USING SYSTEMATIC EQUITY STRATEGIES

Managing Active Portfolios in the Global Equity Universe

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EXECUTIVE SUMMARY

Top-down managers assess the economic outlook and translate macro views into country and industry portfolio positions. In contrast, bottom-up managers select securities based on a set of common criteria, such as valuations, profitability, growth, quality and yield, as well as company-specific attributes. Many institutional equity investors combine top-down analysis and security selection. All types of managers, irrespective of their investment philosophy and process, need to understand their risk exposures, build efficient portfolios and differentiate themselves from their competitors.

Factor models help managers achieve these objectives by bringing transparency and structure to the portfolio management process. They reflect the top-down investment process through country and industry factors. They address the bottom-up investment process by incorporating style factors and specific returns into the model.

Country, industry and style factors help forecast and explain portfolio risk. Systematic Equity Strategy (SES) factors, a subset of style factors, have also earned positive long-term returns historically. These factors have been discussed in academic literature and have been used in quantitative alpha models and fundamental security selection. Some of the most popular SES factors include value, momentum and quality.

In this paper, we review the role of SES factors in global portfolios and show how active managers can use these factors in seeking to differentiate and enhance their investment processes. More specifically:

- We find that most active portfolios have significant exposure to SES factors, irrespective of the underlying investment process.
- We show how SES factors enable managers to monitor risk exposures in a more granular fashion and conduct more accurate performance attribution, helping them to differentiate their investment processes.
- Finally, we examine how SES factors may be used as inputs to enhance quantitative alpha models and fundamental security selection, and may enable managers to improve portfolio performance.

WHY DO SYSTEMATIC EQUITY STRATEGIES MATTER?

Systematic Equity Strategy (SES) factors encapsulate well-documented and widely implemented quantitative investment strategies that have historically earned significant excess returns.[1] SES factors were first identified decades ago in academic and quant practitioner research.

Here are some of the reasons that SES factors have since become important in the institutional investment process:

- **SES factors have earned premia.** The SES factors introduced by MSCI have earned significant excess returns over the long run, albeit with substantial variation across regions and market cycles, as we show later. The historical performance of these factors is also underpinned by risk-based and behavioral economic models.

- **SES factors aren't just for quants.** MSCI research shows that even fundamental stock-picking managers often have significant (perhaps unintended) exposure to SES factors. Understanding SES factors' contribution to risk and return is crucial, even for an investment process that is not based on SES factors.

- **SES factors carry crowding risk.** Because SES factors are applied by many active managers, large pools of capital following these strategies may lead to the risk of factor crowding (see Bayraktar et al. (2015)). The potential for crowding emphasizes the importance of monitoring risks and returns coming from these factors.

- **SES factors are building blocks of factor investing.** The factor investing (also known as "smart beta") universe continues to grow rapidly. Factor investing products built on SES factors have moved from targeting individual factors to implementing sophisticated multi-factor strategies (see Alighanbari and Chia (2014)).

Winkelmann et al. (2013) classify SES factors into the Valuation, Quality, Sentiment and Momentum families. While Momentum and Valuation-type factors have been mainstays of MSCI equity models for many years, Quality and Sentiment are more recent additions. In this paper, we use the new MSCI Long-Term Global Equity Model (GEMLT) to explore use cases for SES factors.

Exhibit 1 gives an overview of the SES factors in the GEMLT model. Factors that were already present in the global factor set are marked in blue, while new additions introduced in GEMLT are marked in red.

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[1] Bayraktar, Radchenko, Winkelmann and Zangari (2013).

Our classification scheme groups factors into families that approximately correspond to investment styles. The Long-Term Global Equity Model extends the global factor set in the Momentum, Value and Quality families, with the most significant changes occurring in Quality.

Exhibit 1: Style Factor Family Tree

VALUE	SIZE	MOMENTUM	VOLATILITY	QUALITY	YIELD	GROWTH	LIQUIDITY
BOOK-TO-PRICE • Book-to-Price	**SIZE** • Log of mcap	**MOMENTUM** • Rel. Strength • Hist. Alpha	**BETA** • Hist. Beta	**PROFITABILITY** • Asset turnover • Gross Profit Margin • Gross Profitability • Return on Assets	**DIVIDEND YIELD** • Hist. Div-to-Price • Fwd. Div-to-Price	**GROWTH** • Sales growth • Earn growth • Fwd LT Growth	**LIQUIDITY** • 1m turnover • 3m turnover • 12m turnover • 12m ATVR
EARNINGS YIELD • hist. Earn-to-Price • fwd. Earn-to-Price • cash Earn-to-Price • EBIT to EV	**MID CAP** • Cube of Size	**LT REVERSAL** • LT Rel. Strength • LT Hist. Alpha	**RESIDUAL** • Hist. Sigma • Daily Std Dev • Cumulative Range	**LEVERAGE** • Debt-to-Assets • Book leverage • Market leverage			
				EARNINGS VARIABILITY • Variability of Sales • Variability of Earnings • Variability of Cashflow • Variability of fwd EPS			
				EARNINGS QUALITY • Cash Earnings/Earnings • Accrual (balance sheet) • Accrual (C/F statement)			
				INVESTMENT QUALITY • Total Assets Growth • CAPEX Growth • Issuance Growth			

Abbreviations: "Fwd." — forward (analyst prediction); "Hist." — historical; "LT" — long term (multi-year horizon); "ATVR" — Annualized Traded Value Ratio.

To see how global SES factors have performed over time, we plot the long-term returns of selected Momentum, Value and Quality factors in Exhibit 2.[2]

In terms of absolute performance, Momentum and Earnings Yield stand out. Besides their standalone performance, Momentum and Value factors have offered considerable diversification benefits due to their low (and mostly negative) correlation to each other.

Quality factors have experienced exceptional risk-adjusted performance, coupled with very low volatility, over the sample period. Of the three Quality factors, Profitability has been the most responsive to market regimes. It posted strong performance in the years of the bear market following the dotcom crash, as well as more recently following the 2008 financial crisis.

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[2] Factor returns are on a monthly frequency (corresponding to monthly rebalancing) and cumulated geometrically.

Exhibit 2: Historical Performance of Select SES Factors
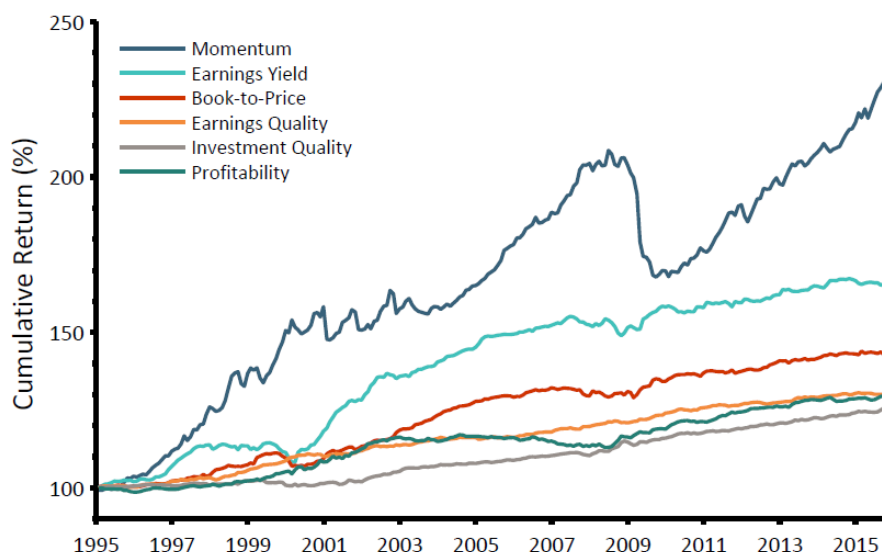
Factor returns are estimated from monthly regression (corresponds to monthly rebalancing) and cumulated geometrically. Data is from January 1995 to December 2015.

In the years between 2003 and the 2008, however, Profitability's returns were flat or even slightly negative. Investment Quality and Earnings Quality have shown more consistent performance across macroeconomic cycles. Summary statistics are shown in Exhibit 3.

Exhibit 3: Return and Risk Characteristics for Select SES Factors

Factor Name	Mean Return (ann. %)	Volatility (ann. %)	Information ratio
Momentum	4.08%	4.38%	0.93
Earnings Yield	2.44%	1.92%	1.27
Book-to-Price	1.67%	1.40%	1.19
Earnings Quality	1.25%	0.75%	1.66
Invest. Quality	1.11%	0.84%	1.32
Profitability	1.23%	1.20%	1.02

Factor returns are estimated from monthly regression (corresponds to monthly rebalancing) and cumulated geometrically. Data is from January 1995 to December 2015.

SES factors are primarily included in risk models as sources of long-term alpha rather than for their ability to capture risk. In fact, their volatility is usually low even compared to other style factors, and they account for a small fraction of risk in the broad market.

Nevertheless, one must be careful not to underestimate the importance of SES factors as carriers of risk. Indeed, their contribution to the *active* risk and return of managers (i.e., the risk and return above the benchmark) may be very significant. The reason is that active managers often take large exposures to SES factors while hedging factors that present more risk but do not contribute to risk-adjusted returns.

Exhibit 4: SES Factor Exposures of Active Mutual Fund Portfolios

	VALUE	LARGE	MID	SMALL	MICRO	MOMENTUM	VOLATILITY	QUALITY	INCOME	DIVIDEND	GROWTH	FOCUS	INDEX
Book to Price	0.46	0.02	0.05	0.16	0.54	-0.16	-0.01	-0.29	0.12	0.13	-0.32	-0.14	0.04
Earnings Yield	0.19	0.10	-0.03	-0.15	-0.15	-0.28	0.11	0.11	0.15	0.19	-0.22	-0.04	0.05
Size	-0.71	0.19	-1.12	-2.05	-3.10	-1.28	-0.29	0.00	0.22	0.04	-0.48	0.10	-0.19
Midcap	0.09	-0.01	0.66	0.07	-1.67	-0.08	0.28	-0.05	-0.06	-0.10	0.12	-0.02	0.02
Momentum	-0.15	0.08	-0.03	0.01	-0.04	0.34	0.13	-0.06	-0.04	-0.07	0.19	0.13	0.03
Reversal	0.02	-0.20	-0.10	0.02	0.17	-0.25	-0.11	-0.14	-0.09	-0.07	-0.24	-0.19	-0.11
Beta	0.11	0.15	0.12	0.11	-0.25	0.09	-0.64	-0.15	-0.01	-0.05	0.20	0.14	0.05
Residual Volatility	-0.46	-0.27	-0.62	-0.41	0.12	-0.14	-0.50	-0.38	-0.30	-0.35	-0.24	-0.21	-0.31
Leverage	-0.02	-0.05	0.01	-0.15	-0.34	-0.18	0.01	-0.13	0.03	0.00	-0.12	-0.06	-0.04
Profitability	-0.25	0.08	0.01	-0.04	0.04	0.09	0.14	0.45	-0.10	-0.04	0.28	0.18	0.02
Earnings Variability	0.07	-0.01	0.14	0.38	0.61	0.38	-0.22	-0.30	-0.16	-0.19	0.19	0.04	0.00
Earnings Quality	-0.01	-0.01	-0.07	-0.04	-0.02	-0.07	-0.05	-0.15	-0.03	0.00	-0.03	0.01	-0.01
Investment Quality	0.14	0.08	-0.10	-0.33	-0.26	-0.34	0.26	0.19	0.24	0.27	-0.32	-0.07	0.04
Dividend Yield	0.00	-0.08	-0.42	-0.56	-0.55	-0.53	0.18	0.11	0.36	0.46	-0.53	-0.24	-0.04
Growth	-0.17	0.08	0.14	0.20	0.17	0.31	-0.22	-0.11	-0.22	-0.25	0.42	0.21	-0.02
Liquidity	0.13	0.06	0.42	0.38	-0.42	0.32	-0.07	-0.17	-0.10	-0.12	0.27	0.09	0.08
# of Funds	355	222	199	319	11	5	8	9	58	58	466	36	99

Source: MSCI Peer Analytics (data as of Oct. 31, 2015).

To illustrate this point, we examine GEMLT factor exposures of U.S. equity mutual funds using MSCI's Peer Analytics dataset.[3] These factor exposures are shown in Exhibit 4, where columns correspond to classes of funds determined by keywords in their name (e.g., "Income" or "Quality") and rows correspond to factors in the GEMLT model.

Not surprisingly, funds tend to have heavy exposure to their target factor. For example, funds with "momentum" in their name have an exposure of 0.34 to the Momentum factor – a close second to Earnings Variability, with Growth and Liquidity ranked third and fourth. "Income" and "dividend" funds predictably have the largest exposure to the Dividend Yield factor, with significant positive exposure to Investment Quality and negative exposure to Growth.

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[3] This dataset is based on Lipper mutual fund holdings data.

It is also apparent from Exhibit 4 that many fund types have significant exposures to factors other than the one they are targeting. "Micro" funds are a case in point. As expected, the largest (negative) exposure is to the Size and Mid-cap factors. However, this comes with significant positive exposures to Book-to-Price and Earnings Variability, and significant negative exposures to Dividend Yield and Liquidity. As a final example, "value" funds have the largest positive exposure to Book-to-Price, but with even larger negative exposures to Residual Volatility and Size. Historically, some of these untargeted factor exposures would have impaired performance.

Another reason for monitoring exposures to SES factors is the possibility of occasional catastrophic drawdowns, such as the August 2007 ''Quant Crunch." Numerous observers believe this event stemmed from many investors attempting to simultaneously unwind positions in crowded strategies. Since SES factors capture strategies that are widely implemented by investors, crowding is a real risk. For further information on measuring and managing crowding risk, see Bayraktar et al. (2015).

Monitoring the contribution of SES factors to fund performance and risk is crucial in maintaining alignment with the fund mandate and managing crowding risk, even if the mandate was not formulated in the language of factors. To paraphrase the well-known legal principle: ignorance of factors is no excuse.

THE GLOBAL SES FACTOR SET

SES factor research aims to identify new factors and to improve the definition of existing ones. In the global equity universe, new or improved SES factors can be applied in a variety of investment use cases in the GEMLT model.

We can summarize extensions to the global factor set as follows:

- The **Quality** family is substantially extended with four new factors: Profitability, Earnings Variability, Earnings Quality and Investment Quality.

- The **Momentum** family is extended with one new factor, Long-Term Reversal.

- In the **Value** family, the calculation of the Earnings Yield factor now uses EBIT-to-EV (Earnings Before Interest and Taxes, normalized with Enterprise Value).

- The **Yield** factor now makes use of forward-looking dividend yield in addition to historical dividend yield.

For a detailed discussion of factor construction, see the GEMLT model's Empirical Notes (Morozov et al. (2015)). Here, we elaborate on the Quality factor family, which has undergone the most extensive overhaul.[4]

Before the GEMLT model, the only Quality factor in the global universe was Leverage. While low leverage is certainly an attribute of high-quality companies, Quality has several additional dimensions, which investors can now capture in a global universe:

- **Earnings Quality** captures the accrual anomaly. It has been thoroughly documented that firms with low accruals and high cash earnings relative to earnings have outperformed firms with high accruals and low cash earnings.
- **Investment Quality** captures the "empire building" anomaly, going short firms with excessive growth in capital expenditures, stock issuance and assets. Firms buying back their own shares would have positive exposure to Investment Quality.
- **Profitability** goes long firms with high earnings relative to assets and sales.
- **Earnings Variability** goes long firms with variability in sales or earnings. In contrast to previous Quality factors, we do not consider Earnings Variability to be an SES factor, due to the variability of expected returns.

All factors in the Long-Term Global Equity Model have experienced low turnover for long-term investors targeting a holding period of six months to one year. The Medium-Term Global Equity Model and the Global Equity Trading Model[5] will cater to investors targeting shorter investment horizons. These models will include higher turnover factors accessible to investors trading on a higher frequency.

APPLICATIONS: SES FACTORS IN ACTIVE MANAGEMENT

In this section, we explore several use cases for active management, using the SES factors in the Long-Term Global Equity Model. We look at the following use cases:

1. Performance and risk attribution using SES factors

2. Replication (tracking) of SES factors

3. Active strategies using SES factors

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[4] For a more detailed review of Quality factor investing and index construction, see Lim et al. (2015).

[5] Both models are scheduled to be launched in 2016.

PERFORMANCE AND RISK ATTRIBUTION WITH SES FACTORS

Monitoring exposure to SES factors is important to ensure that a strategy (be it passive, active, fundamental or quant) truly reflects the targeted factors, does not take unintended bets and does not run crowding risk.

The extended SES factor set of the new Long-Term Global Equity Model allows for better attribution of risk and return in global portfolios. In particular, the risk and return attribution of a portfolio tilting on Quality may become more granular, and the stock-specific contribution will decrease as the Quality factors account for a larger part of the active risk and returns.

In our first exercise, we measure the exposure of the six MSCI Factor Indexes to GEMLT style factors. The rows and columns of Exhibit 5 represent the GEMLT SES factors and MSCI Factor Indexes, respectively.[6] Not surprisingly, an even clearer pattern emerges than for actively managed funds: All factor indexes are heavily exposed to their target factors. Even so, some unintended exposures exist.

The clearest example is provided by the Quality Index. The Index has high exposure to the Profitability factor, which is understandable given that the Index targets high exposure to that factor and low exposure to Leverage. However, the Quality Index also has a significant negative exposure to the Book-to-Price factor — not surprising because Quality stocks tend to also have high valuations.

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[6] Note that Exhibit 5 displays absolute exposures, whereas Exhibit 4 displays exposures as percentiles.

Exhibit 5: SES Factor Exposures of MSCI Factor Portfolios

FACTOR	ENHANCED VALUE	MOMENTUM	EQUAL WEIGHTED	MINIMUM VOLATILITY	QUALITY	HIGH DIVIDEND YIELD
Earnings Yield	0.42	-0.14	-0.07	-0.06	0.01	0.24
Book-to-Price	0.75	-0.24	0.19	-0.12	-0.48	0.08
Momentum	-0.08	0.63	-0.08	0.03	0.04	-0.07
Long-Term Reversal	0.28	-0.06	0.08	-0.05	-0.14	0.08
Size	-0.30	-0.03	-0.87	-0.16	0.18	0.09
Mid Capitalization	0.20	0.03	0.56	0.13	-0.13	-0.08
Beta	0.11	-0.04	-0.07	-0.80	-0.23	-0.36
Residual Volatility	0.05	0.17	-0.03	-0.03	0.01	-0.12
Earnings Quality	0.23	0.04	0.07	0.02	0.00	-0.02
Investment Quality	0.07	-0.03	0.03	0.09	0.15	0.10
Profitability	-0.23	0.16	-0.03	0.16	0.77	-0.14
Leverage	0.10	0.01	0.11	0.10	-0.26	0.09
Earnings Variability	0.24	0.02	0.15	-0.31	-0.21	-0.18
Growth	-0.22	0.19	0.01	-0.15	0.03	-0.30
Dividend Yield	0.19	-0.23	-0.08	0.25	-0.07	0.66
Liquidity	0.18	0.11	0.18	-0.23	-0.14	-0.18

Source: MSCI (data as of Oct. 31, 2015). Analysis conducted with the GEMLT model. Table shows factor exposures of different MSCI Factor Indexes.
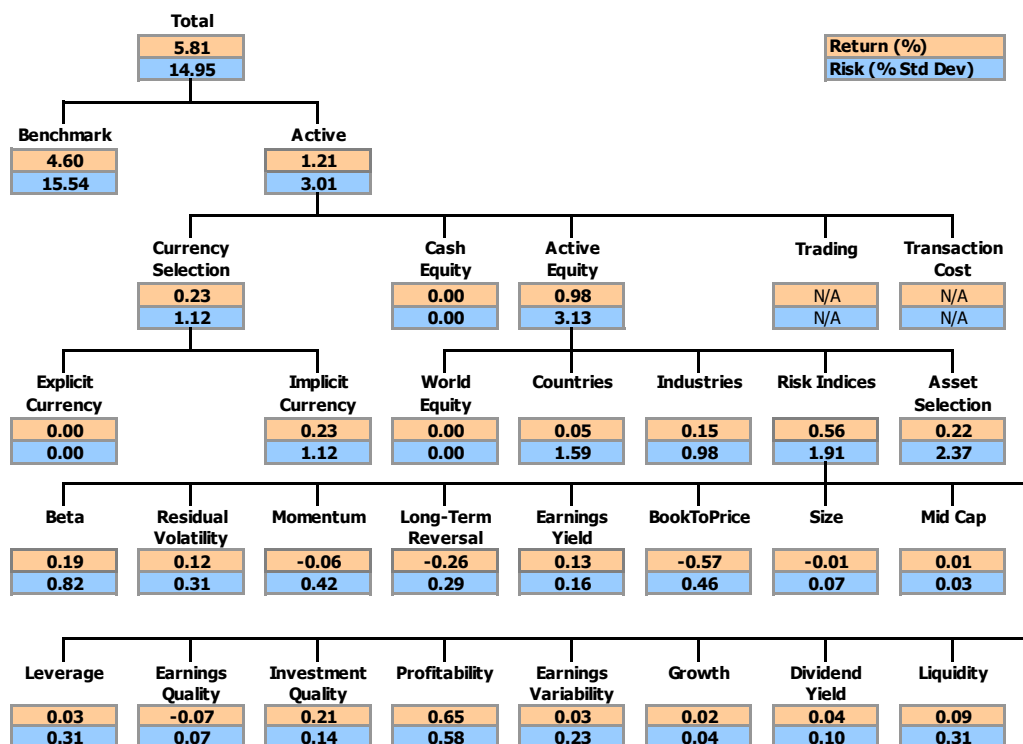
With a factor model at our disposal, we can dig deeper than measuring exposures and perform a detailed attribution analysis on return and risk for any given portfolio.[7]

For our attribution exercise, we use the MSCI Sector Neutral Quality Index. Under the sector-neutral methodology, quality scores are ranked within sectors resulting in a quality index with muted industry exposures. Exhibit 6 shows the full return and risk attribution tree of the MSCI Sector Neutral Quality Index, using GEMLT model factors.

Of the 0.98% active return provided by the Index in the sample period, 0.15% comes from exposure to industries, 0.22% from stock selection and 0.56% from style factors. The largest contributor to performance was the GEMLT Profitability factor, with a 0.65% return; this result is not surprising considering that the index methodology targets Return-on-Equity, one of the descriptors underlying Profitability. The largest negative contributor to performance is Book-to-Price (-0.57%), owing to the Quality Index's negative tilt on Value.

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[7] For more detail, see Lee et al. (2014) and Melas et al. (2010).

Exhibit 6: Risk and Returns Attribution for the MSCI Sector Neutral Quality Index

	Total						Return (%)
	5.81						Risk (% Std Dev)
	14.95						

	Benchmark	Active
	4.60	1.21
	15.54	3.01

Currency Selection	Cash Equity	Active Equity	Trading	Transaction Cost
0.23	0.00	0.98	N/A	N/A
1.12	0.00	3.13	N/A	N/A

Explicit Currency	Implicit Currency	World Equity	Countries	Industries	Risk Indices	Asset Selection
0.00	0.23	0.00	0.05	0.15	0.56	0.22
0.00	1.12	0.00	1.59	0.98	1.91	2.37

Beta	Residual Volatility	Momentum	Long-Term Reversal	Earnings Yield	BookToPrice	Size	Mid Cap
0.19	0.12	-0.06	-0.26	0.13	-0.57	-0.01	0.01
0.82	0.31	0.42	0.29	0.16	0.46	0.07	0.03

Leverage	Earnings Quality	Investment Quality	Profitability	Earnings Variability	Growth	Dividend Yield	Liquidity
0.03	-0.07	0.21	0.65	0.03	0.02	0.04	0.09
0.31	0.07	0.14	0.58	0.23	0.04	0.10	0.31

Source: Barra Portfolio Manager. Date range for analysis is from December 1998 to December 2015.

REPLICATION OF SES FACTORS

Although the performance of SES factors has varied both regionally and across market cycles, they have demonstrated robust performance over the long term. Therefore, one of the most basic use cases for SES factors is to replicate the factor by taking a constant exposure.

To illustrate this use case, we construct a portfolio that has unit active exposure to the Earnings Quality factor, zero active exposure to all other factors and minimum tracking error. Thus, the active position replicates the Earnings Quality factor.

To perform the portfolio backtest, we employ the Barra Open Optimizer with the following settings:

- Benchmark/Universe: GEMLT Primary Estimation Universe[8]

- Rebalancing: monthly

- Portfolio exposures: active exposure = 1 to target factor and <=0.01 to all others

- Long-only | Long-short

- 1-way turnover = ∞ or 8%

Exhibit 7 compares the GEMLT Earnings Quality factor and the performance of four factor-tracking portfolios. The factor-tracking portfolios vary depending on whether they are long/short or long-only and whether they have an 8% turnover limit or no turnover constraint.

Exhibit 7: Tracking the GEMLT Earnings Quality Factor
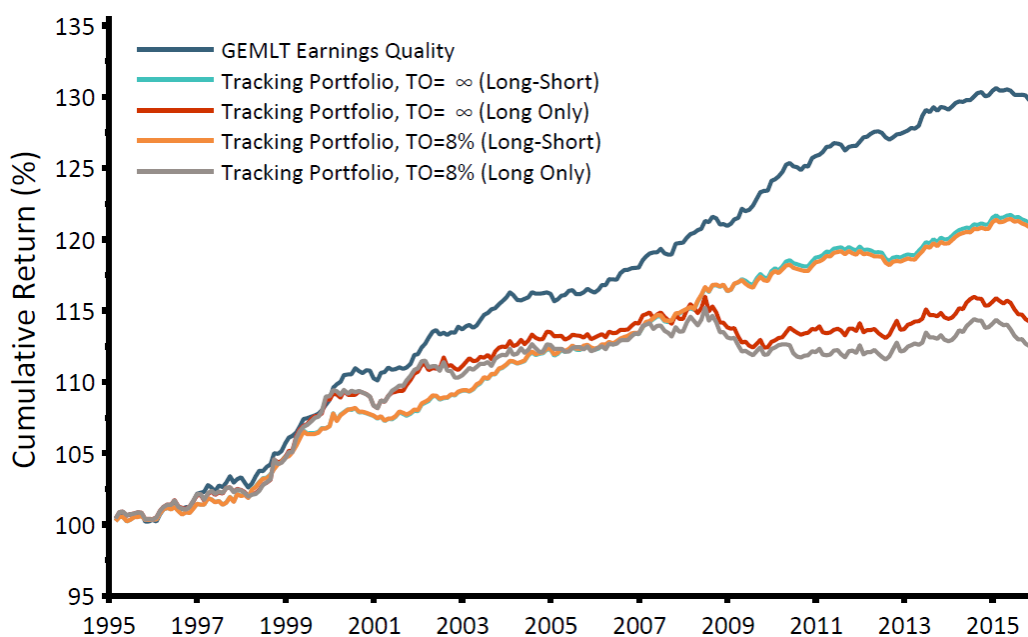
Factor/portfolio returns are monthly and cumulated geometrically. Data is from January 1995 until December 2015.

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[8] The primary estimation universe of the GEMLT model is a subset of the estimation universe which excludes Frontier Markets.

Summary statistics on the tracking portfolios are displayed in Exhibit 8.

Exhibit 8: Return and Risk Characteristics of Tracking Portfolios (GEMLT Earnings Quality)

Portfolio name	Mean Return (ann. %)	Volatility (ann. %)	Information ratio
GEMLT Earn. Quality	1.26%	0.76%	1.66
TO=∞ (Long-Short)	0.93%	0.69%	1.35
TO=∞ (Long-Only)	0.65%	0.99%	0.65
TO=8 (Long-Short)	0.92%	0.68%	1.34
TO=8 (Long-Only)	0.58%	1.00%	0.58

This backtest shows that imposing constraints can have varying effects on portfolio performance. While imposing a one-way turnover constraint of 8% did not cause an appreciable decrease in performance, a long-only constraint had a very significant effect. The likely reason is that a long-only constraint on the total portfolio does not allow the optimizer to sufficiently underweight poor earnings quality companies with respect to the benchmark.

Even without imposing constraints on the optimizer, the model factor and the factor-tracking portfolio need not coincide. Both portfolios have unit exposure to the targeted factor and zero exposure to all others. However, an infinite number of portfolios fit this description. When tracking factors, we seek the portfolio which has minimal active risk, which will not be exactly the same as the model factor.

ENHANCING ACTIVE PORTFOLIOS WITH QUALITY

As discussed, the four Quality factors are the most significant addition to MSCI's global factor set of which three, Earnings Quality, Investment Quality and Profitability, have shown consistent excess performance historically.

In this section, we explore the use of new SES factors in active portfolios constructed by fundamental and quant managers.

FUNDAMENTAL MANAGERS

To show how a fundamental stock-picker might leverage Quality SES factors in portfolio construction, we analyze a real-life mutual fund's "global income" portfolio using MSCI's Peer Analytics data. The approach we present in this section will be explored in greater depth in upcoming MSCI research.

Although the portfolio was probably constructed using fundamental, bottom-up analysis, SES factors contributed significantly to historical performance. Unsurprisingly for an income fund, Dividend Yield delivered the largest positive contribution.

We are interested in understanding how the portfolio's exposure to Quality factors could have been used to facilitate security selection. For ease of analysis, we combine Earnings Quality, Investment Quality and Profitability into a composite Quality factor.

In Exhibit 9, each portfolio holding is represented with the normalized return contribution coming from Dividend Yield factor (on the x-axis) and from composite Quality factor (on the y-axis). An asset's normalized return contribution from a factor is a score calculated by multiplying the asset's exposure to the factor with the factor's long-run average information ratio and forecasted volatility.[9] The obtained scores are then standardized across the universe. The interpretation is that, if an asset has a score above (below) zero then the factor's contribution to that asset's historical return was above (below) the average.

The results are intuitive. Both Dividend Yield and Quality performed well during the study period. Most stocks in the portfolio had higher Dividend Yield relative to the universe. This is consistent with portfolio's tilt on income and resulted in a positive contribution to portfolio performance. Likewise, most assets in the portfolio had higher exposure to composite quality (relative to the universe), which also contributed to positive performance over the study period.

What does Exhibit 9 tell us about potential improvements to the portfolio? Securities to the left of the y-axis had lower than average Dividend Yield. Given the fund's mandate, the inclusion of these stocks in the portfolio is questionable. Assets in the lower right quadrant of the figure received positive return contributions from Dividend Yield, but negative contributions from Quality factors. Their inclusion is in line with the fund mandate, but they dragged down portfolio performance due to their negative tilt on Quality. Eliminating the assets in the lower right quadrant would have resulted in improved performance, while retaining the tilt on Dividend Yield.

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[9] The normalized return contribution score is estimated from long-run historic performance over the 20 years to December 2015.

Exhibit 9: Quality Tilts of Stocks Held in a Global Income Portfolio
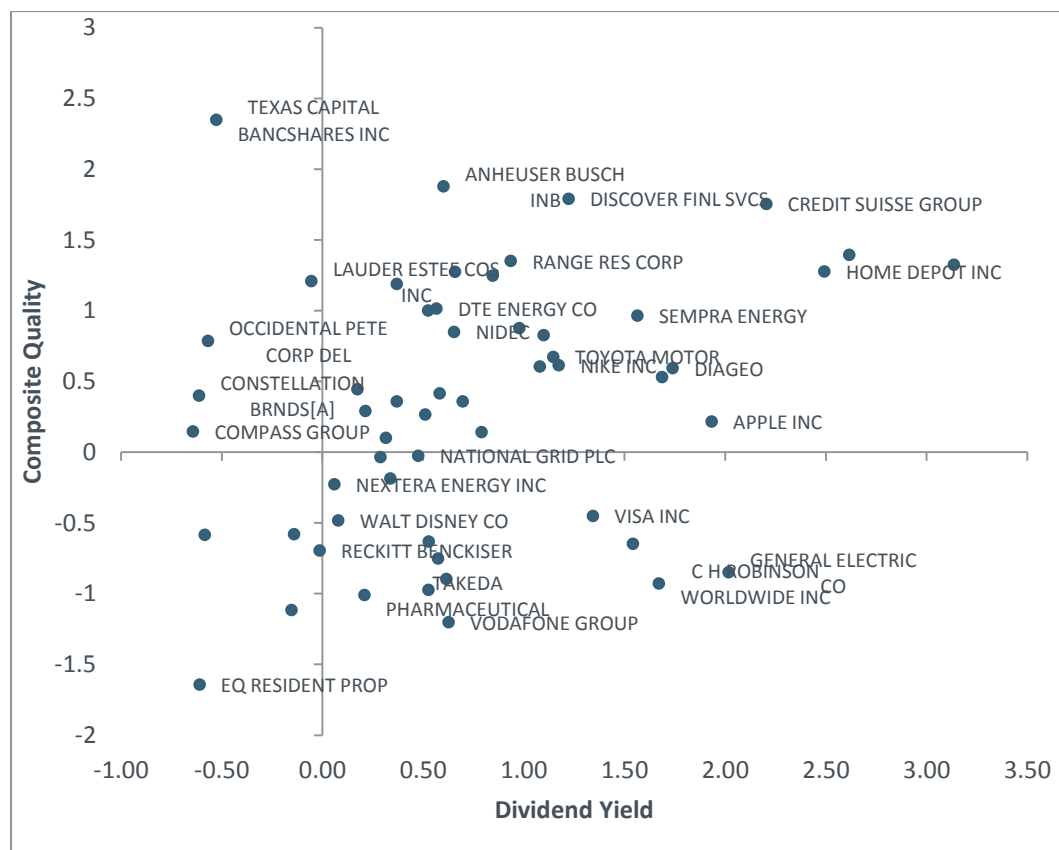
The x -axis (y-axis) represents the expected return contribution from Dividend Yield (Quality) exposure. Analysis based on portfolio holdings as of December 2015 and factor performance estimated from January 1995 to December 2015 data.

QUANT MANAGERS

Unlike fundamental managers, many quant managers construct their portfolios by deliberately targeting factors, rather than analyzing individual assets. To illustrate how a quant manager might make use of global Quality factors, we start with a baseline strategy targeting Momentum and Value. Next, we attempt to improve the portfolio's risk-adjusted performance by applying factor tilts on Quality factors as well.

To see how tilting on Quality may be helpful, we plot the rolling Sharpe ratios of Momentum, Earnings Yield and a combined Quality factor in Exhibit 10. The combined Quality factor equally weights the Earnings Quality, Investment Quality and Profitability factors.

Exhibit 10: Rolling IR of GEMLT Momentum, Earnings Yield and Combined Quality Factors
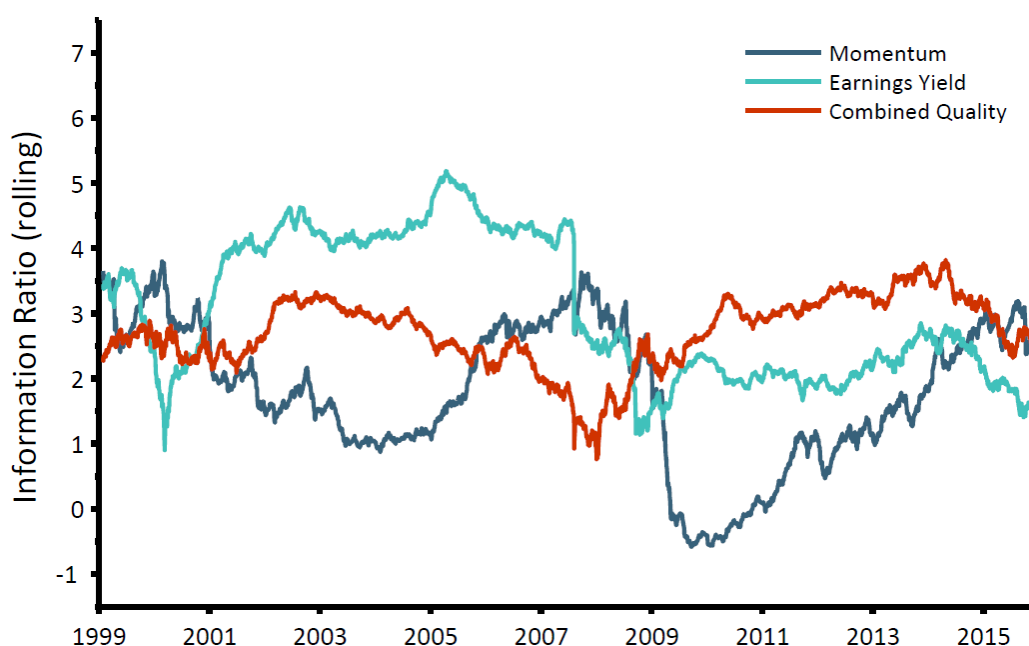
Rolling Information Ratio is calculated using a 2-year exponentially weighted moving average. Data is from January 1995 to December 2015.

By and large, Quality's performance was less sensitive to market cycles than Value or Momentum (Quality's dip during the global financial crisis was due to Profitability's draw-down). Consequently, Quality has served as an effective diversifier, especially during the post-crisis years when Momentum and Earnings Yield were slow to recover.

We turned this observation into a realistic backtest by building a baseline signal combining only Value and Momentum, and an enhanced signal which also targets Quality. We then compared the performance of strategies targeting the two signals in the presence of long-only and turnover constraints.

Our settings are as follows:

- Benchmark/Universe: MSCI World

- Rebalancing: monthly

- Alpha signal: 0.5 * Momentum + 0.5 * Earnings Yield | 0.4 * Momentum + 0.4 * Earnings Yield + 0.2 * Quality

- Long-only | Long-short

- 1-way turnover = 8%

We performed the backtests across a range of different risk aversions. Plotting the historical risk and return corresponding to each risk aversion level traces out the realized efficient frontier shown in Exhibit 11. Both in the long-short and long-only cases, the strategy targeting Quality produced more efficient portfolios, i.e., higher realized returns for any given level of realized risk.

Exhibit 11: Backtested Performance of Active Quantitative Strategies
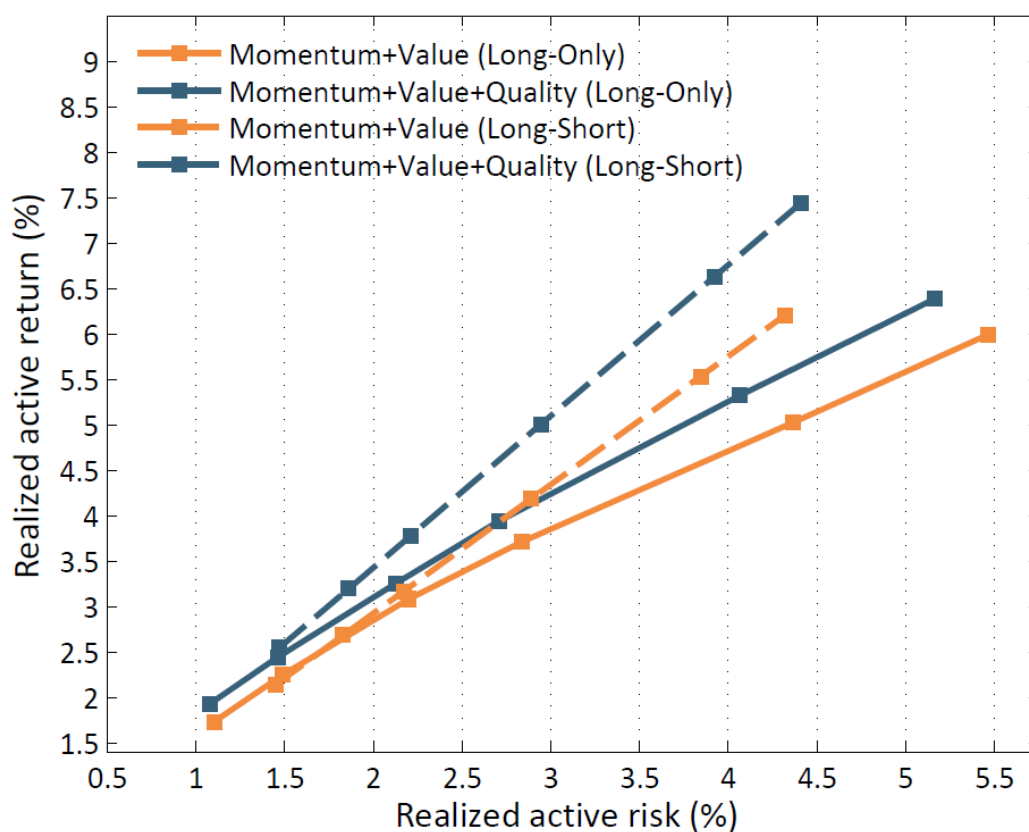
CONCLUSION

Systematic Equity Strategy factors are important tools for both quantitative and fundamental asset managers. They reflect widely adopted quantitative investment strategies that have historically earned significant excess returns.

In this paper, we examined the global SES factor set through the lens of the new MSCI Long-Term Global Equity Model (GEMLT), and showed that SES factors captured significant risk and return characteristics in both active portfolios and factor indexes. Importantly, active portfolios have often been significantly exposed to SES factors, even if the portfolio has been constructed through a fundamental, bottom-up process.

The largest SES factor family in the GEMLT model is Quality. Three of the five Quality factors — Earnings Quality, Investment Quality and Profitability — have shown consistent excess performance historically.

We explored three use cases for leveraging Quality factors in the investment process: (1) capturing Quality in a factor-tracking portfolio, (2) showing how Quality might have enhanced a fundamental stock-picking portfolio and (3) showing how Quality could have been used to create a more efficient active quant strategy.

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