

WHITE PAPER

Embracing fundamental and quant investing in emerging markets

Executive summary

Emerging markets are currently well-positioned to benefit from the next global equity upcycle, from both a macroeconomic and a valuation standpoint. This is also reflected in Robeco's five-year expected return forecast of 8.25% for emerging markets, a premium of 1.5% compared to developed markets. We also see emerging and re-emerging interest from clients for this asset class.

In this context, we explore the suitability of quantitative versus fundamental investment styles for capitalizing on opportunities in emerging markets (EM). Do you have to be fundamental to do well in emerging markets? Conversely, are fundamental investors just factor investors in disguise? Or is there a sweet spot where both styles mutually benefit overall portfolio outcomes?

Investigating a comprehensive sample of emerging market track records spanning more than a decade, we document that both quant and fundamental portfolio managers can successfully outperform the market. Despite achieving similar average outperformance of around 2% p.a., fundamental managers typically take higher active risks, resulting in relatively higher information ratios (IRs) for quant strategies (0.47 vs. 0.32). However, higher active risks (or tracking errors, TEs) are most often a prerequisite for high outperformance. Interestingly, the high TEs of the top-performing strategies often derive from below-average absolute volatility, highlighting the effectiveness of low-volatility strategies in emerging markets.

From an investment style perspective, quant strategies typically exhibit exposure to four style factors, while fundamental strategies do not; they instead load negatively on value, resonating with a growth-like investing style. This distinction suggests a strategic opportunity to enhance portfolio diversification by combining quant and fundamental styles. Indeed, we establish that the average 50/50 combination of quant and fundamental strategies comes with an increase in IR which is around 25% higher than the average IR of the two subgroups.

Naturally, combining quant and fundamental styles should be done bearing investor objectives in mind. Specifically, we provide three efficient allocation examples showcasing: (i) a benchmark-relative core investment, (ii) a sustainable core investment, and (iii) a conservative completion portfolio. Overall, our study highlights the complementary nature of quant and fundamental strategies and the associated EM investment benefits.

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Emerging markets equity investing

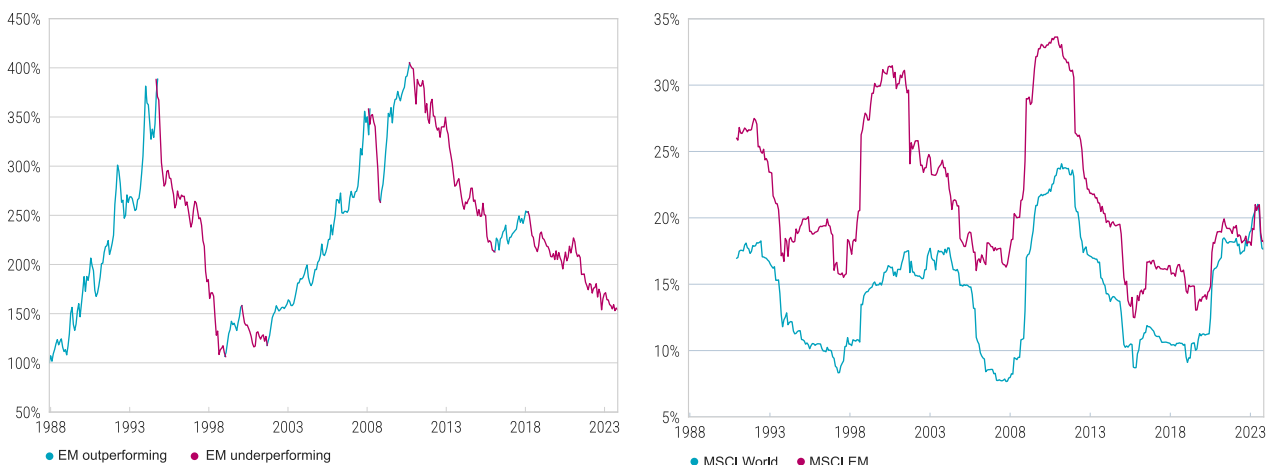
The promise and challenge of EM equity investing

The term ‘emerging markets’ was originally coined in 1981 by Antoine van Agtmael, a World Bank economist who sought to come up with a more positive term than the ‘Third World’ or ‘less developed countries’. While emerging markets have undergone significant changes since then, the term has helped to establish emerging markets as a distinct asset class. The appeal of emerging markets is that of a classic growth story. Compared to their developed markets (DM) counterparts, emerging markets start at a lower base and thus might achieve higher economic growth. However, with their younger and more rapidly growing populations, demographics also favor emerging markets and add to their economies’ vitality.

Yet investing in emerging markets is not without challenges. Historically, these markets have been riskier than developed markets, with higher volatility and more severe drawdowns. Additionally, they face unique risks such as currency fluctuations, geopolitical issues, government intervention and regulatory challenges. Although such country-specific risks are largely diversifiable in a global emerging market portfolio, certain undiversifiable risks, such as correlated political risks or global trade risks, add to the risk of investing in emerging markets.

The left chart in Figure 1 shows that the relative performance of emerging markets versus developed markets equities has been cyclical since December 1987, with prolonged periods of outperformance and underperformance. Overall, EM slightly outperforms DM with an annualized total return of 9.40% versus 8.14%, yet the last decade has proved disappointing for those investing in EM.

Figure 1 - Relative performance EM vs DM (left) and volatility EM and DM (right)



Source: Robeco, MSCI. The left chart shows the relative performance of the MSCI Emerging Market Index compared to the MSCI World Index. The right chart shows the annualized rolling 36-month return volatilities of the two indices. Performance is measured via the total return index, and all returns are in USD. The sample period is December 1987 to November 2023.

Our previous research has shown that changes in relative valuations rather than deteriorating fundamentals explain most of the relative underperformance, leaving emerging markets at a relative valuation last seen 20 years ago—right when they began to outperform their developed counterparts.¹ More specially, given a forward price-to-earnings of 11.5 at the end of November 2023, emerging markets are trading about 30% cheaper than developed ones with a multiple of 16.8.² This discount is also reflected in Robeco's five-year expected return forecast of 8.25% for EM versus only 6.75% for DM.³ At the same time, EM volatility has come down to meet that of DM, as shown in the right chart of Figure 1.

Also, from a macroeconomic perspective, we believe that the advantages that developed markets enjoyed over the past decade have evaporated with the fight against inflation. Quantitative easing is disappearing or has stopped altogether, and real rates are normalizing, while emerging markets are benefiting from lower core inflation, growing foreign exchange reserves, trade surpluses, and prudent fiscal policies.

While some investors might be apprehensive about sustainable investing in emerging markets due to perceived weaker environmental, social and governance (ESG) characteristics compared to developed markets, our research and experience tell a different story. We have found that the most sustainable companies in emerging markets are on par with their counterparts in developed markets. Moreover, with the right tools and data, it is possible to construct highly sustainable equity portfolios in these markets.⁴ In sum, the combination of a favorable macroeconomic environment, attractive valuation, and diminished investment risk offers a unique opportunity to allocate to emerging market equities.

Plenty of portfolio managers have risen to the challenge of harvesting the benefits of emerging markets investing, following either a fundamental or a quant approach to EM equity investing. Notably, Robeco is a pioneer in both, with first investments and strategies dating back to 1930 and 1994, respectively. From a broad perspective, fundamental managers focus on analyzing a company's financial, economic, and business prospects in-depth, considering macroeconomic and political risks in specific emerging market countries. In contrast, quant managers employ systematic methods to capture return premia based on specific firm characteristics, using mathematical models and algorithms to guide investment decisions and portfolio construction.

In light of these approaches, we wonder which style – fundamental or quant – is better suited for investing in emerging markets. Is a fundamental approach essential in these markets, given their unique challenges? Or are fundamental investors actually quant investors in disguise, simply riding the same factor premia that quant managers target systematically? Or is it possible to harness the strengths of both styles within a single portfolio?

Our comprehensive study examines a large cross-section of portfolio managers in emerging markets to address these questions. Are fundamental managers more successful than their quant counterparts, and if so, is this due to their skill or their willingness to take on higher active risk? We also compare the performance of both types of managers, adjusting for active risks. Beyond raw performance metrics, we explore whether fundamental and quant managers adopt distinct investment styles and identify the primary factors differentiating

¹ See, Hanauer and de Koning (2023) and Swinkels and Yang (2023).

² Some investors might argue that the sector composition of the emerging markets index is different from the developed markets index, and that differences in sector valuation affect the index valuation. However, Swinkels and Yang (2023) show that this only marginally affects the valuation gap.

³ Return forecasts are in USD, for EUR both returns are 1% lower. For details, see Robeco (2023), the 13th edition of our flagship annual publication, Expected Returns 2024-2028 'Triple Power Play'.

⁴ See de Groot and Sulman (2022).

them. Additionally, we explore the potential diversification benefits that could be realized by combining a fundamental and a quantitative strategy, potentially leading to improved overall portfolio performance. Lastly, we venture into an edge case where an investor with holdings in the top three fundamental strategies considers the potential benefits of adding a quantitative strategy to their portfolio (or vice versa).

The ecosystem of emerging market equity strategies

Our strategy comparison is based on the eVestment database, a leading data provider for institutional asset managers that covers more than 27,000 institutional strategies across more than 700 universes.⁵ The respective data is self-reported by asset managers but its accuracy is seen as high due to constant scrutiny from clients (cf., Jenkinson, Jones and Martinez, 2016). Moreover, eVestment claims the return data are free from survivorship bias as the database retains data for strategies that have been discontinued.

However, the data may be revised and be subject to 'instant history' or backfill bias as asset managers may have a greater incentive to report information to eVestment following a period of good performance.⁶ In short, the eVestment database represents a widely used and accepted database, but we cannot rule out completely that average returns might be overstated due to the said limitations.

We use the launch date of the MSCI Emerging Markets Index (January 2001) as the start date of our analysis, and we consider strategy returns gross of fees in USD. First, we apply several filters to screen for long-only strategies that invest in large and mid-cap emerging market stocks.⁷ These screens result in a universe comprising 597 different strategies, which were active at some point between January 2001 and September 2023. Of these 597 strategies, 440 follow a fundamental approach and 157 a quant one. This database also includes discontinued strategies, but 365 out of the 597 strategies (61%) were still active in September 2023, suggesting some survivorship bias in the data.

In analyzing strategy performance, we firstly consider those strategies that have been active in emerging markets for a long sample period. This approach enables us to gauge the longer-term track record of fundamental and quant investing in these markets. April 2011 is the start date because it marks the first month of Robeco's Emerging Markets Conservative Equities strategy in the eVestment database. The sample also includes our four other main EM equity strategies: namely the two fundamental strategies EM Core and EM Stars as well as the two quantitative strategies EM Enhanced Indexing and EM Active Quant.

In total, we identified 162 strategies in the database comprising 123 fundamental and 39 quant strategies. Although the resulting sample comes with survivorship bias by design, it is still informative about who succeeds in the sample of surviving strategies. To mitigate the bias, we also consider a five-year rolling analysis, for which we use the complete dataset from January 2001 to September 2023 and include strategies with a minimum of five years of return history at any given time. This echoes the standard approach of an investment consultant who would rank strategies based on their performance over recent investment cycles and periods. After filtering out strategies with less than five years of return data, the sample for the rolling analysis comprises 342 fundamental and 127 quant strategies.

⁵ See <https://www.evestment.com/>. The eVestment database is used by institutional investors and consultants but also in academic studies, see, for instance, Jenkinson, Jones and Martinez (2016) or Jones and Martinez (2017).

⁶ To explore the possibility that backfill bias may affect our results, we delete the first 36 months of each strategy's return data from our sample. However, our conclusions remain unchanged after this correction which is why we present results based on the full history.

⁷ The filters that we apply are as follows: 1. Exclude funds with Primary Equity Capitalization equal to "Micro Cap", "Small Cap", "Small-Mid Cap", or "Mid Cap", 2. Only include funds with Product: Investment Focus equal to "Long Only", 3. Exclude funds with Product: Primary Universe equal to "eVestment Global Emerging Mkts Small Cap Equity", and 4. Exclude funds with Product: Preferred Benchmark equal to "50% MSCI EM / 50% JPM GBI EM indices", "FTSE EPRA/NAREIT Emerging Markets", "MSCI EM Small Cap Size Select-ND", "MSCI EM Small Cap-GD", "MSCI EM SMID Cap Value-ND", "MSCI EM SMID Cap-ND", and "MSCI Frontier Emerging Markets-ND".

A horse race: Fundamental and quant investing in emerging markets

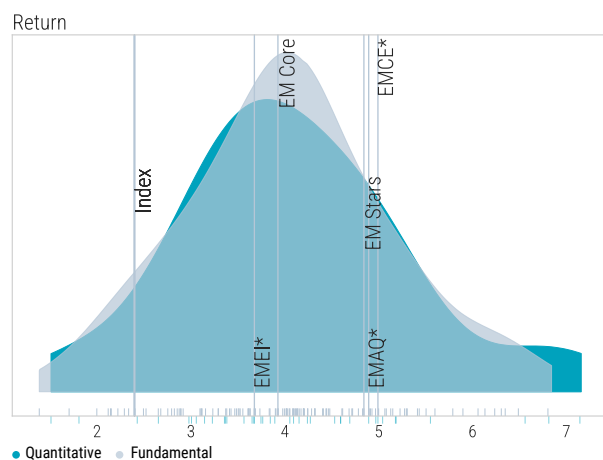
In this section, we examine the performance of emerging market equity strategies, identifying salient differentiators of fundamental and quant approaches. We investigate classic performance measures for risk and return, but also explore the style factor exposure of the examined strategies.

Performance

Our investigation focuses on active strategies from April 2011 to September 2023, and we begin by depicting the corresponding strategy return distributions for fundamental (grey) and quant (blue) strategies in Figure 2. Two key observations can be made. First, we see that, on average, the returns of the fundamental and quant strategies are on par, averaging around 4% p.a. Second, the relevant benchmark index (MSCI EM Index, denoted Index) is outperformed by most strategies, be it fundamental or quant, which is partly reflective of the survivorship bias introduced by requiring that strategies are active over the entire sample period.

Of course, the outcome of this analysis depends on the sample period chosen. Over time, we see that fundamental and quantitative strategies alternate in terms of which has the best performance,⁸ which is well represented by the equal average returns we see in Figure 2.

Figure 2 - Annualized return (%)



Source: Robeco, eVestment. The figure shows density plots of annualized mean returns. The density for the quantitative strategies is shown in blue and for fundamental strategies in grey. We include strategies that were active over the period from April 2011 to September 2023. The sample includes five Robeco strategies, which are highlighted in the figure. The two fundamental strategies are EM Core and EM Stars, and the three quantitative strategies (denoted with an asterisk) are EM Enhanced Indexing (EMEI), EM Active Quant (EMAQ) and EM Conservative Equities (EMCE), with the strategy labels placed right of the corresponding lines.

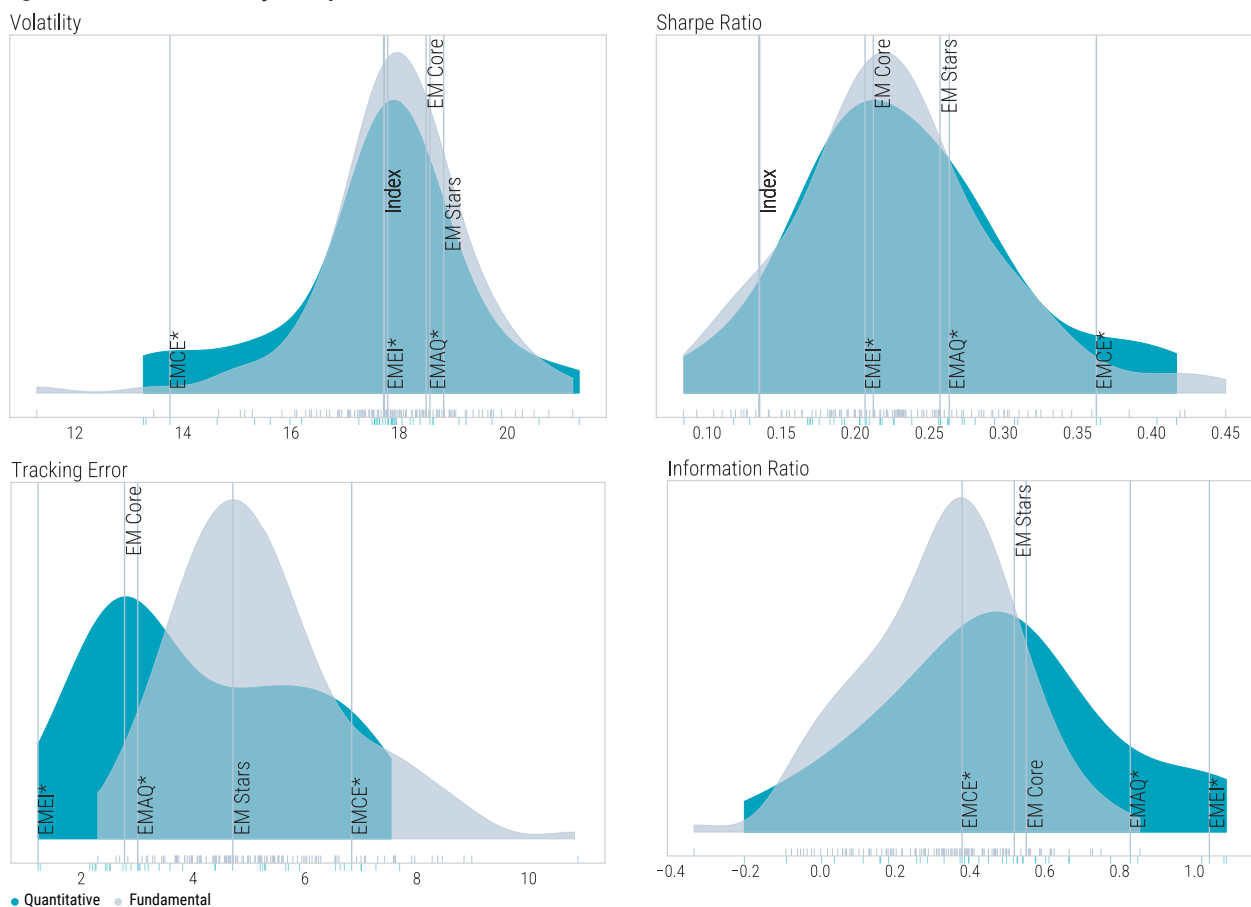
It is worth investigating whether the top performers in the sample share certain characteristics. Of the ten strategies with the highest returns, we note that seven of these are fundamental strategies, and three are quant, roughly matching the ratio of the full sample. Unsurprisingly, six of these ten strategies have above-average TEs, showing that at least part of their outperformance can be attributed to the managers taking higher active risks. What is perhaps more surprising is that in five out of seven cases, these high TEs stem from the strategies having below-average volatility. This finding highlights the relevance of low volatility investing in EM equities, even in conjunction with a fundamental investment proposition.

⁸ See Figure A2 in the Appendix, where we show the rolling five-year relative median quantitative and fundamental return, Sharpe ratio, and Information Ratio.

Note that we are also highlighting five Robeco strategies⁹ in the return distribution, enabling us to further zoom in on the characteristics of these salient investment propositions. In doing so, we take the absolute and benchmark-relative risks into account. To this end, Figure 3 plots the distributions of strategy volatility as well as that of their tracking error relative to the MSCI EM Index. In terms of volatility, fundamental and quant strategies show fairly similar distributions, but more of the latter display lower volatility. A good example of this is Robeco’s EM Conservative Equities (EMCE) strategy, which volatility is only 78% of the index volatility over the sample, resonating with its stated defensive investment objective that aims to exploit the low volatility anomaly alongside other style factors. As a result, the risk-adjusted performance distribution (as measured by the Sharpe ratio) generally echoes Figure 2, but low-volatility strategies such as EMCE are found at the far right of the distribution.

But what about relative risks? The lower left chart in Figure 3 indicates that, on average, quant strategies exhibit lower active risks than fundamental ones, with a mean tracking error of 4.2% for quant strategies compared to 5.2% for their fundamental counterparts. This finding suggests that, on average, fundamental managers are taking higher active risks. In unreported results, we find that the higher active risk (TE) of fundamental strategies can partly be explained by larger active country bets. Indeed, when we consult the information ratio, quant strategies come out better with an average IR of 0.47 versus 0.32 for the fundamental ones.

Figure 3 - Risk and risk-adjusted performance



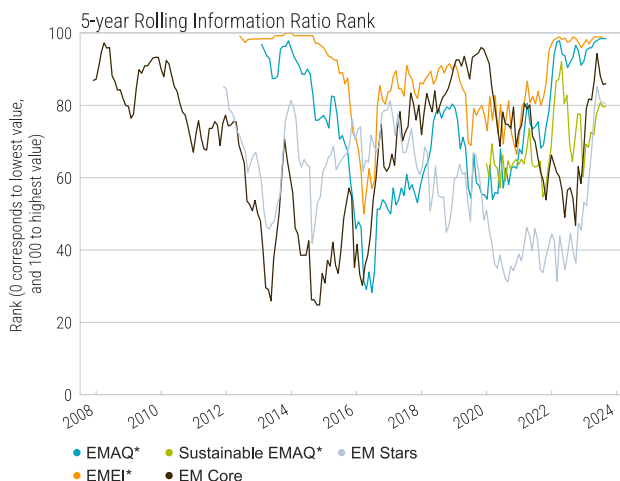
Source: Robeco, eVestment. The figure shows annualized return volatility, Sharpe ratio, tracking error, and information ratio density plots. The densities for the quantitative strategies are shown in blue and for fundamental strategies in grey. We include strategies that were active over the period from April 2011 to September 2023. The sample includes five Robeco strategies, which are highlighted in the figure. The two fundamental strategies are EM Core and EM Stars, and the three quantitative strategies (denoted with an asterisk) are EM Enhanced Indexing (EMEI), EM Active Quant (EMAQ) and EM Conservative Equities (EMCE), with the strategy labels placed right of the corresponding lines.

⁹For a detailed description of the Robeco strategies included in this note, we refer to the Appendix.

Notably, we find the two benchmark-relative Robeco Quant strategies, Robeco Emerging Markets Enhanced Indexing (EMEI) and Robeco Emerging Markets Active Quant (EMAQ), in the top quintile of the quant strategies' IR distribution, with both adhering to their targeted TE risk objective of 1% and 3%, respectively. In fact, EMEI has the lowest TE within the investigated sample while generating the third-highest IR. Furthermore, when compared to the fundamental strategy sample, Robeco Emerging Markets Core (EM Core) and Robeco Emerging Markets Stars (EM Stars) present above-average IRs of approximately 0.5 at still moderate TEs of 2.8% and 4.7%, respectively.

An obvious question concerns how Robeco's EM strategies are ranked through time, and we present their respective trajectories in Figure 4. Specifically, we look into a rolling window of five years, which corresponds to what investment consultants will typically analyze when comparing an available set of strategies at any given time. It turns out that benchmark-aware Robeco strategies fall within the top 2 quintiles of the rolling five-year IR statistics most of the time.¹⁰ EMEI and EMAQ strategy IRs even rank among the top 10% and top 25% for almost half of the active months, respectively. As EMCE has a Sharpe ratio objective aiming for a lower absolute risk profile than the market index but is not constrained by a strict tracking error limit, we exclude it (and similar strategies) from this analysis but include it in a rolling Sharpe ratio analysis in the appendix.¹¹

Figure 4 - Information ratio ranks over five-year rolling window



Source: Robeco, eVestment. The figure shows the rank of selected emerging market strategies based on their rolling five-year information ratio. At each point in time, we rank all strategies that have at least five years of return history based on their information ratio. We then scale the ranks between 0 and 100, where the value of 0 corresponds to the strategy with the lowest IR, and 100 corresponds to the strategy with the highest IR. In this analysis, we exclude strategies with a rolling five-year CAPM beta lower than 0.9. The selected strategies are two fundamental strategies (EM Core and EM Stars) and three quantitative strategies (EMEI, EMAQ, and Sustainable EMAQ, all denoted with an asterisk). The sample period is January 2003 to September 2023.

Drawdown risk

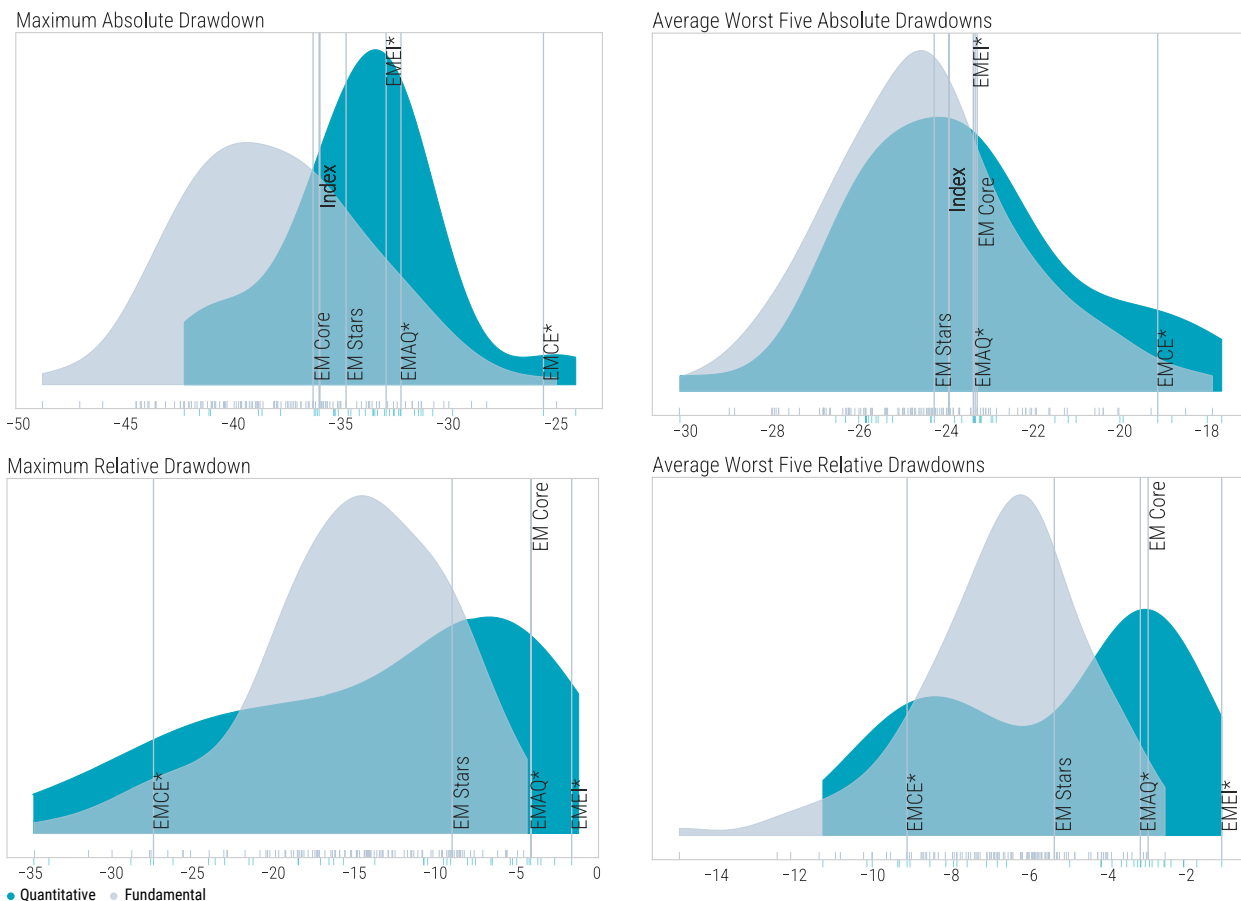
Given that EM equities may entail elevated investment risks, we next examine the associated drawdowns in Figure 5. Indeed, the maximum drawdown of the MSCI EM Index in the considered sample period was -36.0% (the MSCI EM Index peaked in June 2021 and has yet to recover). Notably, the bulk of quant strategies observed smaller absolute drawdowns, with low volatility offerings such as EMCE reducing drawdown to -25.6%. Conversely, two-thirds of the fundamental strategies come with more severe drawdown figures than the index; yet the two fundamental Robeco strategies show an index-like drawdown, speaking to their effective risk management mechanisms.

¹⁰ Here, we label a strategy benchmark-aware if its tracking error is lower than 4%. Regarding the Robeco strategies, this includes the quantitative Enhanced Indexing and Active Quant strategies, as well as the fundamental EM Core strategy.

¹¹ See Figure A1 in the Appendix.

When averaging over the five worst absolute drawdowns, the differences between fundamental and quant strategies naturally shrink, but the overall observation of quant strategies enjoying better drawdown control prevails. This verdict continues to hold in relative risk terms but with an important twist: Looking across all the strategies, low-volatility ones exhibit the highest relative drawdowns. Of course, one can reasonably argue that this observation is not a bug but a feature of low-volatility investing, which tends to lag in times of rallying equity markets, thereby creating such relative drawdown risk patterns.

Figure 5 - Maximum drawdown and average worst five drawdowns



Source: Robeco, eVestment. The figure shows density plots for the maximum and average of the worst five absolute and relative drawdowns. The densities for the quant strategies are shown in blue and for fundamental ones in grey. We include strategies that were active over the period from April 2011 to September 2023. The sample includes five Robeco strategies, which are highlighted in the figure. The two fundamental strategies are EM Core and EM Stars, and the three quant strategies are EM Enhanced Indexing (EMEI), EM Active Quant (EMAQ) and EM Conservative Equities (EMCE), with the strategy labels placed right of the corresponding lines.

Style

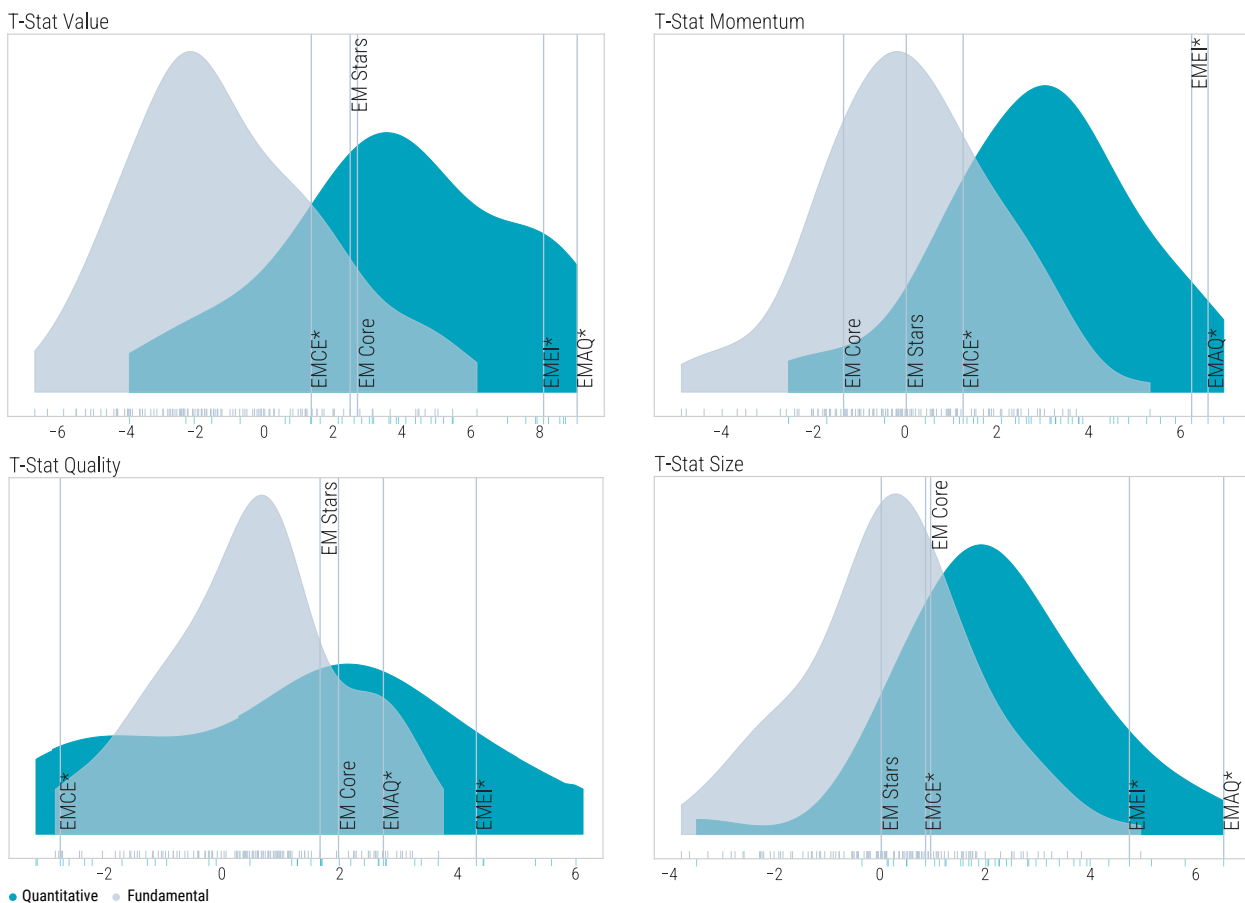
We observe salient differences in the classic risk and return metrics across the two groups. Drilling deeper, is it possible to pinpoint differences in strategy investment styles as well? For quant strategies, we clearly expect to see them loading on common equity factors such as value or momentum. But what about fundamental strategies? Are they just factor investments in disguise? To answer this question, for each strategy f in our sample we investigate a five-factor model, including the market factor and the four well-established style factors value, momentum, quality and size:¹²

¹²The factor returns are top-bottom quintile portfolio returns based on the following generic factor definitions: (1) Book-to-market (value, VAL), (2) 12-1 month returns (momentum, MOM), (3) return on equity (quality, QUAL), and (4) inverse of the market capitalization (size, hence, smaller stocks are in the top, and bigger firms in the bottom portfolio). Additionally, for the quantitative Low Volatility strategies, we assume the factor returns to be top-market capitalization weighted market return, given that these strategies are generally benchmark agnostic. Portfolios are equal-weighted, rebalanced monthly and the holding period is six months. The investment universe consists of the constituents of the MSCI Emerging Markets Index.

$$R_{f,t} - R_{market,t} = \alpha_f + \beta_{1,f}R_{market,t} + \beta_{2,f}VAL_t + \beta_{3,f}MOM_t + \beta_{3,f}QUAL_t + \beta_{4,f}SIZE_t + \varepsilon_{f,t}$$

Figure 6 plots the distribution of the t-statistics pertaining to the investigated strategies' style factor loadings. Here we see a clear distinction between the style exposures of fundamental and quant strategies. First, quant strategies indeed aim to harvest the said equity factor premia, with most strategies showing t-statistics exceeding 2 for value and momentum. As for quality factor exposure, the evidence is less pronounced, which might relate to quality style investing enjoying a wider range of plausible factor definitions, see Kyosev, Hanauer, Huij, and Lansdorp (2020). Second, quant strategies clearly tap into smaller companies; note that this is not necessarily done in search of harvesting a size premium but to gain higher and more diversified exposure to the other factors. Third, while fundamental strategies come out with near-zero t-statistics for momentum, quality and size, we note a pronounced anti-value tilt with t-statistics centered around -3, resonating with a growth investment objective. Fourth, while Robeco quant strategies are consistent with the above reading, we note that Robeco's two fundamental EM equity strategies actually show significantly positive value and quality exposures, in line with their stated investment objective. Overall, these salient differences between the two strategy types present an opportunity to enhance overall portfolio diversification by combining fundamental and quant strategies.

Figure 6 - Distribution of t-statistics for VAL, MOM, QUAL, and SIZE



Source: Robeco, eVestment, Refinitiv. The figure shows density plots for value, momentum, quality, and size t-statistics. Factor definitions and construction are described in footnote 10. The densities for the quantitative strategies are shown in blue and for fundamental strategies in grey. We include strategies that were active over the period from April 2011 to September 2023. The sample includes five Robeco strategies, which are highlighted in the figure. The two fundamental strategies are EM Core and EM Stars, and the three quantitative strategies are EM Enhanced Indexing (EMEI), EM Active Quant (EMAQ) and EM Conservative Equities (EMCE), with the strategy labels placed right of the corresponding lines.

Emerging market equity diversification in style

Seeing how fundamental and quant strategies succeed in EM equity investing with genuine investment styles suggests that there is room for improving overall portfolio outcomes by combining both styles into one investment proposition. In this section, we explore the opportunity set of such fundamental and quant style diversification. We also highlight specific use cases based on Robeco strategies. For this analysis, we again consider the sample focusing on active strategies from April 2011 to September 2023.¹³

The potential for style diversification

To foster intuition about how complementary quant and fundamental strategies are, we examine their outperformance correlations. In the sample period, the average outperformance correlation of strategies is highest within either the group of fundamental strategies (0.21) or quant strategies (0.28). While these figures suggest ample room for diversification even within these style groups, the average outperformance correlation of fundamental and quant strategies is close to zero (0.06). Such a low correlation corroborates that combining fundamental and quant strategies generates more stable outperformance by reducing active risk. To illustrate, we consider all possible 50/50 fundamental and quant combinations. The sample comprises 123 fundamental and 39 quantitative strategies, resulting in 4,797 possible combinations.

The results of this combination analysis are displayed in Figure 7. As before, density plots for fundamental strategies are represented in grey while those for quant ones are in blue. Pink represents density plots for the 50/50 combinations. Our results suggest that investing in a fundamental-quant combination is typically advantageous. Namely, the average TE of the 50/50 combination is only 3.5%, 32% lower than the average TE of fundamental strategies (5.2%) and 16% lower than that of quant strategies (4.2%). Moreover, this approach decreases the risk of losses and drawdowns: the maximum relative drawdown for the 50/50 combinations is -9.5%, relatively speaking 36% lower compared to the average maximum relative drawdown for the fundamental strategies (-14.9%) and 20% lower than the average maximum relative drawdown for the quant strategies (-13.9%).

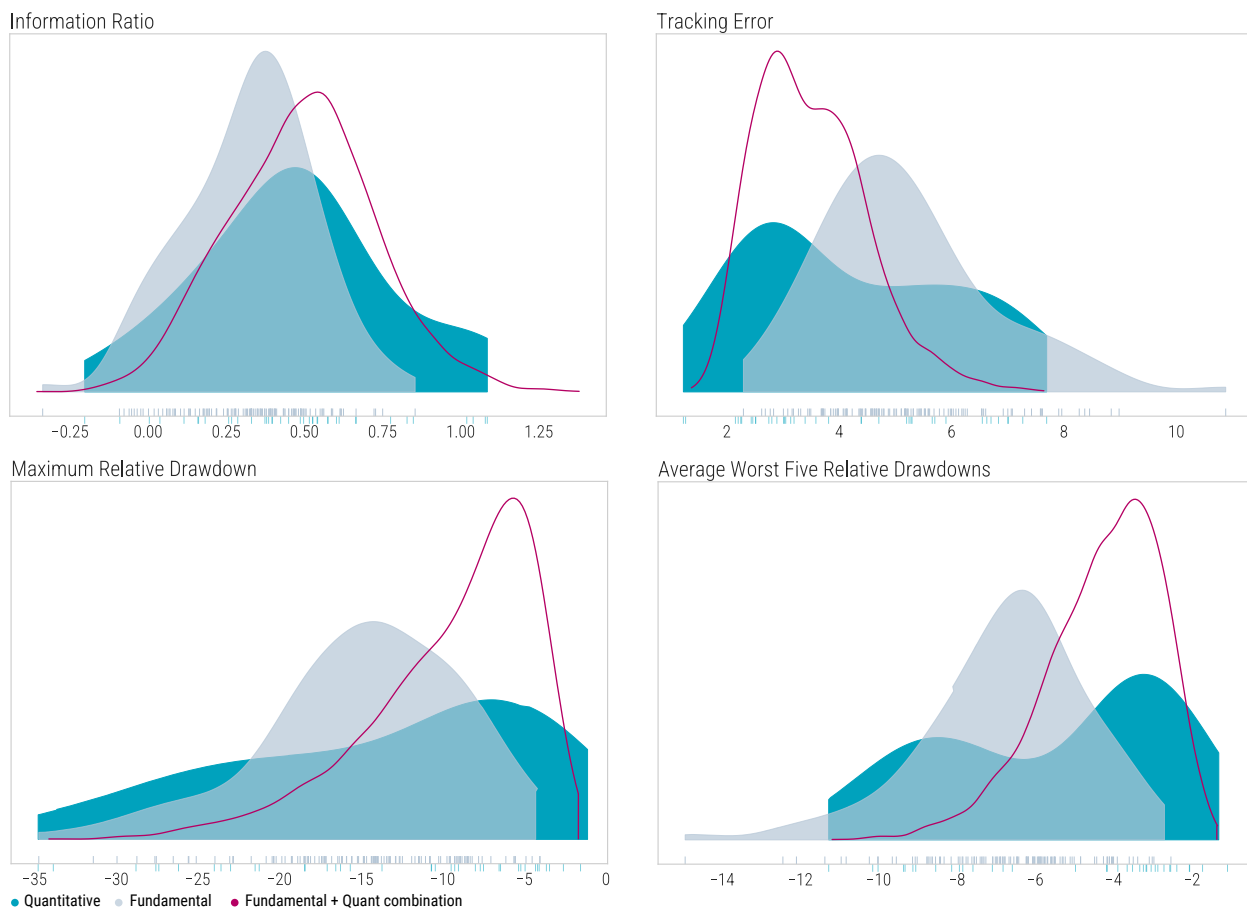
Lastly, combining the active risks of both fundamental and quant strategies results in a beneficial shift of the IR distribution to the right. More specifically, the average IR of combinations is 0.49, representing an improvement of about 25% compared to the average of the two subgroups (0.32 and 0.47).

Taking this exercise one step further, we also consider two extreme perspectives. First, we put ourselves in the shoes of an extremely skilled (or lucky) investor who happens to have equally allocated their capital to the three best-performing¹⁴ fundamental managers. Would they have benefited from allocating a quarter of their holdings to a given quant strategy? In the same vein, we swap sides and explore whether a pure quant investor enjoying the performance of the three best-performing quant strategies would have benefited from considering a 25% allocation to a given fundamental strategy.

¹³ We also considered a sample consisting of the 50% largest strategies in terms of assets under management (as of September 2023). Such a universe would be more reflective of the choice an asset owner actually faces when looking to select strategies that can help deploy the resulting investment proposition at large scale. Yet, restricting to this smaller sample gives very similar results which is why we report the full sample evidence only.

¹⁴ In determining the best-performing strategies, we consider the strategies with the highest outperformance. We exclude those with a beta smaller than 0.9 to avoid any conclusions solely following from the fact that we combine low volatility strategies with regular strategies.

Figure 7 - Information ratio, tracking error, and relative drawdowns for all 50/50 combinations



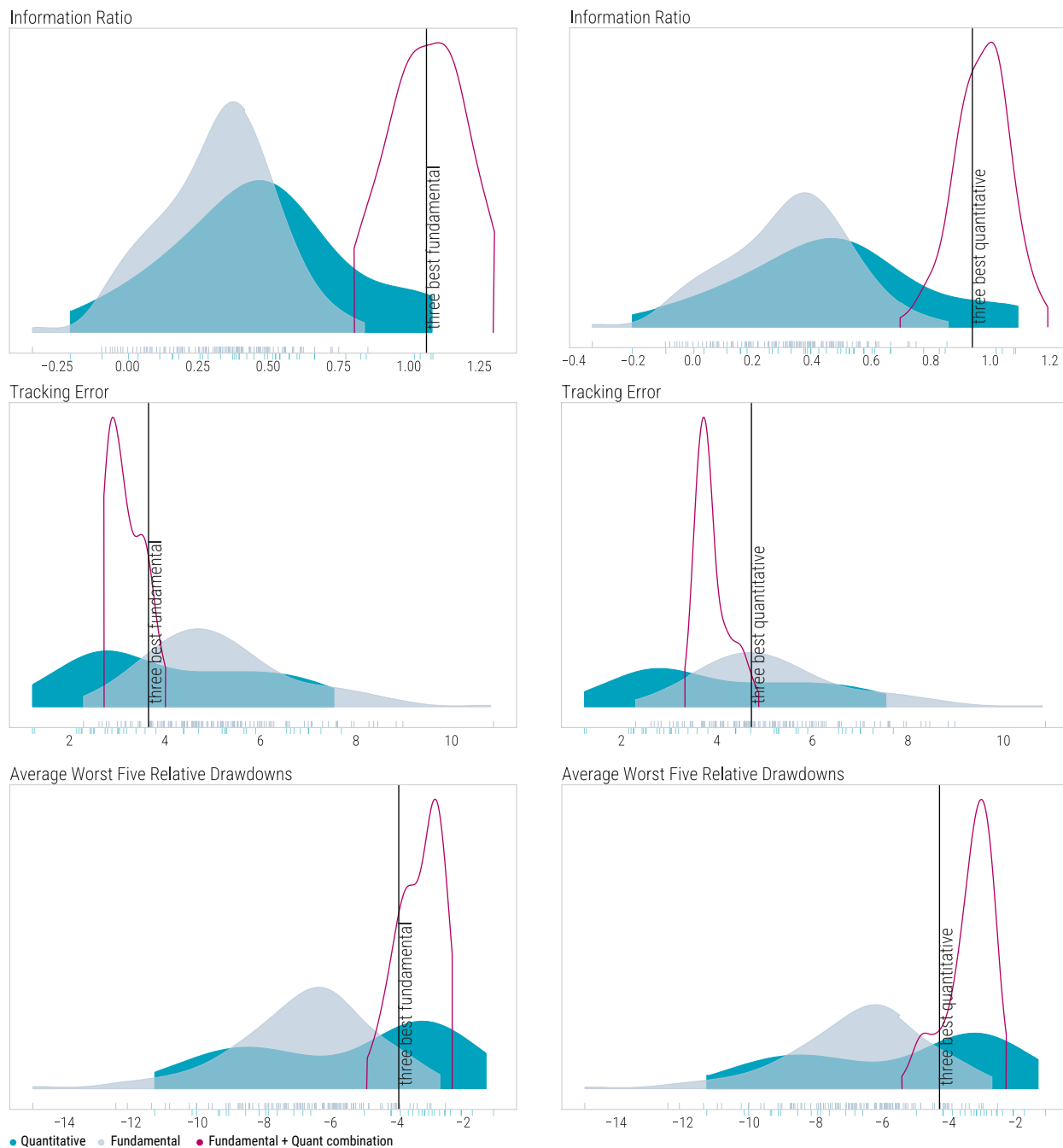
Source: Robeco, eVestment. The figure shows density plots for the annualized information ratio and tracking error, as well as maximum and average of the worst five relative drawdowns. The densities for the quantitative strategies are shown in blue, for fundamental ones in grey, and for the 50 fundamental/50 quant combinations in pink. We include strategies that were active from April 2011 to September 2023. This results in 123 fundamental strategies, 39 quant ones, and $39 \times 123 = 4,797$ 50/50 combinations.

Figure 8 juxtaposes the outcome of these two allocation exercises, now with the density plots for the strategy combinations shown in pink. Here, we also highlight the equally weighted combination of only the three best fundamental/quantitative strategies. Even for these two extreme cases, the results show the power of diversification, whether it is adding one quant strategy to the three best-performing fundamental strategies or vice versa.

Since our selection of the three best performing strategies relies on outperformance, their combinations with any other strategy generally obtain a lower outperformance. However, Figure 8 shows that the reduction in tracking error compensates for this lower outperformance in most cases. On average, the hybrid combinations show a similar, or sometimes even higher, IR in comparison to the three best fundamental/quantitative strategies alone.

Additionally, the lower tracking error obtained through these combinations leads to a more stable outperformance and in a similar vein, relative drawdowns are reduced. This finding is remarkable, considering that we are adding random strategies from one group to the pre-selected top strategies of the other group. In a nutshell, high-performing emerging market investors cannot be complacent when relying on only one investment style, as there are obvious diversification benefits to harvest.

Figure 8 - IRs and TEs for the hybrid combinations



Source: Robeco, eVestment. The figure shows the annualized information ratio, tracking error, and average worst five relative drawdown density plots. The densities for the quantitative strategies are shown in blue, for fundamental strategies in grey, and for the hybrid combinations (three best quantitative/fundamental plus any fundamental/quantitative strategy) in pink. We include strategies that were active over the period from April 2011 to September 2023. The three best strategies are selected based on returns, where strategies with a beta lower than 0.9 have been excluded.

The Robeco way to style diversification in emerging market equities

In the previous section we make a general case for the benefits of combining fundamental and quantitative strategies. In practice, specific strategies are combined with the aim of satisfying a given strategic investment objective. Therefore, this section outlines relevant use cases for combining fundamental and quant investment vehicles. To this end, we resort to combinations of Robeco strategies, which we know best in terms of investment process and objective, so we can meaningfully propose powerful combinations.

To set the stage, we examine the strategies' outperformance correlation in Table 1. As expected, both groups show higher within-correlations than between-correlations, resonating with the fact that each is derived from a genuine alpha model and investment team respectively. The exception is EMCE, which shows low correlations even to quant strategy contenders, reflecting its benchmark-agnostic investment approach. Importantly, the outperformance correlation of fundamental and quant Robeco strategies is 0.32 at max, suggesting ample room for diversification. To illustrate, we consider the following three use cases: 1) a benchmark-relative core investment, 2) a sustainable core investment, and 3) two conservative completion portfolios.

Table 1 - Outperformance correlation Robeco strategies

	EMAQ	EMEI	Sustainable EMAQ*	EMCE	EM Core	EM Stars	EM Sustainable Stars*
EMAQ	1						
EMEI	0.77	1					
Sustainable EMAQ*	0.88	0.82	1				
EMCE	0.20	0.35	0.53	1			
EM Core	0.27	0.25	0.32	-0.07	1		
EM Stars	0.23	0.18	0.27	0.09	0.71	1	
EM Sustainable Stars*	0.29	0.16	0.31	-0.04	0.72	0.85	1

Source: Robeco, eVestment. The table shows the outperformance correlation of selected emerging market strategies. The correlations are calculated from April 2011 to September 2023, except for the sustainable strategies denoted with an asterisk. For these strategies, the correlation with the other strategies is calculated from November 2019 to September 2023.

Benchmark-relative core investment

A frequent investment objective is to outperform the MSCI EM Index within clearly contained active risk limits, ensuring that one stays reasonably close to this core investment. We therefore consider an equally weighted combination of two medium-TE strategies, EMAQ and EM Core, to improve the relative risk and return properties of the overall EM core investment proposition. Indeed, both strategies come with a TE of around 3%, and, given their low outperformance correlation (0.27), this combination sees the TE decrease to 2.31% and the IR increase to 0.87, as shown in Table 2. We also observe that the worst five drawdown statistic (which stands around 3% for the single strategies) goes down to 2%, further reflecting a considerably smoothed relative return pattern.

Sustainable core investment

Sustainable investing has seen considerable interest in recent years, and Robeco has been advancing corresponding investment solutions for a long time. While some consider EM investing difficult to align with sustainability considerations, our research and investment experience tell a different story, see de Groot and Sulman (2022). To bring this to life in the context of style diversification for a sustainable EM core investment, we combine the Sustainable EMAQ variant and the EM Sustainable Stars strategies. Over the available sample period from November 2019 to September 2023, these two strategies have TEs of 3.9% and 5.2%, as well as IRs of 0.69 and 0.59, respectively. However, combining fundamental and quant decreases the overall portfolio TE to 3.7% and increases the IR to 0.78.

Conservative completion portfolio

To diversify the elevated portfolio beta and risks that some fundamental strategies display, a low-volatility investment is a natural choice to complete the overall portfolio profile. To

illustrate, we portray a 75/25 mix of EM Stars and EMCE, along with a 75/25 mix of EM Sustainable Stars and EMCE. Here, we consider the sample period from November 2019 to September 2023. Stand-alone, EM Stars and EM Sustainable Stars both come with a beta of 1.12 and a tracking error of 5.5% and 5.2% respectively. With an average annualized outperformance of 2.13% and 3.08%, this results in IRs of 0.39 and 0.59. Vice versa, Conservative Equity investing in EM brings about a defensive beta of only 0.70. When combining EM (Sustainable) Stars with EMCE, the overall risk profile is considerably improved. Betas are close to 1 and TE is reduced by about 0.8%.

Table 2 - Summary statistics for different Robeco strategies and combinations

	RETURN (ANN %)	VOLATILITY (ANN %)	SR	WORST 5 ABSOLUTE DDS (%)	CAPM BETA	OUTPER- FORMANCE (ANN %)	TE (ANN %)	IR	WORST 5 RELATIVE DDS (%)
PANEL A: BENCHMARK-RELATIVE CORE INVESTMENT									
EMAQ	4.89	18.57	0.26	-23.33	1.03	2.49	3.01	0.83	-3.17
EM CORE	3.93	18.50	0.21	-23.28	1.03	1.53	2.77	0.55	-2.97
COMBO	4.41	18.45	0.24	-23.26	1.03	2.01	2.31	0.87	-2.04
	RETURN (ANN %)	VOLATILITY (ANN %)	SR	WORST DD(%)	CAPM BETA	OUTPER- FORMANCE (ANN %)	TE (ANN %)	IR	WORST RELATIVE DD(%)
PANEL B: SUSTAINABLE CORE INVESTMENT									
SUSTAINABLE EMAQ*	4.78	19.68	0.24	-31.16	0.97	2.68	3.89	0.69	-5.24
EM SUSTAINABLE STARS*	5.18	22.59	0.23	-35.10	1.12	3.08	5.20	0.59	-4.49
COMBO*	4.98	21.01	0.24	-33.04	1.05	2.88	3.70	0.78	-3.12
PANEL C: CONSERVATIVE COMPLETION PORTFOLIOS									
EMCE*	3.58	15.11	0.24	-24.89	0.70	1.49	8.63	0.17	-20.65
EM STARS*	4.23	22.74	0.19	-34.75	1.12	2.13	5.50	0.39	-8.94
COMBO*	4.07	20.64	0.20	-30.82	1.02	1.97	4.75	0.41	-10.57
EM SUSTAINABLE STARS*	5.18	22.59	0.23	-35.10	1.12	3.08	5.20	0.59	-4.49
SUSTAINABLE COMBO*	4.78	20.50	0.23	-31.15	1.01	2.68	4.39	0.61	-5.26

Source: Robeco, eVestment. The table shows the performance statistics for selected emerging market strategies and their combination. Performance statistics have been calculated over the period April 2011 to September 2023, except for the strategies denoted with an asterisk. For these strategies, the correlation with the other strategies has been calculated over the period November 2019 to September 2023. In Panel B and C, instead of reporting the average worst 5 (relative) drawdowns, we report the worst (relative) drawdown because of the short lookback period.

Conclusion

There is ample evidence of successful portfolio managers in emerging market equities, be they fundamental or quant investors, as both achieve similar returns in our sample from April 2011 to September 2023. At the same time, fundamental portfolio managers take higher active risks, resonating with higher IRs for the quant strategies. When zooming in on the ten strategies with the highest outperformance over the sample, the ratio of fundamental and quant strategies is similar to the full sample ratio. Most top performers have above-average TE, indicating that part of their outperformance is simply thanks to higher active risks. Intriguingly, in five out of seven cases, these high TEs derive from the strategy having below-average volatility, highlighting the relevance of low volatility investing in emerging market equities, also in conjunction with a fundamental investment proposition.

From an investment style perspective, we see that quant strategies load significantly on four style factors while fundamental strategies generally do not; however, there is one exception. Whereas quant strategies, on average, have a significant value tilt, fundamental strategies have a significant anti-value tilt. Naturally, these differences present an opportunity to enhance portfolio diversity by combining both strategies. This is demonstrated by the fact that the average 50/50 fundamental/quant combination has an IR of about 25% higher than the average of the two subgroups, mainly driven by reduced active risks. Even if you had been highly skilled (or lucky) enough to be invested in the three best-performing fundamental or quant strategies, adding a complementary strategy proposition of the other group would, on average, preserve risk-adjusted returns and improve the overall risk profile.

However, combining fundamental and quant strategies should not be done in an arbitrary manner but in style. Specifically, the combination should reinforce and strengthen a given investment objective, such as outperforming the MSCI EM Index in clearly contained risk limits just like a typical core investment would. In a combination allocation example, we show how such core combinations can be brought to life, even when including sustainability objectives. Moreover, such combinations can also further new strategic objectives, such as rounding out the risk profile of an overly growth-oriented and/or risky fundamental investment proposition through the completing addition of a defensive equity investing strategy. Overall, fundamental and quant are natural complements.

References

De Groot, W. and Sulman, V. (2022). Marrying sustainability and emerging markets expertise in quantitative strategies. Robeco White Paper, June 2022.

Hanauer, M., and de Koning, J. (2023). Double delight: Seizing the dual discount in emerging markets. Robeco White Paper, September 2023.

Jenkinson, T., Jones, H., and Martinez, J. V. (2016). Picking winners? Investment consultants' recommendations of fund managers. *Journal of Finance*, 71(5).

Jones, H., and Martinez, J. V. (2017). Institutional investor expectations, manager performance, and fund flows. *Journal of Financial and Quantitative Analysis*, 52(6).

Kyosev, G., Hanauer, M. X., Huij, J., and Lansdorp, S. (2020). Does earnings growth drive the quality premium? *Journal of Banking & Finance*, 114.

Robeco (2023), Triple Power Play, Expected Returns 2024-2028, September 2023.

Swinkels, L., and Yang, J. (2023), The value of emerging equity markets. Robeco White Paper, February 2023.

Appendix

A1 Robeco Strategies

In this section, we provide more color for the seven Robeco strategies highlighted in the study. All performance measures mentioned are gross of fees and calculated based on USD returns. The benchmark is the MSCI Emerging Markets Index (Net Returns). Performance measures stated are based on composite returns.

A1.1 Fundamental Robeco Strategies

A1.1.1 Robeco EM Core

Robeco Emerging Markets Core is a fundamental, actively managed emerging markets equities strategy. The strategy has EUR 2.6 billion assets under management as of 29 September 2023. The strategy has two main performance drivers: country allocation and stock selection. Countries are analyzed by looking at their macro environment and political risk, earnings expectations, valuation, technical analysis and sentiment and market supply/demand. Stock selection focuses on the long term to uncover structural drivers and capture mispriced sound business models. It draws from both fundamental analysis and the outcome of leading-edge quantitative models, which serve as an idea generator and a second opinion. Since inception in December 1994, the Emerging Core strategy has generated an excess return of 1.91% per year, gross of fees, with a tracking error of 3.79%. This corresponds to an information ratio of 0.51.

A1.1.2 Robeco EM Stars

Robeco Emerging Stars is the high-conviction counterpart of Robeco EM Core. Its investment approach is index-agnostic and focuses on the most attractive investments. This results in a high-conviction, concentrated portfolio of 35 to 50 stocks. Positions are typically 2% to 4% of the portfolio. Since inception in December 2006, the Emerging Stars strategy has generated an excess return of 3.08% per year, gross of fees, with a tracking error of 5.64%. This resulted in an information ratio of 0.55. The strategy has EUR 3.5 billion under management as of 29 September 2023.

A1.1.3 Robeco EM Sustainable Stars

The Emerging Stars strategy is also available with an enhanced sustainability profile. The sustainable version of the strategy shares the same portfolio management team and investment process. However, it respects (i) an enhanced exclusion list that comprises military contracting, firearms and thermal coal, (ii) an at least 20% better environmental profile than the reference index, and (iii) a better overall ESG score than the index. Since inception in October 2019, the Sustainable Emerging Stars strategy has generated an excess return of 2.80% per year, gross of fees, with a tracking error of 5.17%. This has resulted in an Information Ratio of 0.54.

A1.2 Quantitative strategies

A1.2.1 Robeco QI Emerging Markets Enhanced Indexing Equities

Robeco QI Emerging Markets Enhanced Indexing Equities is a quantitative, actively managed multi-factor emerging markets equities strategy. Its factor-based investment approach is systematic and research-driven and aims to be a better alternative to pure passive investing.

Its benchmark is the MSCI Emerging Markets Index. The portfolio closely follows the benchmark, with a targeted tracking error of 1%.

The strategy relies on a proprietary quant stock selection model that considers academically proven long-term factors, novel signals and short-term dynamics to rank stocks. The portfolio construction algorithm aims to maximize the exposure of the portfolio to the highest ranked stocks, while ensuring neutrality on all relevant risk factors and portfolio turnover is controlled. The portfolio managers check the rankings for issues not captured by models, such as corporate actions or index reviews.

Since inception in June 2007, the strategy has generated an excess return over the benchmark of 1.72% per year, gross of fees, with a tracking error of 1.4%, leading to an information ratio of 1.23. Assets invested in the strategy amount to 12.0 billion as of 29 September 2023.

A1.2.2 Robeco QI Emerging Markets Active Equities

Robeco QI Emerging Markets Active Equities is the more active counterpart of Robeco QI Emerging Markets Enhanced Indexing Equities, with a targeted tracking error of 3%, and high active share. Since inception in March 2008, the Robeco QI Emerging Markets Active Quant strategy has generated an excess return over the benchmark of 3.11% per year, gross of fees, with a tracking error 3.16%. This resulted in an information ratio of 0.98. Assets invested in the strategy amount to EUR 2.6 billion as of 29 September 2023.

A1.2.3 Robeco QI Emerging Markets Sustainable Active Equities

Robeco QI Emerging Markets Sustainable Active Equities is the sustainable counterpart of Robeco QI Emerging Markets Active Equities. Since inception in February 2015, the Robeco QI Emerging Markets Sustainable Active Quant strategy has generated an excess return over the benchmark of 2.22% per year, gross of fees, with a tracking error 3.20%. This resulted in an information ratio of 0.69. Assets invested in the strategy amount to EUR 313 million as of 29 September 2023.

A1.2.4 Robeco QI Emerging Conservative Equities

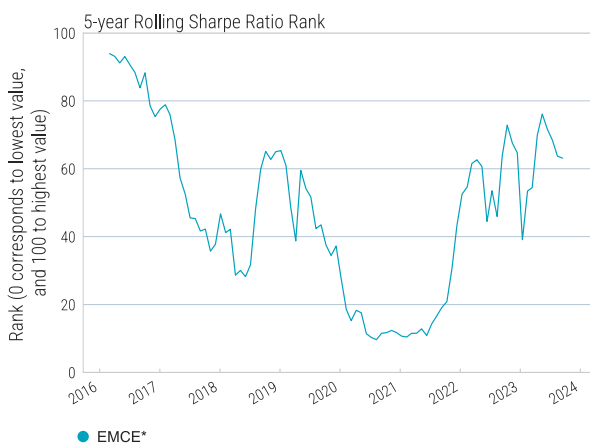
Robeco QI Emerging Conservative Equities is a quantitative, actively managed emerging markets equities strategy. The strategy has a Sharpe ratio objective, aiming for a lower risk profile than the market index, while achieving at least market-like returns. The strategy is not constrained by any tracking error limit. Its reference index is the MSCI Emerging Markets Index. The portfolio has a high active share and assets invested in the strategy amount to EUR 2.9 billion as of 29 September 2023.

The strategy focuses on bottom-up, factor-based stock selection, primarily based on low-risk variables (statistical, forward-looking and distress), complemented with income (value and quality) and sentiment (momentum and revisions) variables. The stock-ranking model produces a ranking for all stocks in the investable universe by combining their scores on the different factors. The portfolio construction process is disciplined and transparent with continuous monitoring and control by the portfolio managers. The algorithm's objective is to obtain maximum exposure to top-ranked stocks given research-based concentration settings while taking transaction costs into account with our proprietary transaction cost model.

The aim is to preserve the model's unique risk-return characteristics as much as possible, while controlling risk and implementing the portfolio in an efficient way. Moreover, client cash flows are used to rebalance the portfolio, further reducing turnover. A human overview process is in place to, among other things, select the right investment instrument (ADRs, ordinary shares or preferred shares), remove stocks with suspicious data patterns and monitor other single-stock risks. This is a team effort carried out together with the Core Quant emerging markets team. Since inception in April 2011, the strategy has generated an excess return over the MSCI Emerging Markets Index of 3.29% gross of fees, at a volatility of 13.76% per year, versus 17.72% for the index. This lower volatility and the higher return have led to a Sharpe ratio of 0.22, versus -0.02 for the market.

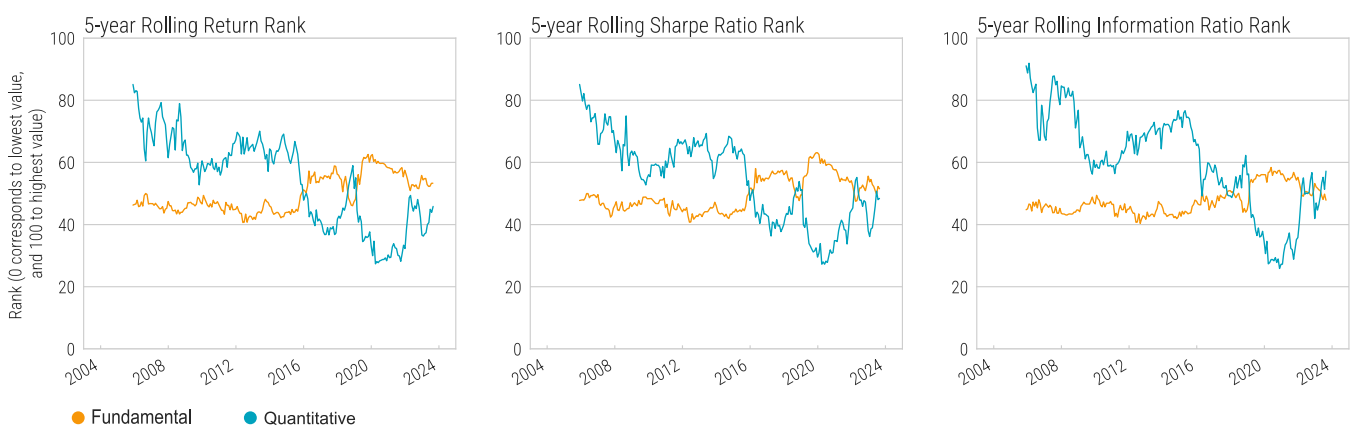
A2 Additional results

Figure A1 - Five-year rolling Sharpe ratio rank for EMCE



Source: Robeco, eVestment. The figure shows the rank of the EM Conservative Equities (EMCE) strategy based on its rolling five-year Sharpe ratio. At each point in time, we rank all strategies that have at least five years of return history based on their Sharpe ratio (SR). We then scale the ranks between 0 and 100, where the value of 0 corresponds to the strategy with the lowest SR, and 100 corresponds to the strategy with the highest SR. The sample period is April 2011 to September 2023.

Figure A2 - Rolling five-year median quantitative and fundamental strategy performance



Source: Robeco, eVestment. The figure shows the average rank of quantitative and fundamental strategies based on their rolling five-year return, Sharpe ratio, and information ratio, respectively. At each point, we rank all strategies with at least five years of return history based on the respective performance measure. We then scale the ranks between 0 and 100, where the value of 0 corresponds to the strategy with the lowest performance, and 100 corresponds to the strategy with the highest performance. For the IR analysis, we exclude strategies with a rolling five-year CAPM beta lower than 0.9. The sample period is January 2001 to September 2023.

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This document has not been registered with the Monetary Authority of Singapore ("MAS"). Accordingly, this document may not be circulated or distributed directly or indirectly to persons in Singapore other than (i) to an institutional investor under Section 304 of the SFA, (ii) to a relevant person pursuant to Section 305(1), or any person pursuant to Section 305(2), and in accordance with the conditions specified in Section 305, of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA. The contents of this document have not been reviewed by the MAS. Any decision to participate in the Fund should be made only after reviewing the sections regarding investment considerations, conflicts of interest, risk factors and the relevant Singapore selling restrictions (as described in the section entitled "Important information for Singapore Investors") contained in the prospectus. Investors should consult their professional adviser if you are in doubt about the stringent restrictions applicable to the use of this document, regulatory status of the Fund, applicable regulatory protection, associated risks and suitability of the Fund to your objectives. Investors should note that only the Sub-Funds listed in the appendix to the section entitled "Important information for Singapore Investors" of the prospectus ("Sub-Funds") are available to Singapore investors. The Sub-Funds are notified as restricted foreign schemes under the Securities and Futures Act, Chapter 289 of Singapore ("SFA") and invoke the exemptions from compliance with prospectus registration requirements pursuant to the exemptions under Section 304 and Section 305 of the SFA. The Sub-Funds are not authorized or recognized by the MAS and shares in the Sub-Funds are not allowed to be offered to the retail public in Singapore. The prospectus of the Fund is not a prospectus as defined in the SFA. Accordingly, statutory liability under the SFA in relation to the content of prospectuses does not apply. The Sub-Funds may only be promoted exclusively to persons who are sufficiently experienced and sophisticated to understand the risks involved in investing in such schemes, and who satisfy certain other criteria provided under Section 304, Section 305 or any other applicable provision of the SFA and the subsidiary legislation enacted thereunder. You should consider carefully whether the investment is suitable for you. Robeco Singapore Private Limited holds a capital markets services license for fund management issued by the MAS and is subject to certain clientele restrictions under such license.

Additional information for investors with residence or seat in Spain

Robeco Institutional Asset Management B.V., Sucursal en España with identification number W0032687F and having its registered office in Madrid at Calle Serrano 47-14º, is registered with the Spanish Commercial Registry in Madrid, in volume 19.957, page 190, section 8, sheet M-351927 and with the National Securities Market Commission (CNMV) in the Official Register of branches of European investment services companies, under number 24. The investment funds or SICAV mentioned in this document are regulated by the corresponding authorities of their country of origin and are registered in the Special Registry of the CNMV of Foreign Collective Investment Institutions marketed in Spain.

Additional information for investors with residence or seat in South Africa

Robeco Institutional Asset Management B.V. is registered and regulated by the Financial Sector Conduct Authority in South Africa.

Additional information for investors with residence or seat in Switzerland

The Fund(s) are domiciled in Luxembourg. This document is exclusively distributed in Switzerland to qualified investors as defined in the Swiss Collective Investment Schemes Act (CISA). This material is distributed by Robeco Switzerland Ltd, postal address: Josefstrasse 218, 8005 Zurich. ACOLIN Fund Services AG, postal address: Leutschenbachstrasse 50, 8050 Zürich, acts as the Swiss representative of the Fund(s). UBS Switzerland AG, Bahnhofstrasse 45, 8001 Zurich, postal address: Europastrasse 2, P.O. Box, CH-8152 Opfikon, acts as the Swiss paying agent. The prospectus, the Key Information Documents (PRIIP), the articles of association, the annual and semi-annual reports of the Fund(s), as well as the list of the purchases and sales which the Fund(s) has undertaken during the financial year, may be obtained, on simple request and free of charge, at the office of the Swiss representative ACOLIN Fund Services AG. The prospectuses are also available via the website.

Additional information relating to RobecoSAM-branded funds/services

Robeco Switzerland Ltd, postal address Josefstrasse 218, 8005 Zurich, Switzerland has a license as asset manager of collective assets from the Swiss Financial Market Supervisory Authority FINMA. The RobecoSAM brand is a registered trademark of Robeco Holding B.V. The brand RobecoSAM is used to market services and products which entail Robeco's expertise on Sustainable Investing (SI). The brand RobecoSAM is not to be considered as a separate legal entity.

Additional information for investors with residence or seat in Taiwan

The contents of this document have not been reviewed by any regulatory authority in Hong Kong. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice. This document has been distributed by Robeco Hong Kong Limited ("Robeco"). Robeco is regulated by the Securities and Futures Commission in Hong Kong.

Additional information for investors with residence or seat in Thailand

The Prospectus has not been approved by the Securities and Exchange Commission, which takes no responsibility for its contents. No offer to the public to purchase the Shares will be made in Thailand and the Prospectus is intended to be read by the addressee only and must not be passed to, issued to, or shown to the public generally.

Additional information for investors with residence or seat in the United Arab Emirates

Some Funds referred to in this marketing material have been registered with the UAE Securities and Commodities Authority ("the Authority"). Details of all Registered Funds can be found on the Authority's website. The Authority assumes no liability for the accuracy of the information set out in this material/document, nor for the failure of any persons engaged in the investment Fund in performing their duties and responsibilities.

Additional information for investors with residence or seat in the United Kingdom

Robeco is deemed authorized and regulated by the Financial Conduct Authority.

Additional information for investors with residence or seat in Uruguay

The sale of the Fund qualifies as a private placement pursuant to section 2 of Uruguayan law 18,627. The Fund must not be offered or sold to the public in Uruguay, except under circumstances which do not constitute a public offering or distribution under Uruguayan laws and regulations. The Fund is not and will not be registered with the Financial Services Superintendency of the Central Bank of Uruguay. The Fund corresponds to investment funds that are not investment funds regulated by Uruguayan law 16,774 dated 27 September 1996, as amended.

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