

May 5, 2016

Global Quantitative Research

Buy (Sell) in Season for Better Short-Term Results

We introduce a stock level seasonality factor which can help investors improve the short-term performance of a fundamental or quantitative strategy. April is the third month of an ongoing global rotation into value and out of momentum.

Our stock level seasonality factor, which consists of buying (selling) stocks that have out (under) performed their regional peers in the same calendar month over the past five years, has a 40-year (1975-2016) track record of robust performance on a 1-month horizon with mild drawdowns in North America, Europe and Japan. The effect, which doesn't have a compelling economic explanation, is not materially related to existing factors. While its very high turnover makes it impractical as a stand-alone quant strategy, it can enhance the short-term performance of fundamental or quantitative strategies based on fundamental and/or momentum metrics. Stocks with favorable (unfavorable) rankings per *both* our MOST model and the seasonality factor have out (underperformed) the top/bottom quintile of MOST materially since 2003. **Screens of stocks with both favorable/unfavorable seasonality and MOST rankings are in [Exhibit 16](#) and [Exhibit 17](#).**

Value and dividend yield have been effective globally in April, adding another month to the ongoing rotation into value, while momentum and revisions have failed globally, along with profitability and trailing growth metrics. Price momentum still has a very negative net beta and large active sector weights (including overweight staples and healthcare and underweight financials). **As momentum volatility remains high, we still recommend trimming short or underweight positions in momentum laggards that are large volatility contributors ([Exhibit 28](#) and [Exhibit 29](#)).** The list includes a large number of financial stocks in Europe and energy/materials/industrials stocks in APxJ & EM. High beta/junk have outperformed low beta/high quality across regions, highlighting the "risk on" mood of global investors. In that context, MOST has done well in Europe and Japan (with Q1-Q5 spreads of +0.4% and +1.0%) and was flat in APxJ & EM.

Since October 2014, most traditional quant factors have experienced a material degradation in performance in Japan, and only size (small vs. mega caps), the low beta/volatility anomaly and quality (high quality vs. junk) have fared well. This time period is coincident with a material ramp up in equity ETF purchases by the BoJ. While the distortive effects of those ETF purchases are likely to manifest themselves within large caps, the degradation in performance since 10/2014 has been similar within large, mid and small caps for most factors. Price momentum and accruals are notable exceptions as they have performed materially better within small caps since then.

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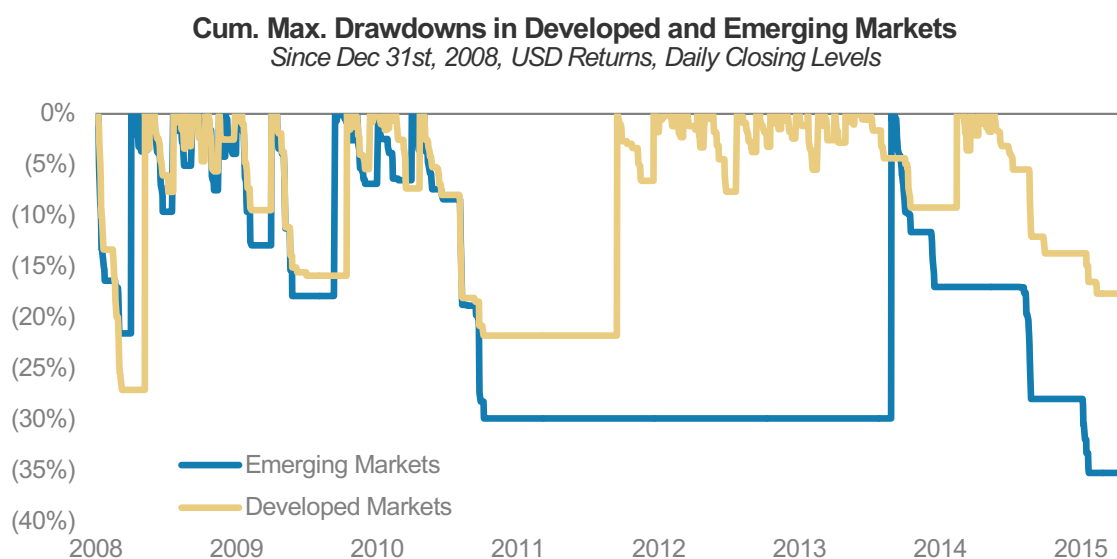
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Macro and Market Dynamics

Developed and emerging markets both exhibited positive performance in April, with USD total returns of +1.6% for the MSCI World index and +0.6% for the MSCI Emerging Markets index. As of the end of April, the max. cumulative drawdowns since the prior peak were still -17.7% in developed markets and -35.2% in emerging markets. [Exhibit 1](#) shows the cumulative maximum performance drawdown for the MSCI World and the MSCI Emerging Markets, based on daily closing values and returns expressed in USD, starting on December 31st, 2008. The charts show cumulative returns during down markets. Once a bottom is reached, the cumulative drawdown remains at its trough level until the market has recovered its previous high, at which point it is reset to zero and stays there until the next downturn starts.

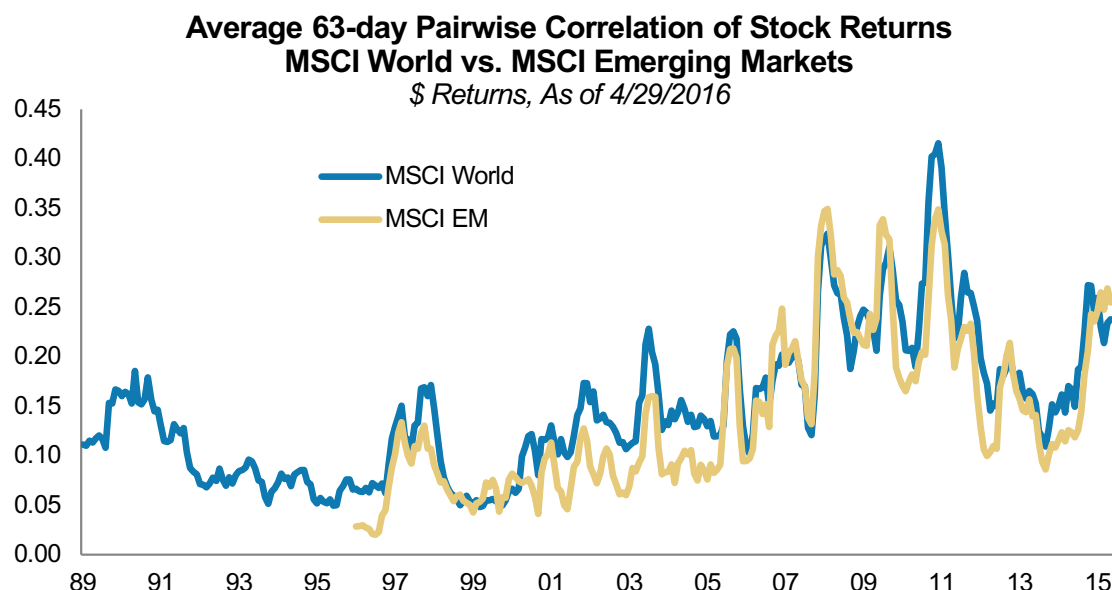
Exhibit 1: Both developed and emerging markets exhibited positive performance in April 2016



Source: FactSet, Morgan Stanley Research

We use the average pairwise correlation of stock returns as an indicator of the importance of macro effects (as opposed to stock specific ones) in explaining stock returns. **After receding in 2012 as the European sovereign debt crisis abated, correlations started rising sharply in May 2015. The average pairwise stock return correlations remained elevated at the end of April in both developed and emerging markets, even though they have receded somewhat in the past couple of months.** [Exhibit 2](#) is based on members of the MSCI World and MSCI Emerging Markets indices. Correlations were calculated using daily stock returns and were measured over rolling 63-day (three month) periods.

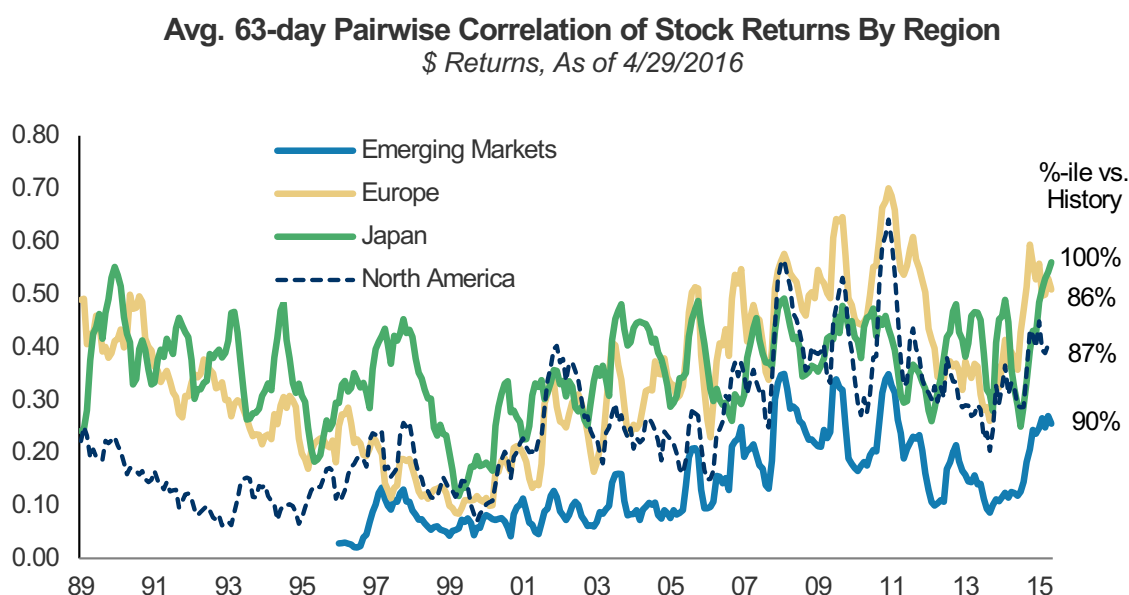
Exhibit 2: At the end of April, pairwise correlations remained elevated in both developed and emerging markets



Source: FactSet, Morgan Stanley Research

The historical pairwise correlations by region are shown in [Exhibit 3](#), and confirm that the importance of macro effects remains high across regions. **Current levels of stock return correlations in North America, Europe, Japan and emerging markets are in the 87th, 86th, 100th and 90th percentiles relative to history since 1988 (1995 for emerging markets).** While outside Japan, pairwise correlations have receded somewhat, such is not the case in Japan, where they keep increasing.

Exhibit 3: Pairwise correlations remained very high in April 2016, across regions

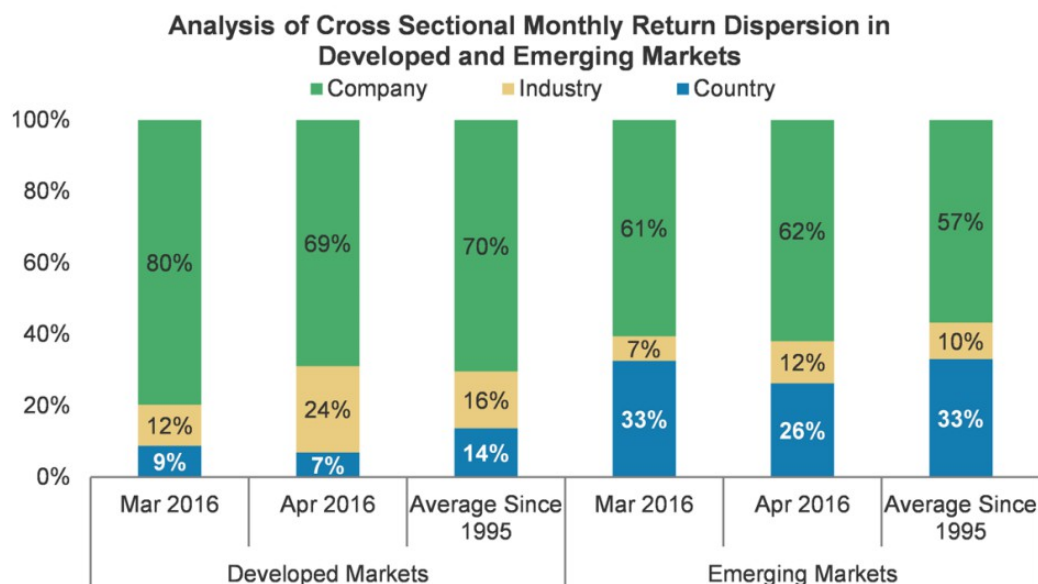


Source: FactSet, Morgan Stanley Research

Besides top-down macro factors, country or industry specific drivers also help explain disparities in stock returns. In order to quantify the relative importance of country vs. industry vs. company specific effects, we perform an analysis of variance with the aim of explaining monthly returns as a function of country and industry group (24 GICS level 2 groups) indicators, in both developed and emerging markets. The results of the analysis for March 2016, April 2016, and the average since 1995 are shown in [Exhibit 4](#). **The contribution from**

industry selection in developed markets in April has been much higher than the historical average since 1995.

Exhibit 4: The contribution from industry selection in developed markets in April has been much higher than the historical average since 1995



Source: FactSet, Morgan Stanley Research

In **Exhibit 5**, we look at the average April returns (USD, cap weighted) by industry group and region on a 24x4 grid, based on the stocks in our model universe. The top and bottom performing regional industry groups are highlighted in yellow and grey. **In March, the best performing regional industry groups are either in Japan or in global energy materials, and banks** (i.e. industry groups that have substantially underperformed in the first two months of the year). **The majority of the underperforming segments are in North America or in European technology and telecom.**

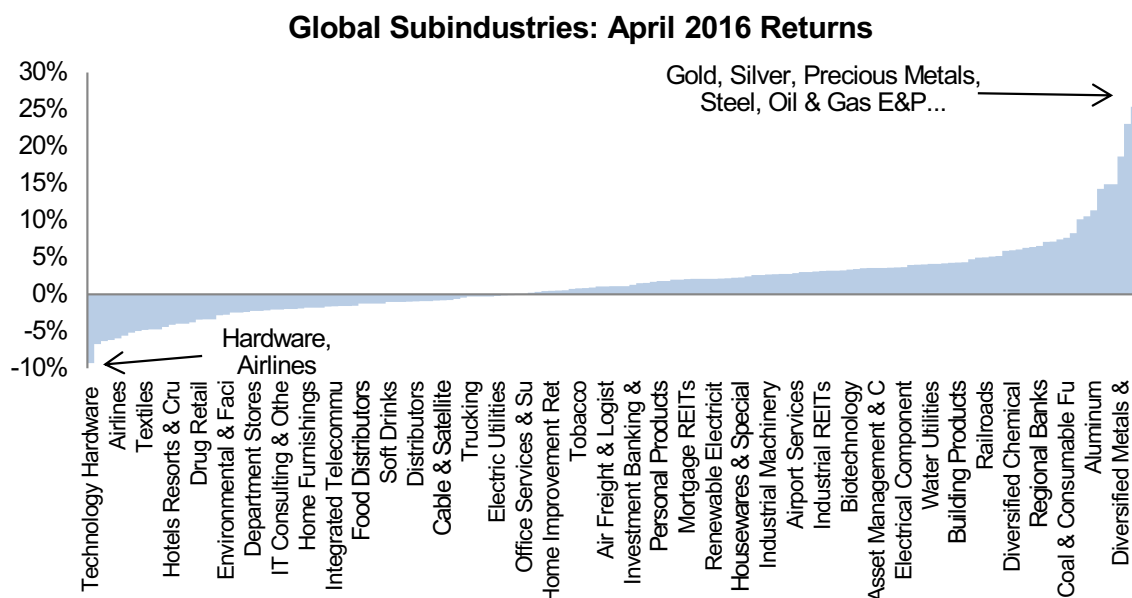
Exhibit 5: The best performing regional industry segments in April are either in global energy, materials and banks or in Japan.

April 2016 USD Return By Regional Industry Group									
	Europe	Japan	APxJ & EM	North Am.		Europe	Japan	APxJ & EM	North Am.
Energy	8.5%	12.5%	7.9%	9.0%	HH Products	1.5%	4.0%	4.2%	(1.5%)
Materials	7.0%	8.0%	7.7%	8.0%	HC Equipment & Svcs	0.8%	6.1%	1.3%	3.4%
Capital Goods	1.0%	6.4%	(0.4%)	2.1%	Pharma/Biotech	3.2%	8.3%	0.4%	2.9%
Business Svcs.	1.4%	5.9%	2.7%	(0.8%)	Banks	6.4%	5.1%	2.9%	6.8%
Transportation	4.3%	3.9%	(0.0%)	1.7%	Div.Financials	3.7%	1.9%	(0.1%)	3.7%
Autos	0.9%	0.6%	(1.7%)	0.4%	Insurance	1.9%	2.1%	0.6%	1.4%
Cons. Durables	(0.2%)	1.7%	(1.4%)	(2.4%)	Real Estate	0.7%	4.8%	2.4%	(1.5%)
Cons. Svcs.	(1.7%)	(0.3%)	(1.4%)	(3.3%)	Software & Svcs	(1.5%)	1.5%	0.0%	(3.4%)
Media	(2.3%)	2.3%	0.9%	0.8%	Hardware	(4.4%)	6.9%	(5.2%)	(9.3%)
Retailing	0.9%	1.3%	1.8%	0.6%	Semis	(2.3%)	5.9%	(7.2%)	(4.5%)
Food Retail	(1.1%)	0.4%	1.9%	(3.8%)	Telecom	(1.9%)	10.8%	(0.1%)	(1.8%)
Food, Bev., Tob.	1.0%	3.9%	1.5%	0.1%	Utilities	3.8%	(0.6%)	(0.5%)	(1.8%)

Source: FactSet, Morgan Stanley Research

The industry group level performance can mask important differences at a more granular level, so we also examine the monthly performance of global subindustries. **Exhibit6** shows that in April, precious metals, steel and oil & gas E&P have been the top performing global subindustries, while hardware and airlines have been notable underperformers. Precious metals are continuing their run that started in December.

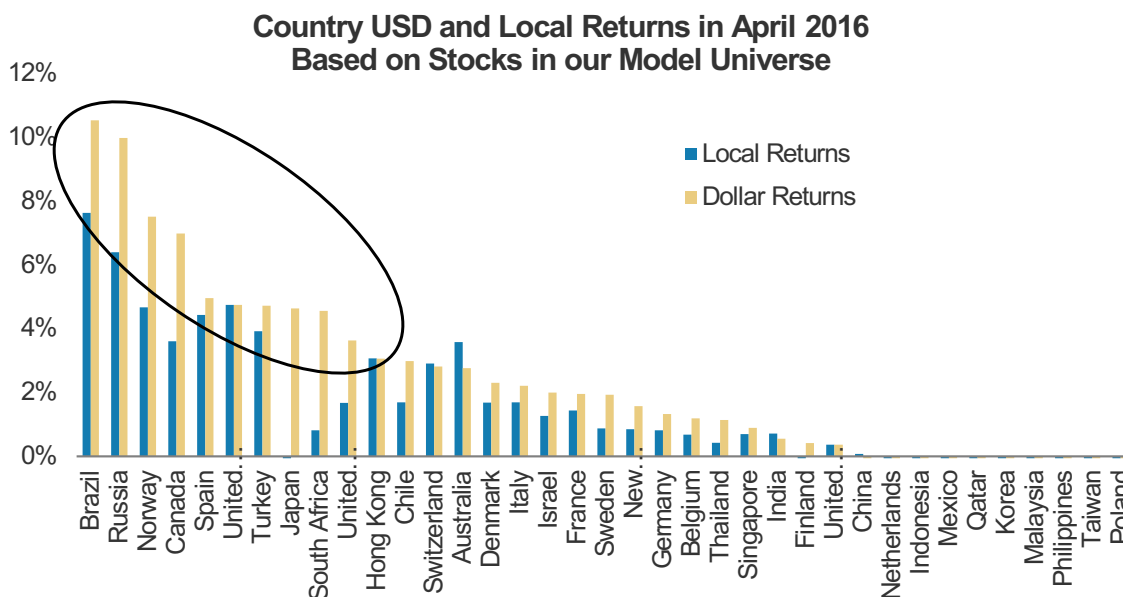
Exhibit 6: Precious metals, steel and oil & gas E&P have been among the best performing global subindustries in April



Source: FactSet, Morgan Stanley Research

April country performance (based on our model universe, which contains more stocks than the MSCI country indices), calculated in terms of USD and local currency float-weighted total returns, is shown in [Exhibit 7](#). **The top performing countries are natural resources oriented (Brazil, Russia, Norway, and Canada), as a result of both local currency gains and currency appreciation.** Brazil has topped our monthly country chart for the second month in a row. Bottom performers include several Asian emerging markets who had fared better than the overall EM universe during the first two months of 2016. Note that Japan has appreciated materially in USD terms in April, as a result of the strong appreciation by the Japanese yen.

Exhibit 7: Natural resources oriented countries (including Brazil, Russia, Norway and Canada) are among the best performing in April



Source: FactSet, Morgan Stanley Research

As we are entering the May through October period, the "Sell in May and go away" phrase is likely to reappear on top of investors' minds, and the historical seasonality pattern may reinforce other arguments in favor of an

upcoming correction in global markets (for example: weak early Q2 macro data in Asia, investor sentiment at historical highs). In a prior note - [Global Quantitative Research: Reversal Rally and Seasonal Patterns \(04 Nov 2015\)](#) -, we documented the presence of seasonality in market returns, showing, for example, that in Europe, monthly returns in the May through October period have been weaker than those in the rest of the calendar year. We also evidenced some seasonality patterns in factor premiums, showing - among other things - that **in May and June, low beta/high quality stocks tend to outperform high beta/junk stocks, especially in Europe and APxJ & EM.**

While lesser known, seasonality patterns can also be observed in individual stocks. We created a stock level seasonality factor as follows: for a given stock at the end of calendar month m , we look at the stock's performance during calendar month $m+1$ (if m is December, then $m+1$ is January) in each of the past 5 years before month m . We then rank order each of the five monthly returns relative to regional peers and then derive cross sectional z-scores based on the ranks. Our final seasonality factor is the average of the five z-scores. **Thus, our seasonality factor at the end of calendar month m favors (disfavors) the stocks that have had high (low) average returns during calendar month $m+1$ over the past five years relative to their regional peers.**

Our data for most factors starts in 1988 for developed markets and 1995 for emerging markets. However, in order to create the most extended possible back test of the seasonality factor, we use MSCI price data (instead of our total returns data series, which starts in 1985) to create both the factor and the forward 1-month return data used in evaluating the factor's performance. As a result, the performance numbers in our long term back test are based on USD price returns instead of total returns. By doing so, **we are able to analyze the performance of the seasonality factor going back to 1975 in developed markets (1993 in emerging markets).** Further analysis, not displayed in the note, shows that on the time period from January 1988 to April 2016, for which we have both types of returns, the performance of seasonality factor is not substantially different whether one uses price or total returns for the factor's construction or to measure its performance. [Exhibit 8](#) summarizes the Q1-Q5 average annualized monthly performance of the seasonality factor by region over the whole period from January 1975 to April 2016 and by decade. **The seasonality factor has performed well over the past four decades on average in North America, Europe and Japan. However, while performance in Europe has been broadly consistent across the decades in Europe, the seasonality factor has experienced a significant decline in performance in North America over the most recent decade.** Performance has been weak in APxJ (developed Asia Pacific ex. Japan) and in emerging markets, except in the most recent decade.

Exhibit 8: The seasonality factor has been effective on average over the past four decades in North America, Europe and Japan

Seasonality Factor: Annualized Monthly Q1-Q5 Performance By Region

MSCI Universe, Jan 1975 - Apr 2016

	Average Ann. Rel. Returns					Ann. Information Ratios				
	North America	Europe	Japan	APxJ	EM	North America	Europe	Japan	APxJ	EM
1975-2016	6.8%	9.9%	6.6%	3.6%	2.9%	0.86	1.18	0.59	0.24	0.21
By decade:										
1975-1984	4.6%	15.7%	10.1%	(3.4%)	na	0.64	1.39	0.90	(0.18)	na
1985-1994	13.2%	6.0%	3.7%	4.9%	na	1.63	0.82	0.25	0.29	na
1995-2004	8.4%	10.6%	6.9%	(0.1%)	(0.8%)	0.90	1.34	0.63	(0.01)	(0.04)
2005-2016	1.5%	7.5%	5.9%	11.8%	5.7%	0.22	1.25	0.99	1.45	0.68

Source: FactSet, Morgan Stanley Research

[Exhibit 9](#) provides a more detailed look at the overall historical Q1-Q5 performance by region. We measure the propensity to generate drawdowns using the 5% conditional value at risk, which is calculated as the average Q1-Q5 efficacy in the 5% worst months over the past four decades. **The seasonality factor has generated mild drawdowns since 1975, especially in Europe and North America. However, its annualized monthly turnover is much higher than that of the traditional quantitative factors in our MOST stock selection model.**

Exhibit 9: The seasonality factor has exhibited mild drawdowns but high turnover since 1975, across regions

Seasonality Factor: Long Term Performance By Region

MSCI Universe, Jan 1975 - Apr 2016

	North America			Europe		
	Q1	Q5	Q1-Q5	Q1	Q5	Q1-Q5
Ann. Avg. Rel. Return	3.9%	(3.0%)	6.8%	4.7%	(5.2%)	9.9%
Ann. Standard Deviation	4.5%	4.5%	8.0%	4.2%	4.7%	8.3%
Ann. Information Ratio	0.86	(0.66)	0.86	1.11	(1.09)	1.18
% Outperforming Months	61%	41%	61%	65%	35%	69%
Monthly Turnover	77%	76%	153%	77%	76%	154%
5% Conditional VAR*	(2.6%)	(2.8%)	(4.7%)	(2.2%)	(2.5%)	(4.5%)
	Japan			APxJ		
Ann. Avg. Rel. Return	4.0%	(2.7%)	6.6%	2.7%	(0.9%)	3.6%
Ann. Standard Deviation	6.0%	6.3%	11.2%	7.5%	8.6%	14.6%
Ann. Information Ratio	0.66	(0.42)	0.59	0.36	(0.10)	0.24
% Outperforming Months	59%	42%	60%	58%	44%	57%
Monthly Turnover	79%	78%	157%	76%	75%	152%
5% Conditional VAR*	(3.5%)	(4.2%)	(7.1%)	(5.1%)	(6.1%)	(10.3%)

* For Q5, the 5% Conditional VAR is calculated on the 5% HIGHEST Monthly Returns

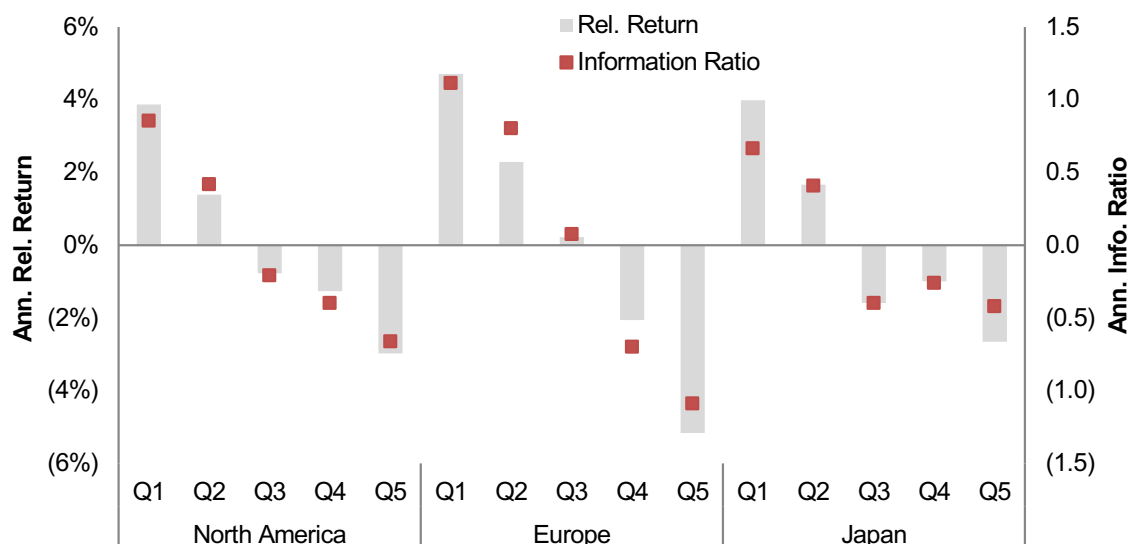
Source: FactSet, Morgan Stanley Research

An attractive property of a quantitative factor is the presence of a monotonic relationship between factor rankings and performance, and its presence reduces the possibility that performance differentials between factor tails is an artifact of data mining. **Exhibit 10** shows that the performance of the seasonality factor in North America, Europe and Japan is monotonically related to factor rankings.

Exhibit 10: The performance of the seasonality factor has been monotonically related to factor rankings in North America, Europe and Japan

Seasonality Factor: Ann. Performance By Quintile

MSCI Universe, Jan 1975 - Apr 2016



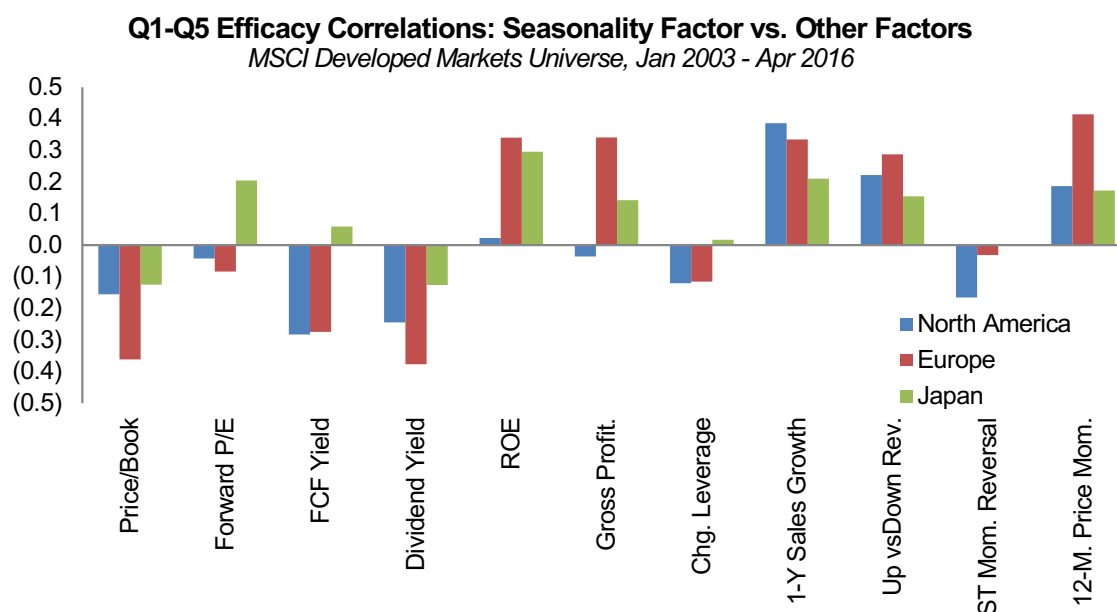
Source: FactSet, Morgan Stanley Research

There is no commonly accepted and compelling theory explaining the presence of seasonality patterns at the stock level. The tax loss harvesting behavior, i.e. the propensity by investors to sell ahead of the fiscal year (and buy back after the fiscal year has passed) in order to generate capital losses as been mentioned as an explanatory factor for December/January seasonality patterns, but we are not aware of explanations related to other calendar months. Keloharju, Linnainmaa and Nyberg (2015) is a broad study of seasonality patterns in individual stocks, country returns, and asset classes. **The authors show that stock level**

seasonality can be in large part explained by seasonality in the premiums to systematic factors. One of their key findings is that 50% of the stock level seasonality premium can be explained by seasonality patterns in the returns to size, industry, dividend yield and value factors. Note that the equity related portion of their analysis was based on US stocks. Our own empirical analysis of seasonality patterns in factor returns indicate the presence of mild seasonal effects within global markets outside North America.

We looked at the correlations of Q1-Q5 monthly efficacies between the seasonality factor and various traditional quantitative factors by region since January 2003 ([Exhibit 11](#)). The seasonality factor doesn't exhibit an obvious, strong correlation with the traditional factors. **The seasonality factor seems to be the most correlated with ROE (in the 3 regions), year-over-year sales growth (in the 3 regions) and 12-month price momentum (in Europe).**

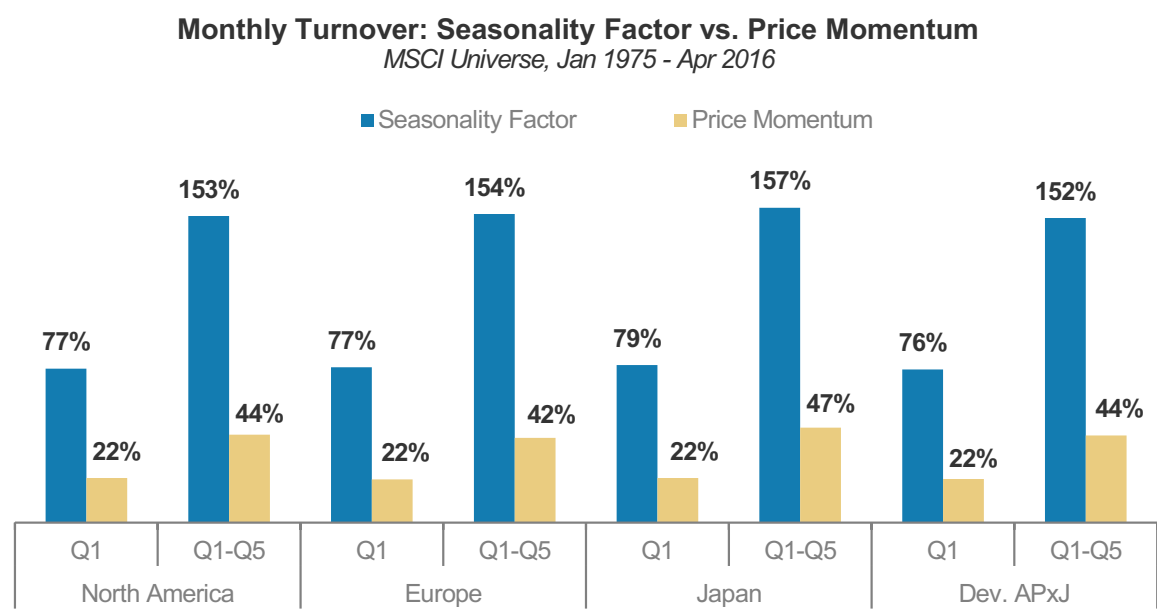
Exhibit 11: Among traditional factors, the seasonality factor seems to be the most correlated with ROE, year-over-year revenue growth and 12-month price momentum



Source: FactSet, Morgan Stanley Research

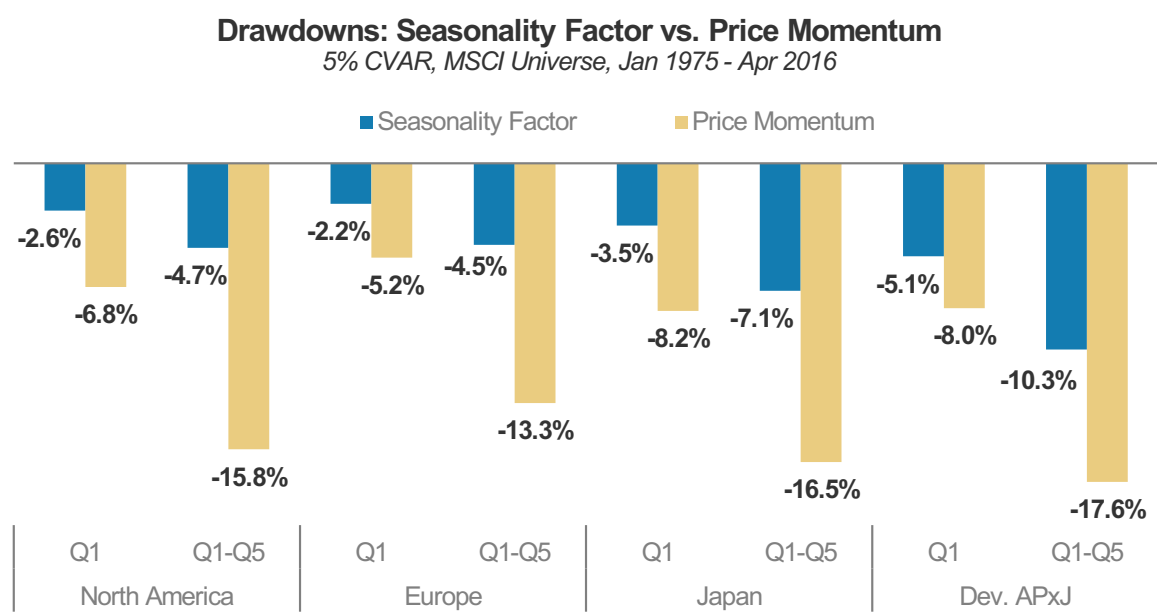
Given the definition of the seasonality factor, it is not inconceivable that it could have some relation with 12-month price momentum. However, the seasonality factor differs materially from 12-month price momentum along two dimensions: turnover and drawdowns. [Exhibit 12](#) shows that across regions, the seasonality factor's turnover is more than 3x that of price momentum, which is already a high turnover factor relative to fundamental or valuation measures. However, as shown in [Exhibit 13](#), the seasonality factor has much milder drawdowns.

Exhibit 12: The turnover of the seasonality factor is more than 3 times that of 12-month price momentum



Source: FactSet, Morgan Stanley Research

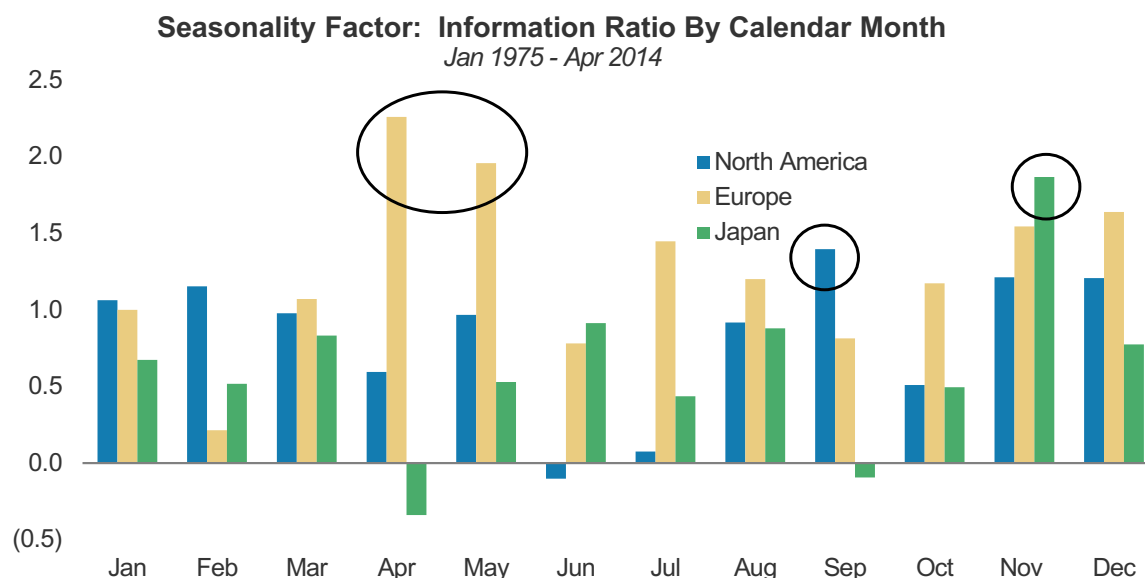
Exhibit 13: ...but its drawdowns have been much milder



Source: FactSet, Morgan Stanley Research

The seasonality factor itself has exhibited some calendar seasonality patterns over the past forty years, as illustrated in [Exhibit 14](#). Its best performing months have been April and May in Europe, September in North America and November in Japan.

Exhibit 14: The seasonality factor has exhibited some calendar seasonality over the past forty years



Source: FactSet, Morgan Stanley Research

In spite of its shallow drawdowns and high information ratios in North America, Europe and Japan, the seasonality factor is unlikely to be used as a standalone quantitative strategy because of its extremely high turnover. However, it could be useful in combination with a stock selection model, in the tactical implementation of an equity strategy (not necessarily quantitative). For example, an investor could delay the purchase of a stock that screen well on fundamental metrics, but has poor seasonality rankings. [Exhibit 15](#) shows, for stocks in developed markets, the average annualized monthly performance, relative to the equal weighted regional average, by quintile of our MOST stock selection model and of the seasonality factor, since January 2003.

Stocks with high (low) rankings for both our stock selection model and the seasonality factor have outperformed (underperformed) the most.

Exhibit 15: Stocks with high (low) rankings for both our stock selection model and the seasonality factor have outperformed (underperformed) the most

Avg. Stock Performance By MOST and Seasonality Quintile													
MSCI Developed Markets Universe. Jan 2003 - Apr 2016													
Information Ratios						Avg. Ann. Relative Returns							
MOST Model Ranking	Seasonality Quintile					MOST Model Ranking	Seasonality Quintile						
	Q1	Q2	Q3	Q4	Q5		Q1	Q2	Q3	Q4	Q5		
	Q1	2.06	2.07	1.98	1.44		1.26	Q1	6.6%	5.3%	4.6%	4.3%	4.3%
	Q2	1.34	0.77	0.79	0.41		0.08	Q2	4.9%	2.0%	1.9%	1.1%	0.3%
	Q3	0.36	0.48	0.17	(0.21)		(0.22)	Q3	1.2%	1.3%	0.4%	(0.6%)	(0.7%)
	Q4	(0.15)	(0.32)	(0.54)	(1.05)		(1.21)	Q4	(0.5%)	(0.9%)	(1.4%)	(3.2%)	(3.7%)
	Q5	(0.87)	(1.60)	(1.67)	(2.26)		(1.83)	Q5	(3.2%)	(5.1%)	(5.5%)	(6.1%)	(7.0%)

Source: FactSet, Morgan Stanley Research

[Exhibit 16](#) and [Exhibit 17](#) show screens of European and Japanese stocks that have favorable (unfavorable) rankings for both the MOST model and the seasonality factor.

Exhibit 16: Stocks with favorable MOST and seasonality rankings in Europe and Japan

Sedol	Ticker	Company Name	Country	Sector	Market Cap (USD Bn)
Europe					
7110388	ROG-CH	ROCHE HOLDING GENUSS	Switzerland	Health Care	218.4
B24CGK7	RB-GB	RECKITT BENCKISER GROUP	United Kingdom	Consumer Staples	68.9
0237400	DGE-GB	DIAGEO	United Kingdom	Consumer Staples	68.1
3091357	BT.A-GB	BT GROUP	United Kingdom	Telecommunication Services	65.0
B3MSM28	AMS-ES	AMADEUS IT HOLDINGS A	Spain	Information Technology	20.1
7062713	SW-FR	SODEXO	France	Consumer Discretionary	15.9
0922320	SN-GB	SMITH & NEPHEW	United Kingdom	Health Care	15.3
4169219	CARL.B-DK	CARLSBERG B	Denmark	Consumer Staples	14.9
3180943	LAND-GB	LAND SECURITIES GROUP	United Kingdom	Financials	13.0
7742468	GFC-FR	CECINA	France	Financials	9.2
0682538	PSN-GB	PERSIMMON	United Kingdom	Consumer Discretionary	8.8
BZ4BQC7	JMAT-GB	JOHNSON MATTHEY	United Kingdom	Materials	8.2
B1YW440	III-GB	3I GROUP	United Kingdom	Financials	6.6
B02L3W3	BKG-GB	BERKELEY GRP HLDGS UNIT	United Kingdom	Consumer Discretionary	5.9
5961544	WDH-DK	WILLIAM DEMANT HOLDING	Denmark	Health Care	5.7
B2987V8	RMV-GB	RIGHTMOVE GROUP	United Kingdom	Information Technology	5.6
5962332	STM-FR	STMICROELECTRONICS	France	Information Technology	5.3
B01MJR4	BIM-FR	BIOMERIEUX	France	Health Care	5.1
B0R7JF1	IPN-FR	IPSEN	France	Health Care	5.1
B5ZN1N8	SGRO-GB	SEGRO	United Kingdom	Financials	4.6
7598003	HER-IT	HERA	Italy	Utilities	4.4
5499131	A2A-IT	A2A	Italy	Utilities	4.4
B01FLG6	GFS-GB	G4S	United Kingdom	Industrials	4.2
3169889	WMH-GB	WILLIAM HILL	United Kingdom	Consumer Discretionary	4.0
B1L3CS6	UBI-FR	UBISOFT ENTERTAINMENT	France	Information Technology	3.4
4501093	GN-DK	GN STORE NORD	Denmark	Health Care	3.2
Japan					
6251363	1925-JP	DAIWA HOUSE INDUSTRY	Japan	Financials	18.0
6054409	2502-JP	ASAHI GROUP HOLDINGS	Japan	Consumer Staples	16.0
6010906	2802-JP	AJINOMOTO CO	Japan	Consumer Staples	14.0
6597067	7011-JP	MITSUBISHI HEAVY IND	Japan	Industrials	12.1
B62G7K6	8630-JP	SOMPO JAPAN NIPPONKOA	Japan	Financials	11.2
6483489	9503-JP	KANSAI ELECTRIC POWER CO	Japan	Utilities	8.8
6616508	6724-JP	SEIKO EPSON CORPORATION	Japan	Information Technology	6.7
6744294	8795-JP	T&D HOLDINGS	Japan	Financials	6.6
BFDTB3	3291-JP	IIDA GROUP HOLDINGS CO	Japan	Consumer Discretionary	5.6
6641544	6471-JP	NSK	Japan	Industrials	4.8
6497082	6473-JP	JTEKT CORP	Japan	Industrials	4.3
6900289	4042-JP	TOSOH CORP	Japan	Materials	3.0
B249G00	3088-JP	MATSUMOTOKIYOSHI HLDGS	Japan	Consumer Staples	2.7
6858731	6302-JP	SUMITOMO HEAVY IND	Japan	Industrials	2.6
6900557	7282-JP	TOYODA GOSEI CO	Japan	Consumer Discretionary	2.3
6470588	4114-JP	NIPPON SHOKUBAI CO	Japan	Materials	2.1
6639840	7248-JP	CALSONIC KANSEI CORP	Japan	Consumer Discretionary	1.9
6651189	6472-JP	NTN CORP	Japan	Industrials	1.6
6476218	9787-JP	AEON DELIGHT	Japan	Industrials	1.5
6576356	9744-JP	MEITEC CORP	Japan	Industrials	1.2

Source: FactSet, Morgan Stanley Research. For important disclosures regarding companies that are the subject of this screen, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures. For valuation methodology and risks associated with any price targets, ratings and recommendations referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-5424-4349. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway (Attention: Research Management), New York, NY 10036 USA. Prices as of 05/04/2016 (on primary exchange in local currency): ROG-CH: 240.5, RB-GB: 66.88, DGE-GB: 18.605, BT.A-GB: 4.482, AMS-ES: 39.7, SW-FR: 87.92, SN-GB: 11.7, CARLB-DK: 630, LAND-GB: 11.34, GFC-FR: 125.9, PSN-GB: 19.76, JMAT-GB: 29, III-GB: 4.67, BKG-GB: 29.51, WDH-DK: 680.5, RMV-GB: 40.01, STM-FR: 5.029, BIM-FR: 113.25, IPN-FR: 52.83, SGRO-GB: 4.224, HER-IT: 2.5640001, A2A-IT: 1.208, GFS-GB: 1.869, WMH-GB: 3.145, UBI-FR: 26.425, GN-DK: 126.6, 1925-JP: 2869.5, 2502-JP: 3519, 2802-JP: 2500.5, 7011-JP: 381.6, 8630-JP: 2865, 9503-JP: 997.8, 6724-JP: 1772, 8795-JP: 1033.5, 3291-JP: 2026, 6471-JP: 930, 6473-JP: 1342, 4042-JP: 483, 3088-JP: 5230, 6302-JP: 454, 7282-JP: 1886, 4114-JP: 5550, 7248-JP: 724, 6472-JP: 329, 9787-JP: 3000, 9744-JP: 3800.

Exhibit 17: Stocks with unfavorable MOST and seasonality rankings in Europe and Japan

Sedol	Ticker	Company Name	Country	Sector	Market Cap (USD Bn)
Europe					
7110753	LHN-CH	LAFARGEHOLCIM	Switzerland	Materials	28.5
5641567	CA-FR	CARREFOUR	France	Consumer Staples	20.6
7184736	UHRN-CH	SWATCH GROUP NAM	Switzerland	Consumer Discretionary	18.6
7634394	TIT-IT	TELECOM ITALIA	Italy	Telecommunication Services	17.7
B1HDJL2	KN-FR	NATIXIS	France	Financials	16.4
B2QPKJ1	FRES-GB	FRESNILLO PLC	United Kingdom	Materials	11.5
B1X8QN2	SAB-ES	BANCO SABADELL	Spain	Financials	10.1
B4R2R50	BAER-CH	JULIUS BAER GROUP	Switzerland	Financials	9.2
B01C3S3	RRS-GB	RANDGOLD RESOURCES	United Kingdom	Materials	9.0
B1VSK10	INDU.A-SE	INDUSTRIVARDEN A	Sweden	Financials	8.2
5474008	BKT-ES	BANKINTER	Spain	Financials	6.7
BBHXP6	POP-ES	BANCO POPULAR ESPANOL	Spain	Financials	5.4
B97C733	TEL2.B-SE	TELE2 B	Sweden	Telecommunication Services	4.3
B71QPM2	DKSH-CH	DKSH HOLDING	Switzerland	Industrials	4.2
B019M65	AZM-IT	AZIMUT HOLDING	Italy	Financials	3.4
B0BKSS2	VIG-AT	VIENNA INSURANCE GROUP	Austria	Financials	2.8
B156T57	SBMO-NL	SBM OFFSHORE	Netherlands	Energy	2.7
7135251	CE-IT	CREDITO EMILIANO	Italy	Financials	2.3
B0LDBX7	INDT-SE	INDUTRADE	Sweden	Industrials	2.3
4491097	CTY1S-FI	CITYCON	Finland	Financials	2.3
BWX4DD6	BMPS-IT	BANCA MONTE PASCHI	Italy	Financials	2.1
Japan					
6499260	6971-JP	KYOCERA CORP	Japan	Information Technology	18.9
6408664	9042-JP	HANKYU HANSHIN HOLDINGS	Japan	Industrials	8.0
B3QX5G4	4581-JP	TAISHO PHARM HOLDINGS CO	Japan	Health Care	7.5
6858849	5713-JP	SUMITOMO METAL MINING CO	Japan	Materials	6.8
6487362	9008-JP	KEIO CORP	Japan	Industrials	5.5
6487306	9006-JP	KEIKYU CORP	Japan	Industrials	5.0
6900267	5901-JP	TOYO SEIKAN GROUP HLDGS	Japan	Materials	4.3
6667733	4666-JP	PARK24 CO	Japan	Industrials	4.2
6591809	8253-JP	CREDIT SAISON CO	Japan	Financials	3.5
B8BSRY1	3279-JP	ACTIVIA PROPERTIES	Japan	Financials	3.3
6220501	4751-JP	CYBER AGENT	Japan	Consumer Discretionary	3.0
B1530B1	8985-JP	JAPAN HOTEL REIT INV	Japan	Financials	3.0
6642967	9031-JP	NISHI-NIPPON RAILROAD CO	Japan	Industrials	2.3
6108179	6324-JP	HARMONIC DRIVE SYSTEMS	Japan	Industrials	2.2
6496506	7984-JP	KOKUYO CO	Japan	Industrials	1.7
B5MTK10	2193-JP	COOKPAD	Japan	Information Technology	1.6
6893884	1860-JP	TODA CORP	Japan	Industrials	1.5
6170167	9449-JP	GMO INTERNET	Japan	Information Technology	1.4
6126892	6425-JP	UNIVERSAL ENTMT CORP	Japan	Consumer Discretionary	1.3
6657808	1833-JP	OKUMURA CORP	Japan	Industrials	1.2
6136374	7599-JP	GULLIVER INTERNATIONAL	Japan	Consumer Discretionary	1.1
6646237	9716-JP	NOMURA CO	Japan	Industrials	1.0
6083704	7864-JP	FUJI SEAL INTERNATIONAL	Japan	Materials	1.0

Source: FactSet, Morgan Stanley Research. For important disclosures regarding companies that are the subject of this screen, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures. Prices as of 05/04/2016 (on primary exchange in local currency):

LHN-CH: 44.69, CA-FR: 24.255, UHRN-CH: 62.8, TIT-IT: 0.8365, KN-FR: 4.542, FRES-GB: 10.71, SAB-ES: 1.596, BAER-CH: 39.33, RRS-GB: 66.05, INDU.A-SE: 155.9, BKT-ES: 6.435, POP-ES: 2.177, TEL2.B-SE: 76.2, DKSH-CH: 61.9, AZM-IT: 20.87, VIG-AT: 19.245, SBMO-NL: 11.06, CE-IT: 6.065, INDT-SE: 453.5, CTY1S-FI: 2.198, BMPS-IT: 0.617, 6971-JP: 5320, 9042-JP: 671, 4581-JP: 8840, 5713-JP: 1236.5, 9008-JP: 914, 9006-JP: 966, 5901-JP: 2106, 4666-JP: 3055, 8253-JP: 1989, 3279-JP: 583000, 4751-JP: 5100, 8985-JP: 96800, 9031-JP: 625, 6324-JP: 2491, 7984-JP: 1424, 2193-JP: 1575, 1860-JP: 502, 9449-JP: 1285, 6425-JP: 1703, 1833-JP: 555, 7599-JP: 1054, 9716-JP: 1838, 7864-JP: 3630

Factor Efficacy Patterns

We have an extended library of 70+ factors and, as mentioned in our launch note [Global Quantitative Research: Finding Alpha in Global Equity Markets \(21 Sep 2015\)](#), we classify quantitative alpha factors into different groups that have a low correlation with each other. In the following exhibits, we analyze the regional performance in April 2016 for a few factors from the various groups.

Exhibit 18 summarizes the Q1-Q5 performance of deep value and current value factors by region, where factors are ranked at the regional industry group (sector for APxJ & EM) level. **Value factors have been effective across regions in April, with the exception of current value in North America. The broad rotation towards value that we observed since the beginning of the year continued in April.** Note that deep value factors have done better than current value factors last month, highlighting the risk seeking mood of global investors.

Exhibit 18: Value factors have been effective globally in April, with the exception of current value in North America

Select Valuation Factors Top/Bottom Quintile Return Spread in Recent Months
Global Markets, Equally Weighted Top/Bottom Quintile Factor Returns in \$, As of 04/30/2016

		Europe			Japan			Asia Ex-Japan & Emerging Markets			North America		
		Monthly Average			Monthly Average			Monthly Average			Monthly Average		
		Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months
Deep Value	Price-to-Book	4.1%	2.4%	(0.4%)	1.3%	(0.3%)	(0.1%)	1.7%	3.6%	0.5%	1.9%	2.4%	(0.2%)
	Price-to-Sales	3.2%	2.7%	(0.2%)	1.8%	(0.2%)	(0.0%)	1.7%	3.0%	0.5%	0.7%	2.6%	0.6%
	Normalized P/E	3.7%	2.7%	(0.6%)	0.5%	0.1%	0.1%	2.8%	3.8%	0.8%	1.4%	2.3%	0.5%
	Cash-to-Market Cap	2.8%	1.8%	(0.7%)	0.9%	(0.8%)	(0.2%)	2.0%	3.0%	(0.1%)	2.0%	1.9%	(0.2%)
Current Value	Forward P/E	1.2%	0.2%	(0.4%)	0.8%	(1.2%)	(0.5%)	0.1%	2.5%	0.4%	(1.6%)	0.2%	0.1%
	EV-to-EBITDA	2.6%	2.1%	0.1%	(0.2%)	(1.3%)	(0.4%)	(0.3%)	2.2%	1.0%	(1.2%)	1.9%	0.7%
	Price-to-Oper. CF	2.1%	3.0%	0.4%	2.8%	(0.3%)	(0.3%)	1.0%	3.4%	1.1%	(0.5%)	2.5%	0.7%
	FCF Yield	0.8%	1.5%	0.9%	0.1%	(0.3%)	(0.2%)	(0.4%)	0.3%	0.8%	(2.8%)	(0.4%)	0.8%

Source: FactSet, Morgan Stanley Research

Profitability and growth metrics have failed across global markets in April, as shown in [Exhibit 19](#). **By contrast, dividend yield was effective across regions in April**, which is not surprising given the continued focus by investors on yield strategies in the current environment of very low yields globally. Accruals has also been moderately effective outside Japan in April.

Exhibit 19: Across global markets, dividend yield has been effective in April, while profitability and trailing growth metrics have failed

Select Alpha Factors Top/Bottom Quintile Return Spread in Recent Months
Global Markets, Equally Weighted Top/Bottom Quintile Factor Returns in \$, As of 04/30/2016

		Europe			Japan			Asia Ex-Japan & Emerging Markets			North America		
		Monthly Average			Monthly Average			Monthly Average			Monthly Average		
		Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months
Capital Use	Dividend Yield	2.5%	1.5%	(0.7%)	1.3%	0.1%	0.1%	0.4%	2.7%	0.8%	1.7%	2.3%	(0.2%)
	Net Buyback Yield	(0.3%)	0.4%	0.5%	(0.4%)	(0.4%)	(0.2%)	(1.4%)	0.2%	0.1%	(1.5%)	(0.4%)	0.8%
	Capex-to-Depreciation	1.3%	0.7%	0.7%	1.0%	(0.0%)	(0.2%)	(0.8%)	(0.9%)	0.4%	(0.2%)	(0.2%)	(0.0%)
	Accruals	2.4%	1.9%	0.4%	0.8%	0.3%	0.0%	(0.2%)	0.8%	0.8%	0.9%	1.5%	0.7%
Profitability	Return on Equity	(4.3%)	(2.2%)	0.7%	(2.4%)	(0.6%)	(0.2%)	(1.6%)	(1.4%)	0.6%	(2.9%)	(1.8%)	0.7%
	Gross Profit Over Assets	(0.9%)	(0.3%)	0.6%	(2.4%)	(0.6%)	(0.0%)	(1.2%)	(1.0%)	0.5%	(2.4%)	(1.9%)	0.3%
	Net Margin 5-Year Z-Scores	(2.8%)	(1.6%)	0.7%	(1.9%)	(1.0%)	0.0%	(2.3%)	(2.4%)	(0.1%)	(2.2%)	(2.1%)	0.2%
	Change in LT Debt-to-Assets	0.4%	(0.1%)	0.2%	(0.2%)	(1.0%)	(0.3%)	(1.0%)	(0.3%)	0.2%	(1.2%)	0.7%	0.4%
Growth	YoY Sales Growth	(2.6%)	(1.6%)	0.6%	(1.4%)	(0.4%)	(0.3%)	(0.1%)	(1.7%)	(0.0%)	(0.1%)	(1.2%)	(0.8%)
	YoY EBITDA Growth	(2.0%)	(1.4%)	0.4%	(1.9%)	(1.3%)	(0.2%)	(1.9%)	(2.5%)	(0.4%)	(1.3%)	(1.4%)	(0.3%)

Source: FactSet, Morgan Stanley Research

Price momentum and revision factors performed poorly across regions in April, as shown in [Exhibit 20](#). On a daily basis, we have been observing a rotation out of momentum in North America and Europe since the end of January.

Exhibit 20: Price momentum and revisions factors have failed globally in April

Select Momentum Factors Top/Bottom Quintile Return Spread in Recent Months
Global Markets, Equally Weighted Top/Bottom Quintile Factor Returns in \$, As of 04/30/2016

		Europe			Japan			Asia Ex-Japan & Emerging Markets			North America		
		Monthly Average			Monthly Average			Monthly Average			Monthly Average		
		Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months
Momentum	1-Month Momentum Reversal	(0.4%)	(0.0%)	(0.7%)	1.4%	0.0%	(0.6%)	(1.9%)	0.2%	(0.4%)	(3.0%)	0.3%	(0.4%)
	3-Month Momentum	(6.1%)	(3.3%)	0.2%	(4.1%)	(1.0%)	(1.0%)	(1.8%)	(4.1%)	(1.5%)	(8.6%)	(5.6%)	(0.6%)
	9-Month Momentum	(8.3%)	(4.6%)	0.9%	(5.8%)	(1.5%)	(0.1%)	(3.1%)	(5.8%)	(0.6%)	(9.0%)	(6.3%)	0.5%
	12-Month Momentum	(8.7%)	(4.6%)	1.0%	(6.7%)	(2.2%)	(0.2%)	(2.4%)	(5.5%)	(0.2%)	(7.6%)	(6.2%)	0.4%
Revisions	Earnings Revisions	(6.4%)	(4.1%)	0.3%	(4.6%)	(1.9%)	(0.3%)	(2.1%)	(3.5%)	(0.2%)	(3.1%)	(3.5%)	0.6%
	Revenue Revisions	(6.0%)	(4.3%)	0.5%	(4.3%)	(1.4%)	(0.1%)	(2.1%)	(3.5%)	(0.1%)	(2.9%)	(3.5%)	0.3%
	Up/Down EPS Revisions	(3.4%)	(1.8%)	0.3%	(2.6%)	(0.8%)	0.1%	0.4%	(0.8%)	0.6%	(1.8%)	(1.8%)	0.0%

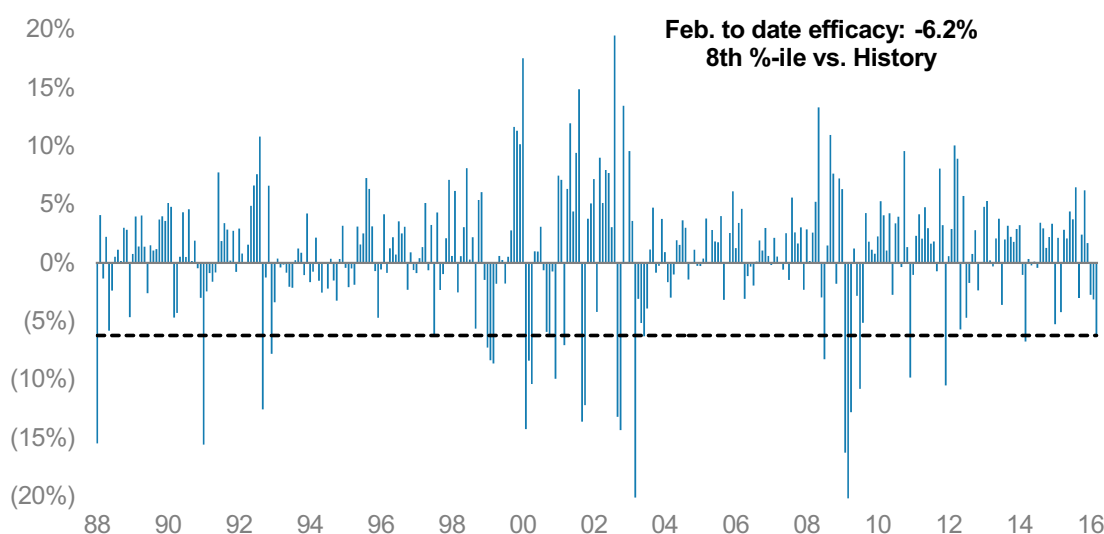
Source: FactSet, Morgan Stanley Research

12-month price momentum (including the most recent month) generated a very negative Q1-Q5 spread in April in Europe (-6.2%, in the 8th percentile relative to history since 1988), as shown in Exhibit 21. The factor had already generated a -2.7% Q1-Q5 spread in February, and a -3.1% spread in March. Out of the -12.1% cumulative monthly Q1-Q5 spread over the past 3 months, ~70% comes from the short Q5 leg.

Exhibit 21: Price momentum's reversal in Europe has continued in April, with a cumulative monthly Q1-Q5 spread of -12.1%

12-Month Price Momentum Q1-Q5 Efficacy in Europe

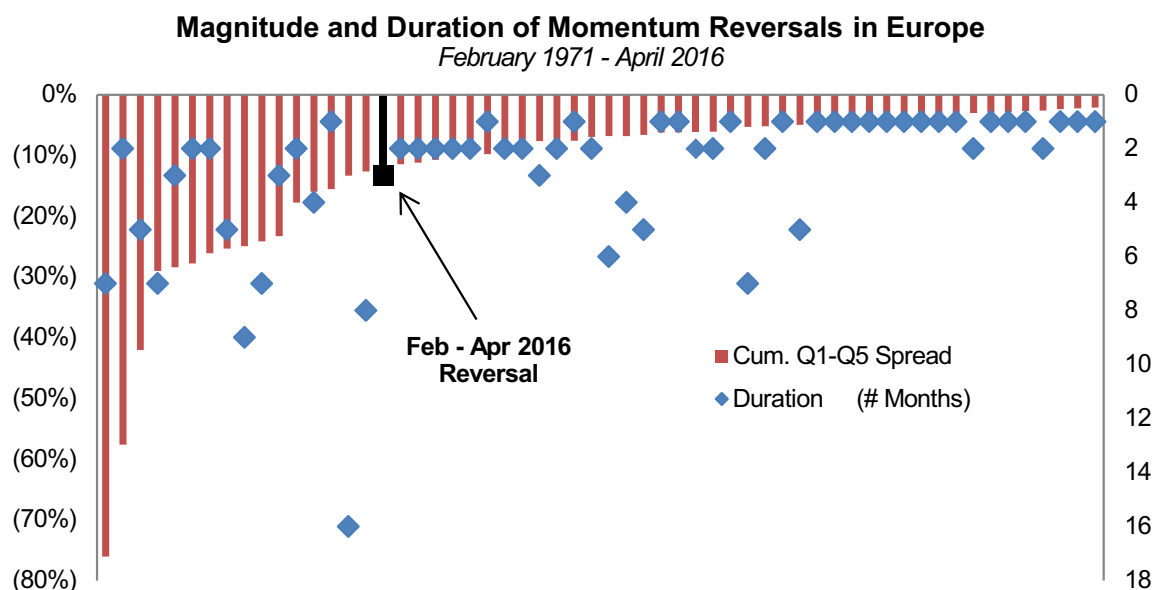
1-Month Forward \$ Returns, Eqw, Through Apr 30th, 2016



Source: FactSet, Morgan Stanley Research

The February-April 2016 momentum reversal in Europe is the 17th in terms of magnitude relative to the history of multi month reversals in Europe since 1971, so it is still far from historical extremes, both in terms of magnitude and duration, as shown in Exhibit 22.

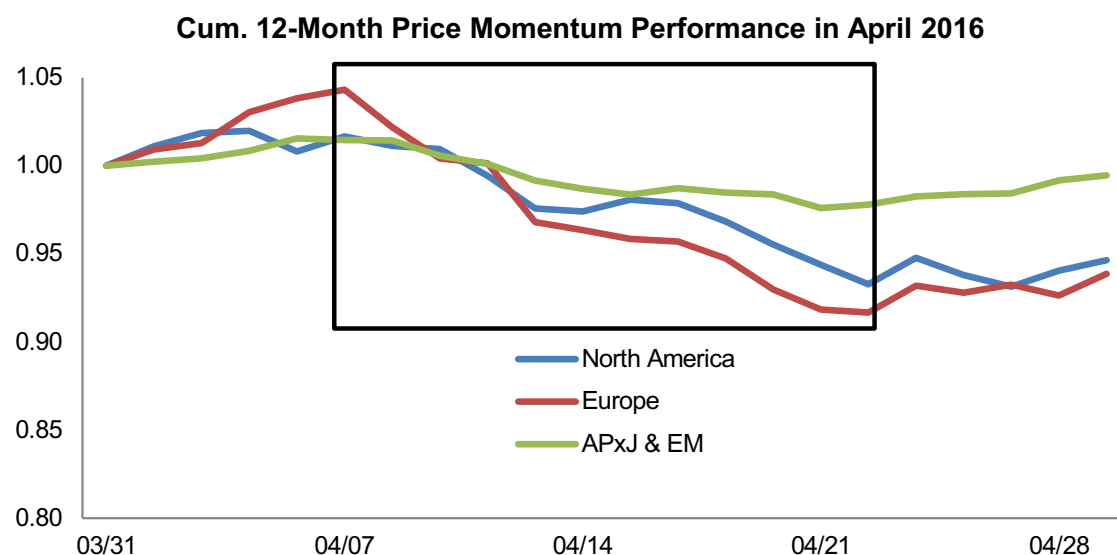
Exhibit 22: The recent momentum reversal in Europe is still far from the historical extremes since 1971, both in terms of magnitude and duration



Source: FactSet, Morgan Stanley Research

A closer look at the daily performance of 12-month price momentum during April reveals that **the entirety of the factor's underperformance in Europe and North America occurred in the two week period between 4/7 and 4/21**, as shown in [Exhibit 23](#). The maximum intra-month drawdown for the factor was -12.1% in Europe and -8.7% in North America.

Exhibit 23: Most of 12-month price momentum's negative efficacy in Europe and North America in April has been concentrated in the two week period between 4/7 and 4/21

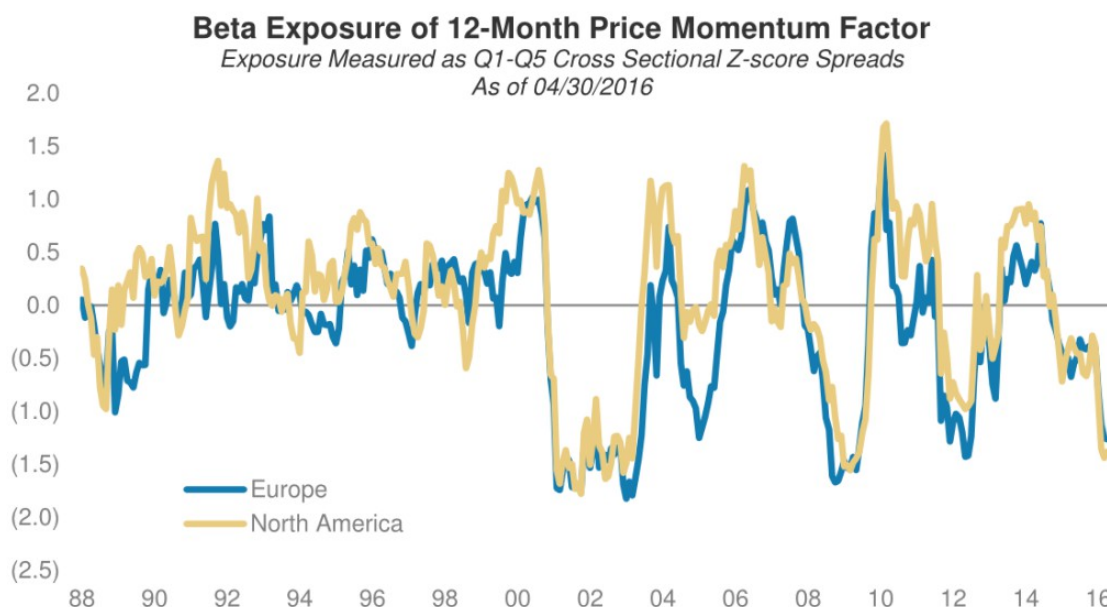


Source: FactSet, Morgan Stanley Research

In order to identify signs of a sustained reversal in momentum's performance, we monitor the net exposure of price momentum to various risk factors, including market beta, size and value. As a reminder, we calculate the exposure of a stock to a given factor as the cross sectional z-score. The net exposures of price momentum to beta, size and value are then calculated as the average exposure of the top quintile minus that of the bottom quintile. **The net market beta of price momentum has stabilized at a historically low level in April after**

a steep decline in January-March: it is now in the 12th percentile relative to history in Europe, and in the 7th percentile in North America, as shown in [Exhibit 24](#). As a result, if the market rallies further, the momentum reversal is likely to continue. However, if the market action over the past two months turns out to be a bear market rally, price momentum should deliver positive performance.

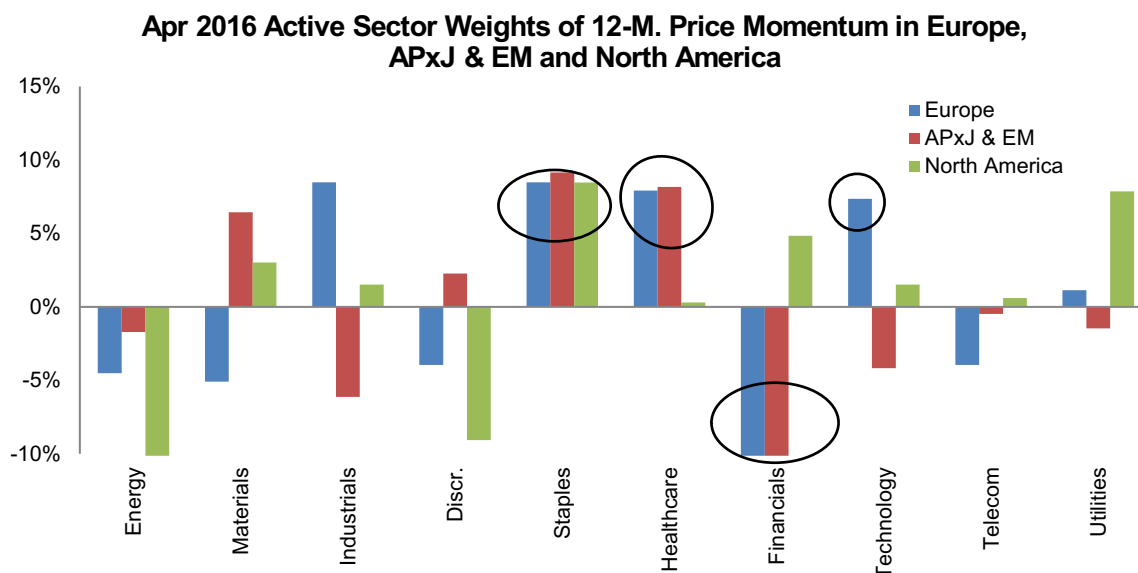
Exhibit 24: The net market beta of 12-month price momentum in North America and Europe has stabilized at a very low level relative to history since 1988



Source: FactSet, Morgan Stanley Research

Price momentum also has significant sector tilts, but some of those have shifted over the past couple of months, given the robust rally in several sectors. [Exhibit 25](#) shows the active sector weights of the price momentum factor (i.e. the active weight of the top quintile minus that of the bottom quintile of 12-month price momentum) in Europe, APxJ & EM and North America as of the end of April 2016. **Over the past couple of months, price momentum's significant negative active weights to energy, materials and industrials have become smaller (and in some cases turned positive) in Europe and APxJ & EM.** Note that in North America, the negative active weight to energy is still very large. **In each of the three regions, staples has a meaningful overweight, and so does healthcare in Europe and APxJ & EM. Financials is the largest underweight in Europe and APxJ & EM.** Technology still is a material overweight in North America.

Exhibit 25: At the end of April, price momentum had substantial overweights in staples and healthcare, and underweights in financials, in both Europe and APxJ & EM



Source: FactSet, Morgan Stanley Research

Exhibit 26 takes a closer look at the contributions by sector to the April 2016 performance of 12-month price momentum (including the last month) in North America, Europe and APxJ & EM. **In each of the three regions, the outperformance by low momentum stocks in energy, materials and industrials contributed meaningfully towards the negative performance by price momentum in April. Note that in North America, the momentum laggards in energy are responsible for about 60% of the factor's underperformance.** Note that in APxJ & EM and North America, the top quintile in industrials contributed positively toward the factor's performance. **Other meaningfully negative contributors include low momentum financial stocks in Europe and North America, high momentum tech and discretionary stocks in North America and low momentum utilities in Europe.**

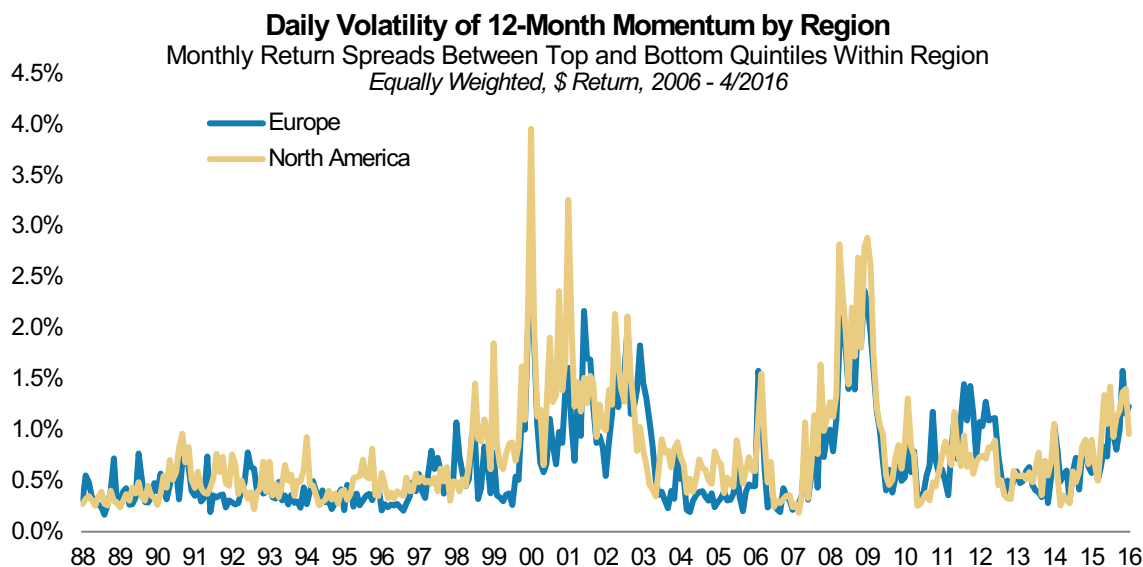
Exhibit 26: The robust performance of momentum laggards in energy, materials and industrials is responsible for a meaningful part of the factor's April failure in Europe, North America and APxJ & EM

	Europe			APxJ & EM			North America		
	Q1	-Q5	Q1-Q5	Q1	-Q5	Q1-Q5	Q1	-Q5	Q1-Q5
Energy	0.2%	(1.0%)	(0.9%)	0.1%	(0.6%)	(0.5%)	0.0%	(3.3%)	(3.3%)
Materials	0.1%	(1.7%)	(1.6%)	0.8%	(1.3%)	(0.5%)	1.1%	(1.1%)	(0.1%)
Industrials	0.2%	(0.7%)	(0.5%)	0.0%	(0.3%)	(0.3%)	0.1%	(0.5%)	(0.4%)
Discretionary	(0.3%)	(0.2%)	(0.5%)	0.3%	(0.3%)	(0.0%)	(0.4%)	0.6%	0.2%
Staples	(0.1%)	0.0%	(0.1%)	0.2%	(0.0%)	0.2%	(0.0%)	0.1%	0.1%
Healthcare	0.2%	(0.1%)	0.0%	(0.2%)	(0.0%)	(0.2%)	0.4%	(0.5%)	(0.1%)
Financials	(0.1%)	(2.1%)	(2.2%)	0.3%	0.1%	0.4%	(0.2%)	(0.5%)	(0.6%)
Technology	(0.0%)	0.2%	0.2%	(0.0%)	0.2%	0.1%	(0.5%)	(0.0%)	(0.6%)
Telecom	(0.1%)	(0.1%)	(0.2%)	0.0%	(0.1%)	(0.1%)	(0.0%)	(0.1%)	(0.1%)
Utilities	0.1%	(0.6%)	(0.5%)	0.3%	0.1%	0.4%	(0.2%)	(0.3%)	(0.5%)
Overall	0.1%	(6.3%)	(6.2%)	1.8%	(2.3%)	(0.5%)	0.3%	(5.7%)	(5.4%)

Source: FactSet, Morgan Stanley Research

The price momentum factor still exhibits a high amount of performance volatility (expressed in terms of the trailing 1-month volatility of daily Q1-Q5 return spreads), which does not bode well for the factor's forward 1-month performance. However, **Exhibit 27** shows that momentum volatility has risen in Europe (from 18.4% to 19.5% annualized) and declined materially in North America (from 22.3% to 15.2%). The current levels of momentum volatility in Europe and North America are in, respectively, the 89th and 77th percentiles relative to history since 1988.

Exhibit 27: The daily volatility of 12-month price momentum has risen slightly in Europe and declined materially in North America in April relative to March, but remains elevated



Source: FactSet, Morgan Stanley Research

As a result of the elevated performance volatility mentioned above, investors following momentum based strategies are feeling the pressure to reduce their momentum exposure. Two months ago, we suggested to **selectively trim the weights to the stocks that generate the highest contributions to overall momentum volatility** instead of applying a blanket weight reduction to all the stocks in a momentum portfolio. **In April, few stocks in the top momentum quintile had a meaningful contribution to the factor's volatility, in both Europe and APxJ & EM. The largest contributors to momentum volatility are concentrated in the bottom quintile of momentum. Exhibit 28 and Exhibit 29 show the top 30 contributors (all in Q5) to price momentum volatility in April, in Europe and APxJ & EM.** The 30 names in Europe represent almost 40% of price momentum's daily volatility. We observe a strong concentration in financial names (18 out of 30) and only 8 energy/materials names. In APxJ & EM, the 30 names on the list represent about one third of price momentum's daily volatility. The energy/materials/industrials complex dominate the list (19 out of 30), and there are only 6 financial stocks on the list.

Exhibit 28: European screen of the largest contributors (in the bottom quintile) to price momentum's daily volatility in April

Sedol	Ticker	Company	Country	Sector	Market Cap (\$ Bn.)	% Contribution to Momentum Volatility
BKJ9QS7	BP-IT	BANCO POPOLARE	Italy	Financials	2.5	2.1%
4116099	BPE-IT	BANCA POP EMILIA ROMAGNA	Italy	Financials	2.3	1.7%
B5M1SM3	UCG-IT	UNICREDIT ORD	Italy	Financials	21.6	1.7%
BWX4DD6	BMPS-IT	BANCA MONTE PASCHI	Italy	Financials	1.7	1.6%
0408284	STAN-GB	STANDARD CHARTERED	United Kingdom	Financials	22.2	1.6%
7622225	UBI-IT	UBI BANCA	Italy	Financials	3.3	1.6%
4072168	PMI-IT	BANCA POPOLARE MILANO	Italy	Financials	3.1	1.5%
0946580	WEIR-GB	WEIR GROUP	United Kingdom	Industrials	3.4	1.4%
0056650	BLT-GB	BHP BILLITON PLC	United Kingdom	Materials	59.9	1.3%
4768768	SPM-IT	SAIPEM ORD	Italy	Energy	4.1	1.3%
5812493	BCP-PT	BCP BANCO COMERCIAL	Portugal	Financials	2.4	1.2%
B1G40S0	MAP-ES	MAPFRE	Spain	Financials	6.7	1.1%
5750355	DBK-DE	DEUTSCHE BANK NAMEN	Germany	Financials	23.5	1.1%
5501906	BBVA-ES	BBVA	Spain	Financials	42.4	1.1%
BBHXPN6	POP-ES	BANCO POPULAR ESPANOL	Spain	Financials	5.6	1.1%
B4T3BW6	GLEN-GB	GLENCORE	United Kingdom	Materials	32.5	1.1%
B1X8QN2	SAB-ES	BANCO SABADELL	Spain	Financials	9.6	1.1%
B7T7721	RBS-GB	ROYAL BANK OF SCOTLAND	United Kingdom	Financials	37.1	1.1%
4076836	ISP-IT	INTESA SANPAOLO ORD	Italy	Financials	46.4	1.0%
B03XPL1	MT-NL	ARCELORMITTAL	France	Materials	12.8	1.0%
BRJFWP3	FCA-IT	FIAT CHRYSLER AUTOMOBILE	Italy	Discretionary	10.4	1.0%
0150080	TLW-GB	TULLOW OIL	United Kingdom	Energy	2.6	1.0%
5705946	SAN-ES	BANCO SANTANDER	Spain	Financials	63.7	1.0%
0718875	RIO-GB	RIO TINTO PLC	United Kingdom	Materials	50.5	1.0%
B0NUJ17	EDF-FR	EDF	France	Utilities	20.9	1.0%
5966516	GLE-FR	SOCIETE GENERALE	France	Financials	29.8	1.0%
7171589	CSGN-CH	CREDIT SUISSE	Switzerland	Financials	26.9	1.0%

Source: FactSet, Morgan Stanley Research. For important disclosures regarding companies that are the subject of this screen, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures. For valuation methodology and risks associated with any price targets, ratings and recommendations referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-5424-4349. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway (Attention: Research Management), New York, NY 10036 USA. Prices as of 05/04/2016 (on primary exchange in local currency): BP-IT: 5.305, BPE-IT: 4.702, UCG-IT: 3.098, BMPS-IT: 0.617, STAN-GB: 5.203, UBI-IT: 3.34, PMI-IT: 0.6, WEIR-GB: 11.39, BLT-GB: 8.753, SPM-IT: 0.3837, BCP-PT: 0.0371, MAP-ES: 2.148, DBK-DE: 15.025, BBVA-ES: 5.715, POP-ES: 2.177, GLEN-GB: 1.498, SAB-ES: 1.596, RBS-GB: 2.225, ISP-IT: 2.316, MT-NL: 4.644, FCA-IT: 6.9049997, TLW-GB: 2.4720001, SAN-ES: 4.16, RIO-GB: 21.545, EDF-FR: 11.785, GLE-FR: 32.83, CSGN-CH: 13.83.

Exhibit 29: APxJ & EM screen of the largest contributors (in the bottom quintile) to price momentum's daily volatility in April

Sedol	Ticker	Company	Country	Sector	Market Cap (\$ Bn.)	% Contribution to Momentum Volatility
AxJP & EM						
2645517	GGBR4-BR	GERDAU PN	Brazil	Materials	2.9	1.9%
BGSHPP4	VVAR11-BR	VIA VAREJO UNIT	Brazil	Discretionary	0.7	1.7%
6562474	WOR-AU	WORLEYPARSONS	Australia	Energy	1.0	1.4%
6439567	IGO-AU	INDEPENDENCE GROUP	Australia	Materials	1.1	1.4%
2196286	VALE3-BR	VALE ON	Brazil	Materials	20.3	1.3%
2328595	BBAS3-BR	BANCO BRASIL	Brazil	Financials	16.0	1.3%
B1YBRG0	CMIG4-BR	CEMIG PN	Brazil	Utilities	2.8	1.2%
B4W5613	117930-KR	HANJIN SHIPPING CO (NEW)	Korea	Industrials	0.7	1.2%
6772217	010140-KR	SAMSUNG HEAVY INDUSTRIES	Korea	Industrials	2.2	1.1%
6088204	BPT-AU	BEACH ENERGY	Australia	Energy	0.9	1.1%
6560995	2883-HK	CHINA OILFIELD SVCS H	China	Energy	7.4	1.1%
6661111	000150-KR	DOOSAN CORP	Korea	Industrials	1.9	1.1%
B41XC98	1313-HK	CHINA RESOURCES CEMENT	China	Materials	2.0	1.0%
6205133	S51-SG	SEMBCORP MARINE	Singapore	Industrials	2.6	1.0%
B23F8S9	BRSR6-BR	BANRISUL PNB	Brazil	Financials	1.0	1.0%
4235864	ALPHA-GR	ALPHA BANK	Greece	Financials	3.4	1.0%
6214861	ORG-AU	ORIGIN ENERGY	Australia	Energy	6.9	1.0%
B17MHG0	CESP6-BR	CESP PNB	Brazil	Utilities	1.3	1.0%
6579010	598-HK	SINOTRANS H	China	Industrials	2.0	0.9%
BSZ2BY7	532174-IN	ICICI BANK	India	Financials	20.8	0.9%
B03J9L7	5099-MY	AIRASIA BHD	Malaysia	Industrials	1.3	0.9%
6181482	1114-HK	BRILLIANCE CHINA AUTO	China	Discretionary	5.2	0.9%
6776703	STO-AU	SANTOS	Australia	Energy	5.5	0.9%
B8L1BL5	816-HK	HUADIAN FUXIN ENERGY H	China	Utilities	2.0	0.9%
6579634	532477-IN	UNION BANK OF INDIA	India	Financials	1.4	0.9%
B5720R0	ECOR3-BR	ECORODOVAS INFRA E LOG	Brazil	Industrials	0.9	0.9%
B52J816	1590-TW	AIRTAC INTERNATIONAL	Taiwan	Industrials	1.1	0.8%
6144690	BHP-AU	BHP BILLITON LTD	Australia	Materials	69.0	0.8%
6580012	532483-IN	CANARA BANK	India	Financials	1.6	0.8%

Source: FactSet, Morgan Stanley Research. For important disclosures regarding companies that are the subject of this screen, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures. For valuation methodology and risks associated with any price targets, ratings and recommendations referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-5424-4349. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway (Attention: Research Management), New York, NY 10036 USA. Prices as of 05/04/2016 (on primary exchange in local currency): GGBR4-BR: 7.1, VVAR11-BR: 6.45, WOR-AU: 6.87, IGO-AU: 3.18, VALE3-BR: 18.66, BBAS3-BR: 20.44, CMIG4-BR: 6.32, 117930-KR: 2160, 010140-KR: 10050, BPT-AU: 0.715, 2883-HK: 6.41, 000150-KR: 104000, 1313-HK: 2.49, S51-SG: 1.64, BRSR6-BR: 8.22, ALPHA-GR: 1.9100001, ORG-AU: 5.31, CESP6-BR: 14.29, 598-HK: 3.37, 532174-IN: 221.35, 5099-MY: 1.9100001, 1114-HK: 7.4, STO-AU: 4.6, 816-HK: 1.76, 532477-IN: 124.35, ECOR3-BR: 7.48, 1590-TW: 220, BHP-AU: 20.73, 532483-IN: 196.35.

In April, factor efficacy patterns have differed across countries and regions within the APxJ & EM universe, as shown in Exhibit 30. Value factors and dividend yield have been broadly effective across the region in April, with some exceptions: value factors and dividend yield have failed in Taiwan, Price-to-book is the only valuation measure that worked in Canada, and forward P/E and dividend yield have been ineffective in both Australia and China H shares. ROE has been broadly ineffective except in ASEAN, and accruals have been ineffective, except in ASEAN and Latam. **Price momentum has been ineffective on average, but negative performance was concentrated in Canada, Korea and Latam.**

Exhibit 30: In April, factor efficacy patterns have differed across countries/region within APxJ & EM**April 2016 T1-T3 Factor Efficacy in Canada and in the APxJ & EM Universe**

	Price-to-Book	Price-to-Sales	Forward P/E	Dividend Yield	ROE	Accruals	12-Month Price Momentum	Up vs. Down Earnings Revisions
Canada	10.7%	(3.6%)	(14.6%)	(2.8%)	(15.4%)	(6.7%)	(3.3%)	11.0%
Australia	3.0%	0.2%	(1.7%)	(0.2%)	(2.9%)	(3.1%)	0.2%	(1.6%)
ASEAN	2.1%	1.9%	(0.7%)	0.0%	(1.5%)	1.8%	0.3%	(0.3%)
China H	(0.4%)	0.1%	(2.3%)	(0.9%)	(2.6%)	(2.1%)	1.4%	1.5%
China A	1.7%	2.4%	1.6%	0.4%	(0.2%)	(0.1%)	(1.3%)	0.8%
Hong Kong	5.2%	3.2%	4.2%	3.9%	3.4%	(3.8%)	(0.4%)	(1.6%)
Taiwan	(0.2%)	(1.1%)	(1.5%)	(0.3%)	(0.1%)	0.1%	1.6%	3.2%
Korea	1.6%	1.9%	1.1%	1.6%	(2.5%)	(1.6%)	(5.6%)	(0.8%)
India	2.3%	2.5%	1.4%	0.7%	(0.0%)	(1.0%)	0.5%	0.6%
Latam	6.8%	4.0%	0.2%	4.0%	(2.6%)	2.0%	(4.1%)	2.1%
CEEMEA	(0.4%)	(1.5%)	0.2%	(1.4%)	(0.7%)	(0.6%)	1.8%	2.0%

Source: FactSet, Morgan Stanley Research

We also measure the performance of stock cohorts defined according to some non alpha factors including style (growth, value or neutral), quality (for which we define four categories: high, medium, low quality and junk), size (mega, large, mid and small caps), beta, the IBES expected long term growth rate, and leverage. [Exhibit 31](#) summarizes the returns to the various cohorts - relative to the equal weighted return of our regional stock universe - by region in April and in the past 3 and 12 months.

In April, we have observed some relative return patterns that are consistent with global risk seeking behavior: high beta has outperformed low beta and junk has outperformed high quality, across regions. In addition, value has outperformed growth across regions. In addition, high leverage companies have outperformed their low leverage counterparts in Japan and APxJ & EM. Furthermore, mega caps have outperformed small caps across regions except North America, where the opposite occurred.

Exhibit 31: In April, high beta, junk and value have outperformed, respectively, low beta, high quality and growth, across regions**Select Non-Alpha Factors Return Relative to Market in Recent Months**

Global Markets, Equally Weighted, \$ Return, As of 04/30/2016

		Europe			Japan			Asia Ex-Japan & Emerging Markets			North America		
		Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months	Last Month	Last 3 Months	Last 12 Months
Beta	High 252-day Beta	3.1%	1.6%	(0.3%)	1.6%	(0.1%)	(0.6%)	1.3%	1.5%	(0.5%)	3.7%	1.3%	(0.8%)
	Low 252-day Beta	(2.0%)	(0.8%)	0.2%	(1.6%)	0.3%	0.4%	(1.2%)	(1.2%)	0.4%	(3.2%)	(1.1%)	0.6%
Leverage	High Net Debt-to-Assets	(0.7%)	0.1%	0.1%	0.6%	0.5%	(0.0%)	0.7%	0.7%	(0.1%)	(0.5%)	0.2%	(0.1%)
	Low Net Debt-to-Assets	(0.6%)	(0.1%)	0.2%	(0.7%)	0.7%	0.4%	(0.5%)	(0.8%)	(0.1%)	(0.6%)	(0.2%)	(0.1%)
Growth Expectations	High Exp. LT Growth	(0.1%)	(0.3%)	(0.0%)	0.2%	(0.1%)	(0.3%)	0.6%	(0.3%)	0.2%	(0.1%)	(0.7%)	(0.5%)
	Low Exp. LT Growth	0.9%	0.7%	(0.1%)	2.1%	0.4%	(0.3%)	(0.1%)	1.4%	0.1%	0.1%	1.0%	0.3%
Style	Growth	(1.9%)	(0.8%)	0.4%	(1.2%)	0.4%	0.4%	(0.5%)	(1.7%)	(0.0%)	(0.2%)	(1.0%)	(0.2%)
	Neutral	(1.1%)	(0.6%)	(0.2%)	(0.2%)	0.1%	(0.0%)	(0.0%)	0.0%	(0.1%)	(0.4%)	(0.2%)	0.1%
	Value	2.5%	1.3%	(0.3%)	1.4%	(0.5%)	(0.3%)	0.5%	1.6%	0.1%	0.4%	1.0%	0.0%
Quality	High Quality	(1.5%)	(0.8%)	0.3%	(1.9%)	0.3%	0.5%	(0.8%)	(1.2%)	0.4%	(2.5%)	(1.1%)	0.5%
	Moderate Quality	(1.9%)	(0.4%)	0.4%	(0.9%)	(0.2%)	0.1%	(0.6%)	(0.0%)	(0.0%)	(1.4%)	(0.6%)	0.5%
	Low Quality	0.0%	0.2%	(0.2%)	0.2%	(0.6%)	(0.3%)	0.3%	0.5%	0.1%	(0.4%)	(0.1%)	(0.1%)
	Junk	3.5%	1.1%	(0.6%)	2.6%	0.5%	(0.3%)	2.1%	1.8%	(0.5%)	4.3%	1.8%	(1.0%)
Size	Mega Cap	3.5%	(0.0%)	(0.4%)	1.8%	0.4%	(0.8%)	0.7%	0.1%	(0.6%)	(0.6%)	(1.8%)	0.4%
	Large Cap	0.2%	(0.3%)	(0.3%)	0.9%	(0.3%)	(0.2%)	(0.2%)	(0.0%)	(0.0%)	(1.0%)	(0.7%)	0.2%
	Mid Cap	(0.3%)	0.1%	0.2%	(0.1%)	0.3%	0.1%	(0.0%)	(0.3%)	(0.1%)	(0.2%)	(0.1%)	(0.2%)
	Small Cap	(0.4%)	0.2%	0.2%	(0.9%)	(0.2%)	0.2%	0.1%	0.3%	0.3%	1.2%	1.0%	(0.0%)

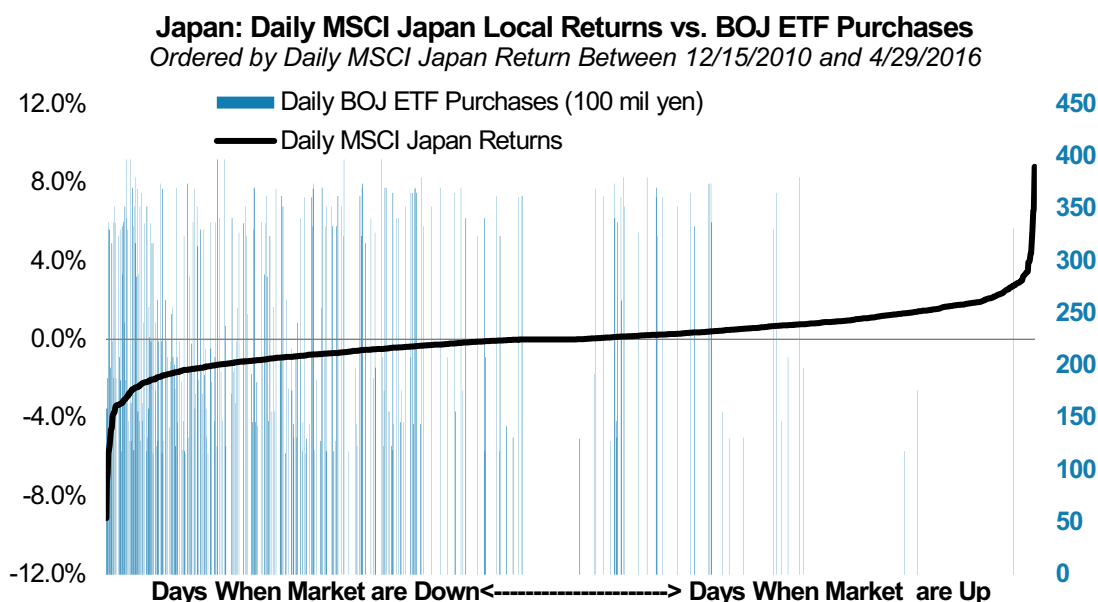
Source: FactSet, Morgan Stanley Research

Over the past few months, we have observed that many of the traditional quantitative factors (valuations, momentum/revisions, profitability) have been ineffective in Japan, which explains in large part the lackluster performance of our stock selection model in that country. **One possible explanation for this phenomenon is that some large equity buyers and sellers could have, via their inflows or outflows, created distortions in the cross section of stock returns.** There are several large investors that influence the Japanese market. Foreigners have generated substantial inflows since Prime Minister Abe came into office, and they now own 31% of the market in terms of market cap. Those investors have pulled 60 Bn USD from the Japanese market in Q1 2016. Public pension funds including GPIF, which have materially increased their allocation to Japanese

stocks over the past year, could also have exerted some influence. Finally, the BoJ is purchasing 3 Tn Yen's worth of Japanese equities per year via ETFs, and could potentially double the current target. While the BoJ may be a less important holder in the Japanese equity markets, the central bank's actions nonetheless influence other investors' decisions. In the next few exhibits, we examine the existence of a relationship between BoJ equity purchases and the Japanese equity market.

There seems to be a relationship between the BoJ's ETF purchases and returns to the Japanese market in local currency. When we plot the daily BoJ ETF purchases vs. the MSCI Japan local currency returns on the same day, **we found that the days when the BoJ made an ETF purchase tend to coincide with the days when the Japanese market crashed** (see [Exhibit 32](#)). The BoJ purchased equity ETFs on each of the 15 worst performing days between 12/15/2010 and 4/29/2016. Further, the BoJ made purchases on 296 days (when the MSCI Japan index also traded), and 87.5% of them were associated with negative returns to the MSCI Japan. We feel that this relationship is too strong to be a pure coincidence. The BoJ seems to be the "fire fighter" that comes to the rescue whenever the market crashes. Note that this is just a statistical observation and we do not attempt to ascribe causation.

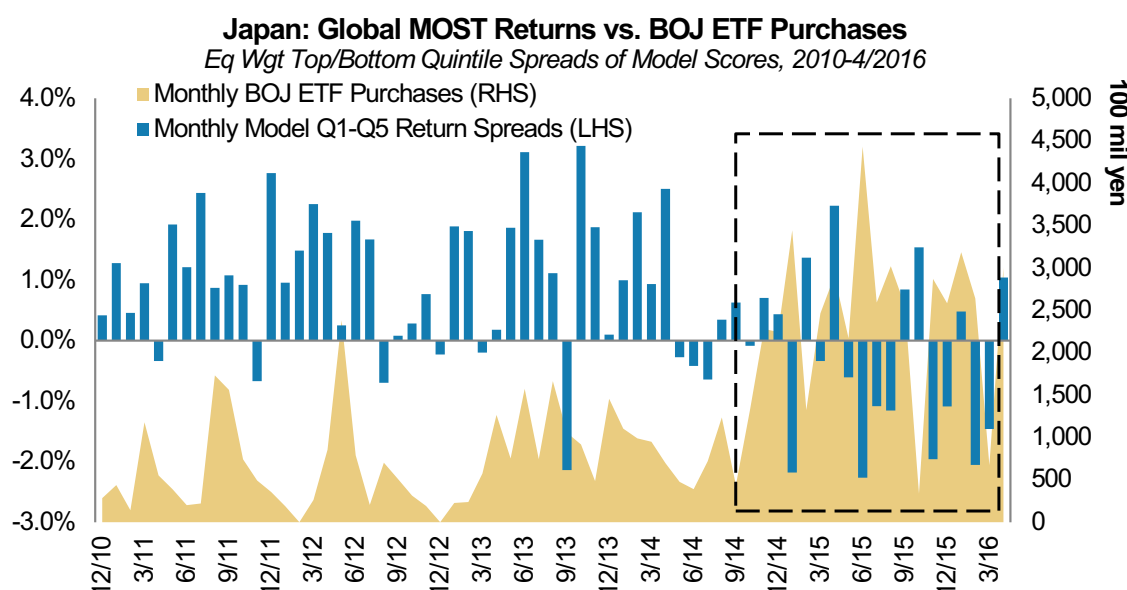
Exhibit 32: The days when BoJ made ETF purchases mostly coincide with down days for the MSCI Japan



Source: FactSet, Bank of Japan, Morgan Stanley Research

Exhibit 33 also shows, on a monthly basis, the amount of equity ETFs purchased by the BoJ versus the Q1-Q5 monthly performance of our MOST model, on a coincident basis. Between December 2010 and September 2014, BoJ purchases have been modest and MOST has been generally effective. **However, starting from October 2014, the BoJ's ETF purchases have ramped up materially while the performance of MOST has been poor.** Again, we observe a coincidence and do not ascribe causation.

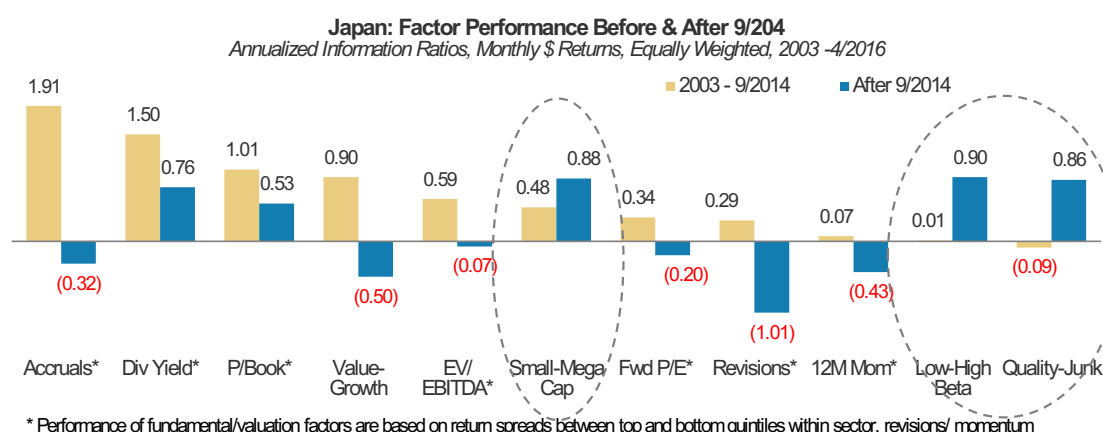
Exhibit 33: The period of poor performance by the MOST model in Japan (since 10/2014) also coincides with substantial ETF purchases by the BoJ



Source: FactSet, Bank of Japan, Morgan Stanley Research

Using September 2014 as a cut-off point between the period of low/no equity ETF purchases by the BoJ (until 9/2014) and the period of material ETF purchases (after 9/2014), we calculated the annualized monthly Q1-Q5 information ratios for various quantitative factors over two periods: 2003-09/2014 and after 09/2014. The results are summarized in **Exhibit 34**. **Most traditional factors (accruals, EV/EBITDA, price-to-book) have experienced a material decline in efficacy since October 2014. Among the factors we considered, only size (small vs. mega caps), beta (low vs. high beta) and quality (high quality vs. junk) have delivered material, positive performance since October 2014.**

Exhibit 34: Among various traditional quantitative factors only size (small vs. mega caps), beta (low vs. high beta) and quality (high quality vs. junk) have outperformed materially since October 2014



Source: FactSet, Morgan Stanley Research

The BoJ is currently buying ETFs tracking the Nikkei, Topix and JPX-400 indices, so its buying is concentrated towards large caps. A recent Bloomberg article (see at the bottom of the note for reference) mentions that, while the BoJ owns only 1.6% of the total market cap, it is a top 10 holder in ~90% of the Nikkei 225, and has near 10% stakes in some of the largest Japanese companies. Therefore, we could conceivably expect factor efficacy patterns in the Japanese market to be more distorted within large caps (where the BoJ buys stocks indiscriminately via ETFs) than within small caps. In **Exhibit 35**, we show the T1-T3 information ratios for various factors within large, mid and small caps (cohorts defined as tertiles in terms of market cap)

before and after 9/2014. **For most factors, the degradation in performance observed after 09/2014 occurs across market cap cohorts, so we don't find strong evidence that BoJ equity purchases are distorting the cross section of stock returns. The only exceptions are accruals and price momentum, which have exhibited higher efficacy within small caps since September 2014.**

Exhibit 35: For most factors, the degradation in performance since 09/2014 has occurred across market cap cohorts

Japan: Factor Performance by Cap Size Before & After 9/2014
Annualized Information Ratios Based on Top/Bottom Quintile Returns
Equally Weighted, Monthly \$ Return, 2003 - 4/2016

Factor	Large Caps		Mid Caps		Small Caps	
	Before	After	Before	After	Before	After
P/Book	0.24	0.01	0.24	(0.07)	0.34	(0.07)
Fwd P/E	0.13	(0.24)	(0.00)	(0.10)	0.12	(0.31)
EV/EBITDA	(0.09)	(0.01)	(0.02)	(0.04)	0.09	0.09
Dividend Yield	0.29	0.27	0.33	0.29	0.24	0.14
Accruals	0.38	0.32	0.37	(0.00)	0.33	0.62
Revisions	(0.01)	(0.17)	0.08	(0.29)	0.22	(0.28)
1M Momentum Reversal	(0.09)	(0.01)	(0.02)	(0.04)	0.09	0.09
12M Momentum	(0.06)	(0.03)	0.04	(0.23)	0.08	0.57

Source: FactSet, Morgan Stanley Research

As shown in Exhibit 36, our MOST stock selection model performed moderately well in April in Europe and Japan, with respective Q1-Q5 return spreads of +0.4% and +1.0%. The model was flat in APxJ & EM. Given the outperformance by mega and large caps relative to small caps in April in Europe and Japan, MOST's long only performance is negative relative to cap weighted benchmarks.

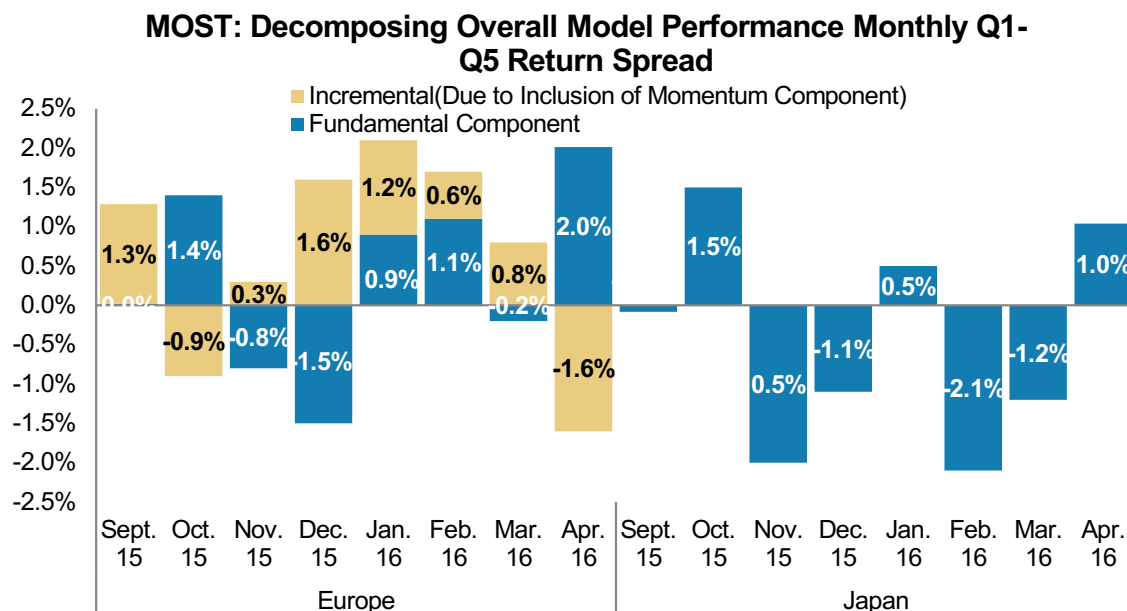
Exhibit 36: Our MOST stock selection model displayed positive Q1-Q5 performance in Europe and Japan and was flat in APxJ & EM in April

MOST: Model Performance by Region
Region Relative Ranks, As of 4/30/2016

	Relative Return			Hit Rate		Region Return
	Q1	Q5	Q1-Q5	Q1	Q5	
Dollar Return, Relative to Float-Weighted Regional Model Universe						
Europe	(1.2%)	(1.6%)	0.4%	39%	35%	2.5%
Japan	(1.1%)	(2.1%)	1.0%	41%	31%	5.3%
APxJ & EM	0.6%	0.6%	0.0%	50%	46%	1.3%
Dollar Return, Relative to Equally-Weighted Regional Benchmark						
Europe	0.4%	0.0%	0.4%	49%	40%	0.8%
Japan	0.4%	(0.6%)	1.0%	54%	39%	3.8%
APxJ & EM	0.4%	0.4%	0.0%	49%	45%	1.6%

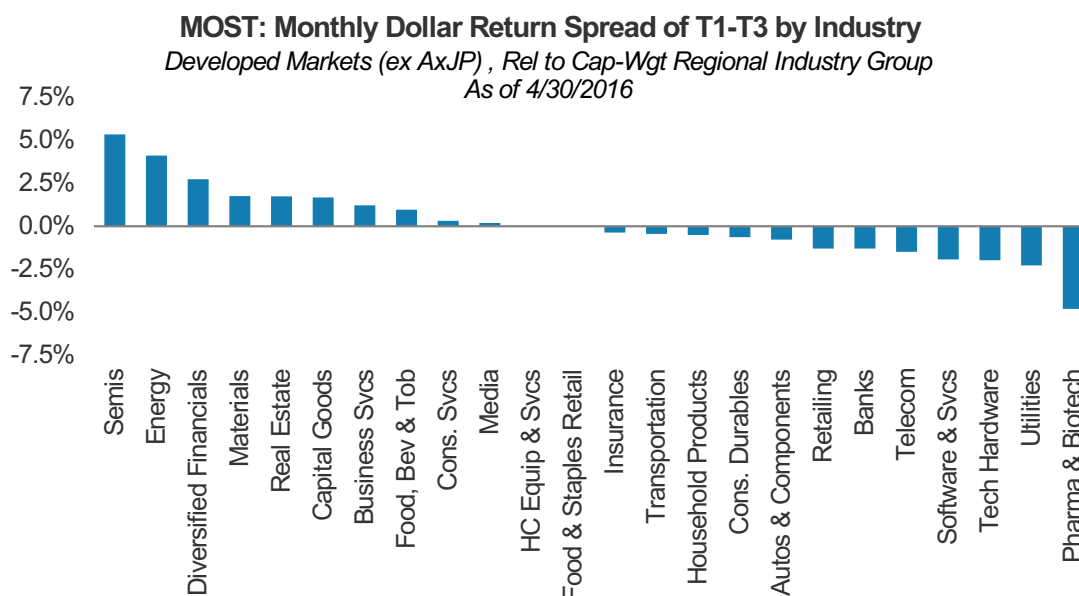
Source: FactSet, Morgan Stanley Research

In our model building process, we emphasized the importance of having a diversified set of factors with balanced weights in order to make the model robust to various environments. In particular, even though MOST is primarily based on fundamental metrics, we assigned a significant weight to momentum and revisions factors. **Exhibit 37** shows the contributions from the fundamental and momentum components to the monthly Q1-Q5 performance of our MOST model in Europe and Japan from September 2015 to April 2016. **In April, the fundamental component of MOST performed well in both Europe and Japan, as a result of the good performance by value and capital use factors. The poor performance of price momentum in April detracted from the performance of MOST in Europe.**

Exhibit 37: Fundamental factors drove the positive performance of MOST in both Europe and Japan in April

Source: FactSet, Morgan Stanley Research

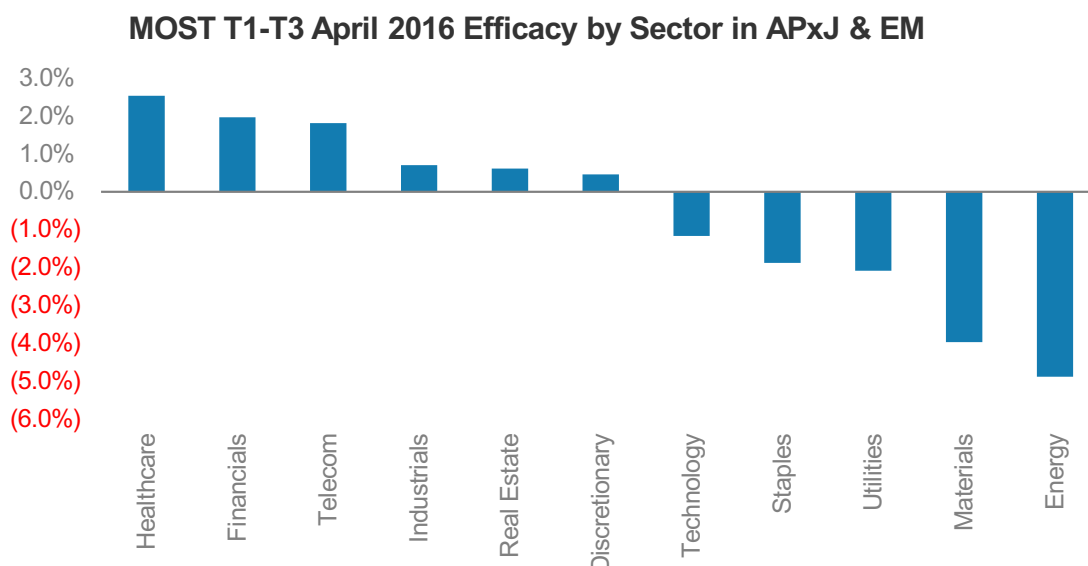
In developed markets, MOST was the most effective in energy, semis and diversified financials in April (Exhibit 38). The model's T1-T3 performance was poorest in pharma/biotech, utilities and hardware.

Exhibit 38: In developed markets, MOST's April performance was the highest in energy, semis, and diversified financials

Source: FactSet, Morgan Stanley Research

In the APxJ & EM universe, MOST was most effective in healthcare, financials and telecom in April (Exhibit 39). The model's performance was especially negative in energy and materials, as a result of a trend reversal for many of those stocks.

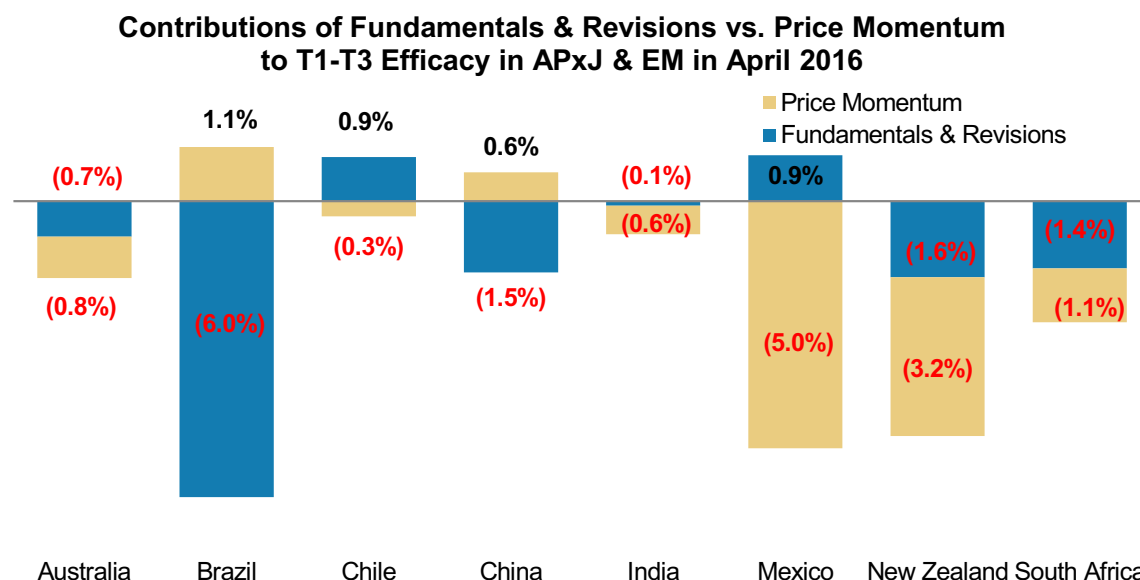
Exhibit 39: In the APxJ & EM universe, MOST was the most effective in healthcare, financials and telecom in April



Source: FactSet, Morgan Stanley Research

In April like in February and March, price momentum contributed negatively to the model's performance: in six of the eight APxJ & EM countries where it is used, and especially in Mexico and New Zealand, the factor has had a detrimental impact, as shown in [Exhibit 40](#). Note the very negative performance of the fundamental component in Brazil, as investors have focused more on changes in the political landscape rather than fundamentals.

Exhibit 40: In April, price momentum contributed negatively to performance in six of the eight APxJ & EM countries where it is used by MOST, especially in Mexico and New Zealand



Source: FactSet, Morgan Stanley Research

Below are updates of our "quantamental" screens of favored and disfavored stocks in Europe, Japan and AxJP & EM. The favored stocks ([Exhibit 41](#)) are those in the top quintile of the MOST model that also have an Overweight rating by our fundamental analysts. The disfavored stocks ([Exhibit 42](#)) are in the bottom quintile of MOST and have an Underweight fundamental rating.

Exhibit 41: Favorable screen: stocks in the top quintile of MOST and rated overweight by MS fundamental analysts

Ticker	Sedol	Company Name	Country	Sector	Market Cap (USD Bn)
Europe					
ROG-CH	711038	ROCHE HOLDING GENUSS	Switzerland	Health Care	218.7
AZN-GB	98952	ASTRAZENECA	United Kingdom	Health Care	72.7
DGE-GB	23740	DIAGEO	United Kingdom	Consumer Staples	68.0
MUV2-DE	529412	MUENCHENER RUECKVERSICH	Germany	Financials	30.9
AMS-ES	B3MSM2	AMADEUS IT HOLDINGS A	Spain	Information Technology	20.0
AKZA-NL	545831	AKZO NOBEL	Netherlands	Materials	17.6
LAND-GB	318094	LAND SECURITIES GROUP	United Kingdom	Financials	13.1
EDP-PT	410359	EDP ENERGIAS DE PORTUGAL	Portugal	Utilities	13.0
ACS-ES	B01FLQ	ACS ACTIV CONST Y SVCS	Spain	Industrials	10.6
FCA-IT	BRJFWP	FIAT CHRYSLER AUTOMOBILE	Italy	Consumer Discretionary	10.3
NHY-NO	B11HK3	NORSK HYDRO	Norway	Materials	9.0
ELUX.B-SE	B1KKBX	ELECTROLUX B	Sweden	Consumer Discretionary	9.0
TUI-GB	B11LJN	TUI	United Kingdom	Consumer Discretionary	8.5
SKF.B-SE	B1Q3J3	SKF B	Sweden	Industrials	8.4
WDH-DK	596154	WILLIAM DEMANT HOLDING	Denmark	Health Care	5.6
RMV-GB	B2987V	RIGHTMOVE GROUP	United Kingdom	Information Technology	5.4
GETI.B-SE	769835	GETINGE B	Sweden	Health Care	5.0
TL5-ES	B01G2K	MEDIASET ESPANA COM	Spain	Consumer Discretionary	4.8
RXL-FR	B1VP0K	REXEL	France	Industrials	4.6
SXS-GB	33086	SPECTRIS	United Kingdom	Information Technology	3.2
LOG-ES	BP3QYZ	CIA DE DIST INTEG LOGIST	Spain	Industrials	2.9
TIE1V-FI	547970	Tieto	Finland	Information Technology	1.9
COMH-SE	BN7PJ6	COM HEM HOLDING	Sweden	Telecommunication Services	1.8
MAB-GB	B1FP6H	MITCHELLS & BUTLERS	United Kingdom	Consumer Discretionary	1.6
Japan					
8316-JP	656302	SUMITOMO MITSUI FINL GRP	Japan	Financials	45.1
4503-JP	698538	ASTELLAS PHARMA	Japan	Health Care	31.1
8591-JP	666114	ORIX CORP	Japan	Financials	19.6
2502-JP	605440	ASAHI GROUP HOLDINGS	Japan	Consumer Staples	15.9
9201-JP	B8BRV4	JAPAN AIRLINES CO	Japan	Industrials	13.4
7011-JP	659706	MITSUBISHI HEAVY IND	Japan	Industrials	12.5
4188-JP	B0JQTJ	MITSUBISHI CHEMICAL HLDG	Japan	Materials	8.2
6762-JP	686930	TDK CORP	Japan	Information Technology	8.0
4005-JP	685856	SUMITOMO CHEMICAL CO	Japan	Materials	7.8
6702-JP	635694	FUJITSU	Japan	Information Technology	7.6
6724-JP	661650	SEIKO EPSON CORPORATION	Japan	Information Technology	6.9
8795-JP	674429	T&D HOLDINGS	Japan	Financials	6.9
7205-JP	642830	HINO MOTORS	Japan	Industrials	5.8
6471-JP	664154	NSK	Japan	Industrials	5.1
4217-JP	642912	HITACHI CHEMICAL CO	Japan	Materials	3.7
6770-JP	602150	ALPS ELECTRIC CO	Japan	Information Technology	3.6
4183-JP	659736	MITSUMI CHEMICALS	Japan	Materials	3.6
9101-JP	664396	NIPPON YUSEN K.K	Japan	Industrials	3.4
6504-JP	635636	FUJI ELECTRIC CO	Japan	Industrials	3.3
6302-JP	685873	SUMITOMO HEAVY IND	Japan	Industrials	2.7
4631-JP	625082	DIC CORP	Japan	Materials	2.3
7248-JP	663984	CALSONIC KANSEI CORP	Japan	Consumer Discretionary	2.0
8056-JP	664268	NIHON UNISYS	Japan	Information Technology	1.4
AxJP & EM					
005930-KR	677172	SAMSUNG ELECTRONICS CO	Korea	Information Technology	181.9
939-HK	BOLMTQ	CHINA CONSTRUCTION BK H	China	Financials	161.6
015760-KR	649573	KEPCO KOREA ELECT. POWER	Korea	Utilities	34.8
PTT-TH	642038	PTT	Thailand	Energy	24.9
SNGSP-RU	B5BHR4	SURGUTNEFTGAZ PREF(RUB)	Russia	Energy	23.8
1186-HK	B2PFVH	CHINA RAILWAY CONST H	China	Industrials	21.2
005490-KR	669323	POSCO	Korea	Materials	18.4
055550-KR	639750	SHINHAN FINANCIAL GROUP	Korea	Financials	17.8
F34-SG	B17KC6	WILMAR INTERNATIONAL	Singapore	Consumer Staples	17.7
2238-HK	B43399	GUANGZHOU AUTO GROUP H	China	Consumer Discretionary	17.2
000270-KR	649092	KIA MOTORS CORP	Korea	Consumer Discretionary	17.0
4-HK	643557	WHARF HOLDINGS	Hong Kong	Financials	16.5
902-HK	609967	HUANENG POWER INTL H	China	Utilities	15.5
914-HK	608039	ANHUI CONCH CEMENT H	China	Materials	13.4
ADVANC-TH	641256	ADVANCED INFO SERVICE	Thailand	Telecommunication Services	13.3
096770-KR	B232R0	SK INNOVATION CO	Korea	Energy	12.7
2881-TW	641167	FUBON FINANCIAL HOLDING	Taiwan	Financials	12.5
1099-HK	B3ZVDV	SINOPHARM GROUP CO H	China	Health Care	11.9
288-HK	BLLHKZ	WH GROUP	Hong Kong	Consumer Staples	11.9
UGPA3-BR	B0FHTN	ULTRAPAR PART ON	Brazil	Energy	11.7
3045-TW	629049	TAIWAN MOBILE	Taiwan	Telecommunication Services	11.3
500547-IN	609972	BHARAT PETROLEUM CORP	India	Energy	10.7
C6L-SG	681173	SINGAPORE AIRLINES	Singapore	Industrials	10.3
2333-HK	671825	GREAT WALL MOTOR H	China	Consumer Discretionary	10.2
2886-TW	644406	MEGA FINANCIAL HOLDING	Taiwan	Financials	9.7
MBT-US	260322	MOBILE TELESYS ADR	Russia	Telecommunication Services	9.6
489-HK	B0PH5N	DONGFENG MOTOR GROUP H	China	Consumer Discretionary	9.5

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Exhibit 42: Unfavorable screen: stocks in the bottom quintile of MOST and rated underweight by MS fundamental analysts

Ticker	Sedol	Company Name	Country	Sector	Market Cap (USD Bn)
Europe					
HMB-SE	568743	HENNES & MAURITZ B	Sweden	Consumer Discretionary	58.9
STAN-GB	40828	STANDARD CHARTERED	United Kingdom	Financials	26.5
TELIA-SE	597838	TELIA CO	Sweden	Telecommunication Services	20.7
UHR-CH	718472	SWATCH GROUP INH	Switzerland	Consumer Discretionary	18.8
LI-FR	758255	KLEPIERRE	France	Financials	14.8
FRES-GB	B2QPKJ	FRESNILLO PLC	United Kingdom	Materials	12.0
UU-GB	B39J2M	UNITED UTILITIES GROUP	United Kingdom	Utilities	9.4
ITRK-GB	316383	INTERTEK GROUP	United Kingdom	Industrials	7.7
ANTO-GB	4561	ANTOFAGASTA	United Kingdom	Materials	7.0
BKT-ES	547400	BANKINTER	Spain	Financials	6.9
JE-GB	BKX5CN	JUST EAT	United Kingdom	Information Technology	3.8
BMPS-IT	BWX4DD	BANCA MONTE PASCHI	Italy	Financials	2.4
NAS-NO	774212	NORWEGIAN AIR SHUTTLE	Norway	Industrials	1.6
Japan					
6861-JP	649099	KEYENCE CORP	Japan	Information Technology	38.2
6954-JP	635693	FANUC	Japan	Industrials	31.8
4581-JP	B3QX5G	TAISHO PHARM HOLDINGS CO	Japan	Health Care	7.6
4684-JP	613674	OBIC CO	Japan	Information Technology	5.4
3769-JP	B06CMQ	GMO PAYMENT GATEWAY	Japan	Information Technology	2.4
8515-JP	601941	AIFUL CORP	Japan	Financials	1.7
AxJP & EM					
NAB-AU	662460	NATIONAL AUSTRALIA BANK	Australia	Financials	54.5
500112-IN	BSQCB2	STATE BANK OF INDIA	India	Financials	22.1
532454-IN	644232	BHARTI AIRTEL	India	Telecommunication Services	21.9
1336-HK	B5730Z	NEW CHINA LIFE INS H	China	Financials	16.2
SMPH-PH	681884	SM PRIME HOLDINGS	Philippines	Financials	16.0
NCM-AU	663710	NEWCREST MINING	Australia	Materials	11.1
068270-KR	B0C5YV	CELLTRION	Korea	Health Care	10.2
23-HK	607564	BANK EAST ASIA	Hong Kong	Financials	9.6
1898-HK	B1JNK8	CHINA COAL ENERGY H	China	Energy	9.2
500790-IN	612860	NESTLE INDIA	India	Consumer Staples	8.3
1919-HK	B0B8Z1	CHINA COSCO HOLDINGS H	China	Industrials	7.7
BPI-PH	607496	BANK OF PHIL ISLANDS	Philippines	Financials	7.6
ORG-AU	621486	ORIGIN ENERGY	Australia	Energy	7.3
500387-IN	610035	SHREE CEMENT	India	Materials	6.7
STO-AU	677670	SANTOS	Australia	Energy	6.5
532822-IN	B1MP4H	IDEA CELLULAR	India	Telecommunication Services	6.4
1171-HK	610989	YANZHOU COAL MINING H	China	Energy	5.9
AIA-NZ	BKX3XG	AUCKLAND INTL AIRPORT	New Zealand	Industrials	5.1
HTO-GR	505160	OTE HELLENIC TELECOM	Greece	Telecommunication Services	4.8
CPIN-ID	631534	CHAROEN POKPHAND INDO	Indonesia	Consumer Staples	4.6
500480-IN	629486	CUMMINS INDIA KIRLOSKAR	India	Industrials	3.7
BEN-AU	609128	BENDIGO & ADELAIDE BANK	Australia	Financials	3.3
MOMO-US	BSS6HX	MOMO A ADR	China	Information Technology	3.1
037620-KR	B0WD5H	MIRAE ASSET SECURITIES	Korea	Financials	2.5
TBIG-ID	B4MMV04	TOWER BERSAMA INFRA	Indonesia	Telecommunication Services	2.2
2498-TW	651053	HTC CORP	Taiwan	Information Technology	2.1
SITESL-MX	BDCD6L	TELESITES L	Mexico	Telecommunication Services	2.0

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References:

<http://www.bloomberg.com/news/articles/2016-04-24/the-tokyo-whale-is-quietly-buying-up-huge-stakes-in-japan-inc>

Finance, Forthcoming; Fama-Miller Working Paper; Chicago Booth Research Paper No. 13-15. Available at SSRN:
<http://ssrn.com/abstract=2224246> or <http://dx.doi.org/10.2139/ssrn.2224246>

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Equal-weight/Hold	1411	42%	326	45%	23%
Not-Rated/Hold	78	2%	7	1%	9%
Underweight/Sell	682	20%	91	13%	13%
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