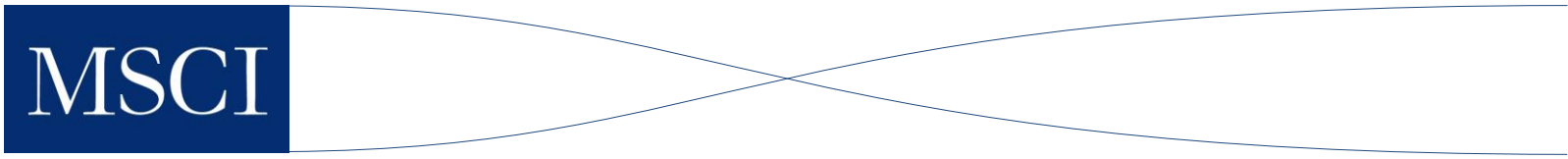

The MSCI Quality Mix Index

Combining the MSCI Quality, Value and Low Volatility Factor Indexes

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May 2014

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Introduction

Factor-based investing has become a widely discussed topic of today's investment canon. This paper is the fourth in a four-paper series focusing on factor investing[1]. In the first paper, we reviewed what systematic factors are, what drives them, and how they can be captured through indexation. In the second paper, we turned to the question on how to deploy multi factor index allocations in institutional portfolios. In the third paper, we presented and discussed a set of metrics used to evaluate factors and combinations of factors. In this paper, we present an example of such index combinations: the MSCI Quality Mix Index, an equal weighted combination of the MSCI Quality, Value and Low Volatility Indexes. We discuss its characteristics and highlight the historical diversification benefits of this combination.

Many active strategies emphasize quality, value and low volatility as important systematic factors in their security selection and portfolio construction. Academic research also shows that quality, value and low volatility strategies have each outperformed the market over time. In combination with one another, they have not only outpaced the market over time, but they have done so with smoother returns and a lower risk profile.

In fact, the impressive performance record of Warren Buffett (one of the most prominent value investors) may be interpreted as such a "combination strategy". Empirical research on the performance of Berkshire Hathaway stock shows that "a significant part of Buffett's success comes from buying safe, high-quality, value stocks" (Frazzini, Kabiller and Pedersen, 2012). Of course, this approach goes much further than simple exposure to quality, value and low volatility securities and includes, for example, skillful selection of stocks and the use of leverage. However, the beta component of the strategy can be largely represented by exposure to three systematic factors: quality, value and low volatility.

In the last few years, the development of investable MSCI Factor Indexes that reflect the performance of systematic risk factors has opened up the potential to passively track systematic drivers of equity returns or factors. The MSCI Quality Mix Index (an equal-weighted combination of the MSCI Quality, MSCI Value Weighted and MSCI Minimum Volatility Indexes) aims to represent the combined performance of quality, value and low volatility factors. Relative to the three component strategy indexes in the MSCI Quality Mix Index, the composite MSCI Quality Mix Index has historically exhibited diversification effects and reduced index turnover resulting from natural internal "crossing opportunities" at each rebalancing. This paper highlights the main features of such composite strategy indexes and introduces the MSCI Quality Mix Index.

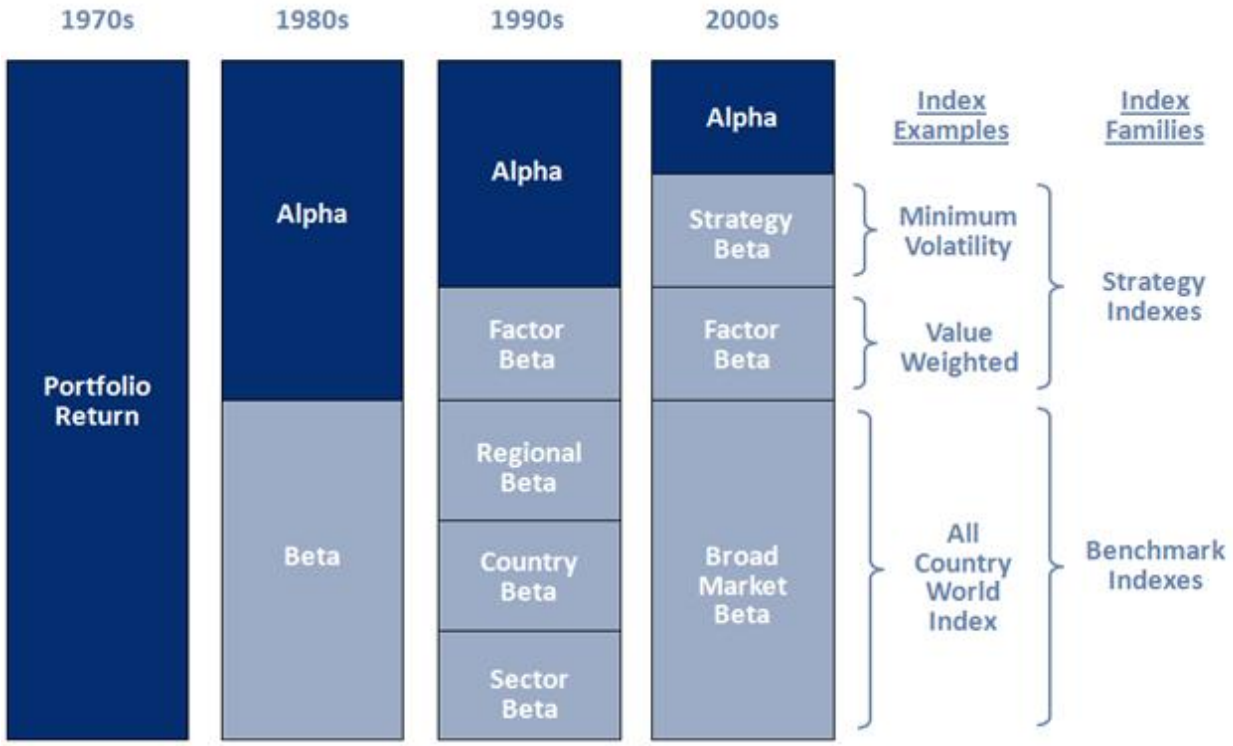
[1] Please see Melas, Bender, Briand and Aylur Subramanian, 2013; Melas, Bender, Briand, Subramanian and Aylur Subramanian, 2013; and Briand, Kouzmenko, Gupta, Kassam and Saurabh, 2013.

Section I – Buffett's Beta and Value Investing

Since value investing was introduced (but not named) by Benjamin Graham and David Dodd, the concept has been widely touted, taking a variety of forms that generally involve buying securities that appear underpriced relative to one or more fundamental characteristics. In this vein, value stocks were originally thought of as securities that trade at a discount (the "margin of safety") to their "tangible book value" (Graham and Dodd, 1934). Value investing was eventually refined to focus on stocks that trade at a discount to their long-term expected distributions or cash flows. The value approach has been adopted by many fundamental and quantitative portfolio managers, and Warren Buffet is perhaps the most prominent self-avowed practitioner of value investing through his company, Berkshire Hathaway. In fact, numerous research studies have shown that value approaches can produce "alpha" for investors, i.e., they have persistently outperformed the overall stock market (Dreman and Berry, 1995; Lyon and Barber, 1997).

More recently, quantitative researchers looking for systematic factors that explain a portion of outperforming stock returns have shown that several factors such as small size, momentum, low volatility, quality, and dividend yield, along with the value factor can be used to identify groups of stocks that over time have historically exhibited better risk-adjusted returns than the market (Fama and French, 1992; Carhart, 1997; Ang et al. 2006 and 2008; among others). The identification of additional systematic sources of returns has broadened the definition of "beta" to include returns that were previously interpreted as belonging to the province of active "alpha" producers, as illustrated in Exhibit 1.

Exhibit 1: Today's alpha is tomorrow's beta…



In turn, MSCI and others have developed investable and transparent rule based factor indexes that have made it possible to seek to passively capture superior risk-adjusted returns akin to the discretionary approaches adopted by fundamental or quantitative investors (Melas, Briand and Urwin, 2011). As such, MSCI Factor Indexes represent a significant change in the scope of implementation options available to investors. Traditionally, investors could allocate to equities passively and obtain market returns, or they could choose active management with the expectation of above market returns but with higher management costs. New investable strategy indexes provide an additional implementation option to obtain potential long-term returns in excess of the market through passive vehicles with lower costs and lower turnover. Factor Indexes are increasingly finding their place between core passive allocations and active mandates in asset owner portfolios.

A key theme in factor investing lies in the potential benefit of combining these factors. This theme is common to active managers designing portfolios to capture systematic sources of returns and to asset owners who select and allocate to multiple managers to capture those returns. One visible example of such an approach can be seen by examining the sources of Berkshire Hathaway's track record, which is among the most impressive in the industry, with a 0.76 Sharpe ratio over the 40-year period starting in 1976. Certainly, a substantial part of Berkshire's success has been driven by an exceptional and unquantifiable ability to pick the "right" stocks, discipline and commitment to an investment style, a level of comfort with highly concentrated portfolios, access to the appropriate investment vehicles, and leverage; however, an important component of Berkshire's performance has resulted from a more straightforward and quantifiable feature: exposure to investable factors.

In fact, when we look more closely at this and other examples of what many have called the value approach to investing, we find that the value factor—as represented by the MSCI Value Weighted Index—is just one of three factors that, together, explain a significant portion of the returns. The other factors are quality, as represented by the MSCI Quality Index, and low volatility, as represented by the MSCI Minimum Volatility Index.

Both Warren Buffett's public comments and empirical research on the performance of the Berkshire Hathaway stock confirm this portrayal of Buffett's investment style. "[T]he secret to Buffett's success is his preference for cheap, safe, high-quality stocks combined with his consistent use of leverage to magnify returns while surviving the inevitable large absolute and relative drawdowns this entails" (Frazzini, Kabiller and Pedersen, 2012). Indeed, the value approach used by many successful active investors turns out to include exposure to quality, value and low volatility factors as important systematic factors in their security selection and portfolio construction processes.[2]

This paper proceeds as follows. Section II explores the rationale behind combining exposure to the quality, value and low volatility premia and highlights the historical effects of factor diversification. Section III introduces the MSCI Quality Mix Index. The MSCI Quality Mix Index combines three MSCI Factor Indexes (the MSCI Quality, Value Weighted and Minimum Volatility Indexes) into one index designed to capture quality, value and low volatility factors. This section further discusses the construction methodology, performance characteristics and sector and style exposures of the MSCI Quality Mix Index. Section IV concludes.

[2] Many well-known so-called "value investors," starting with David Dodd and Benjamin Graham, and including others like Marty Whitman and Joel Greenblatt share a similar investment philosophy. These investors favor stocks that appear to be safe and have high quality, but are priced as bargains.

Section II – More than the Sum of Its Parts: Combining Quality, Value and Low Volatility Factors

Many active strategies, particularly the value investing approach, rely on a combination of three factors: quality, value and low volatility. Exhibit 2 summarizes the main ideas underlying each of these factors.

Exhibit 2: Description of quality, value and low volatility factors

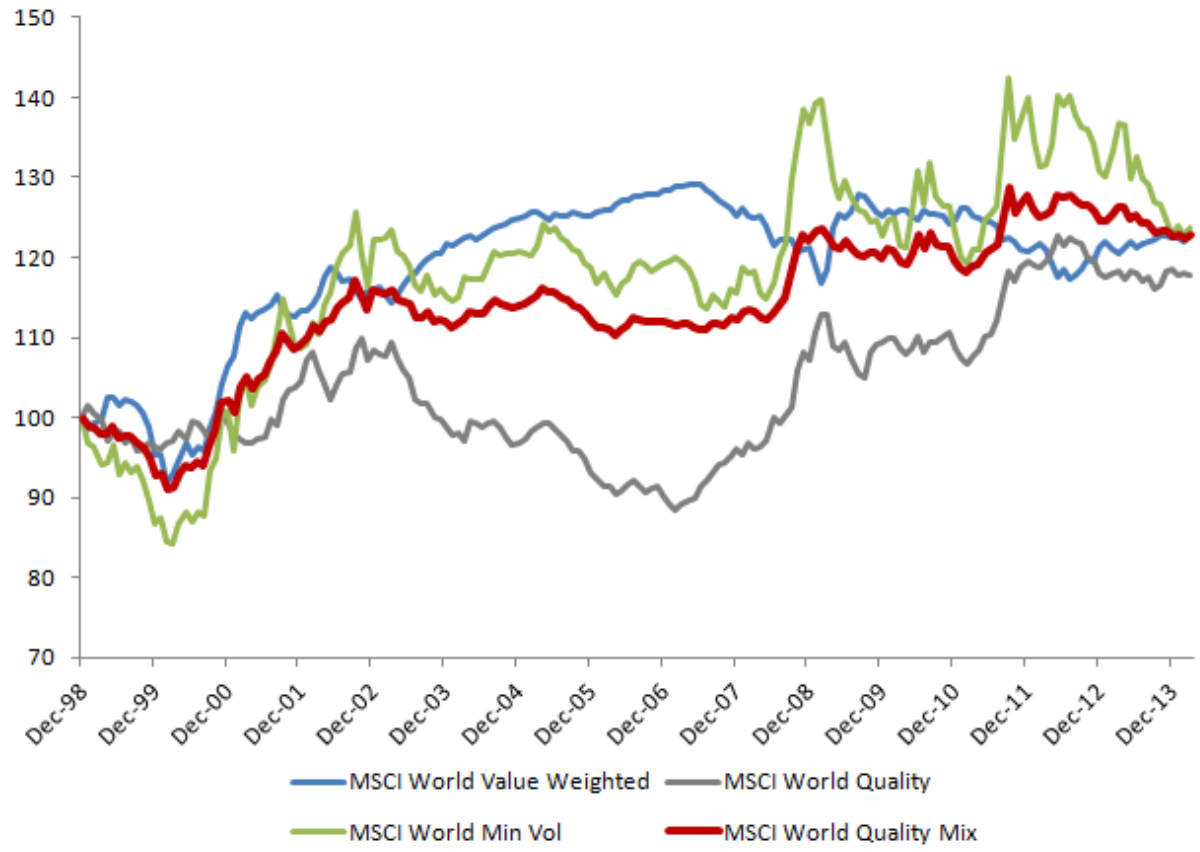
Quality	Quality growth companies have durable business models and sustainable competitive advantages
Value	Value stocks have low prices relative to their fundamental value and returns in excess of the cap-weighted benchmark
Low Volatility	Low volatility stocks are less risky than the market over time

Academics and practitioners have shown that, over time, stocks demonstrating any one of these three characteristics have typically outperformed the market. In addition, the performance of stocks with just one of these factor characteristics has tended to be cyclical and not synchronous with stocks exhibiting other factor characteristics. For example, when value stocks have outperformed, low volatility stocks have often underperformed. Such asynchronous performance cycles result in low correlation among factors and offer an opportunity to exploit potential diversification effects.

In the last few years, new indexes that reflect systematic factors have been developed, opening up the possibility to capture these systematic sources of returns through indexation. MSCI has developed a broad range of Factor Indexes and conducted research exploring the effects of combining different factors to exploit the potential cyclicality and complementarities among them. Each of quality, value and low volatility factors can be represented by one of the currently available MSCI Factor Indexes, which are transparent, rules-based, long-only and investable indexes. The MSCI Quality Indexes capture the performance of the quality premium, the MSCI Value Weighted Indexes capture the performance of the value premium and the MSCI Minimum Volatility Indexes capture the performance of the low volatility premium. The MSCI Quality Mix Index is a multi-factor index constructed by an equal weighted combination of the MSCI Quality, Value Weighted and Minimum Volatility Index and seeks to represent the performance of the popular value investing strategy.

Exhibit 3 shows the cumulative relative performance of the MSCI World Quality Mix Index along with each of the component factor indexes over time and highlights complementary periods across these factor indexes. During the long bull run of the early 2000s, the MSCI World Value Weighted Index outperformed, the MSCI World Minimum Volatility Index tended to track the combined strategy index and the MSCI World Quality Index lagged behind it. During the Global Financial Crisis starting in 2007/8 both the MSCI World Minimum Volatility Index and the MSCI World Quality Index outperformed the market, as measured by the MSCI World Index and the MSCI World Value Weighted Index underperformed it.

Exhibit 3: Cumulative Performance of the MSCI World Quality, MSCI World Minimum Volatility, MSCI World Value Weighted and MSCI World Quality Mix Indexes relative to the MSCI World Index (Dec 1998 – Mar 2014)



We find that the correlation between the active returns for the MSCI World Quality, Value Weighted and Minimum Volatility Indexes are low in the developed world, based on the May 1988 to March 2014 period (Exhibit 4).

Exhibit 4: Correlations of Active Returns (May 1988-Mar 2014)

	MSCI World Quality Index	MSCI World Value Weighted Index
MSCI World Quality Index		-1%
MSCI World Minimum Volatility Index	25%	14%

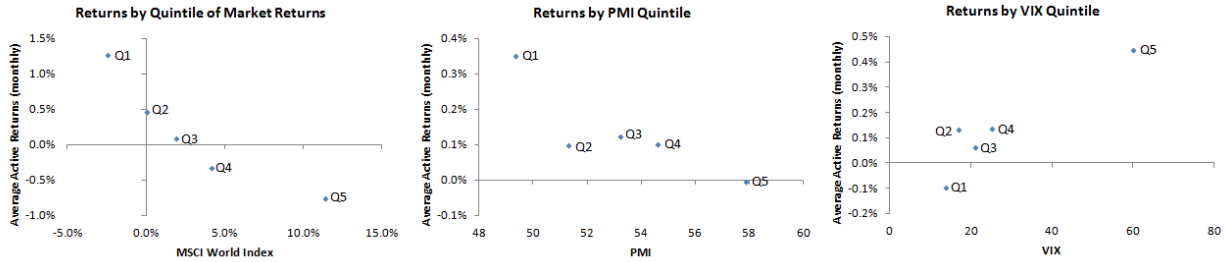
Source: MSCI

What underlies the complementarity across these factor strategy indexes can be tied, to a certain extent, to the economic and business cycle. For example, historically lower risk stocks tend to outperform in times of market stress, quality stocks tend to do better in periods of soft economic growth, whereas value stocks tend to do well in periods of risk seeking. Combining quality, value and minimum volatility factors in equal proportions historically has offered a smoother ride, mitigating the cyclicality of individual factors.

Exhibit 5 shows the average monthly active returns of the MSCI World Quality Mix Index. The active returns for the MSCI World Quality Mix Index are shown by quintile of (1) market returns, (2) Purchasing Managers Index (PMI) of economic activity and (3) a measure of stock market volatility (VIX). Q1 represents the quintile with lowest market return, PMI and market volatility, while Q5 represents the

highest quintile in market returns, PMI and market volatility. The x-axis indicates the threshold value of each indicator for each quintile. Overall, the MSCI World Quality Mix Index generated higher active returns in market environments characterized by uncertainty and softer economic growth. However, while it also performed well during up markets (capturing more than 85% of market gains), performance was lagging during pronounced market rallies.

Exhibit 5: The MSCI World Quality Mix Index: Performance in Different Market Environments



Source: MSCI and FactSet

Section III: MSCI Quality Mix Index

Methodology

The MSCI Quality Mix Index is an equally weighted, transparent, rules-based approach that employs periodic rebalancing. Exhibit 6 describes the methodology for the MSCI Quality Mix Index.

Exhibit 6: MSCI Quality Mix Index Methodology

Parameter	Methodology	Comments
Universe	• Parent index constituents	• Parent Indexes are used as benchmarks by many institutions • Derived Indexes integrate seamlessly with other MSCI Indexes and benefit from parent index construction rules • Cover both developed and emerging markets
Indexes	• MSCI Quality • MSCI Value Weighted • MSCI Minimum Volatility	• Combination of three MSCI Factor Strategy Indexes to represent the performance of Quality, Value and Low Volatility risk premia strategies
Weighting	• Equal weighting of strategies	• Equal weighting assumes no view regarding relative performance across the components of the combined index
Rebalancing	• Semi-annual rebalancing	• Timely data updates, consistent with MSCI rebalancing calendar

Equal weighting is a simple and transparent methodology that makes no assumptions about future expected returns. MSCI Factor Indexes are based on market cap weighted parent benchmarks that have extensive liquidity and investability screening already embedded.[3] Both the MSCI Quality and MSCI Minimum Volatility Indexes have a smaller number of constituents than the parent. MSCI Value Weighted Index has the same number of constituents as the parent index. Rebalancing is semi-annual and synchronized with the other MSCI Factor and MSCI market capitalization weighted indexes. This ensures consistency and seamless integration of the factor and multi-strategy indexes in the investor's investment process employing MSCI benchmark indexes.

Historical Performance

Exhibit 7 presents performance characteristics for MSCI Quality Mix Indexes in comparison to their cap-weighted parent indexes, including the MSCI ACWI, World, USA, Europe and EM Indexes.[4] The exhibit shows that active returns for the MSCI Quality Mix Indexes were positive across all universes, ranging from 0.5% to 2.6%, on an annualized basis. Total risk was also lower for the MSCI Quality Mix Indexes. For all universes, the MSCI Quality Mix Index had beta below 1 and tracking error between 2.7% and 3.3%. Turnover was between 20% and 25%, reflecting a higher turnover compared to cap weighted benchmarks but lower turnover than typical active management portfolios.

[3] For more detail on the MSCI Index methodology, see http://www.msci.com/eqb/methodology/meth_docs/MSCI_Feb13_GIMIMethod.pdf

[4] Note that the period shown begins in 2001, which corresponds to the earliest available history for MSCI ACWI and EM.

Exhibit 7: Performance Characteristics for the MSCI Quality Mix Indexes in Different MSCI Universes, 2001-2014

	MSCI ACWI	MSCI ACWI Quality Mix	MSCI World	MSCI World Quality Mix	MSCI USA	MSCI USA Quality Mix	MSCI Europe	MSCI Europe Quality Mix	MSCI EM	MSCI EM Quality Mix
Total Return* (%)	7.2	8.9	6.9	8.0	6.3	6.9	7.9	9.7	13.4	16.0
Total Risk* (%)	16.5	14.0	16.1	13.8	15.1	13.4	20.0	17.7	23.0	20.9
Return/Risk	0.43	0.63	0.43	0.58	0.42	0.51	0.40	0.55	0.58	0.76
Sharpe Ratio	0.39	0.55	0.38	0.49	0.36	0.43	0.39	0.51	0.59	0.73
Active Return* (%)	0.0	1.7	0.0	1.1	0.0	0.6	0.0	1.8	0.0	2.6
Tracking Error* (%)	0.0	3.2	0.0	3.0	0.0	2.7	0.0	3.3	0.0	2.9
Information Ratio	NaN	0.54	NaN	0.37	NaN	0.21	NaN	0.53	NaN	0.90
Historical Beta	1.00	0.84	1.00	0.85	1.00	0.88	1.00	0.88	1.00	0.91
Turnover** (%)	3.6	21.3	3.3	21.1	3.5	24.4	3.2	22.2	7.3	22.4
Price to Book***	2.1	2.3	2.1	2.3	2.5	2.9	1.8	2.1	1.8	1.7
Price to Earnings***	16.8	16.3	17.2	16.9	18.1	16.9	14.4	15.8	13.4	12.0
Div. Yield*** (%)	2.4	2.7	2.4	2.6	2.0	2.1	3.4	3.5	2.6	3.2

* Annualized in USD for the 11/30/2001 to 03/31/2014 period

** Annualized one-way index turnover for the 11/30/2001 to 03/31/2014 period

*** Monthly averages for the 11/30/2001 to 03/31/2014 period

The definitions of all statistical parameters are available in the Appendix

MSCI World Quality Mix Index

Exhibit 8 presents the historical performance along several dimensions for the MSCI World, the MSCI World Quality Mix and the individual Factor Indexes forming the composite. Again, the three individual Factor Indexes as well as the MSCI Quality Mix Index outperformed the market over the period from May 1988 to Mar 2014. The information ratio for the MSCI World Quality Mix Index is higher than that for the MSCI World Value Weighted and MSCI World Minimum Volatility Indexes and similar to that of the MSCI World Quality Index during this period. Also, the tracking error of the MSCI World Quality Mix Index was substantially lower than that of MSCI World Minimum Volatility and MSCI World Quality Indexes.

Exhibit 8: Historical performance, 1988-2014

	MSCI World	MSCI World Quality Mix	MSCI World Value Weighted	MSCI World Quality	MSCI World Min Vol
Total Return* (%)	7.7	10.0	9.5	11.6	8.6
Total Risk* (%)	15.3	13.1	15.4	13.9	11.5
Return/Risk	0.51	0.76	0.61	0.83	0.75
Active Return* (%)	0.0	2.2	1.7	3.9	0.8
Tracking error* (%)	0.0	3.6	3.5	5.8	6.7
Information Ratio	NA	0.62	0.49	0.66	0.13
Historical Beta	1.00	0.84	0.99	0.84	0.69
Turnover** (%)	2.1	20.9	17.5	25.6	23.5
Price to Book***	2.3	2.4	1.7	4.2	2.3
Price to Earnings***	19.1	17.4	17.1	16.6	18.5
Div. Yield*** (%)	2.3	2.6	2.8	2.3	2.8

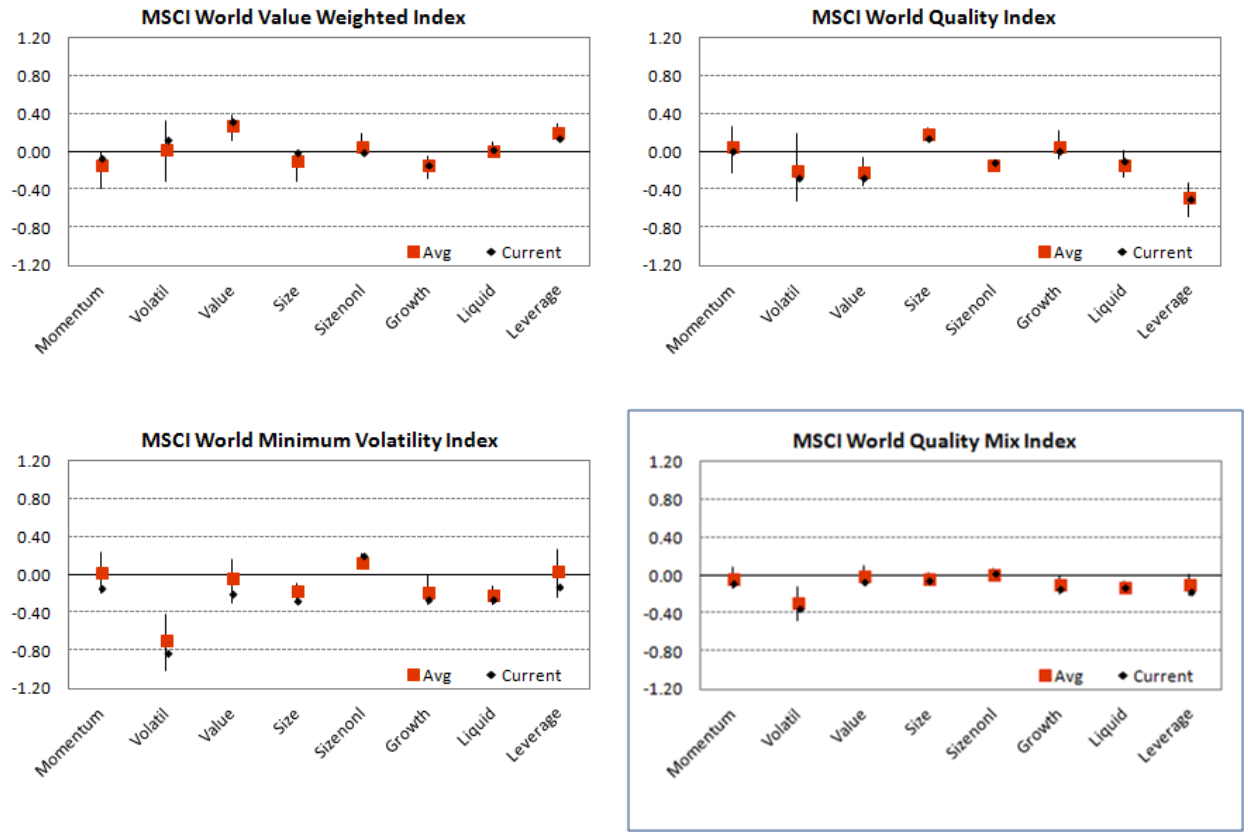
* Annualized in USD for the 5/31/1988 to 03/31/2014 period

** Annualized one-way index turnover for the 5/31/1988 to 03/31/2014 period

*** Monthly averages for the 5/31/1988 to 03/31/2014 period

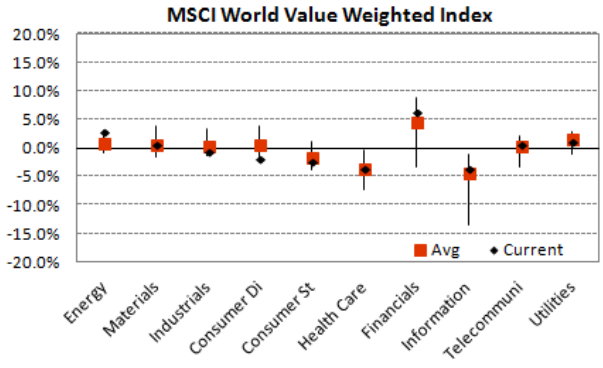
Exhibits 9 - 11 present the active exposures of the MSCI World Quality Mix Index relative to the MSCI World Index for the period from 1998 to 2014. Exhibit 9 shows the active exposures of the individual component indexes on the top right and left panels and the bottom left panel. The combination is on the bottom right panel. The red dot indicates the average exposure while the vertical line indicates the range between maximum and minimum exposure. Note that the largest exposure to styles in the MSCI World Quality Mix Index is the low volatility tilt, which is mainly driven by the MSCI World Minimum Volatility and MSCI World Quality indexes. The exposure to the value factor appears muted on average as a result of the anti-value tilt in the MSCI World Quality Index neutralizing the value tilt from the MSCI World Value Weighted Index. Exposure to other Risk Factors or investment styles appears mainly neutral.

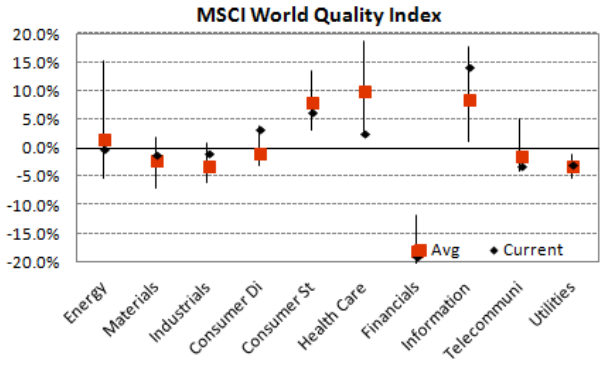
Exhibit 9: Active Exposures to Investment styles

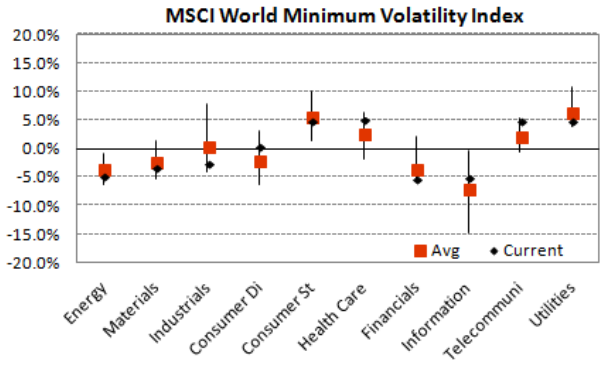


In the same format, Exhibit 10 shows the sector exposures of the individual and combined indexes. Overall, sector exposures appear more muted in the combined index than in the individual indexes. The sizeable underweighting of Financials in the quality index and slight overweighting in the value weighted index results in an overall Financials underweight in the MSCI World Quality Mix Index; conversely the overweighting in Information Technology introduced by the MSCI World Quality Index is neutralized by the underweighting in the MSCI World Value and MSCI World Minimum Volatility Indexes. The largest exposures on average are to the Consumer Staples and Health Care sectors on the overweight side and to Financials on the underweight side (albeit with much smaller magnitude than in the MSCI World Quality Index).

Exhibit 10: Active Exposures to Sectors







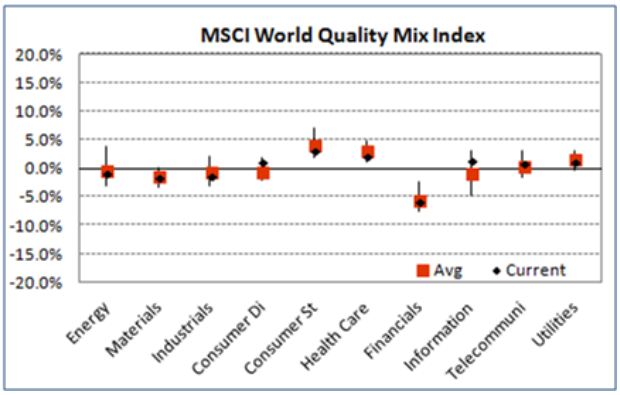
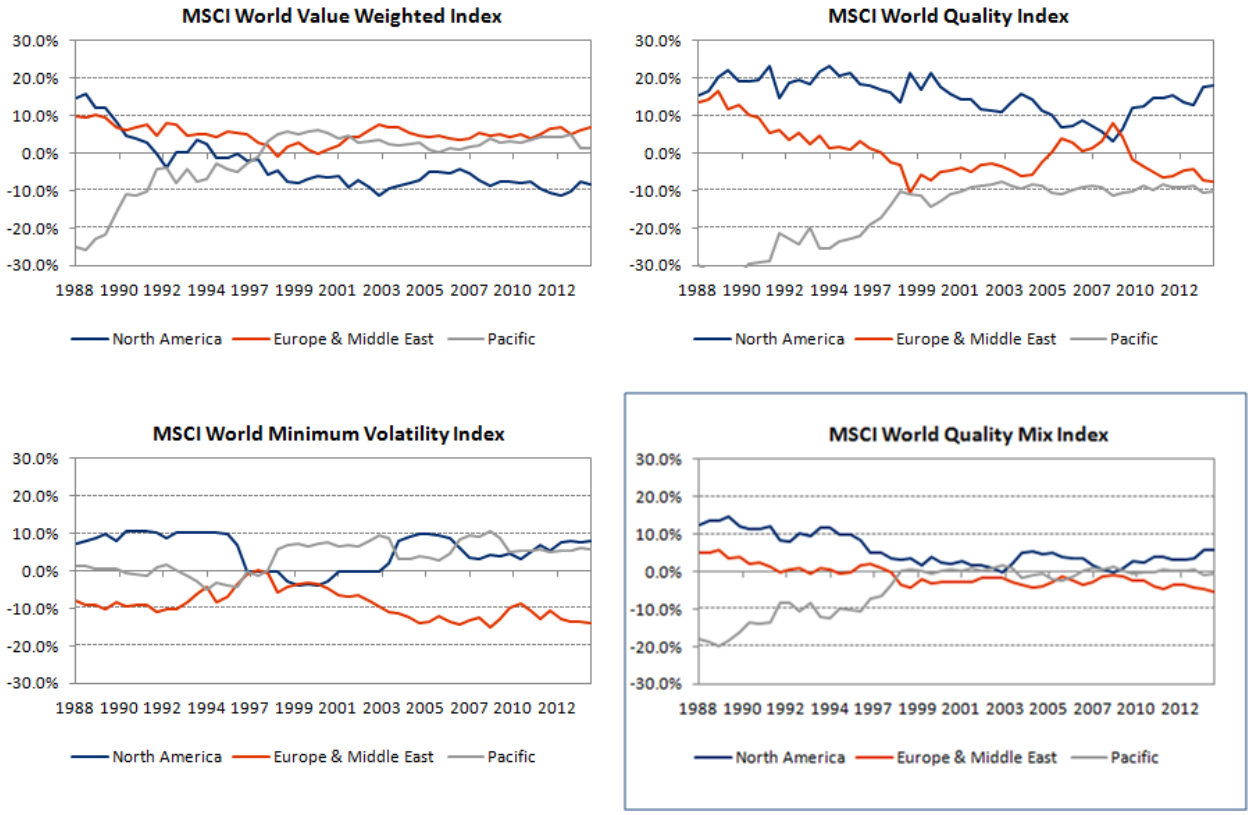


Exhibit 11 shows the exposures of the individual and combined factor indexes to different regions. Once again, the tilts appear more muted in the combination index as the North America overweighting in the MSCI World Quality Index is mostly neutralized by the underweighting in the MSCI World Value Weighted Index, while the Europe overweighting appears neutralized by the underweighting in the MSCI World Minimum Volatility index. Notably, regional exposures since 1998 have ranged between -5% and 5%, with an overweighting to North America and underweighting to Europe.

Exhibit 11: Active Exposures to Regions



Lastly, Exhibits 12 and 13 provide a closer look at index constituents, showing the largest positive and negative active weights as of the end of Nov 2013, respectively. The weight of these securities is driven by the weight in each of the components.

Exhibit 12: Top 10 Constituents by positive active weight

Security Name	Country	Sector	Weight in MSCI World Quality Mix Index	Active weight
EXXON MOBIL CORP	US	ENERGY	2.4%	1.0%
JOHNSON & JOHNSON	US	HEALTH CARE	1.6%	0.7%
MCDONALD'S CORP	US	CON. DISCRETIONARY	1.0%	0.7%
MICROSOFT CORP	US	INFO TECHNOLOGY	1.6%	0.6%
WAL-MART STORES	US	CON. STAPLES	1.0%	0.6%
AUTOMATIC DATA PROCESS	US	INFO TECHNOLOGY	0.7%	0.6%
PROCTER & GAMBLE CO	US	CON. STAPLES	1.3%	0.5%
TJX COS	US	CON. DISCRETIONARY	0.7%	0.5%
GENERAL MILLS	US	CON. STAPLES	0.6%	0.5%
IBM CORP	US	INFO TECHNOLOGY	1.1%	0.5%

Exhibit 13: Top 10 constituents by negative active weight

Security Name	Country	Sector	Weight in MSCI World Quality Mix Index	Active weight
GENERAL ELECTRIC CO	US	INDUSTRIALS	0.2%	-0.6%
AMAZON.COM	US	CON. DISCRETIONARY	0.0%	-0.4%
WELLS FARGO & CO	US	FINANCIALS	0.3%	-0.4%
TOYOTA MOTOR CORP	JP	CON. DISCRETIONARY	0.2%	-0.4%
PHILIP MORRIS INT	US	CON. STAPLES	0.1%	-0.4%
PFIZER	US	HEALTH CARE	0.3%	-0.3%
HSBC HOLDINGS (GB)	GB	FINANCIALS	0.3%	-0.3%
JPMORGAN CHASE & CO	US	FINANCIALS	0.4%	-0.3%
DISNEY (WALT)	US	CON. DISCRETIONARY	0.1%	-0.3%
SCHLUMBERGER	US	ENERGY	0.1%	-0.3%

Crossing Opportunity

Another historical characteristic of combining factor indexes into a single composite index is reduction of turnover in portfolios tracking the composite index. This reduction in the turnover resulted from natural internal "crossing" opportunities at each index rebalancing. Also, a single composite index reallocates within component indexes at each rebalancing thus obviating the need for reallocation of capital across managers when managed in a single mandate.

Exhibit 14 quantifies this by showing the historical turnover levels for MSCI World, the three component indexes and then the "separate" mandate, i.e. tracking each of the three indexes individually and the "combined" mandate which is equivalent to allocating a single mandate to one manager tracking a combined index. The reduction in turnover is 4.1% which is equivalent to 4bps less in trading costs (assuming 50bps costs) for a financial product fully replicating the index.

Exhibit 14: Crossing property

	MSCI World	MSCI Quality	MSCI Minimum Volatility	MSCI Value Weighted	"Separate" Mandates	"Combined" Mandates	Reduction in turnover
Turnover(%)	3.00	22.71	26.82	18.09	24.78	20.68	4.10
Performance Drag in bps (at 50 bps)*	0.03	0.23	0.27	0.18	0.25	0.21	0.04

Annualized from Dec 1998 to Feb 2014

* Performance drag aims to represent the total two-way annualized index level transaction cost assuming various levels of security level transaction cost

Conclusion

Today many active strategies emphasize quality, value and low volatility as important systematic factors in their security selection and portfolio construction. The MSCI Quality Mix Indexes -- an equal weighted combination of the MSCI Quality, MSCI Value Weighted and MSCI Minimum Volatility Indexes -- reflect systematic risk premia such as value, quality and low volatility in a single composite index. The performance of an individual factor index can be cyclical: any factor can underperform for long periods. Therefore, a higher level of diversification may potentially be achieved in a multi-factor index by combining two or more of the factor indexes. Additionally, a multi-factor index may exhibit reduced index turnover as a result of natural internal "cross opportunities" at each rebalancing.

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Appendix

Appendix A: The MSCI Factor Index Family

MSCI Return-Based Factor Indexes

MSCI Value Weighted Indexes
Weighted according to four fundamental variables (Sales, Earnings, Cash Flow, Book Value)
- Semi-annual rebalancing
- Launched in 2010, index history from 31 May 1973 (World)/31 May 1991 (EM)

MSCI Quality Indexes
Weights derived from market cap times a quality score based on D/E, ROE, earnings variability
- Semi-annual rebalancing
- Launched in 2012, index history from 28 Nov 1975 (World)/29 May 1992 (EM)

MSCI Momentum Indexes
Weights derived from market cap times a momentum score based on short- and long-term momentum signals
- Semi-annual rebalancing along with conditional rebalancing
- Launched in 2013, index history from 31 May 1973 (World) / 31 May 1991 (EM)

MSCI High Dividend Yield* Indexes
High dividend yield opportunity set within parent index constituents
- Semi-annual rebalancing
- Launched in 2006, index history from 28 Nov 1975 (World) / 29 May 1992 (EM)

MSCI Risk-Based Factor Indexes

MSCI Minimum Volatility Indexes
Constructed using minimum variance optimization
- Semi-annual rebalancing
- Launched in 2008, index history from 31 May 1988 (World) / 31 May 1993 (EM)

MSCI Risk Weighted Indexes
Weights based on the inverse of historical variance
- Semi-annual rebalancing
- Launched in 2011, index history from 31 May 1973 (World) / 31 May 1991 (EM)

MSCI Equal Weighted Indexes
Equal allocation across parent index constituents
- Quarterly rebalancing
- Launched in 2008, index history from 31 May 1973 (World) / 31 May 1991 (EM)

MSCI Multi-Factor Indexes

MSCI Quality Mix Indexes
Combining Quality, Value and Minimum Volatility Strategy Indexes with equal weights
- Semi-annual rebalancing
- Launched in 2013, index history from 31 May 1988 (World)/ 31 May 1993 (EM)

* *On June 3, 2013, MSCI launched the enhanced HDY Indexes to incorporate additional screens which exclude stocks based on certain "low quality" characteristics and recent 12-month price performance.*

Appendix B: MSCI Quality Index Methodology

Parameter	Methodology	Comments
Universe	• Parent index constituents	• Parent Indexes are used as benchmarks by many institutions • Derived Indexes integrate seamlessly with other MSCI Indexes • Derived Indexes benefit from parent index construction rules
Variables	• Debt to Equity • Return on Equity • Earnings Variability*	• Each variable is winsorized at 5th and 95th percentile rank • Equal weights are used to compute a composite z-score • The composite z-score is translated into a quality score**
Selection & Weighting	• Fixed number of securities • Quality Score x Market Cap • Index weight capped at 5%	• Number targets 30-40% coverage of parent index universe • Tilted market cap weights result in high capacity and liquidity • Weight capping reduces concentration and stock specific risk
Rebalancing	• Semi-annual rebalancing • Buffer zones are applied	• Timely data updates, consistent with MSCI rebalancing calendar • Buffers historically reduced turnover and improved replicability

*Std dev of y-o-y EPS growth in the last five years **For positive z-scores, the quality score is q=1+z, for negative z-scores, the quality score is q=1/(1-z)

Appendix C: MSCI Value Weighted Index Methodology

Parameter	Methodology	Comments
Universe	• Parent index constituents	• Objective approach capturing the standard opportunity set and ensuring Indexes have adequate liquidity and capacity • Combining selection and weighting does not impact historical performance and characteristics but increases index turnover
Fundamental Variables	• Sales, Earnings, Cash Flow, Book Value	• Sales, reported earnings, cash flow, book value are objective measures that capture different aspects of fundamental value • Dividends are not paid by all companies, may be dependent on tax policies and may not be comparable across countries
Rebalance	• Semi-annual rebalancing	• Quarterly rebalancing increases index turnover while leaving performance and characteristics largely unaffected • Annual rebalancing leads to substantially different historical performance by simply varying the rebalancing date
Input Data Smoothing	• 3-year moving average	• Using a 3-year moving average achieves substantial reduction in turnover with little impact on other index characteristics • Average over longer periods does not reduce turnover while it leads to the use of increasingly out-of-date fundamental data

Appendix D: MSCI Minimum Volatility Index Methodology

Parameter	Methodology	Comments
Universe	• Parent index constituents	Derived Indexes benefit from parent index construction rules
Optimization	• MSCI's market leading Barra Global Equity Model (GEM2)	Account for Factor volatility and correlation Comprehensive and robust risk measures
Weighting	• Minimize index volatility subject to constraints	Ensure high investability and liquidity
Constraints	• Stocks: Lower of 1.5% or 20x the cap-weight, with a minimum of 5bps • Sectors:-/+5% relative to the parent index • Countries: -/+5% or 3x relative to the parent index • Style: -/+ 0.25 relative to Barra factor of the parent index (except for Volatility) • Turnover: Maximum 10% one-way turnover per rebalancing	Stock weight cap ensures adequate capacity and replicability Style and Sector caps ensure no unintended exposure Turnover limit ensures lower cost replication
Number of Constituents	• Subset of parent index, number will vary	High level of diversification achieved by a subset of parent index
Rebalancing	• Semi-annual (May and November)	Timely data updates, consistent with MSCI rebalancing calendar

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MSCI Inc. is a leading provider of investment decision support tools to investors globally, including asset managers, banks, hedge funds and pension funds. MSCI products and services include indexes, portfolio risk and performance analytics, and governance tools.

The company's flagship product offerings are: the MSCI indexes with approximately USD 8 trillion estimated to be benchmarked to them on a worldwide basis[1]; Barra multi-asset class factor models, portfolio risk and performance analytics; RiskMetrics multi-asset class market and credit risk analytics; IPD real estate information, indexes and analytics; MSCI ESG (environmental, social and governance) Research screening, analysis and ratings; ISS corporate governance research, data and outsourced proxy voting and reporting services; and FEA valuation models and risk management software for the energy and commodities markets. MSCI is headquartered in New York, with research and commercial offices around the world.

[1] *As of September 30, 2013, as reported on January 31, 2014 by eVestment, Lipper and Bloomberg* *Feb 2014*