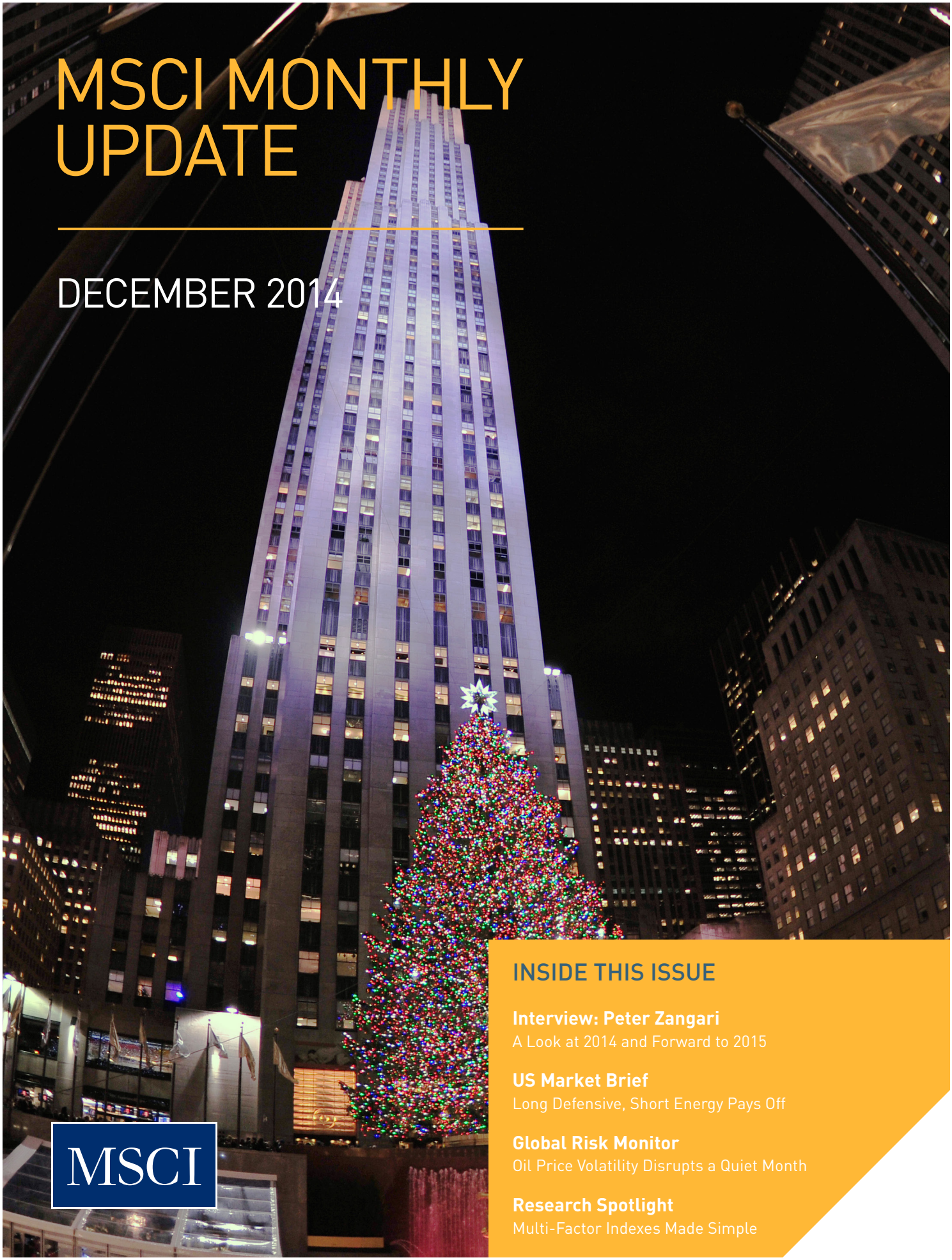


MSCI MONTHLY UPDATE

DECEMBER 2014

MSCI

INSIDE THIS ISSUE

A INTERVIEW WITH PETER ZANGARI

MSCI MANAGING DIRECTOR AND HEAD OF MSCI'S EQUITY PORTFOLIO MANAGEMENT ANALYTICS BUSINESS

Peter Zangari is Managing Director and Head of MSCI's Portfolio Management Analytics product line. He is responsible for MSCI's broad range of equity portfolio management analytics products including Barra Portfolio Manager, Barra Aegis and the Barra equity model suite. His career spans twenty years in risk and portfolio analytics. Prior to joining MSCI, Mr. Zangari spent thirteen years at Goldman Sachs where he was most recently Managing Director and Head of Risk for GSAM's Quantitative Investment Strategies (QIS) business. Before joining Goldman Sachs, Mr. Zangari worked at J.P. Morgan for four years where he was an original member of the RiskMetrics team.

Mr. Zangari has written extensively on topics related to risk and portfolio management. He currently serves on the editorial board of the Journal of Investment Strategies.

WHAT WILL 2014 BE REMEMBERED FOR?

PETER: On the financial market front, particularly in the U.S. public equity markets, 2014 might best be remembered for showcasing an interesting mix of low volatility markets, markets near or at all-time highs, and markets that demonstrated sharp but relatively short drawdowns.

Also, while the US seems to be recovering, big questions continue with signs of further slowing in China and Europe. The implications of the Fed's withdrawal from years of unconventional monetary policy are one aspect driving uncertainty. What remains to be seen is the big picture outlook without continued Fed intervention and whether growth can pick up without an excessive reliance on leverage like we saw in the last cycle.

WHAT ARE SOME OF THE THINGS MSCI ACCOMPLISHED IN 2014?

PETER: With one of the largest research groups in the industry, including over 160 researchers, our goal has been to provide tools and insight to help our clients navigate these challenging markets.

We have taken an institutional investor's perspective when developing our research. We agree with our clients that great research is not a commodity. In fact, it is actually a differentiator and is not something that is easy to replicate. Because we have this incredible asset, we have been a leader in a number of areas.

For example, we launched over 150 Factor Indexes this year alone based on our factor research.

We are also developing new equity risk models with our recently released US equity model suite and Asia Pacific equity models. These new models have been enhanced to include Systematic Equity Strategies (SES) in addition to the standard MSCI Barra style factors found in every Barra Model, marking a new development in measuring and managing risk.

Additionally, we have been an industry leader by creating and enhancing the software and tools clients need to manage risk over different time horizons. Institutional investors often need to manage both their short run exposure to volatility and to have a structured way of thinking about long-run returns and asset allocation. MSCI's offerings including BarraOne, Barra Portfolio Manager and RiskManager are examples of cutting edge tools that help clients address these issues to manage risk.

Finally, we've spent a significant amount of time developing our own internal infrastructure so that we can greatly reduce the amount of time it takes to "convert" a research idea into a model or respond to a client request.

WHAT ARE SOME OF THE THINGS MSCI IS FOCUSED ON FOR THE COMING YEAR?

PETER: We serve institutional investors of many different types, all over the world. In fact, 95 of the top 100 investment managers are clients of our risk, performance, portfolio, index and benchmark offerings[1]. Clients look to MSCI to help them throughout the investment process. This includes developing custom research models, brainstorming ways to improve workflow, helping them communicate better with their clients, and much more. Our focus is to bring practical insight when thinking about research topics and product development and to help clients identify and understand important sources of risk in their portfolio.

To do this, we'll be focused on three areas in 2015:

First, we will continue to build upon our impressive data warehouse with its breadth of truly global asset class coverage. Institutional investors want a portfolio view – and that's why they turn to MSCI. We offer not only equities and fixed income coverage, but also hedge fund, real estate and other alternatives, and support asset classes designed to meet environmental, social and governance (ESG) goals.

Second, as we enter a new era of risk, institutional investors will be asking a new set of questions and will need new tools, software and models to help them answer their questions. We aim to help them make sense of the data and answer their questions about both short run volatility and long run financial and macroeconomic uncertainty.

Finally, we will be completely focused on enhancing the accuracy and transparency of our models. Model validation is a key area for us in 2015, and allowing clients to see the results of our validation are paramount. We are also working to provide transparency to the underlying data of the models and will be offering a number of research enhanced data sets including access to descriptors and data receipts.

INVESTORS NEED TO MANAGE BOTH THEIR SHORT RUN EXPOSURE TO VOLATILITY AND TO HAVE A STRUCTURED WAY OF THINKING ABOUT LONG-RUN RETURNS AND ASSET ALLOCATION. MSCI'S OFFERINGS INCLUDING BARRAONE, BARRA PORTFOLIO MANAGER AND RISKMANAGER ARE EXAMPLES OF CUTTING EDGE TOOLS THAT HELP CLIENTS ADDRESS THESE ISSUES TO MANAGE RISK.

US MARKET BRIEF

LONG DEFENSIVE, SHORT ENERGY PAYS OFF

DECLINING OIL PRICES TOLD THE BIG STORY IN NOVEMBER: TOP-PERFORMING ACTIVE MUTUAL FUND MANAGERS UNDERWEIGHTED ENERGY STOCKS AND DERIVED MOST OF THEIR OUTPERFORMANCE FROM INDUSTRY TILTS RATHER THAN INVESTMENT STYLE TILTS.

Despite good overall market performance and a positive oil shock for consumers, defensive stocks — such as large cap, low beta, low volatility and high quality securities with high liquidity — outperformed the market in November. This result was somewhat counter-intuitive as normally we would expect stocks that are associated with risk-averse behavior (i.e., low beta, low volatility, large cap, etc.) to suffer when the market performs well. We believe that investor flows into passive funds and out of active equity funds may be partly responsible for this performance.

For example, inflows into MSCI Index-related ETFs in the first three quarters of this year were up more than 80% over the same period last year and at least 40% higher than any comparable period we have seen historically. This increase in passive flows has coincided with growing investor interest in factor investing, creating concerns that such flows may drive affected security prices to unsustainable levels. However, our indicators do not show that MSCI Factor Indexes are overvalued at this point.

“DESPITE GOOD OVERALL MARKET PERFORMANCE AND A POSITIVE OIL SHOCK FOR CONSUMERS, DEFENSIVE STOCKS — SUCH AS LARGE CAP, LOW BETA, LOW VOLATILITY AND HIGH QUALITY SECURITIES WITH HIGH LIQUIDITY — OUTPERFORMED THE MARKET IN NOVEMBER.”

If you want to run this kind of analysis on your portfolio, click here to contact us

EXHIBIT 1 Large cap top vs bottom mutual fund attribution (in bps)

	Top	Bottom	Difference
Active return	199	-412	610
Investment styles	-50	-178	127
Industries	169	-56	226
Stock specific	89	-171	261

EXHIBIT 2 MSCI USA IMI and Sector Indexes Performance - November (Gross Return in USD)

MSCI USA IMI INDEX	2.39%
Consumer discretionary	5.60%
Consumer staples	5.27%
IT	4.90%
Health Care	3.26%
Industrials	2.19%
Financials	1.88%
Telecom	1.26%
Materials	1.09%
Utilities	0.81%
Energy	-9.27

Consumer discretionary was the top-performing sector in November (+5.60%) while the recent decline in oil prices dragged down the energy sector (-9.27%) last month (Exhibit 2).

EXHIBIT 3 Investment style decomposition

	Contribution (in bps)		Active exposure (% rank)	
	Top	Bottom	Top	Bottom
Liquidity	25	29	72%	68%
Growth	7	5	68%	44%
Residual volatility	-33	-79	66%	90%
Asset turnover	8	3	63%	64%
Beta	-27	-52	57%	69%
Prospect	6	-4	53%	21%
Profitability	3	8	51%	45%
Momentum	-5	1	49%	41%
Sentiment	1	-4	47%	69%
Leverage	-2	-2	46%	59%
Long-term reversal	2	-4	40%	54%
Earnings quality	-5	18	35%	70%
Value	13	-8	32%	74%
Size	-49	-89	26%	22%

Sector Decomposition

	Active Exposure (% Rank)	
	Top	Bottom
Information Technology	71%	49%
Healthcare	71%	25%
Consumer Discretionary	63%	50%
Industrials	60%	49%
Materials	45%	65%
Financials	32%	52%
Consumer Staples	26%	36%
Telecommunication	22%	46%
Energy	11%	72%
Utilities	7%	43%

Top managers outperformed bottom-performing managers by 610 bps in November due to superior stock picking and better industry bets. Looking at their active sector bets, top-performing managers had much smaller bets on Energy and Utilities compared to bottom- managers (Exhibit 3).

Active Exposure (% Rank) is a percentile rank calculated against the whole US large cap active mutual fund universe (as defined by Lipper). The higher percentile rank, the larger the exposure of the manager to a particular Barra factor when compared to his/her peers.

EXHIBIT 4 Risk-adjusted performance of selected investment styles[1]

	Total market			Small cap		
	September	October	November	September	October	November
Liquidity	(0.5)	(2.3)	1.5	(1.9)	(0.9)	(0.0)
Size	2.7	(1.8)	1.1	1.1	(0.9)	1.8
Asset turnover	1.7	1.0	1.1	1.7	1.1	1.1
Long-term reversal	(0.6)	(2.5)	0.6	(1.2)	(1.3)	0.6
Earnings quality	1.6	(1.0)	0.6	1.4	2.1	0.1
Momentum	1.7	0.1	0.2	1.8	(0.1)	(0.1)
Leverage	(2.1)	(0.8)	0.1	(2.3)	(1.8)	0.1
Short-term reversal	(2.9)	0.5	(0.3)	(2.2)	0.7	0.0
Seasonality	(0.7)	(2.5)	(0.5)	0.2	(1.0)	0.9
Value	(1.4)	0.4	(0.9)	(2.7)	(0.4)	(0.3)
Industry momentum	0.8	1.4	(0.9)	0.6	0.8	0.9
Sentiment	(0.5)	0.3	(0.9)	0.4	0.7	0.1
Growth	1.7	(0.3)	(1.0)	1.2	(0.1)	(1.4)
Prospect	0.6	1.9	(1.0)	1.8	0.5	(0.6)
Beta	(1.4)	0.2	(1.1)	(1.3)	0.3	(0.9)
Residual volatility	(0.4)	(0.1)	(1.3)	(0.6)	(2.2)	0.1
Profitability	(0.4)	0.7	(1.3)	0.5	1.3	(0.8)

1 Source: MSCI Barra US Sector Model and MSCI Barra US Small Cap Model

Liquid, large-cap stocks outperformed last month as both Liquidity (high vs low liquidity) and Size (large vs small) factors delivered the strongest risk-adjusted returns compared to the total market (Exhibit 4). In the small cap universe, Size was also the strongest performer. Elsewhere, stocks with good earnings quality and high operating efficiency (Asset Turnover) outperformed in November. Asset Turnover has delivered positive performance for the third month in a row in both Total Market and Small Cap universes.

EXHIBIT 5 Investment style risk-adjusted performance by sector (November 01 through November 30, 2014.)

	Consumer discretionary	Consumer staples	Energy	Financials	Healthcare	Industrials	Information technology	Materials	Telecom	Utilities
Liquidity	0.3	0.2	1.3	2.5	0.9	1.2	1.0	1.8	0.9	0.9
Size	1.4	1.9	0.2	0.9	0.9	0.6	0.6	0.3	(0.7)	0.5
Asset Turnover	1.5	(0.8)	0.1	(0.2)	1.0	1.1	0.5	(1.3)	(0.4)	0.3
Long-Term Reversal	0.4	(1.4)	0.8	1.3	1.1	(0.7)	(1.0)	(0.8)	(0.9)	(0.9)
Earnings Quality	0.3	1.1	(0.6)	0.4	(0.8)	2.6	2.3	(0.3)	0.7	1.2
Momentum	(0.7)	(0.7)	0.3	1.9	(0.8)	0.1	1.5	0.9	1.2	0.0
Leverage	2.3	(1.2)	(0.0)	0.0	(0.5)	0.8	(0.5)	(0.6)	(0.2)	(0.6)
Short-Term Reversal	0.7	1.3	(1.2)	0.6	(0.7)	0.5	(0.4)	0.5	(0.4)	0.8
Seasonality	0.8	(1.8)	0.8	2.0	(1.7)	1.0	(1.1)	(0.8)	2.6	(1.7)
Value	0.1	(0.8)	(0.1)	(0.2)	(2.0)	(0.6)	(0.3)	(0.1)	(1.3)	(1.4)
Industry Momentum	(0.4)	1.6	0.8	(1.3)	(0.0)	(1.7)	(0.7)	1.1	0.3	0.0
Sentiment	(0.0)	1.2	0.2	1.2	(1.1)	(0.0)	(1.5)	(1.3)	(0.8)	0.0
Growth	(2.2)	(1.7)	0.3	1.3	(0.4)	2.0	(0.2)	(0.5)	(0.9)	(1.9)
Prospect	0.3	(1.9)	0.3	(1.6)	(0.9)	(0.4)	1.0	0.1	(2.2)	(0.4)
Beta	0.5	(0.0)	(1.1)	(0.7)	(0.7)	(1.3)	(0.8)	(1.1)	(1.8)	(1.3)
Residual Volatility	0.1	0.6	(0.5)	(0.5)	(1.6)	(1.5)	(0.8)	(1.0)	(0.9)	0.4
Profitability	(1.2)	(0.5)	0.1	0.4	(1.5)	(0.1)	0.3	(1.5)	(0.1)	(0.5)

Across sectors, similar patterns can be observed: Liquidity outperformed in all sectors and Size outperformed in all but Telecom (Exhibit 5).

High beta and residual volatility (specific risk) stocks performed poorly in the Total Market and across the majority of the sectors (Exhibits 4 and 5). Coupling this with the underperformance of more cyclical factor indexes and continued strong performance of the MSCI Minimum Volatility Index (Exhibit 6) suggests increased investor risk aversion.

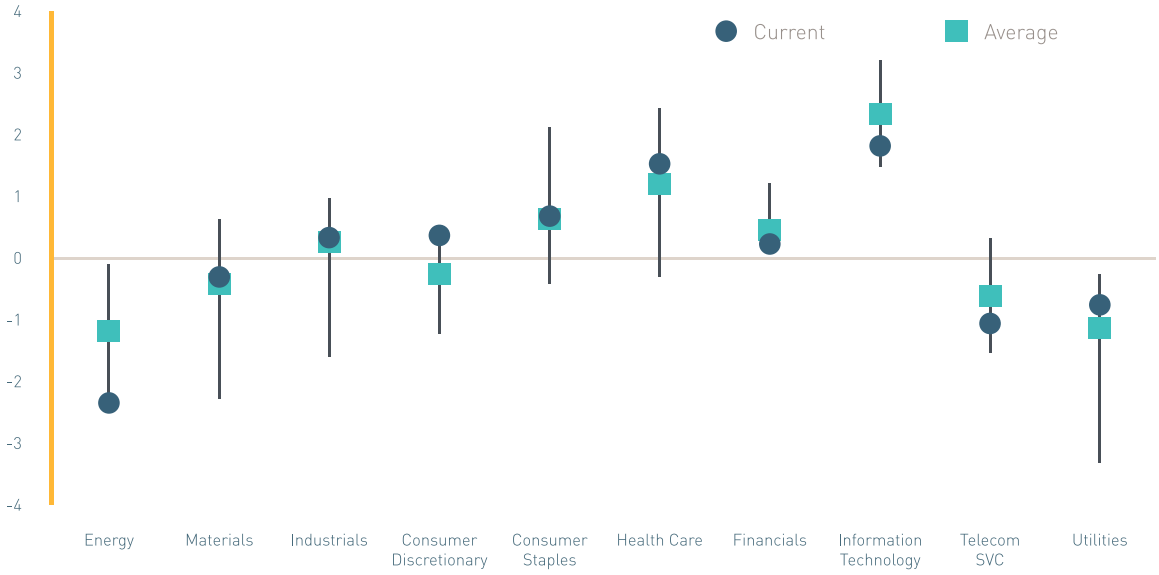
EXHIBIT 6 Factor indexes momentum

This chart shows the total gross return in USD for the MSCI USA Factor Indexes over the last 12 months (x-axis) and three-month (y-axis). Factor Indexes in the top right (bottom left) quadrant are showing positive (negative) momentum – i.e. three-month and one-year returns are positive (negative). On the other hand, those in the top left (bottom right) quadrants are showing positive (negative) reversal – i.e. three-month returns are stronger (weaker) relatively than one-year.

Risk aversion behavior also was evident when one looks at highly levered stocks. Leveraged stocks as a whole had a flat month, ending their downward spiral over the past few months (Exhibit 4). Looking across sectors, highly levered Consumer Discretionary stocks and, to some extent, Industrials, performed well during the month, but other sectors were negative to flat (Exhibit 5).

This observation, combined with the outperformance of the MSCI High Dividend Yield Index, indicates that investors continued to favor companies with high dividend payouts amid uncertainties about when the Fed might hike short-term interest rates. Another indicator of risk-averse behavior was the MSCI Quality Index's strong performance over the last three months, clawing back some of its underperformance against the market year-to-date (Exhibit 6).

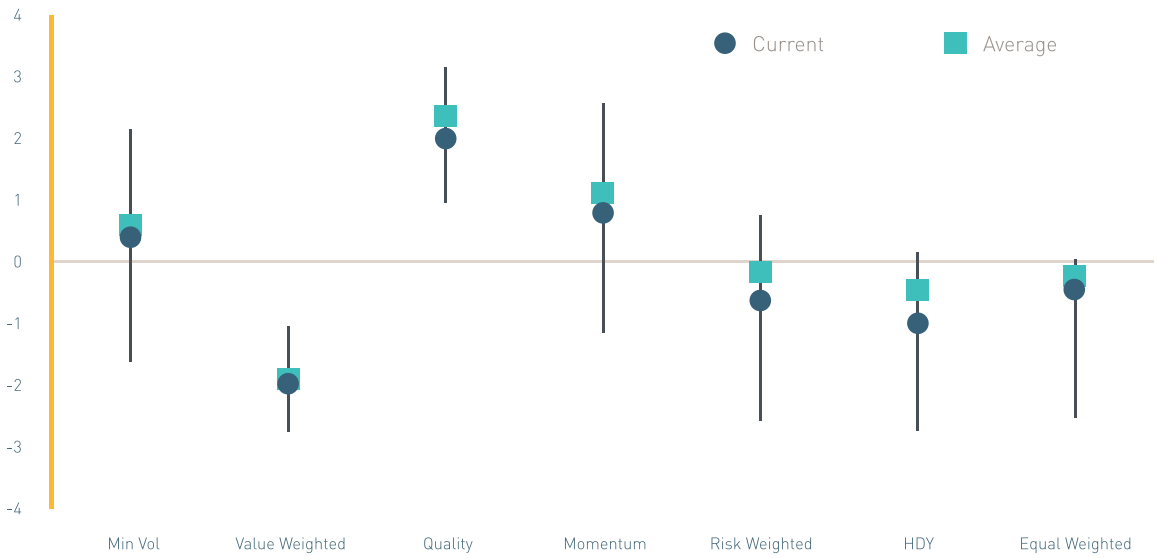
EXHIBIT 7 Relative valuations on MSCI USA Sector Indexes (Nov 2014)



Based on price to earnings, price to book value, price to cash earnings and price to sales at semi-annual index reviews. Values below 0 indicate the sector is cheaper than the parent. A current value below average indicates that the sector is cheap relative to its own history. The line endpoints indicate historical minima and maxima.

Looking at relative valuations of sectors, Energy is now trading at the lows of its long-term valuation — not surprising given its recent sell-off. Similarly, Information Technology is moving towards its historical low. Meanwhile, the cyclical Consumer Discretionary sector appears to be highly valued compared to its historical averages (Exhibit 7).

EXHIBIT 8 Relative Valuations on MSCI Factor Indexes - November 2014



Based on price to earnings, price to book value, price to cash earnings and price to sales at semi-annual index reviews. Values below 0 indicate the sector is cheaper than the parent. A current value below average indicates that the sector is cheap relative to its own history. The line endpoints indicate historical minima and maxima.

However, relative valuations of MSCI Factor Indexes have not become stretched and are in line with their long-term averages (Exhibit 7). This observation holds despite the strong recent outperformance of the Defensive indexes.

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Mehmet is responsible for driving the research agenda for Barra Equity Models globally. Prior to MSCI he was Head of Research and Chief Economist at IS Asset Management, the largest asset management firm in Turkey. Before IS Asset Management, Mehmet was the lead portfolio manager for European and UK quant equity portfolios and the GS Dynamic Asset Allocation Fund in the Quantitative Investment Strategies group at Goldman Sachs Asset Management. He holds an MBA and MSc in Finance and Economics from the University of Chicago and London School of Economics and Political Science respectively.

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Ting is a Vice President and a member of the client consultant team at MSCI. Ting's responsibilities include client education and training, product implementation and on-boarding, as well as custom-projects design and execution based on client's specific needs and objectives. Before joining MSCI in 2010, he worked at Ivy Asset Management, the Fund of Hedge Funds division of Bank of New York Mellon.

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GLOBAL RISK MONITOR

Using a standard RiskMetrics forecasting model, the monthly MSCI Global Risk Monitor shows forecasts for 12 key global risk factors. We examine changes in volatility and correlation behavior, and identify days when factor returns were surprising relative to the risk forecasts.

DECEMBER 2014

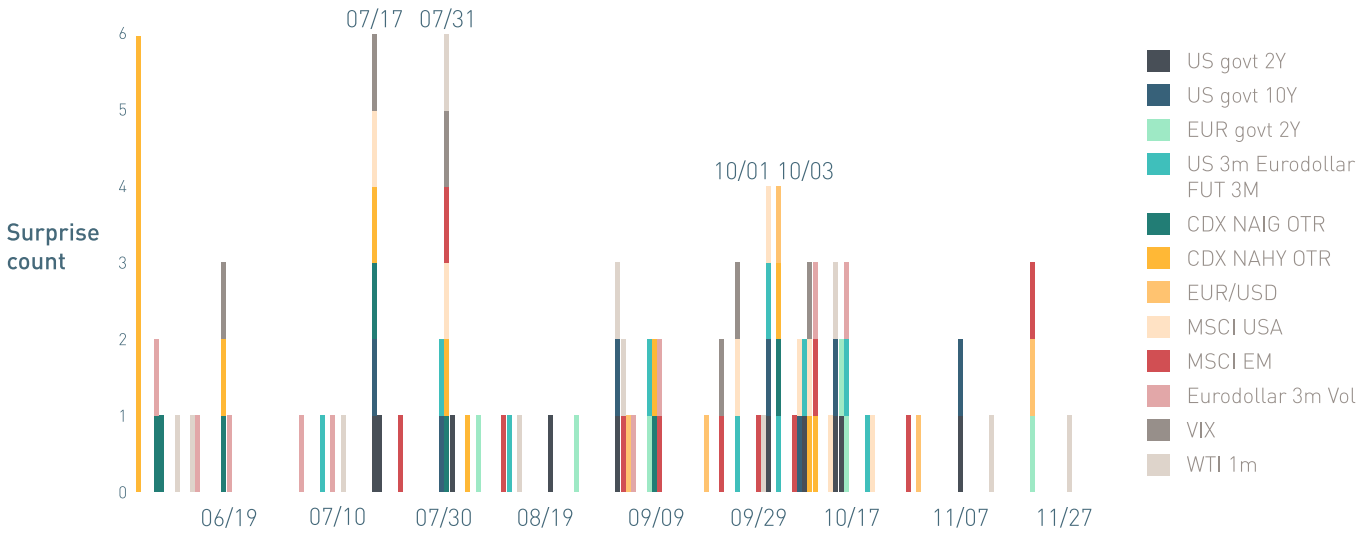
OIL PRICE VOLATILITY DISRUPTS A QUIET MONTH

After a very turbulent October, November 2014 saw the markets return to the low volatility environment of previous months, with most of the risk factors that we monitor experiencing relatively low volatility. There were only seven exceedances over the period as compared to 33 exceedances in October. One notable exception was the change in oil prices.

Oil prices, as measured by the WTI one-month risk factor, experienced an increase in volatility in November. Over the past months, there has been a downward pressure on oil prices due to weak global growth and rumors on OPEC's little willingness to cut its output, which further contributed to investor nervousness. This peaked on November 28, after an OPEC meeting resulted in no decision on output cuts. Oil prices dropped and showed a negative return of -10.77 percent, which is around seven times the volatility estimate of the WTI one-month oil price (Figure 2).

RISK FACTOR SURPRISE DAYS

FIGURE 1: Daily returns exceeding two times forecast volatility



Date range: June 01, 2014 to November 30, 2014

November was a relatively calm month, with far fewer exceedances than in October. However, there are two important exceptions: November 21 and November 28. There were three exceedances on November 21, making it the largest cluster in the month. This occurred after a speech was delivered by Mr. Draghi, President of the European Central bank, which increased investors' expectations of further support to the European bond markets. On November 28, there was a spike in oil price volatility, as measured by the WTI one-month risk factor.

FORECAST VOLATILITY

VOLATILITY STATS FOR EWMA (DECAY FACTOR OF 0.97)

TABLE 1: Risk forecast of daily absolute changes in rates (bps) over prior month, prior three months and prior year (decay = 0.97)

	Prior month[1]				Prior 3 months[2]				Prior year[3]			
	Return	Avg. vol.	Min. vol.	Max. vol.	Return	Avg. vol.	Min. vol.	Max. vol.	Return	Avg. vol.	Min. vol.	Max. vol.
US govt 2Y	-2.15	2.32	2.15	2.50	-1.44	2.18	1.81	2.54	18.94	1.85	1.36	2.54
US govt 10Y	-19.43	3.85	3.60	4.02	-17.93	3.82	3.51	4.17	-65.07	4.03	3.43	4.94
EUR govt 2Y	3.27	1.10	**1.06**	1.19	-0.07	1.15	**1.06**	1.28	-14.98	1.47	1.05	2.01
US 3m Eurodollar Fut 3m	0.15	0.38	0.35	0.39	0.04	0.34	0.24	0.45	0.06	0.36	0.23	0.62

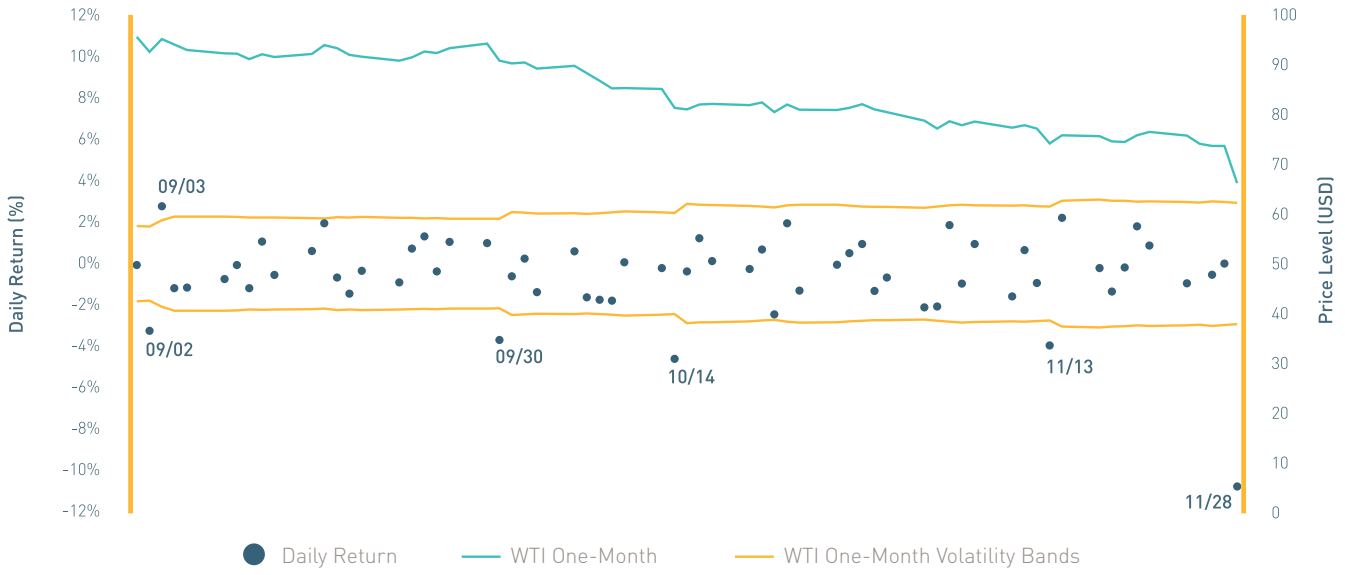
Overall, we see markets returning to the low volatility regime, with very few risk factors hitting a three-month high volatility. Exceptions are the EUR/USD exchange rate and the WTI one-month oil price, which reached a one-year high maximum volatility. The 17.78 percent drop in the oil price over November was mainly driven by the exceptionally large negative return on November 28.

TABLE 2: Risk forecast of daily relative (log) changes over prior month, prior three months, and prior year (decay = 0.97)

	Prior month[1]				Prior 3 months[2]				Prior year[3]			
	Return	Avg. vol.	Min. vol.	Max. vol.	Return	Avg. vol.	Min. vol.	Max. vol.	Return	Avg. vol.	Min. vol.	Max. vol.
CDX NAIG OTR	-4.04%	2.47%	2.29%	2.74%	7.91%	2.54%	2.13%	3.00%	-12.05%	2.14%	1.52%	3.00%
CDX NAHY OTR	-2.52%	2.15%	1.99%	2.40%	7.51%	2.15%	1.79%	2.57%	-1.58%	1.89%	1.44%	2.57%
EUR/USD	-0.50%	0.42%	0.40%	**0.44%**	-5.36%	0.36%	0.23%	**0.44%**	-8.44%	0.33%	0.23%	**0.44%**
MSCI USA	2.42%	0.77%	0.68%	0.87%	2.98%	0.70%	0.50%	0.90%	14.43%	0.66%	0.49%	0.90%
MSCI EM	-1.12%	0.72%	0.68%	0.75%	-7.64%	0.66%	0.51%	0.76%	-1.33%	0.67%	0.47%	0.84%
Eurodollar 3m Vol	16.61%	5.48%	4.92%	6.17%	28.12%	5.79%	4.74%	6.84%	-3.05%	5.89%	4.67%	6.90%
VIX	-4.99%	7.70%	6.89%	8.63%	10.62%	7.43%	5.87%	9.28%	-2.70%	6.51%	4.82%	9.28%
WTI 1m	-17.78%	1.50%	1.38%	**2.36%**	-30.87%	1.31%	0.89%	**2.36%**	-28.69%	1.02%	0.71%	**2.36%**

1 Prior month date range: November 01, 2014 - November 30, 2014. **2** 3 month date range: September 01, 2014 - November 30, 2014. **3** One year date range: December 01, 2013 - November 30, 2014
Highlighted prior month volatilities indicate that the volatility level reached its minimum/maximum value of the last three months or twelve months. The relevant three-month/ twelve-month minimum/ maximum values are highlighted as well.

FIGURE 2: WTI one-month oil price



Oil prices (green line) erode throughout the month as volatility of daily returns of the WTI one-month oil price (blue dots) increases, and the two-standard deviation volatility bands widen on a 0.97 EWMA volatility estimate (orange).

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As member of the risk methodology team, Thomas works on the development of new methodologies for Barra and RiskMetrics risk models. He is a CFA charter holder and holds a PhD in applied economics from KU Leuven, Belgium.

RISK FACTOR DEFINITIONS

CDX NAIG OTR

Five-year North American Investment Grade CDS Index Spread Level, constructed by MSCI using the most liquid five-year North American Investment Grade CDS Index and smoothed over a period when a new series becomes on-the-run.

CDX NAHY OTR

Five-year North American High Yield CDS Index Spread Level, constructed by MSCI using the most liquid five-year North American High Yield CDS Index and smoothed over a period when a new series becomes on-the-run.

EUR two-year government bond

Euro government two-year Zero Rate, constructed by MSCI from on-the-run German Bunds.

EUR/USD

Mid quote for EUR/USD Foreign Exchange Rate snapped at 1100 EST. Appears in the report each month

Eurodollar three-month volatility

Implied volatility time series of three months at-the-money options on Eurodollar interest rate futures.

Europe two-year government bond

Euro two-year Zero Rate, constructed by MSCI from on-the-run German Treasury bonds..

MSCI emerging market index

Time series of MSCI Emerging Market Equity Index using end-of-day closing prices.

MSCI EM Europe Index in EUR

The MSCI Emerging Market Europe equity index using end-of-day closing prices quoted in Euros.

MSCI USA Index

Time series of MSCI USA equity index using end-of-day closing prices.

US 10-year government bond

US Government 10-Year Zero Rate, constructed by MSCI from on-the-run US Treasury bonds.

US three-month Eurodollar Futures three-month rate

Interest rate of three-month interest rate futures calculated by MSCI based on CME Eurodollar futures quotes on three-month deposits.

US two-year government bond

US Government Two-Year Zero Rate, constructed by MSCI from on-the-run US Treasury bonds.

VIX

Time series of the CBOE Market Volatility Index using end-of-day closing prices.

WTI

One-Month Crude Oil: One-Month CME light sweet crude oil time series. One-Month tenor constructed as a Constant Maturity Future time series by interpolating the first two nearterm CL futures contracts.

MSCI RESEARCH SPOTLIGHT

MULTI-FACTOR INDEXES MADE SIMPLE

A REVIEW OF STATIC AND DYNAMIC APPROACHES

Multi-factor index fund allocations are increasingly becoming the preferred approach to factor investing. In this paper, we examine the return/risk characteristics of nine static and dynamic weighting strategies over a 36-year period. The results highlight that a simple strategy that equal weights multiple factor indexes has historically proved more effective than many of the more complex approaches — pointing to its potential as a way to combine factors, especially in the absence of active investment views and skills. However, a dynamic factor weighting strategy based on fundamental signals also has merit if the investor believes she has the insight or skills required.

KEY FINDINGS

- A simple equal-weighted strategy has been highly effective historically. Many simple rules-based and optimization-based dynamic weighting strategies have failed to match its performance after accounting for turnover cost.
- Fundamentals-based approaches have produced attractive risk-adjusted returns in simulation. The three strategies tested here have delivered higher active returns against the equal-weighted strategy, highlighting the potential benefits of exploiting fundamental insights in the construction of a multi-factor index. Such strategies, however, are active in nature and typically come with the extra costs of higher turnover and greater complexity.
- As investors explore multi-factor investing, the equal-weighted strategy index — which we call Simple Diversification — brings simplicity, transparency and robustness to the investment process and can serve as an attractive starting point for factor allocation.

A Six-Factor Simple Diversification Index

A Simple Diversification multi-factor index provides the simplest combination of factors by equally weighting factor indexes. We use six MSCI World factor indexes — Equal Weighted, Value Weighted, Quality, Momentum, Minimum Volatility and High Dividend Yield — to represent six well-researched risk premia. We consider the Simple Diversification a static approach to factor allocation, as the weight for each factor is defined as 1/n. The multi-factor index captured the long-term risk premia but offered smoother performance than any of the underlying factor indexes, as shown in Exhibit 1. The long-term outperformance and low active correlations among the MSCI Factor Indexes help explain this phenomenon.

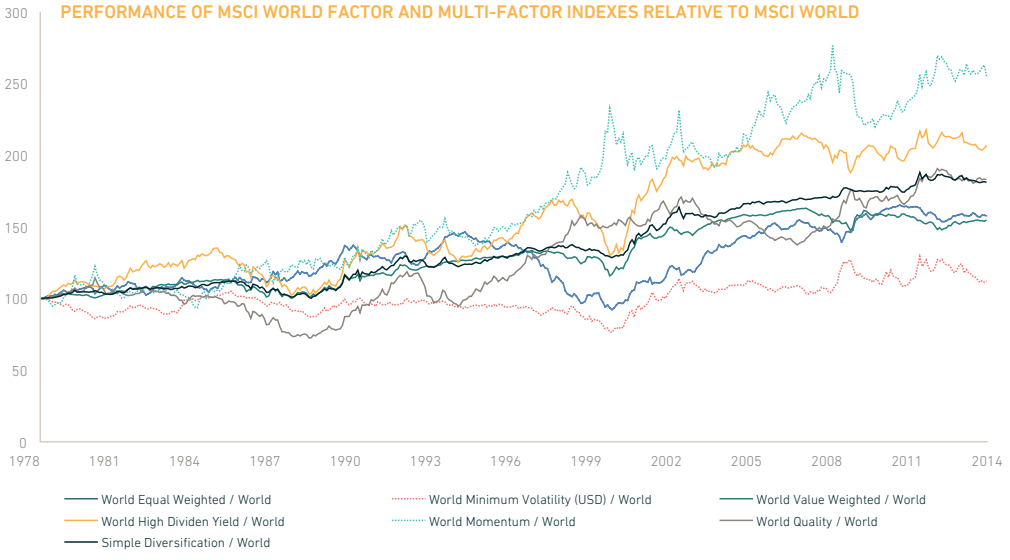
While a Simple Diversification multi-factor index may look naïve in terms of construction, it represents a reasonable starting point for investors who want exposure to systematic risk premia but do not have specific views on the expected risk or return of the underlying factor indexes nor the skills to actively manage factor exposures.

Simple Rules-Based and Optimization Weighting Approaches

Going beyond Simple Diversification in a dynamic multi-factor index requires active views on factors and skills to manage the related exposures. A dynamic factor allocation model adjusts weights regularly — overweighting factors expected to outperform and underweighting factors expected to underperform. The investment belief is that factors have different return streams and active factor allocation can add value. There are many possible approaches to achieve a dynamic factor allocation. Here, we focus on a few that can be replicated with a set of mechanical rules.

- The Inverse of Variance and Risk Parity strategies can be considered risk-based approaches. The underlying investment beliefs are that overweighting factors with lower volatility or balancing the risk contribution of each factor could improve risk diversification and help achieve better risk-adjusted returns.
- The Inverse of Tracking Error and Tracking Error Optimization approaches add a risk budgeting dimension. The former aims to minimize the tracking error of the multi-factor index without optimization. The latter seeks to maximize the return outcome using mean-variance optimization subject to a tracking error constraint.
- Finally, the Trend Following strategy takes a conventional momentum strategy and applies it to factor allocation.

EXHIBIT 1: SIMPLE DIVERSIFICATION HAS HISTORICALLY OFFERED A SMOOTHER RIDE



Return/Risk Profiles of Simple Rules-Based and Optimization-Based Strategies

The Inverse of Variance and Risk Parity strategies produced risk and return characteristics similar to those of the Simple Diversification strategy during the November 1978 to March 2014 period. This can be explained by the fact that weights of various factor indexes are stable in these two strategies and did not differ from equal weighting. Inverse weighting each factor index based on its tracking error would not have added much value either.

Optimization techniques are typically employed when investors have a set of objectives and constraints they want in their portfolios. But optimization can be complex, requiring accurate risk and return inputs. The Tracking Error Optimization multi-factor index outperformed the cap-weighted benchmark but underperformed other multi-factor strategies including Simple Diversification. It also had the lowest information ratio in the study.

The only rules-based strategy that outperformed the Simple Diversification strategy is the Trend Following approach. It produced slightly higher return/risk and information ratios, suggesting that factor indexes exhibited some forms of momentum behavior that could be exploited. However, it would have experienced greater variations in factor weights and hence higher index turnover.

The Fundamentals-based Approach

The Fundamentals-based approach to multi-factor indexing refers to the systematic implementation of fundamental or valuation-based investment strategies following specified rules or algorithms. Its core tenet is that fundamental data contain important signals that can be used to understand the drivers of volatilities and correlations among assets, as shown in Exhibit 2.

While using valuation or a measure of quality to weight each factor index is a rational approach, we recognize that each factor premium may be better captured by a different fundamental signal. For instance, the Minimum Volatility Index has historically delivered superior risk-adjusted returns during high volatility regimes. A volatility indicator such as the VIX may provide a better signal to help manage the volatility factor exposure. Thus, we can anchor different factor exposures to relevant signals. We call this the "Blended Factors" approach.

Return/Risk Profiles of Fundamentals-Based Strategies

Historically, the use of valuation or other fundamental signals would have improved the performance of multi-factor indexes without significant increases in the total risk, as shown in Exhibit 3.

EXHIBIT 2: EXAMPLES OF FUNDAMENTALS-BASED STRATEGIES

Multi-Factor Strategy	Investment Belief	Possible Approach	Weighting Scheme
Valuation Based	Factor indexes may become overcrowded and/or expensive which may impair performance	Overweight cheap factor indexes/underweight expensive ones	Normalized current E/P level*
Quality Based	Factor indexes with higher ROE will outperform ones with lower ROE	Overweight high ROE indexes/ underweight low ROE ones	Normalized current ROE*
Blended Factors	Factor indexes perform well when the underlying signal is strong	Weight each factor index based on the strength of its underlying signal	Normalized E/P spread* (Value) Normalized effective number of stocks* (Size) Normalized ROE spread* (Quality) Normalized D/P spread* (Yield) Normalized VIX (Low Volatility) Normalized past 6-month momentum* (Momentum)

* Compared to its own history

We make the following observations:

- Valuation-based and Quality-based multi-factor indexes produced similar risk and return characteristics over the November 1978 to March 2014 period, but the Valuation-based index produced a higher information ratio and a lower maximum active drawdown.
- The Blended Factors multi-factor index provided the strongest return, outpacing the Simple Diversification strategy by 100 basis points without a significant increase in risk.
- The simulated performance suggests that an investor might have been able to add value to a multi-factor portfolio by managing factor exposures with the right signals.

EXHIBIT 3: PERFORMANCE OF FUNDAMENTAL SIGNAL STRATEGIES

	MSCI World	Simple Diversification	Valuation-Based	Quality-Based	Blended Factors
Total Return* (%)	10.6%	12.4%	13.0%	12.9%	13.4%
Total Risk* (%)	15.1%	13.9%	13.9%	13.8%	14.0%
Return/Risk	0.70	0.90	0.94	0.93	0.96
Maximum Drawdown	-53.7%	-52.0%	-51.9%	-51.5%	-49.7%
Active Return*		1.9%	2.4%	2.3%	2.9%
Performance Drag (bps) **		26.3	39.0	38.5	44.8
Active Return (Net of Performance Drag)		1.6%	2.0%	1.9%	2.4%
Tracking Error*		3.3%	3.9%	4.2%	3.7%
Information Ratio***		0.49	0.52	0.46	0.65
Maximum Active Drawdown		-10.7%	-9.7%	-12.2%	-10.9%
One-way Index Turnover ****	3.0				
Separate Mandates		35.4	63.8	64.5	76.1
Combined Mandate		26.3	39.0	38.5	44.8

* Annualized gross return (USD) from 11/30/1978 to 03/31/2014
** Performance drag calculated based on annualized two-way index turnover for combined mandate assuming a transaction cost of 50bps
*** Information Ratio is calculated using active return (net of performance drag)
**** Annualized one-way index turnover for the 05/31/1999 to 03/31/2014 period

CONCLUSION

There are many ways to construct multi-factor indexes. We use nine weighting strategies to proxy different investment approaches and examine the return/risk characteristics over a 36-year period. The results highlight that a Simple Diversification approach to constructing multi-factor indexes has historically proved more effective than many of the more complex approaches — pointing to its potential as a way to combine factors, especially in the absence of active investment views and skills.

Dynamic factor allocation strategies have their merits as well—particularly for those with the requisite views and skills. The Blended Factors strategy would have provided the best overall return/risk profile among the dynamic strategies analyzed. In considering whether to manage a multi-factor index via a simple equal weighting or more dynamic weighting strategies, the decision depends on investors' investment beliefs and process and — critically — whether they are confident of possessing the insight or skills to manage factor exposures dynamically.

If you'd like to read more about any of these subjects, please visit msci.com/resources/research_papers for the full version of this research paper.

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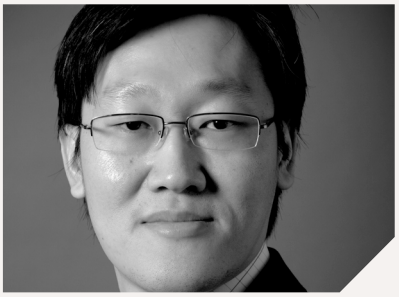

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1 Based on P&I AUM data as of December 2013 and internal MSCI data as of September 2014.
2 Based on "The Hedge Fund 100" from Institutional Investor in June 2014 and internal MSCI data as of June 2014.

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