Institutional Article
Active Quantitative Equity (AQE)

October 2019

Quantitative vs. Fundamental Equity Investing

Comparing and Contrasting

Michael Lin, CFA
Investment Strategist,
Active Quantitative Equity

In recent years, the landscape for active equity investors has evolved quite dramatically. While the active equity market has historically been dominated by 'fundamental/discretionary' managers, 'quantitative/systematic' investing has been a growing force in the market (but remains a minority) — supported by technological improvements and data availability.

In the first part of this series, we compare and contrast the two main approaches in active management for equities, and dispel some of the common misconceptions that investors have about 'quantitative investing'. In the second part, we discuss how active quantitative should be measured against smart beta, and whether their higher management fees are justified. In the third part, we look at ways in which active quantitative and fundamental strategies can be complementary.

Definitions

For clarity purposes, we will refer to 'systematic' strategies that use a repeatable, data-driven investment approach as 'quantitative strategies'. For 'discretionary' strategies that involve in-depth analysis across a smaller number of securities and relies more on information that cannot be easily codified, we will refer to them as 'fundamental strategies'.

Evolution of Quantitative Equity Investing

Active quantitative equity investing can trace its roots back to Benjamin Graham and David Dodd, when they published a booked titled 'Security Analysis' that urged investors to consider a disciplined framework to analyze securities. Starting in the late 1970s, a series of academic papers showed that investors were able to achieve excess returns above the market by systematically applying certain financial characteristics such as earnings yield and size. At the time, these findings were not a surprise to fundamental analysts, as they were natural starting points for more sophisticated valuation models that they had built.

By the mid-1980s, compelling bodies of evidence supporting market inefficiency were being documented in academic studies. Researchers discovered that variables other than beta could explain the cross section of expected returns. In particular, 'size' and 'value' were found to contain useful explanatory power. In tandem with the increasing availability of financial market data in machine-readable form, these discoveries spurred the launch of active quantitative/systematic strategies.

By the 1990s, size and value anomalies morphed into mainstream and were re-labeled as factors. The benchmark model, at least in academic research, was a three-factor model with beta, size, and value. But it wasn't until the aftermath of the GFC in 2007–09, that quantitative investing landscape truly evolved to become much more heterogeneous and sophisticated. In 2011, the president of the American Finance Association described the proliferation of factors as a "zoo of new factors."[1] This was in part a reaction to the severe performance challenges during the GFC, but it also stemmed from a need to differentiate in a market where standards for new factors are much higher.

In recent years, active investors are still looking for ways to differentiate and improve performance over more-passive smart beta indexes. Truly differentiated quantitative strategies have focused on researching and developing unique aspects of their investment process while reducing their reliance on generic and commonly known themes. Examples include incorporating the ability to dynamically adjust allocations to different factors based on the macroeconomic environment and investment conditions, or utilizing big data to grab insights before it becomes more widely known.

What Is a Factor? A factor refers to any quantifiable firm characteristic or market anomaly that can explain differences in stock returns. At its most basic level, factor-based investing is simply about defining and following a set of rules (factors) that produce diversified portfolios with the aim of outperforming a benchmark.

Generating Excess Returns in a Zero-sum Market

As active investors, we believe market inefficiencies can come in many different forms — some are fleeting, whilst others are more enduring. In order for any market participant to exploit these inefficiencies and generate above market returns, one must possess at least one of the following advantages over other market participants:

1 **Informational Advantage** Informational advantage is having access to material non-public information that other investors do not. In other words, inside information. This practice is illegal in most if not all markets and can result in long term imprisonment/fines/forfeiture of assets.

2 **Analytical Advantage** Having same access to information as other market participants but having different levels of information identification, or placing different weights on certain information, and ultimately arriving at different investment decisions. This is where most fundamental managers claim to have an edge.

3 **Behavioral Advantage** A way to exploit investors' behavioral biases. Quantitative managers will often trade on perceived market anomalies caused by behavioral biases. Fundamental managers may also attempt to exploit this inefficiency but tend to be less explicit about doing so.

Since active investors can only (legally) trade on publically available information, the path to outperformance comes from being able to perform better analysis and/or being able to exploit other people's behavioral biases over the long term. Both quantitative and fundamental managers attempt to achieve analytical superiority, but quantitative managers generally differ to fundamental managers when it comes to achieving behavioral advantage by explicitly exploiting behavioral anomalies through different behavioral-based factors.

Compare and Contrast

While the vast majority of active equity managers fall distinctively into either the quantitative or fundamental bucket, a manager can be both quantitative and fundamental. The two approaches to investing share many similarities, but differ primarily in how their 'fundamental ideas' are captured and expressed. On the whole, the commonalities in Figure 1 highlight how fundamental ideas can be built into a Quantitative process via 'Factors'. Note the differences in vocabulary used by each camp.

Similarities

Figure 1
Commonalities Between Quantitative and Fundamental Approaches

Fundamental Ideas	Description	Quantitative Factors
Similar Broad-based Investment ideas Employed		
Cheap	Companies trading at less than their intrinsic value	Value (e.g. Forward looking valuation ratios)
Profitable, efficient and stable	Companies with proven resilient business models that can generate reliable earnings and cash flows through the market cycle	Funding, profitability and efficiency
Catalyst for growth	Companies that can improve their returns from potential future events	Momentum, analyst forecasts and industry specific (e.g. R&D)
Sound accounting practices	Companies with conservative accounting practices	Earnings quality/Accruals
Strong customer base	Companies with customers that have good prospects	Supply chain sentiment
Good management	Where management is acting in shareholders' best interest e.g. Not holding onto too much cash or taking on too much debt	Textual analysis of management commentaries, insiders' trades and management opportunism
Macroeconomic considerations	Different types of companies can benefit from different macroeconomic environments and different points along the business cycle	Dynamic tilting, macro risk sensitivities and indicators, country and sector signals
Similar ideas Employed Within a Sspecific industry (e.g. Banks)		
Banks with robust financial strength	Banks with significant 'core capital' will keep it functioning through all forms of risky transactionsintrinsic value	Common equity ratios
Quality of a bank's lending business	Banks with higher quality lending practices (e.g. loan standards)	Tangible valuation metrics (related to loans and leases, deposits, net interest margins etc)
Value created in non-traditional activities by a bank	Measures of a bank's non-core/intangible activities that may or may not be linked to deposit activity	Intangible valuation metrics (e.g. investment banking or mortgage lending fees and related operating costs)

Source: State Street Global Advisors. The information contained above is for illustrative purposes only.

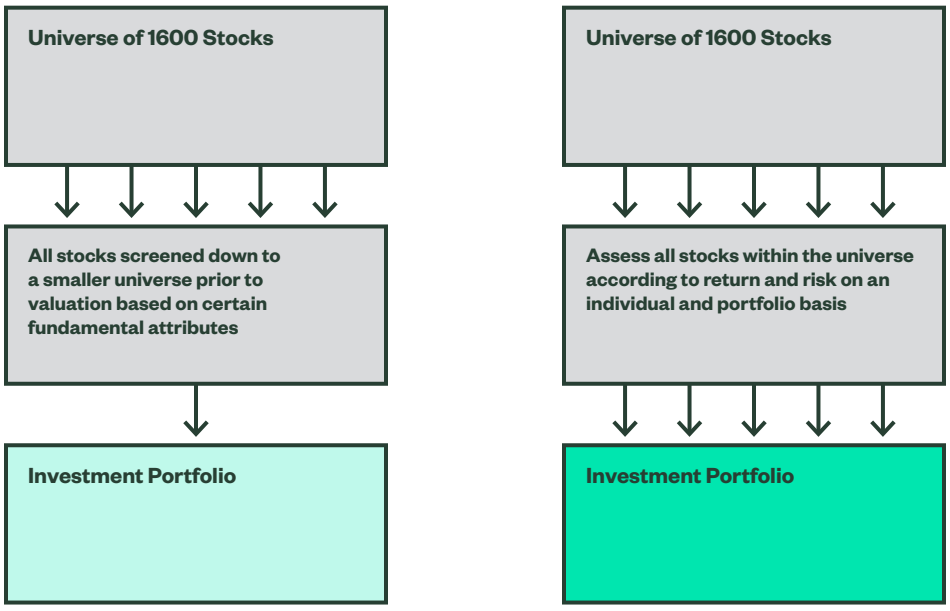
As the race for analytical superiority rages on, true active quantitative managers have evolved and incorporated fundamental considerations into their portfolios that are comparable to those considered by fundamental managers. Examples of this are highlighted in Figure 1. The factors on Banks, as a case in point, tread the line between quantitative and fundamental investing, and some investors may consider these signals to be a mix of both — commonly known as 'Quantamental'.

In a similar fashion, fundamental managers can also incorporate certain 'quantitative elements' in their investment approach. For example, a 'fundamental contrarian value manager' may place a greater emphasis on cheapness and good management, and systematically screen out companies that appear poor on these attributes. For a quantitative manager, this is analogous to assigning a bigger weight to certain value and sentiment 'factors'. Not every quantitative manager will care equally about all the factors listed in Table 1, just as not every fundamental manager will care equally about all of the corresponding fundamental themes. This is what defines an active manager's philosophy and "edge".

Differences

Aside from differences in vocabulary, a key difference between quantitative and fundamental investing is 'how' investment themes are applied across the investable universe. Generally speaking, quantitative managers tend to focus on capturing fundamental considerations and market inefficiencies across a greater number of stocks. By contrast, fundamental managers tend to focus on a smaller number of stocks but will drill deeper into their non-quantifiable return drivers. Diversification, applied in a scientific manner, is a key selling point for quantitative managers. In a well-diversified portfolio, higher "breadth" generally leads to better risk-adjusted returns. Further, certain market anomalies or themes are better captured across a larger sample size of stocks, therefore increasing overall 'hit rate'. Fundamental managers try to improve their hit rate through deep, fundamental research; such as insights about leadership gained from company meetings. Figure 2 provides a graphical representation of the differences in investment process.[2]

Figure 2
Typical Investment Processes Compared Using a MSCI World Stock Universe



Source: State Street Global Advisors. The information contained above is for illustrative purposes only.

A Key Difference Between Quantitative & Fundamental — How Managers get their "Edge"
Despite both being underpinned by fundamentals, Quantitative and Fundamental managers get their outperformance from having a slightly different edge. We can try to understand this by looking at the Fundamental Law of Active Management as represented by the following formula:

$$\text{Information Ratio (IR)} = IC \times \sqrt{BR} \times TC$$

Information Ratio (IR) is a common measure of benchmark risk-adjusted returns. The above equation tells us that Information Ratio is a function of Manager Skill (IC) * Breadth of Investments (BR) * Ability to Implement their Ideas (TC).

As we touched on earlier, most fundamental strategies have a deep focus on company specifics; they typically follow a 'best ideas' approach to select among a handful of companies filtered down through a screening process. The end portfolio is typically more concentrated though there is generally some focus on diversification across sectors and countries. The claim here is trying to achieve a higher IC. In contrast, quantitative strategies typically have a greater emphasis on "breadth (BR)" — evaluating every stock in the investment universe, sometimes over thousands of companies. This allows the quantitative manager to apply their investment thesis across a highly diversified set of smaller positions — allowing for improved risk-adjusted outcomes.

There are also market anomalies that quantitative managers explicitly try to capture in which a traditional fundamental manager typically does not (see Figure 3). These anomalies are often a result of persistent, human behavioral biases related to decision making. As we alluded to earlier, exploiting behavioral biases is frequently an explicit part of a quantitative manager's investment process, but rarely incorporated into a fundamental manager's investment process.

Figure 3
Example of Major Differences Between Approaches

Ideas that are Typically Not Analyzed by Fundamental Managers

Fundamental idea	Description	Quantitative Factor
Capturing the herding behavior of analyst forecasts	Analyst as a group exhibit herding behavior, which introduces implicit momentum and long bias into their forecasts. Career risk is often a root cause.	Trends within Earnings and sales forecasts
Capturing investor under-reaction to corporate announcements	Analysts often underreact when information arrives continuously in small doses or when changes are small, leading to slow price convergence.	Share price momentum

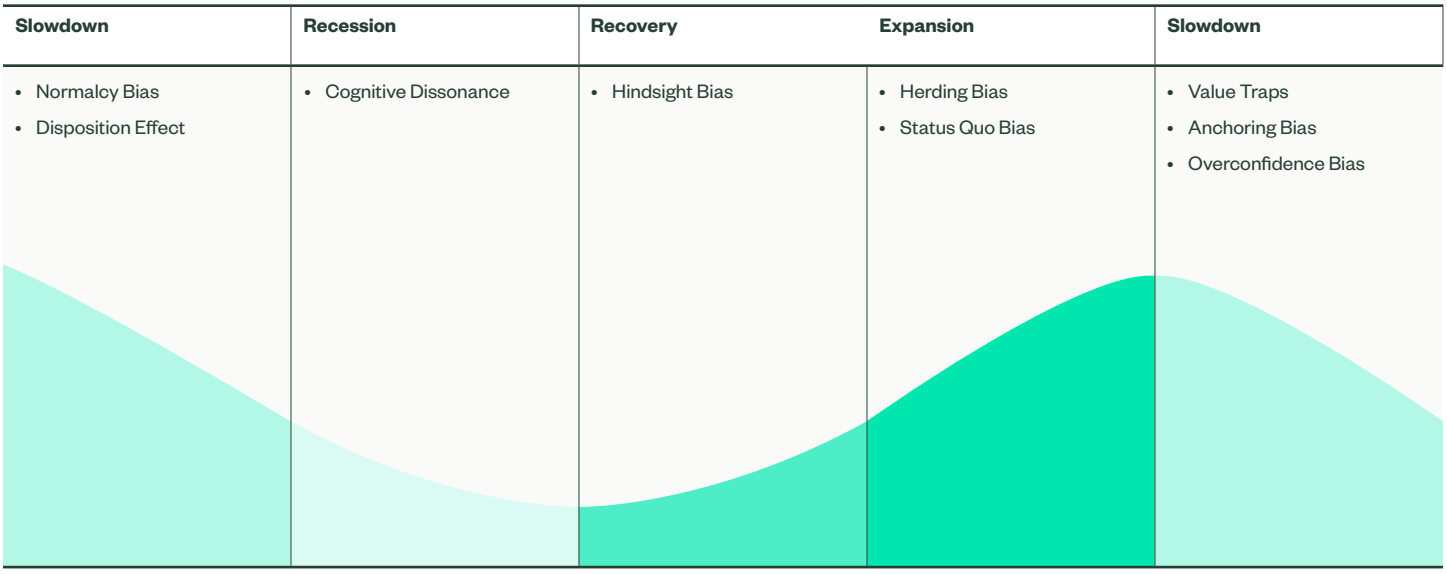
Source: State Street Global Advisors. The information contained above is for illustrative purposes only.

We view human behavioral biases as an integral part of the fundamental construct of a dynamic marketplace. These biases are both prevalent and persistent across geographies and asset classes, providing fertile ground for savvy investors to extract excess returns.

Behavioral biases affect all investors, even the hyper-rational. Left unchecked, investors can end up repeating the same mistakes on a regular basis. We commonly see these biases manifest throughout the cycle. For example, towards the end of a market cycle — as earnings and economic growth slows, analysts often anchor[3] (see anchoring bias) to historical valuations and it's not uncommon to hear them talk about stocks that are "cheapest they have been in years". When judging current valuation ratios of a stock against its own history, we are ignoring the changes in macro conditions that have occurred over time and can fall prey to value traps.

Figure 4 illustrates some of the most common behavioral mistakes investors make at different points of the business cycle. While these biases may become more pervasive at certain points in the market cycle, investors will almost always suffer from them to some degree. A quantitative process will naturally circumvent these biases, and in some cases, profit from them.

Figure 4
Common Behavioral Mistakes at Various Points of the Business Cycle



Source: State Street Global Advisors.

Myths and Misconceptions

In the previous section we explored some commonalities and differences between Quantitative and Fundamental managers, and described some fundamental inputs that go into a quantitative process. But despite an increasingly acceptance of quantitative strategies in the market, a number of myths and misconceptions remain. These misconceptions often relate to the notions that quantitative managers use 'black box' processes, or the lack of conviction/accountability that comes from investment decisions made by machines without any human insights. On the next page Figure 5 provides a summary of these myths and contrasts them with reality.

Figure 5

Myths, Misconceptions and Common Concerns About Systematic/Quantitative Managers

Myth/Misconception	Main concerns	Reality
Overdependence on machine/models	Lack of human judgement and accountability	Human judgement is used heavily in the design/implementation, ongoing monitoring, and revision of active quantitative strategies. The investment manager is completely accountable for achieving risk/return targets.
	Overreliance on historical data	Models include various forward-looking signals such as analyst earnings forecasts and implied volatilities. Both fundamental and quantitative managers use historical data, the key is to avoid data-mining and overfitting to the past.
	Overreliance on 'quantitative' and not enough 'qualitative'	Much of the information that was previously deemed 'qualitative only' can now be quantified — e.g. dimensions of ESG or supply chain information. Further, quantitative managers can have some level of qualitative risk management or qualitative investment overlay process. Highly qualitative analysis tends to be more susceptible to human behavioral biases.
'Black boxes'	Difficult to understand	Inputs, investment process and portfolio decisions can be very transparent.
	Data mining/lack of fundamentals	Fundamental inputs are used as inputs for many quantitative managers.
Lack of conviction	Benchmark-hugging	Active quantitative strategies can be completely benchmark unaware.
	Too diversified	Repeatable processes allow better and more scientific diversification across many dimensions — away from idiosyncratic risks and towards well-rewarded factors.
Lack of stories	Quantitative managers use less company specific information and miss out on good company 'stories'	Quantitative managers rely on 'process' to generate alpha (or excess returns) — applying the same signals across a set of comparable stocks. While fundamental managers rely much more on single-stock 'stories', good stories can lead to analysts becoming overly attached to a particular aspect of a company that may/may-not be priced-in already.
Just another Smart Beta	Investment process is too similar to smart beta strategies	True active quantitative strategies should be highly differentiated from smart beta strategies. Investors should be able to identify significant 'active management' and 'accountability' from an active quantitative manager. True active quantitative strategies use signals that are proprietary & differentiated. Smart Beta typically use well-known factors.
	Fee differential vs Smart Beta is not justified	Higher fees need to be justified through true active management. We ask investors to consider the degree to which an active strategy can fully express differentiated views e.g. objective based portfolio construction, proprietary signals, alternative & big data sources and/or dynamic factor tilting etc.

Figure 5 (cont.)
Myths, Misconceptions and Common Concerns About Systematic/Quantitative Managers

Myth/Misconception	Main concerns	Reality
Too much momentum	Quant models are not able to quickly adapt to structural changes and market inflection points	Not all quantitative strategies are 'momentum' heavy. Historical performance shows quantitative strategies do not underperform Fundamental strategies more during major market turning points. See part 3 of this series where we detail this further.
Too many similarities between quantitative managers	Crowding of signals, not being able to 'exit' when needed	There are material differences between quantitative portfolio designs and factors used. This is evident in both portfolio characteristics and returns. Historical returns show that fundamental managers have a similar level of correlation in returns amongst one another as quantitative managers (refer to Part 3 of this series).

Source: State Street Global Advisors. The information contained above is for illustrative purposes only.

Quantitative Investing IS:

- Studying and implementing fundamental investment insights
- Rigorous ongoing testing and refining of investment ideas
- Applying the best insights in a systematic way
- Harnessing computing power to process vast amounts of data and avoiding human behavioral biases

Quantitative Investing Is NOT:

- Complete reliance on a black box making investment decisions
- Pure momentum strategies or High Frequency Trading
- A bunch of math/physics PhDs with no investment knowledge building models
- All the same

Conclusion

While all active managers aim to generate excess returns through active risk taking, the way in which this is achieved can be very different. One key difference is how managers utilize information when constructing a portfolio - whether systematically across a broader set of securities or discretionarily on a narrower subset. Another key difference is a quantitative manager's greater focus on achieving behavioral advantages, versus a fundamental manager's greater focus on achieving analytical advantages (through a deeper focus on the unquantifiable).

Regardless of one's belief in the efficacy of active management, an investor's ultimate goal should be to identify managers that can outperform and to blend them in a complementary way. As smart beta products continue to gain momentum, the bar is being set ever higher for true active strategies to differentiate themselves. Investors are increasingly asking the question: "Am I just getting smart beta returns?" To answer these types of questions, we look at ways to identify an active manager's skill using smart beta benchmarks in the second part of this series.

Appendix

Behavioural Biases

Source: State Street's Centre for Applied Research: The Folklore of Finance, 2015

Anchoring Bias beginning an analysis with a default number in mind and adjusting up or down from that number. The "anchor" number often unduly influences the ultimate conclusion. (Bunn 1975)

Availability Bias giving a greater weight to easily recalled and recent information over information that is less recallable or harder to understand. (Taylor 1982)

Career Risk occurs when the remuneration and decision to replace or retain an investment manager depends directly on the manager's performance, driving the manager to short-termism and irrational behaviour. (Dasgupta 2006)

Cognitive Dissonance mental discomfort that results when confronted by new information that conflicts with existing beliefs or ideas. (Festinger 1962)

Confirmation Bias seeking out, overvaluing or misinterpreting information that confirms prior beliefs and ignoring contradictory information. (Nickerson 1998)

Conservatism Bias maintaining prior views or forecasts by inadequately incorporating new information. This causes individuals to overweight initial beliefs and underreact to new information. (Ritter 2003)

Decision Fatigue deteriorating quality in decisions made by an individual after making a series of decisions. Results in inadequate consideration of information and rushed judgment. (Tierney 2011)

Disposition Effect hastily selling assets whose price has increased while retaining for too long assets that have dropped in value. (Shefrin 1985)

Endowment Effect valuing an asset more (greater than its objective value) when it is held. (Kahneman 1991)

Emotional Quotient the level of one's ability to understand other people, what motivates them and how to work cooperatively with them. (Gardner 1983)

Framing Bias arriving at a different decision based on how the options are worded. (Tversky 1981)

Gambler's Fallacy believing that the probability of an event is lowered when that event has recently occurred, even though the probability of the event is objectively known to be independent from one trial to the next. (Clotfelter 1993)

Herding Bias trading on the same side of the market in the same securities, ignoring conflicting information in favor of acting as other investors do, often for reassurance and comfort. (Grinblatt 1995)

Heuristics simple rules used in forming judgments to make decisions, consisting of "mental shortcuts" that focus on certain aspects of a decision and ignoring others. (Nielsen 1994)

Hindsight Bias seeing past events as having been predictable and reasonable to expect before they occurred. (Fischhoff 1975)

Home Bias maintaining a high proportion of investments in securities listed in one's own country as opposed to internationally diversifying. (Coval 1999)

Illusion of Control Bias believing one can control and influence outcomes that one actually has no control over. (Langer 1975)

Loss Aversion permitting losses and disadvantages to shape preferences differently than gains or advantages. The utility derived from a gain is much lower than the utility given up by an equivalent loss. (Tversky 1991)

Appendix (cont.)
Behavioural Biases

Mental Accounting Bias treating one sum of money differently than another equal-sized sum based on how the money is categorized. People mentally group their assets into non-interchangeable mental accounts, when in reality money is inherently interchangeable. (Thaler 1980)

Normalcy Bias — The tendency for people to underestimate the probability of a disaster that hasn't happened before and, consequently, to fail to prepare for it.

Overconfidence Bias demonstrating undeserved faith or confidence in one's own judgments, to a higher degree than the judgment's objective accuracy warrants. (Gerry 2002)

Phantastic Object a mental representation in which an imagined scene fulfills a person's desires to have exactly what she wants. The imagination drives investors to see what they want to see in an investment. (Tuckett 2008)

Regret Aversion avoiding an action for fear of making a poor choice. (Humphrey 2004)

Representativeness Bias classifying new information based on past experiences and classifications; especially using those classifications even if the new information does not necessarily fit. (Kahneman 1972)

Self-Serving (Self-Attribution) Bias people's tendency to attribute positive events to their own character but attribute negative events to external factors. (Boyes 2013)

Self-Control Bias failing to act in pursuit of long-term goals because of a lack of self-discipline. Short-term satisfaction interferes with the achievement of long-term objectives. (Pompian 2006)

Short-Termism avoiding investments that are necessary for the future but require a sacrifice of short-term benefits. (Laverty 1996)

Status Quo Bias doing nothing or maintaining a previous decision when instead a change should be made. (Kahneman 1991)

Value Attribution imbuing someone or something with certain qualities based on perceived value, rather than objective data. (Brafman 2008)

Endnotes

1 J. Cochrane, "Presidential Address: Discount Rates," Journal of Finance 66 (August 2011): 1047–108.

2 This example is a representation of how State Street Global Advisors approaches quantitative investing. It may not accurately reflect the investment process of all active systematic managers.

3 See Appendix 1 — List of Behavioral Biases.

ssga.com

Australia: State Street Global Advisors, Australia, Limited (AFSL Number 238276, ABN 42 003 914 225) ("SSGA Australia"). Registered office: Level 17, 420 George Street, Sydney, NSW 2000, Australia T: +612 9240-7600 Web: ssga.com.

This material is general information only and does not take into account your individual objectives, financial situation or needs and you should consider whether it is appropriate for you. Investing involves risk including the risk of loss of principal. There is no representation or warranty as to the current accuracy of this material, and SSGA Australia shall have no liability for decisions based on such information.

Past performance is not a reliable indicator of future results. Index returns reflect all items of income, gain and loss and the reinvestment of dividends. Performance of an index is not indicative of the performance of any product managed by SSGA.

The views expressed in this material are the views of the Active Quantitative Equity team, through the period ended 30 September 2019 and are subject to change based on market and other conditions. This document contains certain statements that may be deemed forward-looking statements. Please note that any such statements are not guarantees of any future performance and actual results or developments may differ materially from those projected.

Standard & Poor's and S&P are registered trademarks of Standard & Poor's Financial Services LLC ("S&P") and Dow Jones is a registered trademark of Dow Jones Trademark Holdings LLC ("Dow Jones") and have been licensed for use by S&P Dow Jones Indices LLC and sublicensed by SSgA. The S&P/ASX indices are a product of S&P Dow Jones Indices LLC, and has been licensed by SSGA. The SSGA strategies contained within are not sponsored, endorsed, sold or promoted by S&P Dow Jones Indices LLC, Dow Jones, S&P, their respective affiliates, and none of S&P Dow Jones Indices LLC, Dow Jones, S&P, nor their respective affiliates make any representation regarding the advisability of investing in such product(s).

MSCI indices are the exclusive property of MSCI Inc. ("MSCI"). MSCI and the MSCI index names are service mark(s) of MSCI or its affiliates and have been licensed for use for certain purposes by State Street Global Advisors ("SSGA"). The financial securities referred to herein are not sponsored, endorsed, or promoted by MSCI, and MSCI bears no liability with respect to any such financial securities. No purchaser, seller or holder of this product, or any other person or entity, should use or refer to any MSCI trade name, trademark or service mark to sponsor, endorse, market or promote this product without first contacting MSCI to determine whether MSCI's permission is required. Under no circumstances may any person or entity claim any affiliation with MSCI without the prior written permission of MSCI.

ID126512-2701070.1.2.ANZ.RTL 1219
Exp. Date: 09/30/2020