

Volatility outbreak

February 2020

Research Signals

The shot of volatility that investors received in equity markets in the second half of January paled in comparison to the dose injected into stocks in late-February, with many regional markets experiencing their worst weekly loss since the financial crisis amid intensifying fears surrounding the coronavirus' impact on the global economy. Indeed, the J.P.Morgan Global Manufacturing PMI suffered its steepest contraction since May 2009, as the coronavirus outbreak disrupted demand, international trade and supply chains, with China the hardest hit as output and new business fell at survey-record rates. Investors, meanwhile, continued to inoculate their high momentum stock exposure with low beta trades (Table 1).

- US: Amid uncertainty surrounding the impact of the coronavirus on corporate financials, investors favored firms with the highest analyst outlook, as gauged by 3-M Revision in FY2 EPS Forecasts, particularly for small caps
- Developed Europe: The risk-off trade was prevalent in equity markets, confirmed by 60-Month Beta's top tier performance
- Developed Pacific: Small cap stocks in Japan suffered the weakest returns during the market rout, as captured by Natural Logarithm of Market Capitalization
- Emerging markets: High momentum stocks, as measured by Rational Decay Alpha, continued to briskly outpace the most undervalued names, as measured by Book-to-Market

Contacts

Research Signals · MK-ResearchSignals@ihsmarkit.com

Table 1

Global factor quantile return spread performance snapshot, Feb 2020

Factor	Factor Group	US Large Cap	US Small Cap	Developed Europe	Developed Pacific ex Japan	Japan Standard Cap	Emerging Markets
Book-to-Market		-4.37	-4.98	-2.32	-3.63	-0.37	-3.97
Forward 12-M EPS-to-Enterprise Value	Deep Value	-4.38	-3.37	-2.10	0.46	1.78	-0.69
TTM EBITDA-to-Enterprise Value		-6.42	-5.98	-4.25	-1.21	-0.11	-3.34
TTM Free Cash Flow-to-Enterprise Value		-1.18	-2.30	-0.97	-0.34	0.06	0.28
Industry Relative Leading 4-QTRs EPS to Price	Relative Value	-2.43	-1.29	-3.93	-0.10	-0.12	-2.60
Industry Relative TTM Dividend Yield		-1.53	-1.15	-2.37	-0.93	-1.40	1.52
Fixed Assets Turnover Ratio		1.09	-1.65	-1.64	1.73	-3.72	1.21
Inventory Turnover Ratio	Management Quality	-4.90	-0.40	-1.68	-2.99	-1.18	0.58
Net Operating Asset Turnover		1.43	-3.05	-1.69	-2.35	-2.51	0.79
Change in Accruals to Assets		-0.46	-2.30	-0.03	-1.77	-0.17	1.99
Change in TTM COGS vs. Inventory Level	Earnings Quality	0.72	-1.56	-0.52	1.48	1.53	1.35
Change in TTM Sales vs. Accounts Receivable		-1.97	-2.10	0.70	0.46	0.70	-0.60
Working Capital Accruals		-2.12	-1.49	1.84	-3.31	1.28	-0.71
1-yr Growth in TTM Free Cash Flow	Historical Growth	-0.01	-0.68	-1.20	-0.42	-1.38	1.05
Reinvestment Rate		0.43	-3.83	1.15	4.42	-1.96	-0.98
Average Monthly Trading Volume-to-Market Cap		-4.60	-0.93	-3.18	1.13	-4.31	0.77
60-Month Beta		3.17	1.84	5.90	-0.14	3.32	2.79
Asset Quality Index	Liquidity, Risk & Size	1.45	1.61	-1.67	1.85	-0.07	1.26
Operating Leverage		1.92	-0.43	-0.31	0.15	0.06	-0.23
Natural Logarithm of Market Capitalization		-4.22	-2.47	-0.60	-1.85	-5.32	2.79
2-Year Ahead EPS Growth		-2.97	-0.95	-2.75	3.77	-1.47	-2.96
3-M Revision in FY2 EPS Forecasts	Earnings Momentum	3.70	5.22	1.90	4.66	0.93	3.33
Real Earnings Surprise		1.61	0.88	0.82	0.24	-0.20	-0.27
24-Month Value at Risk		2.21	-0.74	3.87	0.24	3.77	3.21
5-day Industry Relative Return		-3.50	-1.22	-3.21	3.89	-2.02	-0.62
Industry-adjusted 12-month Relative Price Strength	Price Momentum	2.73	1.87	1.66	0.08	0.63	3.79
Rational Decay Alpha		6.36	5.58	1.95	3.57	-0.41	4.48
Demand Supply Ratio	Short Sentiment	0.02	-1.86	0.24	-1.51	1.36	-5.84
Implied Loan Rate		2.41	-0.99	-0.55	-5.43	0.80	-1.28

Source: IHS Markit

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United States

US Large Cap

US manufacturing firms signaled a loss of growth momentum in February, with the PMI dropping to 50.7 in February, down from 51.9 in January, the weakest pace since last August. While trade war fears have eased, helping to push business confidence to the strongest since April 2019, supply chain issues following the coronavirus outbreak were reported to have affected production. Likewise, stocks entered correction territory at the end of the month, recording their worst weekly slide since October 2008.

Momentum and value signals remained key drivers of stock market performance in February, based on top (Table 2) and bottom (Table 3) performing factors, respectively. Factors that were at the furthest extreme of these two themes include 24-Month Active Return with 1-Month Lag (7.80%) and, for a second consecutive month, Time Weighted Cash Yield (-8.67%), with both signals demonstrating nearly monotonic return distributions across deciles (Figure 1), suggesting systematic trading across these measures. Other factors at the extremes of factor performance include a repeat appearance of Std Dev of FY2 EPS Estimates-to-Price (5.47%) at the top end and long term price reversal metrics such as 36-Month Active Return with 1-Month Lag (-8.59%) at the bottom end.

Table 2

US Large Cap top decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
24-Month Active Return with 1-Month Lag	7.80	Price Momentum
30-75 Week Stock Price Ratio	7.57	Price Momentum
18-Month Active Return with 1-Month Lag	7.41	Price Momentum
Fama-French Momentum	7.40	Price Momentum
Rational Decay Alpha	6.36	Price Momentum
Debt to Market Cap	6.13	Liquidity, Risk & Size
Growth Duration	6.08	Liquidity, Risk & Size
52-Week High	5.73	Price Momentum
12-Month Active Return with 1-month Lag	5.63	Price Momentum
Averaged Last 6-M EPS Revisions for FY2	5.60	Earnings Momentum
Std Dev of FY2 EPS Estimates-to-Price	5.47	Earnings Momentum
15/36 Week Stock Price Ratio	5.37	Price Momentum
TTM Capital Expenditures-to-Price	5.16	Deep Value
Time Weighted Earnings Revision	5.05	Earnings Momentum
50-200 Day Stock Price Ratio	5.04	Price Momentum

Source: IHS Markit

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Table 3

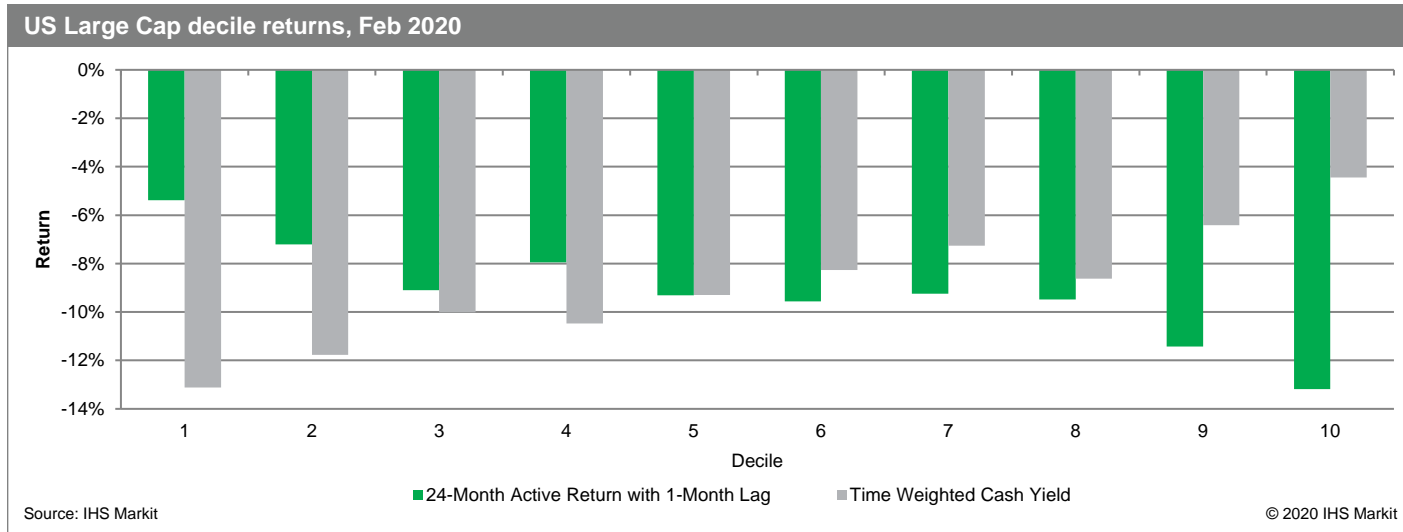
US Large Cap bottom decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
Time Weighted Cash Yield	-8.67	Deep Value
36-Month Active Return with 1-Month Lag	-8.59	Price Momentum
60-Month Alpha	-8.46	Price Momentum
TTM Cash Flow-to-Price	-8.42	Deep Value
TTM EBITDA-to-Price	-8.28	Deep Value
Price-to-Book Return-on-Equity Combination	-8.23	Deep Value
TTM Operating Cash Flow-to-Price	-8.18	Deep Value
Leading 12 Month EBITDA/ EV	-8.16	Deep Value
TTM Operating Income to Enterprise Value	-8.08	Deep Value
36-Month Sharpe Ratio	-7.99	Price Momentum

Source: IHS Markit

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Figure 1



US Small Cap

While momentum and value styles were once again prominent among top (Table 4) and bottom (Table 5) factor performers for small caps in February, as with large caps, broader representation across other styles was seen for this market cap group. Averaged Last 6-M EPS Revisions for FY2, an Earnings Momentum signal, is one such factor with a two-month cumulative sum in spread of 13.9% (Figure 2), suggesting that investors relied on analyst outlook during the market tumult. Management Quality measures such as Operating Liability Leverage (6.41%) also outperformed, alongside Rational Decay Alpha (5.58%), the top performing Price Momentum metric, while the weakest performing Deep Value factor was TTM Operating Cash Flow-to-Price (-7.68%).

Table 4

US Small Cap top decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
TTM Capital Expenditures-to-Price	7.93	Deep Value
Operating Liability Leverage	6.41	Management Quality
Averaged Last 6-M EPS Revisions for FY2	6.19	Earnings Momentum
Rational Decay Alpha	5.58	Price Momentum
26-Week Relative Price Strength	5.46	Price Momentum
Advertising Intensity	5.44	Management Quality
Debt to Market Cap	5.28	Liquidity, Risk & Size
3-M Revision in FY2 EPS Forecasts	5.22	Earnings Momentum
Capital Expenditure-to-Total Assets	4.59	Management Quality
Attention Span Ratio	4.51	Management Quality
TTM Capital Expenditures-to-Sales	4.17	Management Quality
1-Year Price Momentum Indicator	4.15	Price Momentum
Inflation Sensitivity	4.10	Macro
50-200 Day Stock Price Ratio	4.03	Price Momentum
Inventory-to-Total Assets	4.01	Management Quality

Source: IHS Markit

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Table 5

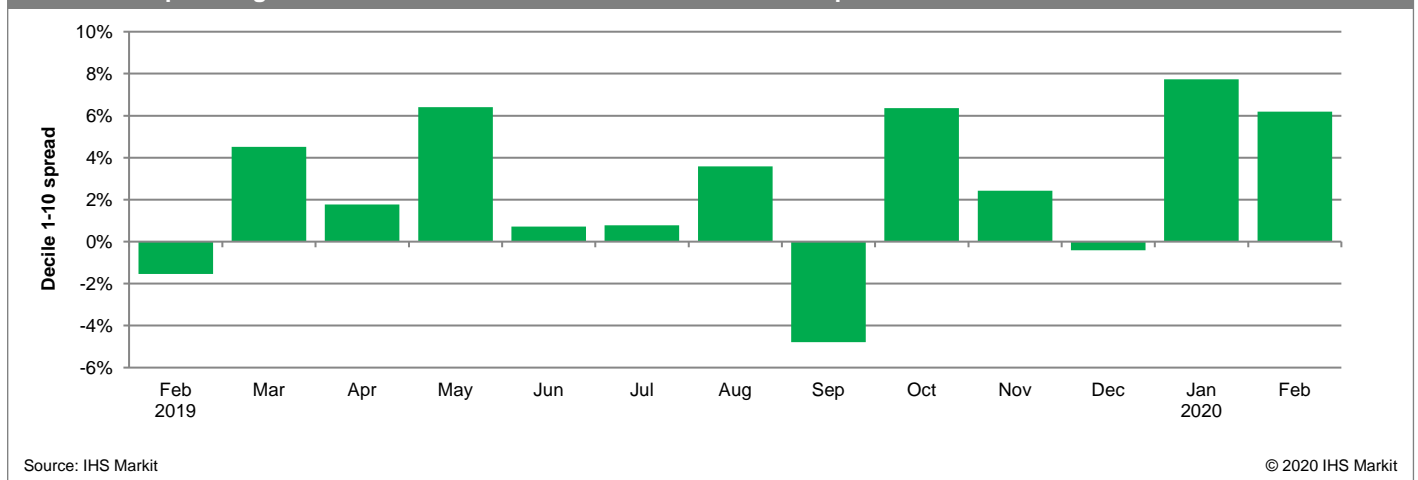
US Small Cap bottom decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
Asset Composition	-8.89	Liquidity, Risk & Size
Operating Cash Flow Ratio	-7.75	Liquidity, Risk & Size
TTM Operating Cash Flow-to-Price	-7.68	Deep Value
Working Capital-to-Trailing 12-Month Sales	-7.64	Management Quality
TTM Operating Income to Enterprise Value	-7.58	Deep Value
Graham Number Fair Value Premium	-7.32	Deep Value
Time Weighted EBITDA/ EV	-7.21	Deep Value
Time Weighted Sales Yield	-7.20	Deep Value
Price Above Last 260-day Lowest Trading Price	-7.18	Price Momentum
Natural Logarithm of TTM Sales (USD)	-7.08	Liquidity, Risk & Size

Source: IHS Markit

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Figure 2

US Small Cap Averaged Last 6-M EPS Revisions for FY2 decile return spreads

Source: IHS Markit

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Europe

While operating conditions in the euro area manufacturing economy remained in contraction territory, the PMI rose for a second straight month, reaching 49.2, compared with 47.9 in January, inching closer to the 50.0 no change mark. Despite widespread reports from companies that the coronavirus outbreak disrupted supply chains and hit foreign sales, encouraging signs of an easing in the manufacturing downturn were seen. Yet, coronavirus-related concerns remain, and stocks fell double digits from the intra-month record high on the biggest weekly drop since 2008.

Like US markets, Price Momentum and Deep Value measures occupied the list of top (Table 6) and bottom (Table 7) performing factors, respectively, in developed Europe equity markets in February. However, the risk-off trade was a more prevalent theme as exemplified by the pattern of decile spreads for 60-Month Beta (Figure 3) where we find an 11.0% cumulative sum in spread over the past two months following four months of underperformance. At the opposite extreme, 1-month Active Return (-5.99%), a short-term price reversal indicator, was the weakest performer.

Table 6

Developed Europe top decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
Product of Beta and Sigma	6.49	Liquidity, Risk & Size
60-Month Beta	5.90	Liquidity, Risk & Size
Std Dev of FY1 EPS Estimates-to-Price	4.83	Earnings Momentum
Std Dev of FY2 EPS Estimates-to-Price	4.34	Earnings Momentum
39-Week Return with 4-week Lag	4.15	Price Momentum
20-Day Volume Volatility to Price Volatility	4.14	Liquidity, Risk & Size
24-Month Active Return with 1-Month Lag	4.10	Price Momentum
52-Week High	4.06	Price Momentum
6-Month Nominal Change in 36-Month Alpha	4.00	Price Momentum
1-Month Realized Stock Return Volatility	3.98	Liquidity, Risk & Size
Year-over-year Change in Leverage	3.97	Liquidity, Risk & Size
24-Month Value at Risk	3.87	Price Momentum
Stock Return Volatility	3.83	Liquidity, Risk & Size
18-Month Active Return with 1-Month Lag	3.60	Price Momentum
26-Week Relative Price Strength	3.54	Price Momentum

Source: IHS Markit

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Table 7

Developed Europe bottom decile return spread factor performance, Feb 2020

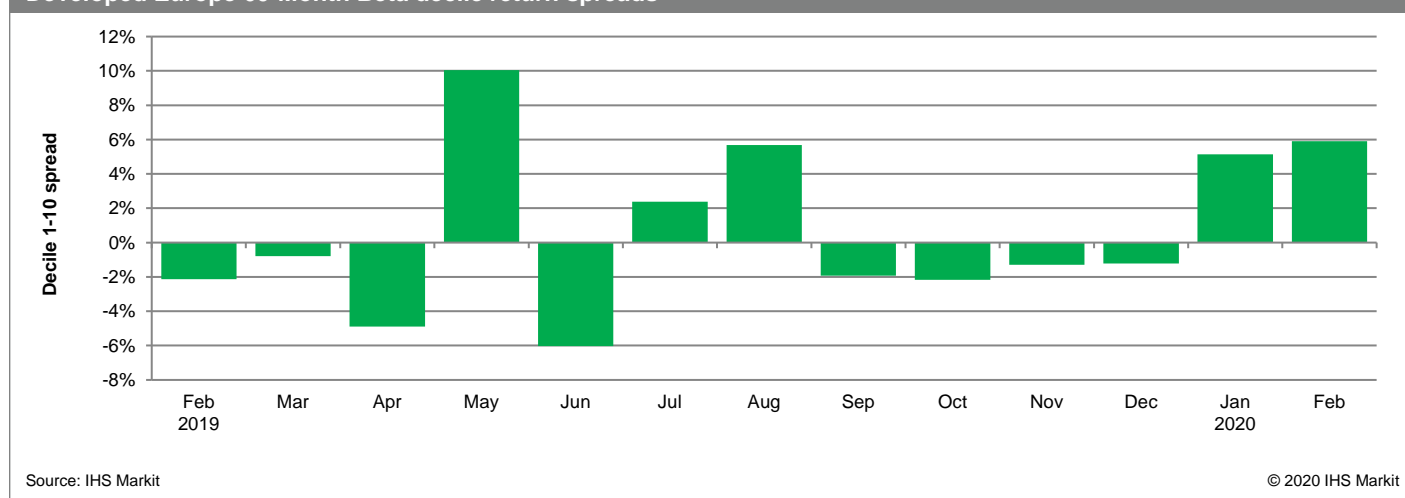
Factor	Decile spread (%)	Factor group
1-Month Active Return	-5.99	Price Momentum
Time Weighted EBITDA/ EV	-5.54	Deep Value
Cash-to-Price	-5.14	Deep Value
5-yr Relative TTM Sales-to-Price	-4.94	Relative Value
TTM Operating Income to Enterprise Value	-4.93	Deep Value
Leading 12 Month EBITDA/ EV	-4.82	Deep Value
Leading 12 Month Sales Yield	-4.81	Deep Value
14 Day Relative Strength Index	-4.77	Price Momentum
Time Weighted Sales Yield	-4.73	Deep Value
Time Weighted Earnings Yield	-4.63	Deep Value

Source: IHS Markit

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Figure 3

Developed Europe 60-Month Beta decile return spreads



Source: IHS Markit

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Asia-Pacific

The coronavirus outbreak acutely impacted manufacturing operating conditions in the two largest Asian economies of China and Japan in February. China was the more severely obstructed, with the PMI slipping from 51.1 in January back into contraction territory at 40.3 in February, the lowest reading since the survey began in April 2004. Output, new orders and employment all fell at record rates; however, business confidence rose on hopes of a recovery in production over the next year. Japan's manufacturing sector was also hit by the biggest drop in demand since December 2012, with the PMI falling to its lowest mark since May 2016 at 47.8 in February, from 48.8 in January. Stocks in Asia recorded their worst February since the financial crisis, with equities in Japan hit harder than in China during the late month rout.

Factor performance in the developed Pacific region diverged from that of other developed markets. Earnings Momentum metrics returned to the list of top performing factors in developed Pacific markets outside Japan in February (Table 8) after a one-month respite. Street Consensus Rating (6.43%) was once again the leader of the group, with a 12.6 percentage point swing in month-on-month spread (Figure 4). Interestingly, several Short Sentiment signals

made their way to the tail end of factor performance (Table 9), including Lending Supply (-7.29%) and Active Utilization (-6.41%), suggesting that investors disregarded negative sentiment in the securities lending market.

In Japan, the risk-off trade was the most highly rewarded theme once again, sending factors such as 1-Month Realized Stock Return Volatility (5.38%) to the top of the factor performance list in February (Table 10). Investors also shied away from small cap names, with Natural Logarithm of Market Capitalization (-5.32%) moving to the top spot on the list of bottom performers (Table 11), with a progressively decreasing trend in spread performance since October of last year (Figure 5).

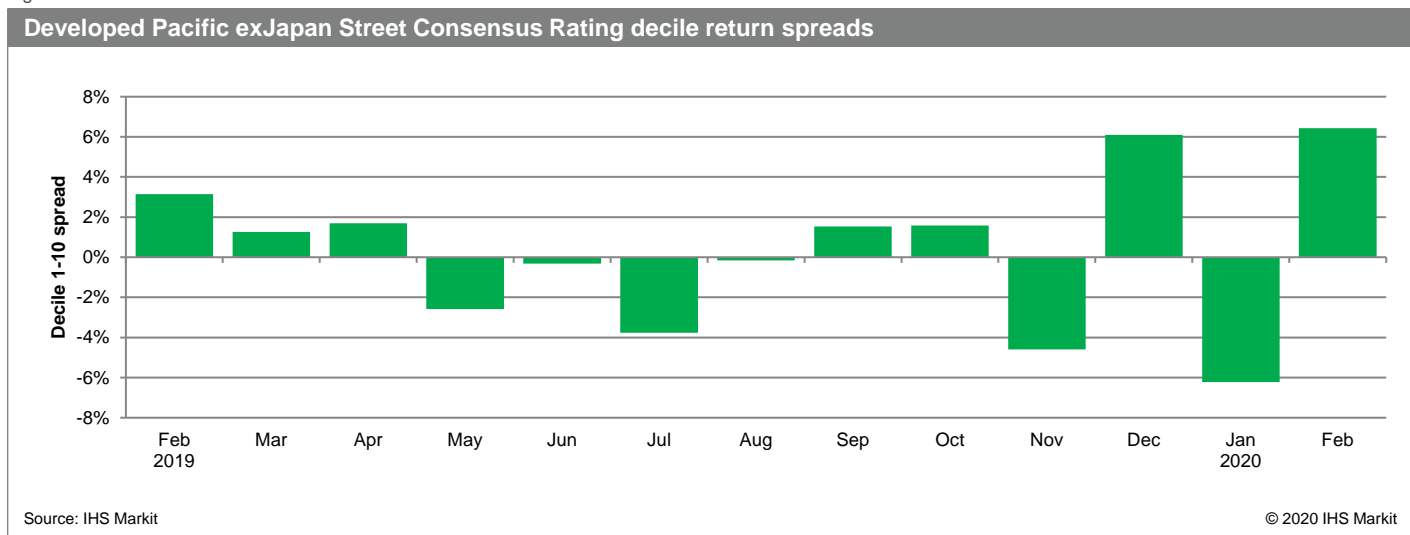
Table 8

Developed Pacific exJapan top decile return spread factor performance, Feb 2020		
Factor	Decile spread (%)	Factor group
Natural Logarithm of Closing Price (USD)	6.46	Liquidity, Risk & Size
Street Consensus Rating	6.43	Earnings Momentum
Industry-adjusted Quarterly Return on Equity	6.07	Management Quality
Cash to Enterprise Value	5.89	Deep Value
Net Debt to EBITDA	5.74	Management Quality
Cash-to-Price	5.68	Deep Value
Reciprocal of Dividend Yield-adjusted PEG	5.41	Earnings Momentum
2-Year Projected EPS Growth	5.10	Earnings Momentum
Inverse of PEG Ratio	5.09	Earnings Momentum
3-M Revision in FY2 EPS Forecasts: Dispersion Relative	4.85	Earnings Momentum
Time Weighted Earnings Revision Dispersion	4.70	Earnings Momentum
3-M Revision in FY2 EPS Forecasts	4.66	Earnings Momentum
50-200 Day Stock Price Ratio	4.46	Price Momentum
Time Weighted Earnings Revision	4.45	Earnings Momentum
Reinvestment Rate	4.42	Historical Growth

Source: IHS Markit

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Figure 4



Source: IHS Markit

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Table 9

Developed Pacific exJapan bottom decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
Asset Composition	-8.04	Liquidity, Risk & Size
Lending Supply	-7.29	Short Sentiment
1-Month Stock Return Interquartile Range	-6.69	Liquidity, Risk & Size
Active Utilization	-6.41	Short Sentiment
Utilization	-6.33	Short Sentiment
Operating Cash Flow Ratio	-5.61	Liquidity, Risk & Size
Inventory Value Concentration	-5.57	Short Sentiment
Change in TTM Depreciation vs. CapEx	-5.49	Earnings Quality
Implied Loan Rate	-5.43	Short Sentiment
Change in Inventory to Average Assets	-5.34	Management Quality

Source: IHS Markit

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Table 10

Japan Standard Cap top decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
1-Month Stock Return Interquartile Range	5.93	Liquidity, Risk & Size
1-Month Realized Stock Return Volatility	5.38	Liquidity, Risk & Size
52-Week High	4.80	Price Momentum
Short Loan Concentration	4.77	Short Sentiment
Market Cap per Analyst	4.53	Liquidity, Risk & Size
Product of Beta and Sigma	4.52	Liquidity, Risk & Size
20-Day Volume Volatility to Price Volatility	4.51	Liquidity, Risk & Size
Stock Return Volatility	4.50	Liquidity, Risk & Size
SG&A Expenses-to-Sales	4.48	Management Quality
Natural Logarithm of Total Assets (USD)	4.42	Liquidity, Risk & Size
60-Day Residual Risk	4.17	Liquidity, Risk & Size
Regression Error of 60-Month CAPM	4.16	Liquidity, Risk & Size
Shareholder Payout to Gross Profit	4.11	Management Quality
Utilization	3.93	Short Sentiment
Market Volatility Sensitivity	3.81	Macro

Source: IHS Markit

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Table 11

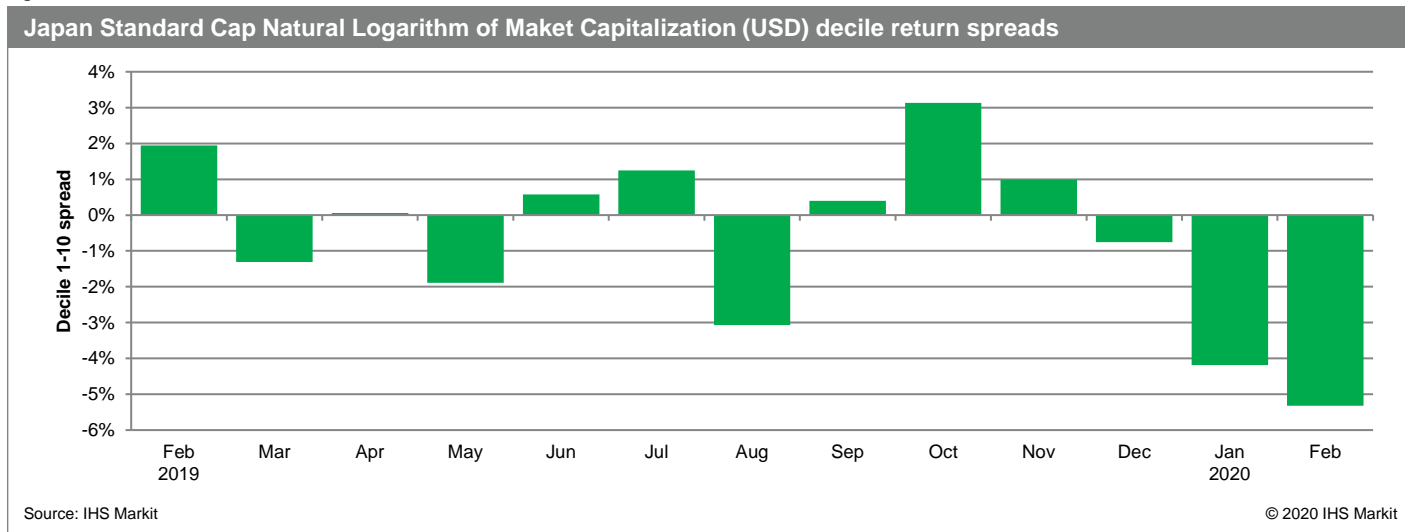
Japan Standard Cap bottom decile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
Natural Logarithm of Market Capitalization (USD)	-5.32	Liquidity, Risk & Size
Average Monthly Trading Volume-to-Market Cap	-4.31	Liquidity, Risk & Size
Stock Illiquidity	-4.03	Liquidity, Risk & Size
Fixed Assets Turnover Ratio	-3.72	Management Quality
TTM Gross Profit to Assets	-3.40	Management Quality
4-week Industry Relative Return	-3.29	Price Momentum
Industry Relative TTM Sales-to-Price	-3.19	Relative Value
Natural Logarithm of Closing Price (USD)	-3.16	Liquidity, Risk & Size
14 Day Relative Strength Index	-3.00	Price Momentum
Time Weighted Sales Yield	-2.86	Deep Value

Source: IHS Markit

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Figure 5



Emerging Markets

We round out the report with a review of top (Table 12) and bottom (Table 13) performing factors in emerging markets in February. As with markets in the US and Europe, Price Momentum and Deep Value measures made their way to the two extremes, as captured by 6-Month Active Return with 1-Month Lag (4.80%) and Time Weighted Earnings Yield (-5.19%), respectively. We also draw attention to North America Sales Exposure (10.62%) which topped the leaderboard. While the factor quintile distribution is skewed due to sparse firms having sales exposure to North America, we focus on the several hundred stocks in the top quintile and find a large spike in excess return in February (Figure 6), reaching the highest level since August 2005, suggesting a deeper reliance on firms with the highest linkage to this region.

Table 12

Emerging Markets top quintile return spread factor performance, Feb 2020

Factor	Decile spread (%)	Factor group
North America Sales Exposure	10.62	Macro
Std Dev of FY1 EPS Estimates-to-Price	6.06	Earnings Momentum
Std Dev of FY2 EPS Estimates-to-Price	5.65	Earnings Momentum
6-Month Active Return with 1-Month Lag	4.80	Price Momentum
24-Month Active Return with 1-Month Lag	4.79	Price Momentum
Averaged Last 6-M EPS Revisions for FY2	4.64	Earnings Momentum
FY1 EPS Estimates Dispersion	4.62	Earnings Momentum
Interest Coverage	4.53	Liquidity, Risk & Size
24-Month Residual Return Variance	4.51	Price Momentum
Rational Decay Alpha	4.48	Price Momentum
52-Week High	4.37	Price Momentum
1-Year Price Momentum Indicator	4.35	Price Momentum
Regression Error of 60-Month CAPM	4.31	Liquidity, Risk & Size
12-Month Active Return with 1-month Lag	4.29	Price Momentum
CV of Prior 90-Day Closing Prices	4.27	Price Momentum

Source: IHS Markit

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Table 13

Emerging Markets bottom quintile return spread factor performance, Feb 2020

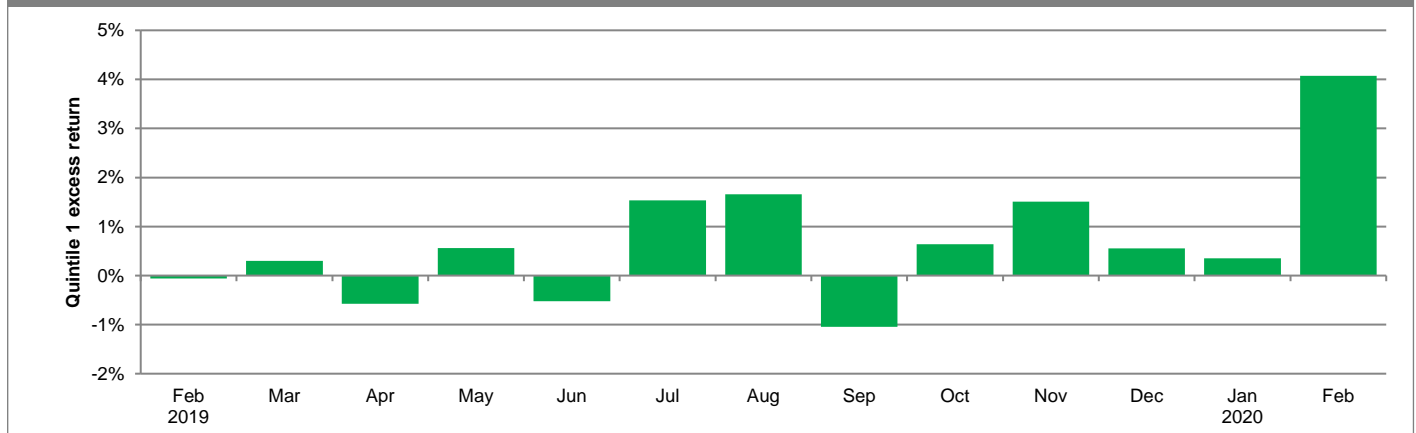
Factor	Decile spread (%)	Factor group
Net Cash to Equity	-5.24	Liquidity, Risk & Size
Time Weighted Earnings Yield	-5.19	Deep Value
14 Day Relative Strength Index	-5.16	Price Momentum
60-Month Active Return with 1-Month Lag	-5.05	Price Momentum
Time Weighted Book Yield	-4.99	Deep Value
Natural Logarithm of Total Assets (USD)	-4.95	Liquidity, Risk & Size
Time Weighted EBITDA/ EV	-4.90	Deep Value
Leading 12 Month Book Yield	-4.88	Deep Value
Net Current Assets-to-Price	-4.87	Deep Value
Net Debt Ratio	-4.86	Management Quality

Source: IHS Markit

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Figure 6

Emerging Markets North America Sales Exposure top quintile excess returns



Source: IHS Markit

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Support@ihsmarkit.com

Americas: +1 877 762 7548

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