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Systematic Investing / Quant Whitepaper

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Contents

Welcome to CAMRADATA's Systematic Investing / Quant Whitepaper

Strict data-led strategies using non-human intuition to navigate volatile markets have been the main offerings of quantitative investment since it first arrived on the asset management scene.

Combining the underlying factors buried within specific assets that perform at different times should have been the answer to investors' diversification challenges.

Yet, many have failed to live up to expectations, in both benign and explosive scenarios, leading to some disillusionment with the sector.

The prevalence of so-called 'black box' strategies and a reliance on historical data have – in the bad times at least – conspired to cause both blow ups or unexplainable (if impressive) results, which have turned off investors.

Additionally, like traditional fund management, closet index trackers have been guilty of offering beta-like performance at alpha-appropriate prices.

However, the advent of new technology in the form of AI, NLP, ML and a host of other acronyms may be bringing solutions to challenges investors will face in the near future.

New, forward-looking data sources, with active or even human curation and care may help investors to see how elements of sustainability could be integrated into long-term portfolios.

Elsewhere, alpha-seeking strategies may enable investors to tap into previously undiscovered sources, while also earning fees for margin-seeking managers.

As technology develops and investors equip themselves with the right questions, some may be tempted to dive into this widening spectrum of approaches and firms bursting with new ideas.

Meet the Team

Sean Thompson
Managing Director

Natasha Silva
Managing Director, Client Relations

Amy Richardson
Managing Director, Business Development

Sam Buttress
Associate, Business Development

Sarah Northwood
Marketing and Events Coordinator

Orin Ferguson
Associate, Business Development

Systematic Investing / Quant Roundtable

The CAMRADATA Systematic Investing / Quant Roundtable took place in London in April 2023

New technology heralds a new dawn for quantitative investing

Strategies and asset classes offering greater diversification and uncorrelated returns have become more appealing to institutional investors as market volatility has ramped up in recent times. As such, quant and systematic strategies have also grown in popularity in the past five-to-10 years.

Toby Goodworth, managing director – head of liquid markets at consultancy bfinance, says there are many reasons why investors turn to quant strategies, including greater diversity of return, scalability, and lower costs.

"When we do quantitative-oriented investment, the big driver is the predictability of the investment strategy. If it's following a defined set of rules or guidelines, there is predictability of outcome," says Goodworth. "Also, quant strategies can be more diversified, so there is potentially less idiosyncratic risk in the portfolio versus something discretionary that is high conviction."

"It depends on what strategies or factors are in vogue," adds Goodworth. "Over the past few years, we've seen market-neutral strategies becoming more popular, and they can only be done in a quant framework."

Richard Tomlinson, chief investment officer at investment manager Local Pensions Partnership Investments (LPPI), says trustees' investment strategy discussions are more sophisticated now, rather than the single-stock conversations many had with fund managers in the past.

"There is more focus now on key issues and how they relate to the bigger picture and deliver investment outcomes," says Tomlinson. "This leads more into a factor-based conversation as opposed to the single-stock conversation, which is frankly pointless unless it is about the risk associated with that individual stock."

Over the years, systematic strategies have become more transparent about how they operate, dispelling the 'black box' perception that many investors have traditionally held about the strategies, says bfinance's Goodworth.

"Investors are presenting their strategies in a way that investors understand and are much more familiar now with factor-based language, such as value, momentum or carry," he explains. "There is more of an understanding, and that black-box label is no longer there."

> ***"There was a time when clients would make portfolio reallocation requests and explicitly say 'please don't include quants'. But clients are now far more receptive to an allocation in their portfolio"***

Wee-Tsen Lee, head of fund research at wealth manager Lockhart Capital Management, says some private investors may be reluctant to allocate to these strategies because they lack the experience or don't understand the sophisticated models, which many are based on.

"The onus is often on us to make the call to allocate rather than the client itself," he explains. "From our perspective, we are open to using these strategies, as long as they serve a purpose within the portfolio."

Thomas Stork, senior investment consultant at Aon, says passive-like, factor-based strategies have

attracted a lot of interest in recent years, but there are a growing number of active strategies that performed strongly when factor investing struggled. That has further widened their appeal.

"There was a time when clients would make portfolio reallocation requests and explicitly say"please don't include quants'. But clients are now far more receptive to an allocation in their portfolio," notes Stork.

A new 'black box' approach

Technology innovations are leading the evolution of quant and systematic strategies, particularly artificial intelligence (AI) and machine learning. This is giving rise to new active systematic strategies and a new frontier for black box investing.

Mamdouh Medhat, senior researcher and vice president at Dimensional Fund Advisors, says the quantitative approach and its reliance on data makes it a natural area for the application of these new technologies.

"To me, quant investing is a broad spectrum. In one sense, it is pure passive indexing because it replaces the subjectivity of talking about individual stocks, to looking at how an asset class or group of stocks defined according to some criteria, has performed," comments Medhat.

"At the other end of the spectrum, there's the complete black box approach. And this is where machine learning and artificial intelligence are getting more market share because that approach essentially lets the data speak without interference from human beings."

Arup Datta, senior vice president and head of team, at Mackenzie Investments, says the firm has used machine learning to help it select stocks and implement strategies.

For example, where the signal-to-noise ratio is low and too much data clouds predictability, it can lead to bad investment decisions.

"I'm a very old school quant. I like everything to be explained," says Datta. "We use machine learning techniques to go after things where signal to noise ratio is very high and predictability is high. However, it can't explain returns where signal to noise is very low."

"Evolution is a key part of being an investor," adds Datta. "It makes you a better investor."

Machine learning and AI's growing popularity is contributing to a growing 'haze' between quant and the fundamental approach, says LPPI's Tomlinson, as traditional boundaries become blurred.

"It is much hazier between what is fundamental and what is quant because the leading fundamental managers are building these machine learning tools to cherry pick," he says. "But you could also argue they are introducing new potential biases."

Aon's Stork notes that "while these tools are becoming ever more accessible, its' still very much a specialist skillset where a little bit of knowledge can be a dangerous thing".

Some of the popularity of machine learning and AI-backed strategies among investors can be attributed to a type of FOMO – 'fear of missing out' – in a similar

> *"There has been an explosion in the amount of heavily marketed alternative data in recent years begging the question of how useful it all is."*

way that drove investors toward ESG.

"We saw FOMO with ESG, and we are seeing it now with AI," says Dimensional's Medhat. "It's not just about being sceptical of any kind of new technology, but applying a healthy dose of scepticism because risk management is so important."

"Risk management is usually a set of quant rules," adds bfinance's Goodworth. "It's actually risk management that tended to crystallise some of the losses around the Flash Crash and other crises. So, even if you're in a discretionary strategy, you're still technically part-quant through risk management. And that's something that investors tend to forget."

Quant's data challenge

For quant managers, the challenge is the quality and sheer amount of data now available on the market.

"There has been an explosion in the amount of heavily marketed alternative data in recent years," says bfinance's Goodworth, begging the question of how useful it all is.

For some managers, alternative data can offer unique insights, which help inform new strategies and approaches. However, it also comes at a higher cost than more widely available traditional data.

"The kind of data we use is very cheap and has many different vendors, the quality is relatively similar and you can go way back in time," says Dimensional's Medhat. "But the more esoteric and idiosyncratic the data, the more expensive it becomes, the shorter the time period available, and the lower the coverage."

"Alternative data only makes sense when it's scalable because if an alternative data set only has data for 30 stocks, it doesn't give me any confidence in my back test," adds Mackenzie's Datta.

"We are sceptical of many of the alternative data vendors. But having said that, we do use some of them."

Quant managers must ultimately assess whether the data adds anything new to their understanding of markets and if it can be applied to their models.

"All data has a half-life," adds LPPI's Tomlinson. "Markets are complex, adaptive systems and everything that is new has an edge, but it is soon commoditised. So, even if you do find data, you must go beyond the face value to find out how unique it is, what it tells you, who else has access to it, and whether that information is priced in."

"This is all the same bread-and-butter quantitative analysis that quant managers have been doing for years. And, in many instances, they are the same questions they were asking 30 years ago, but with different data."

Sustainability and quants

As more institutional investors embrace sustainability and ESG, demand will grow for quant and systematic strategies that can cater to that need.

"At a high level, there are different ways to incorporate sustainability and all the ESG factors," says bfinance's Goodworth. "You can focus on it as an alpha source; will ESG help me beat the market? But most people approach it as a risk factor; how do I mitigate potential future negative impacts from other investors' ESG views on positions in my portfolio."

"There should be a differentiation between quants that can be used to invest in a more sustainable and ESG friendly way, and those that use ESG as a factor to generate alpha; whether this means going long or short the factor," adds Lockhart Capital's Lee. "We need clarity either way, and potentially an investor base that either will appeal to."

However, there are considerable challenges for managers offering an ESG strategy.

"ESG is broad and there are different quality data sets, but some of the most standardised and best data we have is for the environment," says Dimensional's Medhat. "So, you can structure a strategy around the environment in line with values, without sacrificing the tilts on factors or diversification."

However, different factors may favour or avoid areas that are bad for the environment, and vice versa. Therefore, it makes sense to design strategies that avoid such biases, says Medhat.

"A sector-relative approach makes more sense because tech companies do not pollute as much as energy companies or utilities," he explains. "But then it becomes a portfolio-engineering problem."

"How can you design a portfolio that delivers high returns, is broadly diversified and has low exposure to carbon? Managers must be transparent and upfront about how they go about implementing an ESG strategy and what they can achieve."

Aon's Stork notes the opportunity this creates for quants: "As disparate ESG needs emerge, who is better placed to provide that customisation at scale and build an efficient portfolio comprising multiple objectives, than quants?"

One of the biggest challenges in incorporating ESG into a quant or systematic strategy is keeping up to date with data, as new reporting and legislation create better ESG data and approaches to quantifying risk emerge, says Mackenzie's Datta.

"ESG is a changing landscape," he explains. "When I started ESG research in 2015-16, it was all about the 'G', governance factors. Data was very scarce, but wherever you had it, governance dominated the ESG score."

"Today, it is the 'E', environment, that dominates, particularly with events such as COP27 and the Paris Agreement. In a few years, it may be the 'S' or social as diversity becomes more important."

What next for quant?

Future trends in the space could open new opportunities and challenges for investors.

And panellists agreed that as institutional investors seek greater value for money, cost will come under greater scrutiny.

"There is an absolute dollar or pound cost for all of the resources needed to run these strategies," says bfinance's Goodworth. "If you can only run a small fraction of what another competitor strategy can with the same cost of production, then naturally the capacity-constrained strategy should come with a higher fee expectation.

"As a result of this, quants are generally lower-priced versus many discretionary peers."

Lockhart Capital's Lee says more data around quants focused on non-traditional factors, such as forward linkages, would be a welcome development for the industry, particularly with the application of new technologies.

"Natural language processing can add interesting elements to return generators but we have to ensure there is something unique rather than spurious in relation to correlation with various attributes," he says. "There needs to be a sense that these data points will work moving forward and are not just data mining exercises."

Another idea taking hold is the democratisation of the quant space, says Aon's Tom Stork.

"For many years, quants have been beneficiaries of the open-source philosophy of the data science and technology fields," he explains. "Alongside cloud computing and the proliferation of alternative data providers, this has lowered the barriers to entry for new players."

Innovations such as hybrid public-private strategies are also garnering more interest and could offer investors enhanced returns and greater diversification, says Dimensional's Medhat.

"Collaboration with private markets, such as private equity and private debt, is another area that is quite interesting to us," adds Medhat. "We're seeing growing interest in portfolios that are not only based on public liquid securities but have private capital exposure alongside public markets."

"The two can work well together because you have to focus on delivering systematic premiums in your liquid markets where alpha opportunities might be few and far between, and then combine it with a portion of the portfolio that is actively engaging in private markets."

However, lessons can be learned from previous attempts to replicate alternative investment strategies.

"A few decades ago there were attempts to replicate hedge funds, but that didn't go so well," says Goodworth. "It morphed into what is now called the alternative risk premia. Instead of trying to replicate hedge fund return profiles, these strategies used quantitative factors as dynamic, well-understood, building blocks to construct lower-cost liquid alternative strategies; a much better way to approach it."

Ultimately, it's important to remember that the quant space is still a relatively young space and has come a long way.

"Quant has grown quite a lot," says Datta. "I remember in 1992 having to explain what quantitative investing was and when it was easy to make money. It was like shooting fish in a barrel using analyst revision factors, but now it's much more efficient. I'm very positive on quants, provided we can continue to deliver more consistent alpha."

Roundtable Participants

Mamdouh Medhat
Senior Researcher and Vice President

Personal Profile

Mamdouh Medhat, a London-based Senior Researcher and Vice President, conducts theoretical and empirical research into drivers of expected returns, often in collaboration with Dimensional's academic affiliates, and communicates Dimensional's research to clients and the broader public.

Prior to joining Dimensional, Mamdouh was an assistant professor of finance at Cass Business School in London. His research has been published in the Review of Financial Studies, Journal of Corporate Finance and Journal of Financial Econometrics. He holds a PhD in finance from Copenhagen Business School and a BSc and an MSc in mathematics-economics from the University of Copenhagen. He has also held visiting-scholar positions at Stanford and Princeton in the US.

Company Profile

Since 1981*, Dimensional has sought to provide better investment outcomes for clients through a transparent, rules-based approach that combines the knowledge gained from rigorous theoretical and empirical research with thoughtful and effective implementation. Four decades of practical experience have enabled Dimensional to gain insights about operating in competitive markets, and to hone our ability to manage the tradeoffs that we believe matter for performance.

Dimensional has over 1,400 employees across our 14 global offices and manages $584bn of client assets across equity, fixed income and other asset classes (figures as at 31 December 2022). Owned primarily by current and former employees and headquartered in Austin, Texas, Dimensional maintains investment offices in Santa Monica, Charlotte, London, Dublin, Sydney, Singapore, and Tokyo, in addition to client service offices in Vancouver, Toronto, Amsterdam, Berlin, Melbourne, and Hong Kong.

*1981 refers to the opening of Dimensional's US office

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Arup Datta

Senior Vice President, Head of Team

Personal Profile

Arup heads the Mackenzie Global Quantitative Equity Team which provides quantitative investment capabilities in Global and Emerging Markets equities.

Arup has over 25 years of experience in quantitative equity investing. Between 1992 and 2012 he was a Quantitative Analyst, Portfolio Manager, Director of US and Director of Portfolio Management with Man Numeric, where he managed capacity-constrained equity strategies (traditional long only, active extension and hedge funds) in all capitalization strata and regions of the world. In 2012, Arup founded Agriya Investors, a firm focused on global equities, which eventually became the global/international arm of AJO. As Chief Investment Officer - International, Arup launched capacity-constrained equity strategies in emerging and developed markets.

Arup joined Mackenzie in September 2017 to head the Global Quantitative Equity Team.

Arup has a Bachelor of Technology degree from the Indian Institute of Technology in Kanpur, India, and earned an MBA with distinction from the Johnson School of Management at Cornell University. He is a CFA charterholder.

Company Profile

Mackenzie Investments, founded in 1967, is a leading Canadian global asset manager, headquartered in Toronto with international investment teams in Boston, Dublin and Hong Kong. As part of IGM Financial Inc., a subsidiary of Power Corporation with a history dating back to 1925, Mackenzie benefits from the financial stability of a deep corporate structure while maintaining a boutique investment management profile.

Our distinct and experienced investment teams offer both fundamental and quantitative approaches with expertise across traditional and non-traditional asset classes, including equities, alternatives, currency and multi-asset strategies.

We provide investment management services to pension plans, consultants, foundations and other institutions, building trusting relationships that seek to understand client perspectives. We are committed to delivering strong investment performance and offering innovative, relevant solutions to our clients by drawing on the experience gained through over 50 years in the investment management business.

MACKENZIE
Investments

Roundtable Participants

Thomas Stork

Senior Investment Consultant

Dr Toby Goodworth

Managing Director, Head of Liquid Markets

Personal Profile

Thomas is a senior member of Aon's Global Investment Manager Research team based in London. He provides investment recommendations on Global and Emerging Market equity strategies, with a particular focus on quantitative investment managers. Additionally, he is the lead researcher responsible for the design, implementation and oversight of Aon's factor investing service, which has won multiple Factor Investing Offering of the Year Awards at the Pensions Age Awards.

Thomas is well known within the asset management community for his strong skillset in data science and quantitative research.

Personal Profile

Toby Goodworth is Head of Liquid Markets at bfinance, and a member of the firm's Senior Management Team. Previously, Toby was Head of Risk Management and a member of the Investment Committee at Key Asset Management, one of Europe's oldest fund of hedge funds. He has over 20 years of industry experience, including 18 years as an allocator within the hedge fund industry.

Toby holds a Ph.D in Physics from University College London and a First Class honours degree in Physics, also from UCL.

Wee-Tsen Lee

Head of Fund Research

Personal Profile

Wee-Tsen has spent his career in multi manager investing either as a fund researcher or portfolio manager. He has experience covering the major asset classes, mainly focusing on equity strategies.

Working with some of the largest pension funds and wealth managers globally has fostered a broad and differentiated perspective to his understanding of multi asset investment.

Richard J Tomlinson

Chief Investment Officer, Local Pensions Partnership Investments

Personal Profile

Richard is CIO at LPPI and has responsibility for management of all investment and client activity. Richard has over 20 years of investment experience.

Prior to joining LPPI in 2017, Richard was Head of Portfolio Advisory (EMEA) at Albourne Partners for six years where he advised European investors on alternative investments, portfolio construction and risk management.

Earlier in his career, Richard was Head of Multi-Strategy at Old Mutual Asset Managers and prior to this an analyst at GNI Fund Management. Richard holds a degree and a master's degree in engineering from the University of Cambridge and is a Chartered Alternative Investment Analyst.

LOCKHART
CAPITAL MANAGEMENT

LPP
Local Pensions Partnership Investments

Moderator

Elizabeth Pfeuti
Chief Client Officer

Personal Profile

Former Dow Jones staffer Elizabeth Pfeuti is Rhotic's Chief Client Officer and a member of the Rhotic Media executive leadership team. A highly-decorated journalist, Elizabeth has been in financial journalism for around 15 years. At Dow Jones, she covered the asset management, investment banking and investor services beats for Financial News, where she also wrote on a wide range of regulatory themes

She was previously the European Editor for CIO Magazine and boasts an exceptional contact book of buy-side and in-house institutional CIOs and asset management executives. More recently she has worked on corporate briefs for pension consultants, investment banks and asset management groups.

Putting Financial Science to Work

Guided by a strong belief in the power of markets, Dimensional combines academic insight with years of practical experience designing and implementing systematic strategies in competitive markets around the world. Since 1981, Dimensional[1] has applied a consistent, research-based approach to help clients pursue higher expected returns.

Learn more about Dimensional's systematic approach to investing at **dimensional.com.**

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1. "Dimensional" refers to the Dimensional separate but affiliated entities generally, rather than to one particular entity.

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Evaluating Systematic Managers

“Systematic investing has the potential to be active yet disciplined, additive yet transparent, & repeatable yet customisable”

Systematic investing is a rules-based approach to managing money. It replaces the subjectivity of traditional stock and bond picking with quantitative research, and the inflexibility of indexing with an active, yet repeatable, pursuit of premiums. When done right, systematic can be more reliable and less costly than traditional active management without sacrificing the greater diversification and easier monitoring typical of indexing.

Systematic strategies can work well alongside other funds in an asset allocation. Common examples include using a systematic core portfolio as the centre of an allocation or using a systematic style portfolio in a barbell allocation.

There are many flavours of systematic managers, differing on everything from investment philosophy to trading approach. In the following, I provide a framework for evaluating systematic managers, both before and after hiring.

Before hiring

Evaluate a systematic manager holistically across all aspects of implementation: research, portfolio design, portfolio management, and trading.

Research

Systematic investing has its roots in academic factor-based asset pricing models. The proliferation of factors, however, means managers must research which premiums are worth pursuing and how. When evaluating premiums, start with economic rationale, then look for statistical reliability, robustness, and evidence of real-world efficacy. Be wary of a black-box approach, redundant factors, excessive turnover, or an ever-changing set of technical indicators. Any claim of “alpha” should be met with “relative to what?” Systematic managers commonly provide simulations to demonstrate a strategy’s viability. While potentially useful in setting reasonable expectations, simulations come with many degrees of freedom and are prone to overfitting. The results can be highly sensitive to the time period, investable universe, weighting scheme, rebalancing choices, and cost assumptions. Be wary of research that is difficult to replicate.

Design

Translating research into investable strategies requires balancing trade-offs. For a systematic manager, portfolio design should balance pursuing premiums with managing risks and controlling costs. Look for a direct link to the research and clear justifications for the choices around security selection, weighting scheme, and exclusions. Ask how the design accounts for premium interactions and how it controls concentration risk and turnover. Be wary of strategies that are difficult to scale or customise.

Author:

Mamdouh Medhat,
Senior Researcher
& Vice President

costs. Look for a direct link to the research and clear justifications for the choices around security selection, weighting scheme, and exclusions. Ask how the design accounts for premium interactions and how it controls concentration risk and turnover. Be wary of strategies that are difficult to scale or customise.

Portfolio management

Portfolio management at a systematic firm should aim to keep the strategies positioned according to their designs while maximising the value of holdings and staying within risk limits. This requires the infrastructure for data processing, order generation, holdings management, and risk assessment. Outsourcing parts of portfolio management may reduce infrastructure costs but result in a less integrated and more rigid function. It should be clear how —and when— orders are generated to rebalance portfolios. Look for efficient processes for extracting rents from securities lending, handling corporate actions, and engaging with companies through investment stewardship.

Trading

How a systematic manager trades can make or break their ability to deliver premiums. All the work put into research, design, and portfolio management is for naught if trading incurs excessive costs. There are fixed costs to trading, and executing trades at favorable prices may require being flexible on order size or timing, even among liquid securities. Look for effective controls of explicit costs, such as commissions and broker fees, as well as implicit costs, such as bid-ask spreads and price impact. Be wary of claims that transaction costs are no longer a concern to investors. Liquidity varies across securities and markets and can quickly evaporate in volatile times.

After hiring

After hiring, evaluate a systematic manager on their ability to deliver premiums, manage risks, and control costs.

Delivering premiums

It is tempting to look at a strategy's unconditional performance for clues about the manager's implementation skill. But the volatility of returns means this inference is noisy. Luck, both good and bad, can drive performance, especially over short periods. It is more informative to assess a strategy's ability to deliver the premiums it pursues. Look at the strategy's positioning as well as its benchmark-relative performance conditional on positive premiums. A well-positioned strategy should have a clear focus on securities expected to deliver the premiums. A well-managed strategy should, on average, beat its benchmark, after fees, over periods when the premiums are positive. When assessing positioning, be wary of analyses based solely on the comovement with factors. These can only estimate average tilts and may be sensitive to the choice of factors and time period. Analysing holdings and characteristics is more robust and gives a period-by-period look under the hood without estimation. Look at the strategy's positioning over a grid to assess how it accounts for premium interactions.

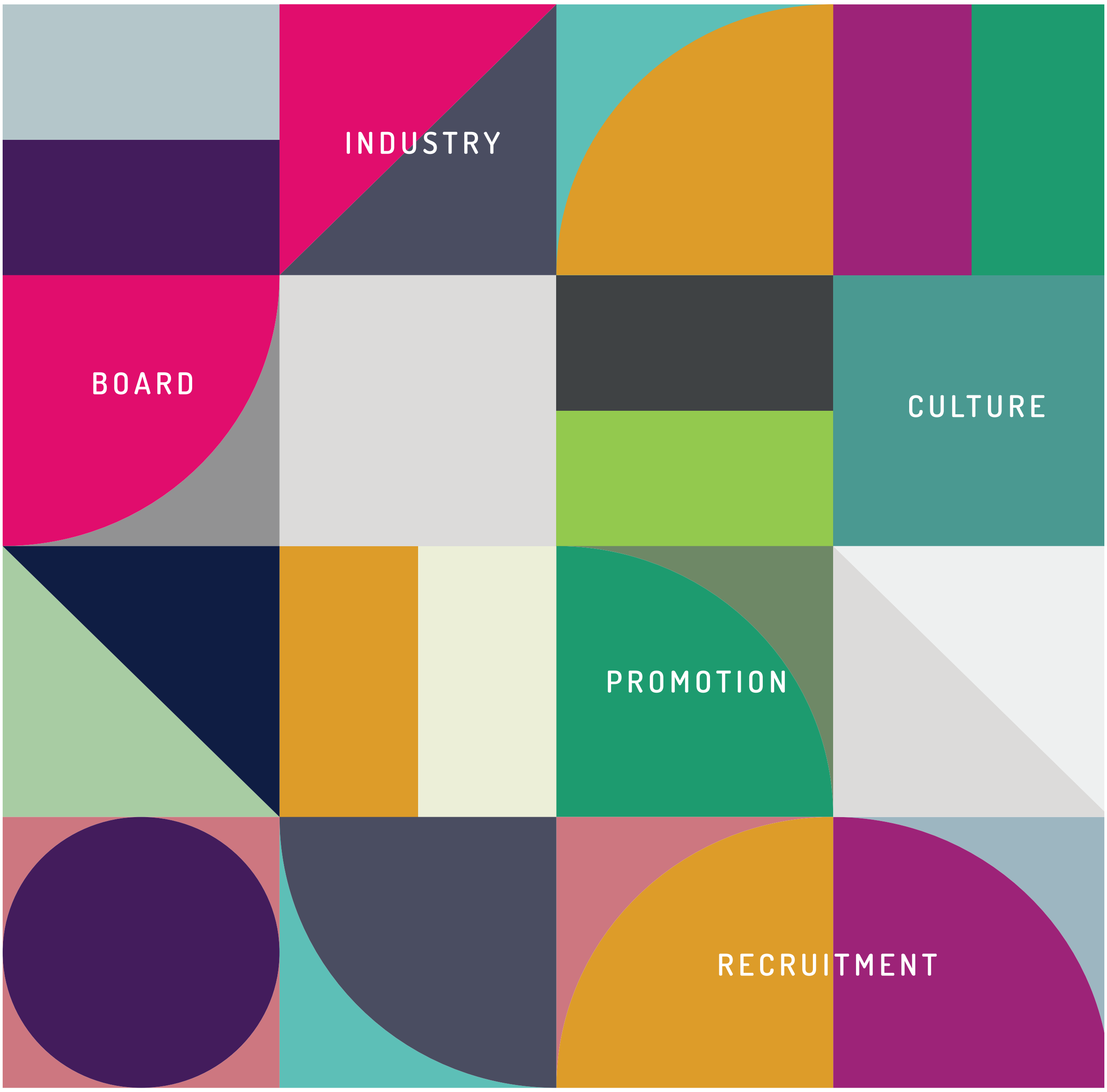
Managing risks

A good systematic manager delivers premiums while staying within risk limits. Doing so instils trust that the process meets expectations and is repeatable. Look for levels of volatility, tracking error, and turnover within the ranges expected from the strategy's design. Check for compliance with concentration limits at the security, sector, and country levels. Be wary of style drift in equities and breaches of limits on duration, credit quality, and currency exposure in bonds. Ask about exceptions to the process, their rationale, and their outcomes.

Controlling costs
Avoiding excessive turnover is necessary for minimizing costs, but some trading is inevitable. Transaction-cost analyses should be part of routine monitoring of managers. Look for a sizable price advantage over adjacent trades or compare to an approach that sells at the bid and buys at the offer (SBBO), especially during volatile times. A good manager should consistently rank favourably relative to peers on explicit and implicit costs.

Take-aways

Systematic investing has the potential to be active yet disciplined, additive yet transparent, and repeatable yet customisable. Whether or not that potential can be realised depends on the manager. While not exhaustive, my hope is the framework outlined here serves as a useful foundation for evaluating systematic managers.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A Quantitative Approach to Inefficient Markets

Global Quantitative Equity Approach

Mackenzie's Global Quantitative Equity team believes in a core style of investing that employs fundamental ideas through a disciplined, risk-aware investment approach in seeking to generate alpha within global markets. The team, led by 30-year quantitative industry veteran, Arup Datta, uses several of the same elements that a fundamental manager uses, however his team utilizes a systematic process to analyze more factors and stocks than a traditional fundamental manager. The team defines their edge as a steadfast belief in the adherence to a core focus which produces a more consistent alpha profile through and across multiple market environments. In addition, they believe that their daily stock analysis and proprietary transaction cost estimation along with our focus on capacity management, sets them apart from their competitors. A quantitative lens, aided by computing power, sophisticated algorithms and adaptive models, provides the team with a measurable process to value securities across the broad investment universe.

> *"The team defines their edge as a steadfast belief in the adherence to a core focus which produces a more consistent alpha profile through and across multiple market environments."*

Balance of Factors

Through a quantitative lens, the investment team constructs portfolios with a "core" focus, which aims to provide a balance between growth and value characteristics and seeks to outperform in various market environments. The investible universe is viewed within a region/sector/industry relative model framework. Within each of the three regions, stocks are measured against sector and industry peers. This model framework yields a matrix (by region, sectors and industries) in which each stock is categorized and ranked in a region-based peer group.

Each stock is adjudicated against 15-20 factors broadly grouped into four "super factors" consisting of Value, Quality, Revisions and Informed Investor. A balanced weight is assigned to these super factors at the portfolio level; however, weights vary by individual stock. Within Value, the team places emphasis weight between Quality Value (cash flow and dividend-based valuations), Pure Value (earnings, book and gross profit-based valuations) and including innovative ways at looking at valuations. The Quality factor balances management actions such as capital allocation, operating efficiency, ESG, employee sentiment and use of accounting practices; it also includes notions of management quality. The Revisions factor refers to analyst revisions to forecasts (earnings, sales and dividends), long-term growth, innovation and insights from linked companies. While the Informed Investor factor analyzes informed market participant activity, such as short interest in and option pricing on securities.

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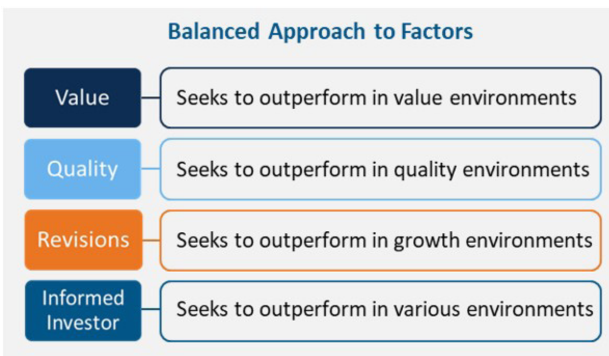
Arup Datta
Senior Vice President,
Head of Team



Beyond the four Super Factors, contextual variables are applied to determine the weight of factors for each stock. The contextual model incorporates a sophisticated approach to weighting, as the efficacy of factors vary based on underlying stock characteristics. A human overlay at extremes, such as a three-sigma event, is employed for factor weighting during periods of market dislocation. For instance, the team employed a value-tilt based during the early stages of the global pandemic based upon a three-sigma opportunity and unwound the tilt as the spread in valuations came in.

Expand the universe, daily trading, and a focus on capacity management & strong implementation

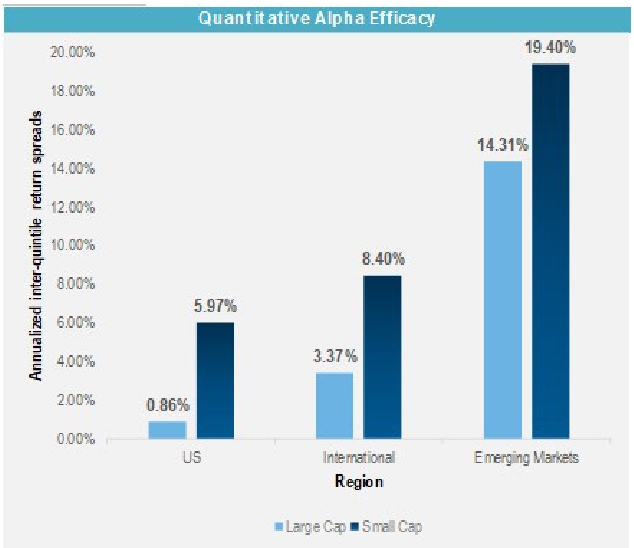
The investment team manages their flagship strategy, Mackenzie Emerging Markets All Cap, to the MSCI Emerging Market IMI Index, which has approximately 3,200 index constituents. The team expands upon the index constituents to include more than 10,000 securities within their investable universe. For fundamental managers, a typical analyst would be responsible for having a deep understanding of, at most, 30-50 companies. To successfully cover such a broad emerging markets universe, fundamental managers must employ a large team of analysts. The process of expanding the investable universe beyond benchmark constituents is in place for all of the investment strategies managed by the team.

The team strongly believes that there is an advantage in daily portfolio rebalancing and trading. A quantitative approach allows the investment team to be nimble and incorporate daily changes in stock alpha forecasts for the entire investment universe, which allows the team to rapidly and efficiently trade in and out of stocks. This more frequent incorporation of new information helps generate the freshest alpha into the portfolio, but this is only possible with a strict focus on capacity management and efficient trading. The team has placed limits on the asset size of their strategies to maintain nimbleness for portfolio trades.

Another critical consideration when investing in emerging markets is relatively high trading costs when compared to developed markets. The same is also true in less efficient small-cap securities versus higher liquidity large-cap companies. In order to deliver alpha efficiently, the team has constructed a sophisticated transaction cost model which is used in conjunction with the alpha model as part of the investment process. The model helps the team quantify the trading impact of each security by measuring round-trip transaction costs (market impact, commissions and stamp duties). Trading volume demanded and volatility are key drivers of the team's market impact cost model.

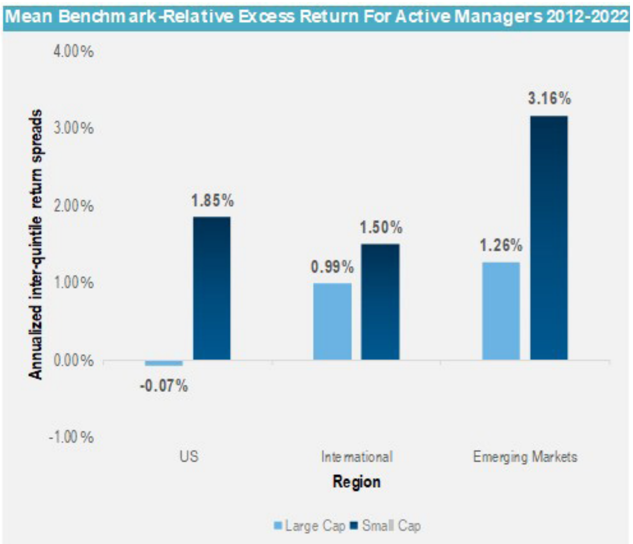
Fertile Ground for Alpha

Mackenzie's Global Quantitative Equity team believes that as an equity asset class there is no place more ripe for alpha then emerging markets. The chart below depicts a simple factor-based analysis of portfolios that blend stocks with both value and momentum characteristics. The results of this simple analysis clearly show the potential alpha opportunity in emerging markets and the added benefit of a small cap focus. In the flagship strategy, Mackenzie Emerging Markets All Cap, the team positions the portfolio to extract alpha in mid and small-cap stocks, an area that is particularly rich in alpha.



Represents inter-quintile return spreads using 50/50 blend of Value and Momentum from September 2002 – December 2022 Source: Mackenzie Global Quantitative Equity boutique proprietary research. Data source: Bloomberg

The benefits of emerging markets and small cap stocks can also be seen on a realized basis. The chart below serves as evidence that emerging markets as an equity asset class, coupled with a tilt towards small-cap stocks, truly has the potential to generate alpha over the long-term. The team also sees this small-cap advantage to be evident in their international and US portfolios as well.



Source: eVestment Universes. Returns shown represent past performance, are not a guarantee of future performance and are not indicative of any specific investment. Please note that the benchmark for the strategies within each universe vary, excess performance of active strategies is based on managers preferred benchmark.

Conclusion

At Mackenzie, we believe that emerging market equity, as an asset class, is often overlooked for the wrong reasons. From a total asset allocation standpoint, emerging markets continues to represent only a small portion of most plan sponsors equity allocations. We view the asset class as a critical component of the equity allocation puzzle. While emerging makets has encountered high volatility historically, we maintain a strong belief in the growth rate potential in the companies and countries within the emerging markets and the long-term return and diversification benefits of a broad-based allocation. We believe, that the opportunities are plentiful within a broad emerging markets investment universe and through a disciplined, risk-controlled investment process, as employed by Mackenzie's Global Quantitative Equity team, successful security selection in emerging markets can be achieved. We see similar opportunities for harvesting alpha by applying our disciplined process to more inefficient small-cap universes in emerging, international and US markets.

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