-6.25 %). Yet behavioural finance suggests that the investor is very likely to compare today's figure with the high-watermark and thus "feels" a 25 % drawdown (a loss of R250 000).

Because investors track recent highs and lows, we calculate Client Experience VaR (CE-VaR) which is the simple average of the three-, six- and twelve-month VaR numbers. By blending multiple horizons, CE-VaR keeps fresh peaks and troughs in focus and lets advisers discuss risk in language that matches what clients live to experience.

How our portfolio managers put the numbers to work

Before the dashboard, each portfolio management team would wrestle with complex spreadsheets and related data issues to estimate drawdown impact for their portfolio – a slow, manual process, prone to error and not consistently applied across different teams. The dashboard replaces this with a consistent and efficient solution rooted in rigour but with practical assumptions. The dashboard that has been developed unlocks the following capabilities for the portfolio management teams:

- Pre-trade sizing: the dashboard offers "what-if" functionality. By changing an asset allocation, a manager can see how their fund risk numbers would change.
- Ongoing monitoring: thanks to the availability of the dashboard VaR calculations have moved from quarterly checks to being a daily discipline. Fund VaR numbers reflect real time holdings data and trigger an alert if any fund violates its threshold. Risks that once hid between reporting cycles now surface the same morning they appear.
- Committee oversight: portfolio reviews need comparable risk numbers for every candidate fund. A single export from the dashboard supplies up-to-date and consistent VaR figures, saving hours of ad-hoc, inconsistent, calculation.
- Reporting transparency: having VaR data on minimum disclosure documents (MDDs) closes the loop. The same VaR data is available for public MDDs, so advisers and investors see exactly what managers monitor– one source, many audiences, and zero mismatches.

Putting the dashboard to work: A "what-if" in real time

Table 1 shows the Scenario-Analysis tab of the VaR dashboard – a workbench where portfolio managers test how prospective tactical moves will alter a fund's drawdown profile.

The table is organised in three side-by-side columns:

- Strategic Asset Allocation (SAA) – the portfolio's centre of gravity.
- Current Asset Allocation (CAA) – the live positions that reflect any swings away from the SAA.
- Tactical Asset Allocation (TAA) scenario – a "what-if" column that previews the risk impact of an asset allocation change the manager is considering.

Because mandates are set relative to the SAA, managers must monitor how far current and proposed tilts push the portfolio's risk beyond that of the SAA benchmark. The interface now highlights whichever TAA scenario is active, making it effortless to read the 95% VaR figures for the SAA, the CAA, and the proposed TAA side-by-side and judge them in one glance.

In the snapshot, the portfolio's risk **budget is framed** as a 95 % Client-Experience VaR of **-5%**, with a narrow band of ± 1 percentage points serving as the mandate's guard-rails. The **Strategic Asset Allocation (SAA)** is calibrated to sit comfortably inside that band and currently prints a CE-VaR of **-4.67%. The Current Asset Allocation (CAA)**, however, shows **-5.65%**, nudging above the upper limit and signalling that recent tilts have added downside risk.

Expecting softer equity markets and seeing value in domestic bonds, the manager suggests a new mix into the asset allocation scenario fields, shifting 2 % out of local equities and into local bonds. The dashboard recalculates on the spot: CE-VaR drops to -5.19%, drawing the portfolio closer to its prescribed risk corridor and confirming that the proposed trade ensures alignment with the mandate's guardrails.

Beneath the main table, a second panel decomposes the 95 % CE-VaR delta into three parts:

- Allocation effect – risk added (or removed) by the CAA relative to the SAA.
- Strategy effect – we acknowledge that there is an implication for portfolio risk based on whether we decide to execute mandates in a passive or active manner. The strategy effect quantifies the impact of using active managers instead of passive exposures.
- Interaction effect – how allocation and manager choices amplify or offset one another.

By spelling out why the risk number changes – not just that it changes – the dashboard converts intention into a quantified trade-off. With a single click the tool verifies that a modest reweighting delivers meaningful downside protection, ensuring the portfolio's risk remains anchored to its strategic budget before any trade is booked.

	Reference Point		Scenario
	Strategic Asset Allocation	Current Asset Allocation	Tactical Asset Allocation
95% Client Experience VaR	-4,67%	-5,65%	-5,19%
95% 12m VAR	-3,52%	-4,88%	-4,17%
95% 6m VAR	-5,46%	-6,35%	-5,96%
95% 3m VAR	-5,02%	-5,72%	-5,45%
95% 12m cVAR	-7,9%	-9,55%	-8,77%
95% 6m cVAR	-8,49%	-9,79%	-9 ,16%
95% 3m cVAR	-7,57%	-8,52%	-8,06%
Client Experience VaR Attribution			
VaR impact From CAA/TAA	0,6	1,65	1,18
VaR Impact from Strategies	-0,6	-0,6	-0,6
Interaction Effect	0	0	0
Total VaR Delta	0	1,05	0,58

Table 1: A snapshot of the "what-if" scenario functionality provided by the VaR dashboard

Multiple risk lenses

After the global financial crisis, regulators decided that the banking system needed a sharper view of tail risk. Under the Fundamental Review of the Trading Book (often referred to as Basel IV), the 99 % ten-day VaR that had served since Basel II was replaced with a 97.5 % Expected Shortfall (also called Conditional VaR). The switch recognised that knowing where the cliff starts is only half the story; banks must also gauge how far they might fall once they step over the edge (as shown in figure 2 below).

Our portfolios face the same logic. 95% VaR pinpoints the threshold that we expect to breach only five percent of the time; Conditional VaR reports the average loss if the 95% VAR level is breached. VaR is the more stable day-to-day metric and serves as our primary limit, but we keep CVaR alongside it to understand the full depth of the tail. The combination lets managers see both the edge and the drop, grounding allocation decisions in a complete view of potential loss.

Figure 2: Contrasting 95% 12- month VaR with CvaR for the local equity asset class

Conclusion

Risk is inevitable; surprise is optional (and unwelcome). By fusing six decades of history with current market views, overweighting the crises that shape investor memory, and presenting both VaR and CVaR in a live dashboard, Momentum Investments' research team has turned abstract statistics into practical guidance.

The result: portfolio managers can size trades in seconds; committees compare alternatives using common metrics; and clients view risk through a lens that matches their emotional experience. The outcome is simple, portfolios stay within drawdown budgets, and investors know their capital is managed with discipline and foresight.

03 Seeing managers in 3D: Returns-based style analysis

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Equity style factors

Decades of research have shown that some stocks systematically outperform others for reasons beyond simple market exposure. The earliest evidence highlighted the value effect: companies trading at low prices relative to their fundamentals (such as earnings or asset values) tended to outperform their expensive peers over time. Later work identified momentum, the tendency for recent winners to keep winning, and quality, the resilience of profitable and well-governed firms, as prominent drivers of equity outperformance. These return drivers–known as equity style factors–reward investors for accepting distinct types of company-specific risks, as explored in our Mindfields: Factor Fusion edition. These risks are often driven by underlying economic, fundamental or psychological factors. Crucially, these equity styles tend to deliver their outperformance at different times. When value stalls, momentum or quality often leads, and vice versa. This diversification power explains why factors sit at the core of Momentum Investments' equity philosophy.

How Momentum Investments builds a multi-asset portfolio

Our investment process begins with a clear strategic asset allocation decision: deciding how much of the total fund should be split between local and global assets, or between the various asset classes (equities, bonds, property, cash). This decision is based on a fundamental forward-looking view around return and risk expectations from each asset class as well as the interdependencies between them.

Within the equity sleeve we set explicit long-run targets for our exposure to value, quality and momentum factors, based on sound and detailed fundamental research to derive the forward-looking return expectations. The final step is to choose whether each factor tilt should be implemented through active fundamental managers or systematic, rules-based products. Finally, we award mandates to managers whose behaviour aligns with the factor mix we target.

"Our investment process begins with a clear strategic asset allocation decision: deciding how much of the total fund should be split between local and global assets, or between the various asset classes (equities, bonds, property, cash)."

Why factor clarity matters

A key problem is that most active managers are not factor-purists. While some managers lean deeply into one style, others blend multiple styles or vary them through time, and a few claim to be entirely style-agnostic. Regardless of their approach, we need to know whether the individual managers, or the roster of mandates that we choose actually deliver the intended factor balance. For example, if several managers drift toward the same style (perhaps because it is working well in that specific period), the aggregate portfolio risks becoming unintentionally concentrated and vulnerable when that factor falls out of favour. Self-declared style maps (such as those provided by the managers themselves) depend on interviews and memory and can turn stale quickly, particularly when these factors are not working on a relative basis against the benchmark.

Holdings-based risk models, such as MSCI Barra and FactSet, focus on benchmark tracking error and require detailed holdings files, which are often delayed (if available at all). We needed a lighter, more objective tool that keeps pace with managers' behaviour – Returns-Based Style Analysis provides exactly this.

Returns-based style analysis (RBSA)

Decades of evidence show that the majority of variance within equity-market behaviour can be traced to just three systematic styles: value, quality and momentum. Figure 1, which plots the rolling factor exposures of the FTSE/JSE Capped Swix index since 2011, illustrates how these drivers dominate the index even as their individual contributions ebb and flow through the cycle. Over the full period, these three factors alone explain more than 97% of the variance within the index. Fund managers build on this foundation aiming to exploit these factors in different ways–some anchor their process to a single factor, others blend two or three, while more dynamic firms tilt between styles in search of an edge.

Returns-Based Style Analysis (RBSA) turns those broad market forces into a clear, manager-level diagnosis. By examining a defined slice of returns, over either a fixed period or a rolling window–the model estimates how much of a mandate's performance behaves like value, quality or momentum. Factor weights are constrained between 0% and 100% and must sum to 100%, while any residual return is captured as alpha. Because RBSA uses Momentum Investments' own factor definitions, it speaks the same language we apply in portfolio construction and lets us quantify manager behaviour without waiting for position files or relying solely on interviews.

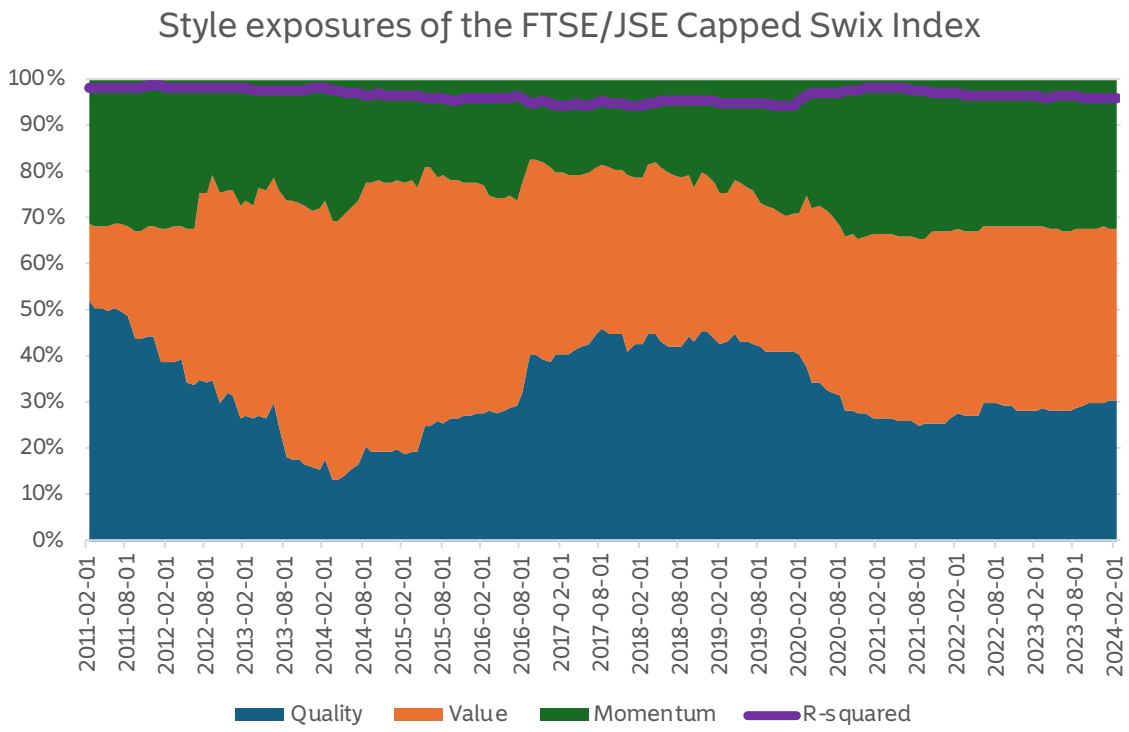

Figure 1: Graph showing how 3 equity risk factors can explain more than 97% of variance in the FTSE/JSE Capped Swix Index.

The evolution of style-snapshot tools

There's no shortage of style-snapshot tools. Off-the-shelf packages such as MSCI Barra, FactSet, Style Analytics and Morningstar deliver benchmark-relative risk breakdowns at the click of a button. Our own manager research team captures the qualitative style mappings and other nuanced views that emerge from individual manager engagements. Each serves a purpose, yet they occupy very different positions on the spectrum ranging from academic rigour to practical usability. The vendor models are academically thorough but data-hungry, locked to their own factor definitions and limited to equities. Qualitative maps sit at the opposite end: highly practical and

fully aligned with our philosophy, but labour-intensive and prone to staleness when analyst capacity is stretched or when investment conditions change. It is not feasible for our manager research team to constantly update the qualitative mappings across the dozens of managers they monitor.

RBSA bridges this gap. It applies transparent, academically grounded statistics to Momentum's own factor definitions, yet it needs only readily available return series, so it remains 'light' enough for routine use. The result is a tool that matches the alignment of our qualitative research while meeting the practical, cross-asset demands that off-the-shelf systems and static maps cannot satisfy.

What RBSA changes in practice

RBSA has already improved several aspects of our daily workflow. The managers we select claim to follow a specific process, but this is self-declared and at best, reflects an average over time. Managers are flexible because of changing market conditions and management teams, often leading to drift. With RBSA, we can validate this formally and continuously. RBSA creates an objective classification framework and by translating each manager's behaviour into a common stylistic language, it enables like-for-like comparisons across otherwise diverse mandates.

> *... making performance stories easier to grasp.*

Monthly reports either confirm or challenge the styles in our qualitative database, alerting analysts when a mandate deviates from its stated profile. Drift that once surfaced only during annual reviews is now flagged in near real time, allowing quicker engagement with managers and reactions from portfolio management teams.

Aggregating RBSA weights across mandates also reveals the true factor balance of the entire equity sleeve, helping portfolio management teams avoid unintended tilts or factor concentration. When we speak to advisers and clients, clear RBSA-based factor-fingerprint charts replace jargon with evidence, making performance stories easier to grasp.

Early insights

Applying RBSA to live mandates has already revealed valuable insights. RBSA shows that a flagship fund (see Figure 1) that markets itself as style-agnostic indeed shifts meaningfully between value, momentum and quality as opportunity and market conditions fluctuate. By comparison, a self-proclaimed value-plus-quality manager shows the expected two-factor bias with minimal momentum exposure (see Figure 2). Meanwhile, a multi-factor smart beta manager (see Figure 3) reveals a consistent exposure across all three factor premia, validating that it is passive in both design and implementation.

Traditional qualitative style maps, refreshed only at periodic review meetings, leave a significant blind spot: most active managers adjust their style exposures as market conditions evolve. This suggests that relying solely on static qualitative style mappings for active fundamental managers ignores the variable nature of alpha extraction. RBSA closes that gap by capturing those temporals, letting us monitor changes in style exposures before unintended crowding builds up. Static classifications remain appropriate for genuinely passive or rules-based strategies, whose factor weights are fixed by design. Portfolio construction should acknowledge their fluid exposures and adapt allocation weights accordingly.

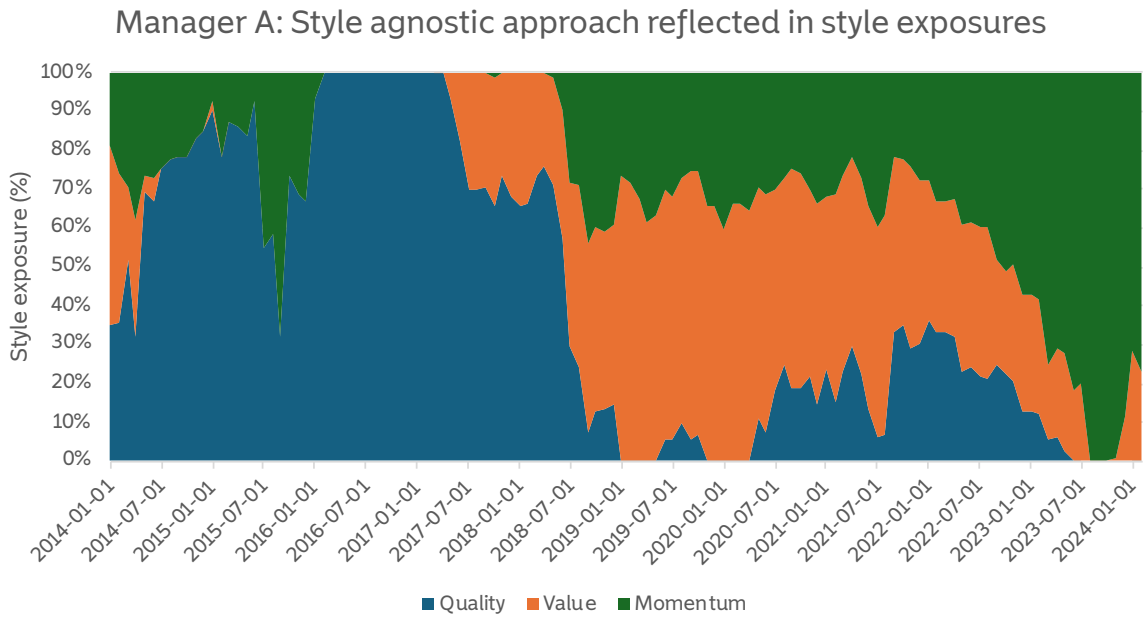

Figure 2: Manager A – Factor agnostic (RBSA analysis – rolling 12m window)

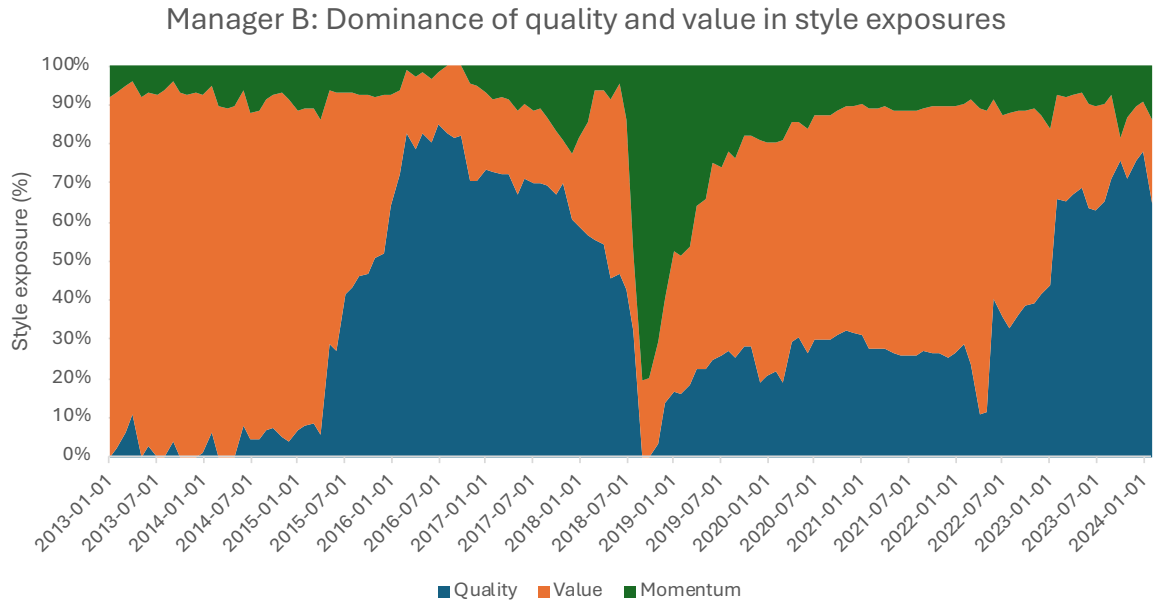

Figure 3: Manager B - Value and Quality (RBSA analysis – rolling 12m window)

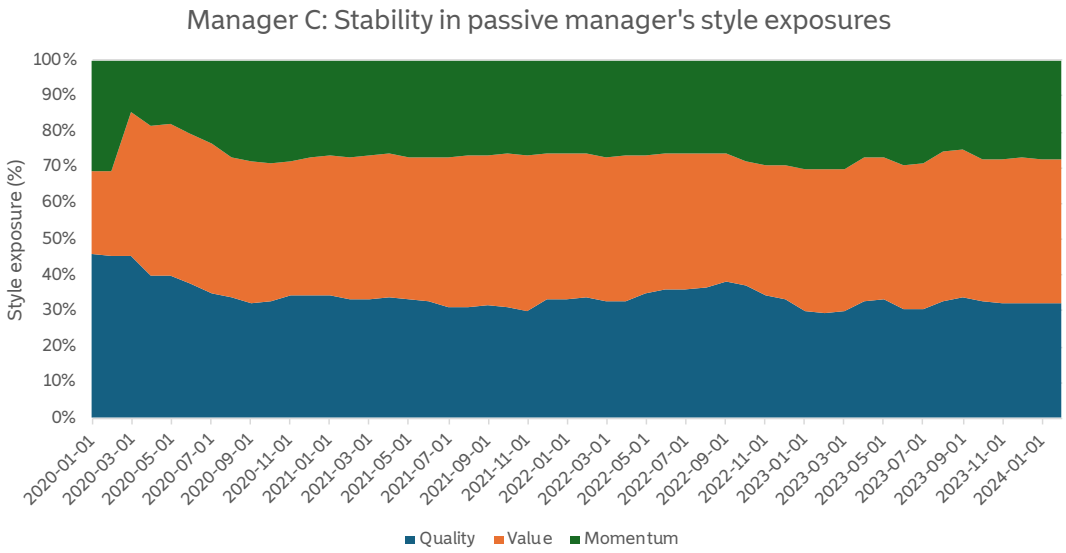

Figure 4: Multi-factor Smart Beta (RBSA analysis – rolling 12m window)

RBSA provide a complementary lens

RBSA does not replace holdings-based analytics such as those provided by MSCI Barra – it complements them. Where MSCI Barra or FactSet can explain how individual positions contribute to tracking error, RBSA focuses on what styles drove absolute returns. It is fast, data-light and fully aligned with our internal factor taxonomy, providing a second, independent, perspective on manager behaviour – one that speaks the same language we use to construct and monitor portfolios.

RBSA also allows us to bridge the gap between qualitative and quantitative assessments. It supplements the traditional face-to-face due diligence with a consistent, evidence-based perspectives on how managers actually allocate risk across styles.

Conclusion

RBSA gives us at Momentum Investments the benchmark-agnostic, real-time lens we need to ensure that our multi-manager equity sleeve delivers the factor exposures we intend.

Because it rests on our own factor definitions and refreshes automatically from simple return data, RBSA bridges the gap between academically rigorous but data-heavy vendor models and the labour-intensive qualitative maps produced by our research team. It's quick, interpretable, and easy to scale–making it a powerful part of our research and portfolio oversight toolkit.

Like any model, RBSA has limits. Overlapping definitions can blur distinctions between factors and the chosen window length can affect weights, so analyst judgement remains important. That's why RBSA is a complement to–not a substitute for–sound judgement. But used well, it meaningfully improves how we monitor manager style exposures and enhances portfolio construction and risk management.

04 Quantitatively evaluating fund manager skill

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Introduction - why assessing manager skill matters

At Momentum Multi-Manager, we build investment solutions by first deciding on the desired long-term strategic asset allocation. Then, within equities, we select our desired equity risk factor exposures[1], such as value, momentum, or quality. Finally, we decide on how to access these asset classes and factor exposures by giving specialist asset managers a mandate where we define the benchmark against which their performance will be assessed[2].

As the asset managers are where the 'rubber hits the road' for our clients, their selection and allocations are conditional on our assessment of their skill in terms of delivering the desired outcomes. Meeting with the managers and understanding their 'three Ps' – People, Philosophy and Process – is necessary, but not always sufficient[3]. Having a quantitative way to effectively assess their skill is a very important complement to this analysis and forms a key part of our solution design and implementation.

"As the asset managers are where the 'rubber hits the road' for our clients, their selection and allocations are conditional on our assessment of their skill in terms of delivering the desired outcomes."

Recognising the limitations of traditional peer comparisons (see the next section), we developed MIPODS, or Momentum Investments' implementation of the Portfolio Opportunity Distribution Set (PODS) method. MIPODS helps us evaluate manager skill by comparing their returns to a distribution of thousands of simulated no-skill portfolios constructed under realistic constraints. This approach adds a quantitative edge to our manager research, grounded in the opportunity set each manager faces.

How to quantitatively assess equity manager skill

There are several ways to assess equity manager skill. The first, and most common, is comparing their performance relative to a broad benchmark such as the ALSI or Capped SWIX for the same period. This answers the question – did the manager outperform a passive investment solution such as an index tracker? It does not, however, necessarily tell us whether the manager is skilful. This is because managers have exposures to specific risk factors based on their philosophical approach. These risk factors have relative return profiles that will influence the market relative performance. Take **value** as an equity risk factor – it outperforms the market relatively infrequently, but very strongly when it does. Therefore, assessing a value-biased manager against the ALSI or Capped SWIX would lead to some incorrect conclusions about the manager's skill. The same holds for the other equity risk factors that we believe are present in the SA equity market: momentum and quality. Using a factor-specific (or blended multi-factor) benchmark thus offers a more meaningful comparison when assessing skill – and it is something that we do explicitly in MIPODS.

Another way is to compare the fund's returns to the returns of a group of managers managing funds which have similar mandates – its peer group. This is a more helpful approach as it controls for the style exposure, but it also makes two key assumptions: firstly, it assumes that there are peers to compare it to. This is not always the case. Secondly, it implicitly assumes that it is easy to define exactly which funds qualify as peers. This is not easily done on a qualitative basis as manager actively strive to differentiate themselves from each other[4].

[1]See the first article in the February 2025 edition of MindFields (available here: https://sls-fresco.momentum.co.za/files/documents/invest/updates-and-news/from-the-experts/general/mindfields-february-2025.pdf) for more details of this approach.

[2]In addition to the benchmark, additional constraints may be specified such as sector allocations or tracking error limits.

[3]See the sixth article in this edition of MindFields (available here: https://sls-fresco.momentum.co.za/files/documents/campaigns/effectofcovid/mindfields-2022-fiduciary-risk-edition.pdf) for more details on our approach to qualitatively assessing the skill of fund managers.

[4]William Sharpe's Returns-Based Style Analysis of is one way to quantitatively overcome this problem. (see Sharpe, W. (1988) "Determining a Fund's Effective Asset Mix". Investment Management Review (December): 59–69). As is explained later in this article we use this approach in MIPODS, but not for peer comparisons.

Finally, and most importantly, observed performance of any manager is a combination of both luck and skill. Given the high degree of randomness in financial markets, there is always some element of chance (or randomness) in the outcomes that we observe i.e. their fund's performance.

We would thus like to be able to assess the extent to which randomness can affect returns, and provide an automatic peer group, in a very targeted way. Luckily, there is a methodology that does both.

The Portfolio Opportunity Distribution Set (PODS) approach

The PODS approach was first proposed by Ron Surz in 1994[5]. This method compares the performance of the manager against the performance of many simulated portfolios that reflect what a peer manager, with no skill, could have invested in. It assumes that these simulated portfolios are derived from the same specific opportunity set and constraints at a point in time.

The key to this method is defining the opportunity set. This will be defined by the manager's style exposures[6] and any other restrictions built into the mandate. The potential/no-skill portfolios are created by randomly simulating weights for the constituents of the manager's opportunity set at a point in time.

PODS thus proceeds by constructing multiple no-skill potential portfolios that are drawn from the investment universe that the manager is (or should be) considering given their espoused investment philosophy. The result is a distribution of the returns of directly comparable portfolio outcomes that vary based on randomness only. By comparing a manager's actual return to this distribution, we can estimate the likelihood that their performance result reflects true skill rather than chance.

This is a potentially more insightful measure of relative skill than a comparison with a specific peer group or broad-based benchmark as it provides a more relevant peer group and take randomness directly into account, making it a more robust and interpretable measure of skill.

How do we implement PODS at Momentum Investments (MIPODS)?

While the concept of PODS is disarmingly simple, its practical implementation becomes complicated quite quickly – particularly in South Africa, where the equity market is small and highly concentrated. To implement the method effectively, we need to firstly, define the opportunity set correctly; secondly, define an appropriate set of constraints for the no skill portfolios over period under consideration; thirdly, introduce a rebalancing period to reflect changes in the factor-based investment universe; and finally, reflect their returns net of transaction costs.

These choices help ensure that the portfolios are realistic representations of the investment environment that the manager is facing and thus can stand as an effective no-skill peer group for the assessment of a manager's skill.

1. Opportunity set (i.e. what shares should be included?)

As the intent of the PODS approach is to provide a set of randomly selected/no-skill portfolios that can function as a peer group, we need to identify the shares that the manager would be investing in themselves. This is exactly the point of the PODS approach after all!

In practice this choice of shares should reflect the philosophical approach to investing, which in turn directly relates to factor exposures that the manager's investment strategy is either targeting or has effectively been exposed to[7]. This requires that a factor exposure needs to be defined, and that the share selection used in the PODS reflect that exposure. Secondly, liquidity limits need to be imposed. The South African equity markets are significantly skewed from a liquidity perspective. Any investment manager's investment choices are constrained by the shares that they can trade relatively easily and with minimal market impact.

[5]Surz, R.J. 1994. "Portfolio Opportunity Distributions: An Innovation in Performance Evaluation" The Journal of Investing, 3(2):36.

[6]These style exposures can be estimated using the Returns Based Style Analysis approach (RBSA) which is covered in a separate article in this edition of Mindfields

[7]This is measured by the results of a Returns Based Style Analysis (RBSA) which identifies the effective combination of factors that replicates the observed fund returns as accurately as possible. See the article on RBSA in this edition of Mindfields for more details..

In our MIPODS approach we address these issues by firstly, using a weighted factor score for the ranking of the top 80 shares in the Capped SWIX index. Secondly, we select the top 40 of these shares as the relevant investment universe for the creation of the random PODS portfolios. Finally, this ranking is updated monthly to reflect the changing investment environment.

The weighted factor score reflects the relative attractiveness of a share to the manager given their exposure, or effective, factor exposures as it relates to their philosophy. The specific weights for the factor scores are thus an input to the process and can be derived either from a qualitative assessment of the manager's investment philosophy (i.e. what they say they do from a factor exposure perspective), or from doing a Returns Based Style Analysis (RBSA) which identifies the effective factor exposure evaluation (i.e. what their factor exposure actually was) over a relevant preceding period.

The top 80 share limitation reflects our choice of liquidity filter. Most large equity managers are not able to make meaningful investments into shares outside this universe due to liquidity constraints[8].

2. Random selection of weights

As the South African equity market is significantly skewed by size, and managers are predominantly benchmark aware, the random weight allocations must reflect those constraints if it is to be an effective peer basis for comparison.

To address this, we have developed a bespoke algorithm that uses a pre-determined maximum deviation (or active weights) from the benchmark weights as a reference point for the random allocation. Shares with large enough weights in the benchmark will have an automatic minimum allocation, while the random allocation to smaller shares are constrained to a multiple of their benchmark weights. This prevents an unrealistic allocation to these shares in the random portfolios for a benchmark-aware manager.

3. Resampling frequency

Traditional PODS simulations are usually done on a rolling 12-month basis with a buy and hold assumption over this period[9] . We felt that this is an unrealistic approach as it does not reflect the changing factor-based investment environment that managers face in practice and consequently ignores the ability of managers to respond to this. As a result, we implemented a six-month resampling frequency for the simulations in MIPODS but can be flexible. This means that the portfolios are randomly resampled every six months from the relevant investment environment at that point in time. This is meant to keep the random portfolios' investment universe in MIPODS from becoming stale relative to the manager's portfolios.

4. Trading costs

The returns of any comparable portfolio must reflect the reality that any changes to an investment portfolio will incur transaction costs. The observed manager returns are net of fees, so we have tracked the changes to the portfolios for the random portfolios and calculated the relevant transaction costs using actual brokerage fees[10].

MIPODS assessment periods

MIPODS provides a distribution of the absolute returns and risk-adjusted returns that a no-skill peer group of funds might have produced over a specific period. We then compare the actual fund's return over the same period and identify the percentile of the MIPODS distribution that it represents. The better the skill, the higher the average percentile will be over time. This is illustrated in Figure 1, where the average returns are calculated for the period May 2017 to February 2024 for the random portfolios (represented by the blue shaded area), the benchmark (the Capped SWIX) and the fund itself (the dotted vertical lines). The Momentum Factor benchmark (dotted line) is the return of a representative Momentum Factor portfolio that we have created to demonstrate the performance of a stylised portfolio built to maximise exposure to the momentum factor signal.

[8]By liquidity constraints we mean the ability to enter, and exit, an investment position without materially impacting the price of the share as you do so. If demand or supply for a share is limited (i.e. it is illiquid) then any trade will either bid the price up (if you are buying) or push it down (if you are selling). As both these effects reduce the return that you can earn, investment managers avoid situations where this can occur.

[9]By 'buy and hold' we mean that the randomly selected shares at the start of the period are held for the entire 12-month period. There is no rebalancing or trading of any sort in this approach. The transaction costs of this approach are simply the costs of buying and selling the portfolio at the start and end of the period.

[10]We have assumed zero price impact is realized, however, as the liquidity filter of only investing in the top 80 shares should make this negligible.

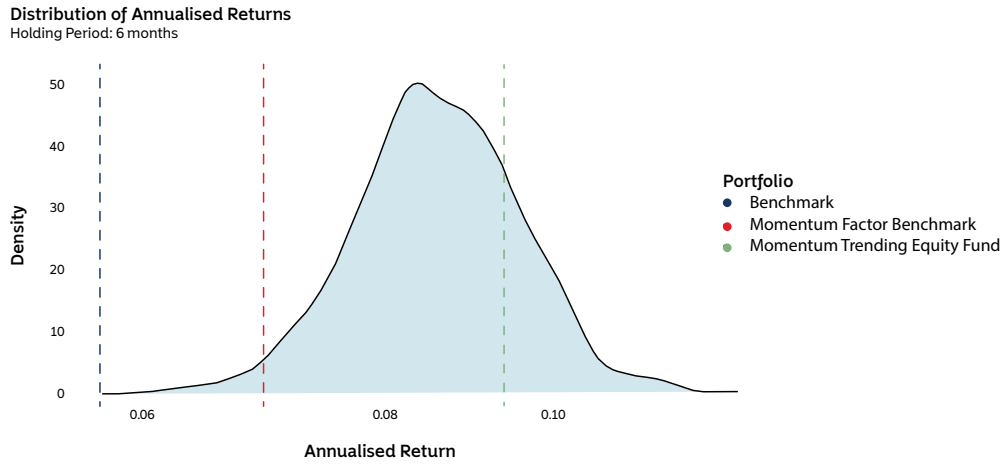

Figure 1: Distribution of random portfolio average returns (p.a.) with the Capped SWIX, the Momentum Factor Benchmark portfolio and Momentum Trending Equity Fund average returns (p.a.) for the same period

Source: Momentum Investments

To provide a sense of the manager's performance over time we have built the tool to provide these percentiles on rolling 12-, where possible, 36-month periods. This allows us to see how the skill levels vary through time.

Finally, we summarise these relative performance results over time by looking at the quartile hit rate – in other words, how many times the manager's returns were in the first (best), second, third or fourth quartile (worst) of the simulated distribution in each rolling period.

Case study 1: Applying MIPODS to the Momentum Trending Equity Fund

The Momentum Trending Equity Fund is run by the Systematic Equity team at Momentum Investments. It holds shares that have short- and medium-term price momentum characteristics as well as positive changes to their one-year earnings forecasts at any point in time.

We simulate this investable universe by taking the top 40 (out of the top 80) shares ranked on their momentum factor score[11]. We then simulated 1 000 random benchmark-cognisant portfolios from this universe, resampling their holdings every three months from the relevant momentum-biased investment universe at that point in time, and then calculated their monthly returns, net of transaction costs. We then calculated the percentile of the fund's returns across the distribution of the 1 000 random portfolios over rolling 12-month periods which are shown in Figure 2. Finally, the quartile hit-rate results are presented in Figure 3.

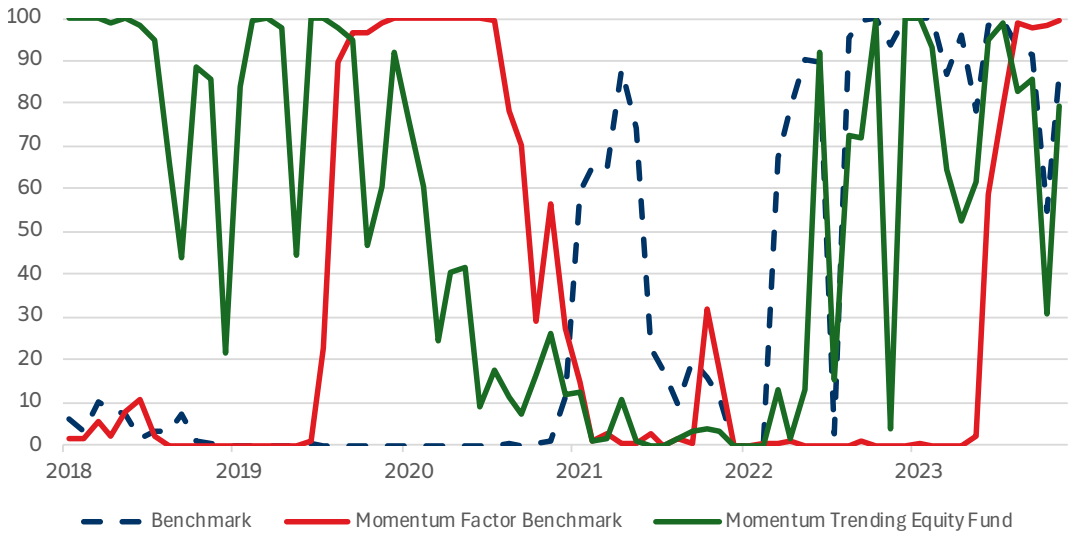

Figure 2: Relative Return Percentiles - Momentum Trending Equity Smart Beta fund (rolling 12-month periods)

[11]The momentum factor score is calculated by calculating weighted average of the following normalised characteristics for every share in the liquidity adjusted universe: 6- and 12-month price momentum (25% each) and change in forward earnings expectations (50%).

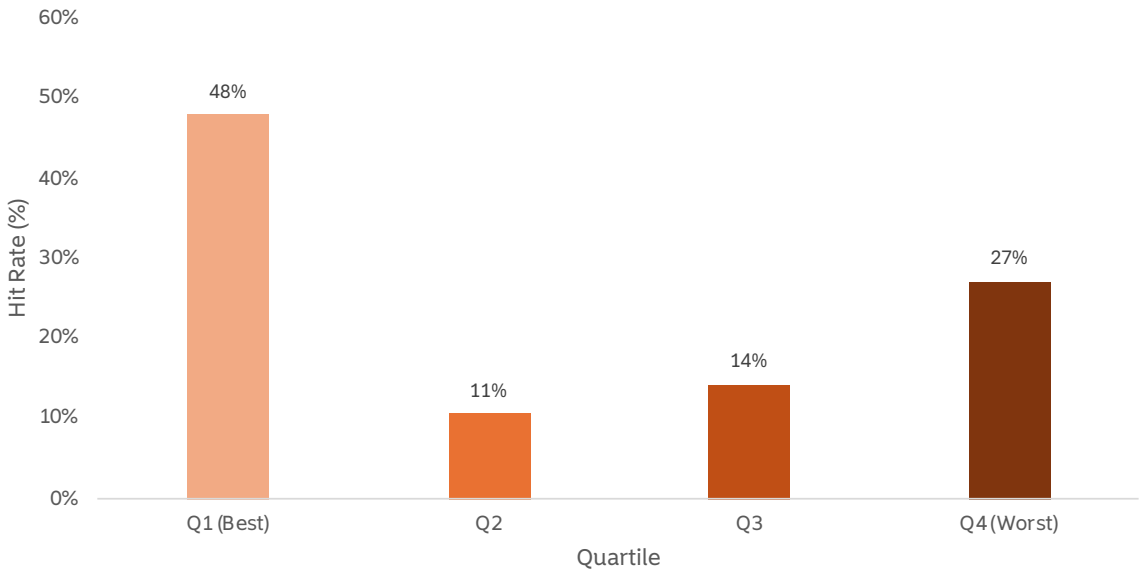

Figure 3: Quartile bucket hit rates - Momentum Trending Equity Fund (rolling 12-month periods)
Source: Momentum Investments

The analysis suggests that this fund manager is doing relatively well over this period. They are typically achieving top quartile performance when compared to the 1000 momentum-orientated randomly simulated portfolios' returns over a rolling 12 month basis – exactly what we want to see from our managers. The variation in percentiles does, however, suggest that it would be optimal to have longer time periods of manager returns to analyse before reaching any definitive conclusion.

Case study 2: Applying MIPODS to multi-factor fund managers

To illustrate the multi-factor application case, we applied the MIPODS methodology to the funds of two external (unnamed) South African equity managers as well. We have chosen these two on the basis that they have a long track record and reflect funds of managers that we have qualitatively deemed to be skilful/not skilful respectively[12].

In this case, there is one extra step required. Unlike the Momentum Trending Equity Fund which has an explicit single factor exposure, these equity funds tend to have investment philosophies that integrate several different factor-related strategies. To identify the relevant factor exposures for the MIPODS approach we used the Returns Based Style Analysis (RBSA) approach to identify the effective average factor exposures for these two funds for the period under review.

In this case, the RBSA showed that the two funds had the average factor exposures shown in Table 1 for their relative periods since inception.

	Average factor exposures		
Funds	**Momentum**	**Value**	**Quality**
Fund A (skilful)	46%	35%	19%
Fund B (not skilful)	38%	27%	35%

Table 1: Average factor exposures for the two funds over the entire period

[12]This assessment has been done independently of the MIPODS analysis. It's based on our Manager Research team's qualitative assessment of their investment philosophies, process and people. The size of the fund is also considered as larger funds are less able to take advantage of the breadth of investment opportunities available in the SA equity market context.

These average factor exposures are used as the weights for the monthly factor scores to create the investable universe for the no-skill peer portfolios for each manager. The top 80 shares are ranked each month on their weighted average factor scores, using the fund's average factor exposures presented in Table 1. The random allocations are then made to the top 40 shares ranked on this basis, in the same benchmark-relevant way as for the single factor fund shown previously. As for the previous fund, the rolling 12- month percentiles of the fund's returns are presented in Figure 4. The quartile hit rates for the funds for this period are presented in Figure 5.

This analysis clearly shows that the qualitative skill/no-skill assessment is supported by this analysis. Fund A (skilful) has a significantly higher Q1 hit rate. Their percentile performance is also consistently higher than that of Fund B (not skilful). Note that all these results are calculated relative to their own average equity risk factor exposure universes.

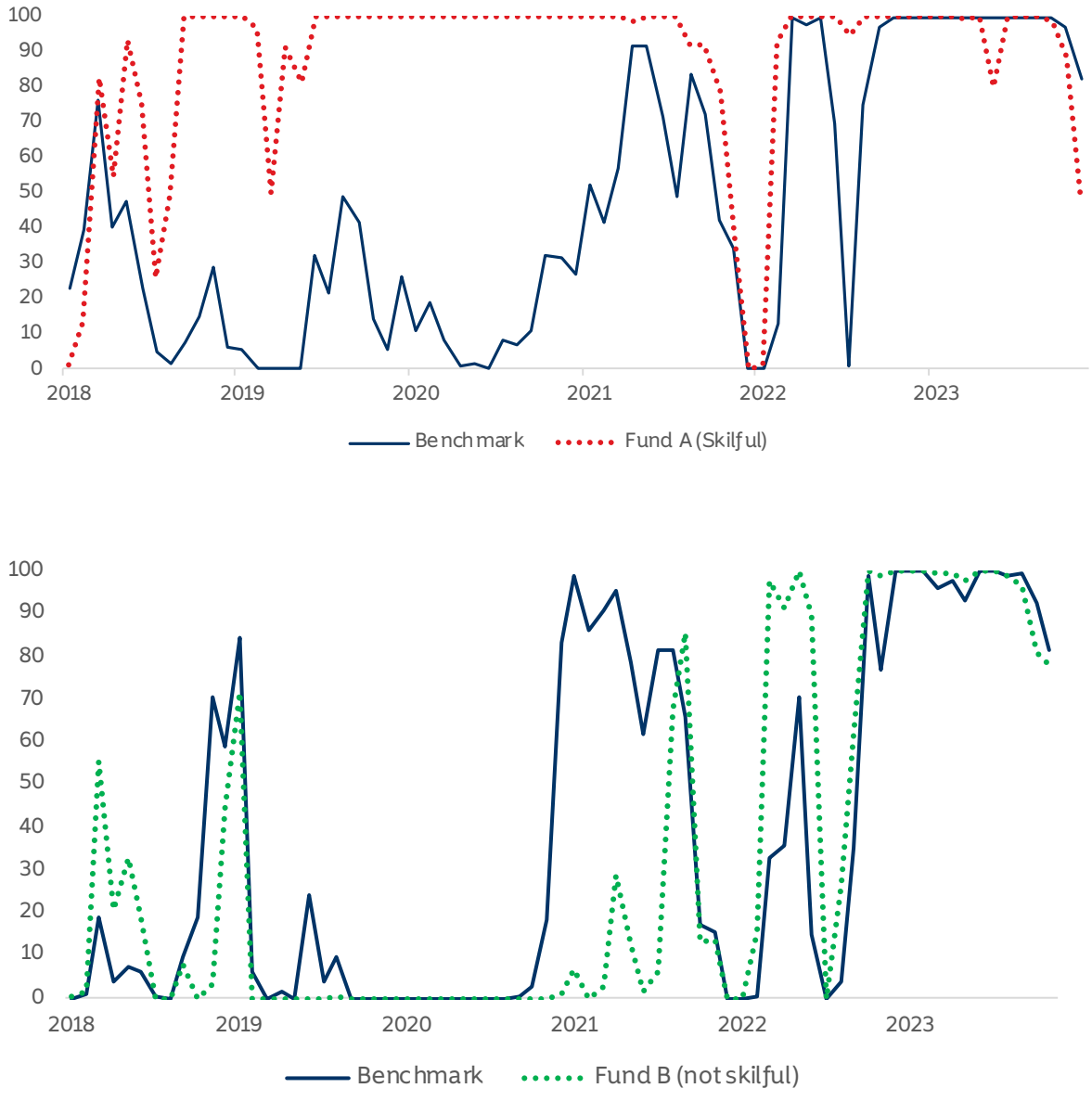

Figure 4: MIPODS fund return percentiles over rolling 12-month periods: Fund A and Fund B

Source: Momentum Investments

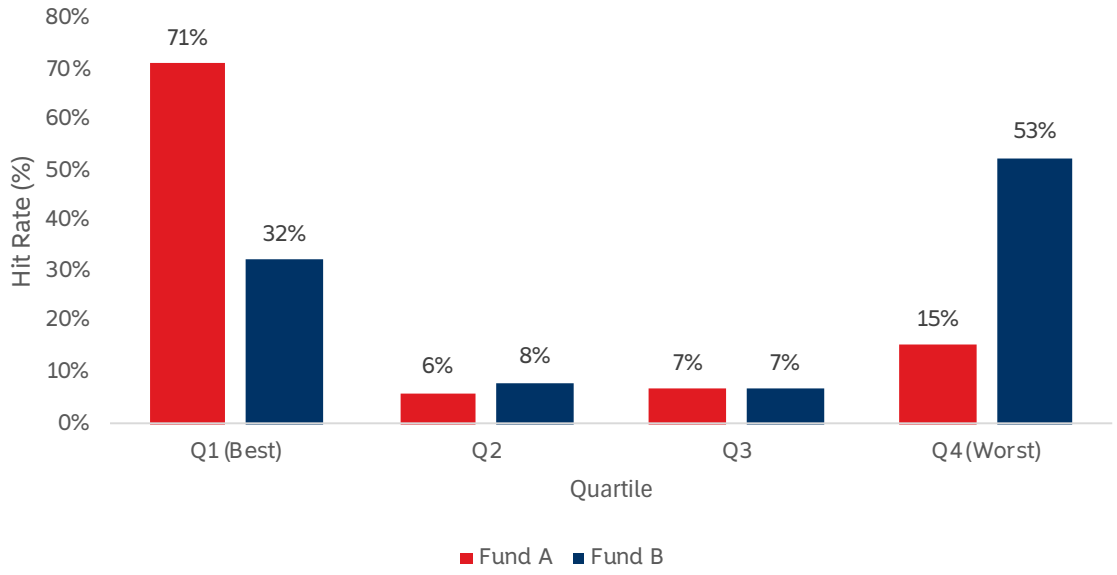

Figure 5: Quartile bucket hit rates for Fund A (skilful) and Fund B (not skilful).
Source: Momentum Investments

Conclusion

Assessing manager skill is a very important part of constructing effective investment solutions. At Momentum Investments, we do this through a combination of qualitative and quantitative approaches. The MIPODS approach presented in this article provides a very flexible effective approach to generating a customised, no-skill peer group of risk-adjusted returns which can be used a yardstick to assess the skill of a manager over time.

There are challenges in its implementation which makes a careful approach vital in terms of coming up with the right conclusions. By including the ability to explicitly model fund-specific multi-factor equity specific opportunity sets, combined with a benchmark-relative random portfolio weight construction engine, we believe that MIPODS can give us exactly these sorts of relevant insights for any equity fund. This will help us assess fund manager quality and thus improve our ability to make the right choices in this regard.