Global Market Report

Inside the Tech Wreck

Analyzing the Recent Sell-Off in Information Technology and Health Care Using MSCI Indexes and GEM3

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"The stock market's recent drop might not have been so unsettling to investors but for one thing: ***the lack of a clear reason as to why it happened****."*

Heard on the Street
Stock Sell-Off's Mystery Momentum
The Wall Street Journal
April 8, 2014

Introduction

Earlier this month, market observers were puzzled by the recent information technology and health care stock sell-off. But the granularity of the Barra Global Equity Model (GEM3) offers some solid answers.

During the first seven weeks of 2014, information technology and health care stocks performed notably well. By late February 2014, the global Pharmaceuticals & Biotechnology GICS industry group in the MSCI ACWI[1] Investable Market Index (IMI) had outperformed the global equity market by more than 800 bps. At the same time, the global Software & Services GICS industry group beat the global market by roughly 400 bps.

However, early March 2014 saw a reversal in this strong performance. In the six weeks from March 1 through April 10, the Pharmaceuticals & Biotechnology industry group gave back almost all of its gains, year-to-date. The Software & Services industry group fared even worse; year-to-date, it has underperformed the broad global equity market by more than 200 bps.

In this Global Market Report, we analyze the recent sell-off in information technology and health care stocks using MSCI Indexes and GEM3. First we look at the broad GICS sectors of Information Technology and Health Care, drilling down to those GICS industry groups hit hard by the recent drops: Software & Services and Pharmaceutical & Biotechnology.

GEM3 allows us to look inside the GICS industry groups and examine the drivers of this recent run-up and sell-off – not only industry factors but, importantly, style factors and stock-specific contributions.

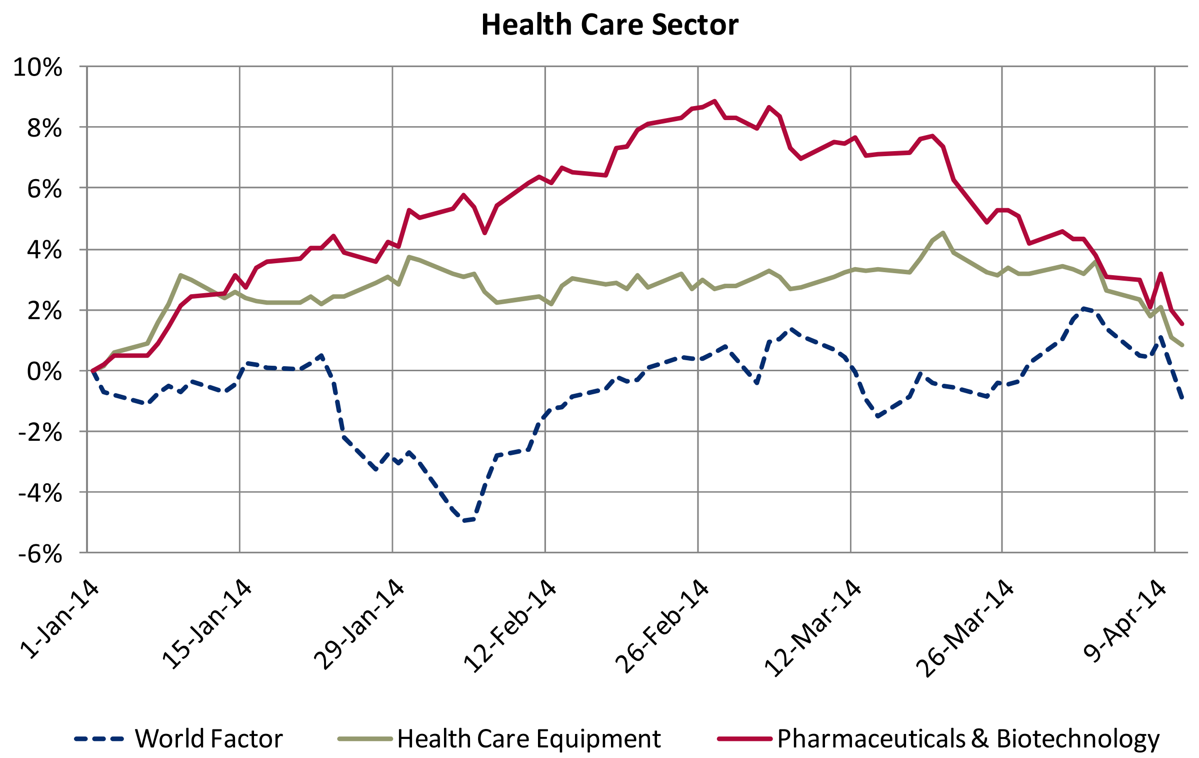
[1] The MSCI All Country World Index (ACWI) covers approximately 14,000 securities and includes large, mid, small and micro cap size segments for all Developed Markets countries in the index together with large, mid and small cap size segments for the Emerging Markets countries.

Divergence in Industry Group Performance

We begin by examining the performance of industry groups within the Information Technology and Health Care sectors. We first consider the Health Care sector (GICS code 35), which consists of two industry groups: Health Care Equipment (code 3510) and Pharmaceuticals & Biotechnology (code 3520).

In Figure 1, we plot the cumulative return of the GEM3 World factor. This essentially represents the cap-weighted return (currency hedged) of the ACWI IMI. We also plot the cumulative active return of the two Health Care industry groups versus the ACWI IMI. What stands out is the steep rise and fall of the Pharmaceuticals & Biotechnology industry group. During the first two months of 2014, it outperformed the broad market by more than 800 bps. Since then, however, Pharmaceuticals & Biotechnology has seen a steep decline, although it is still slightly positive for the year.

Figure 1: Year-to-date performance of the GEM3 World factor and active performance of GICS-based industry groups of the ACWI IMI Health Care sector relative to the ACWI IMI, January 1, 2014 – April 11, 2014.

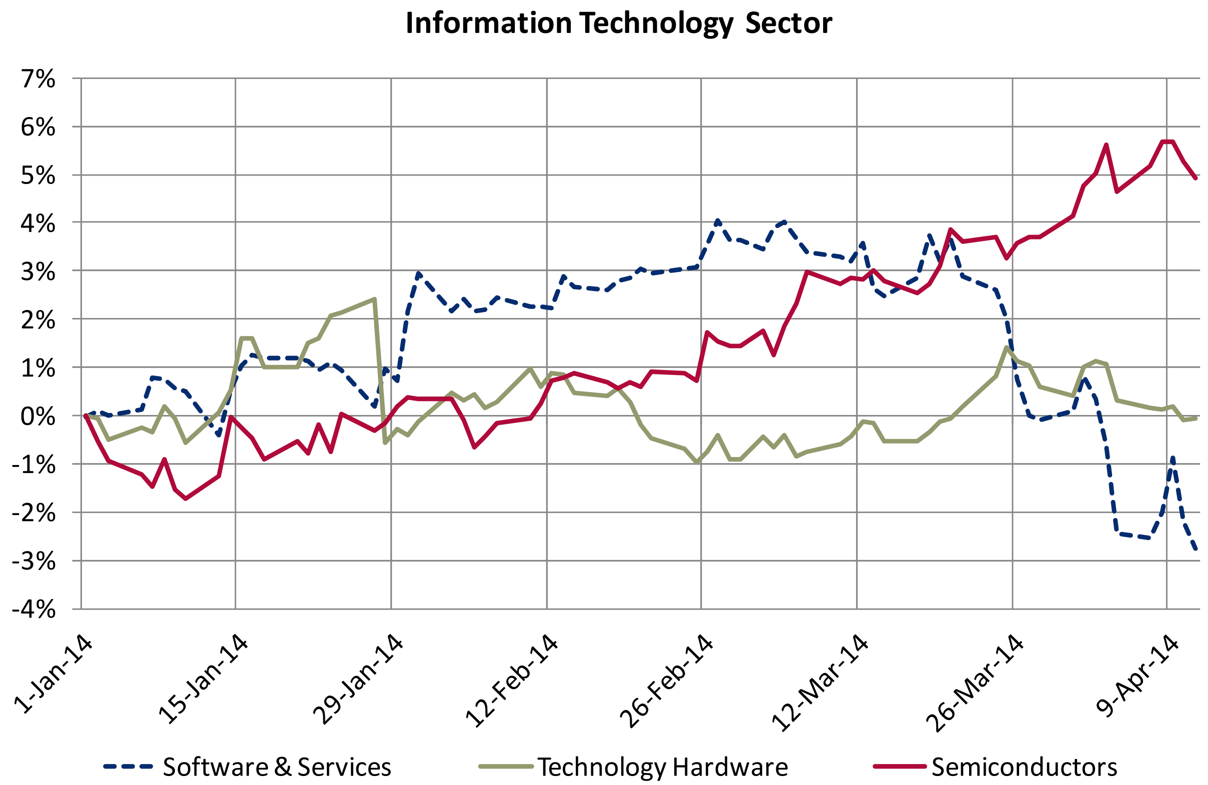


In Figure 2, we plot the cumulative active return of the three industry groups within the Information Technology sector (GICS code 45). These industry groups are: Software & Services (code 4510), Technology Hardware (code 4520) and Semiconductors (code 4530).

We see that Software & Services exhibited a similar pattern of behavior relative to Pharmaceuticals & Biotechnology; in both cases, the performance was very strong for the first two months of the year before suffering steep declines as we moved into March. Year-to-date, Software & Services has underperformed the broad equity market by almost 300 bps.

The Technology Hardware industry group has moved mostly sideways during 2014, now with a cumulative active return close to zero. By contrast, the Semiconductors industry group declined sharply the first week of January, but has climbed upward since then. At present, Semiconductors have outperformed the broad market by almost 500 bps, year-to-date.

Figure 2: Year-to-date active performance of GICS-based industry groups of the ACWI IMI IT sector relative to the ACWI IMI, January 1, 2014 – April 11, 2014.



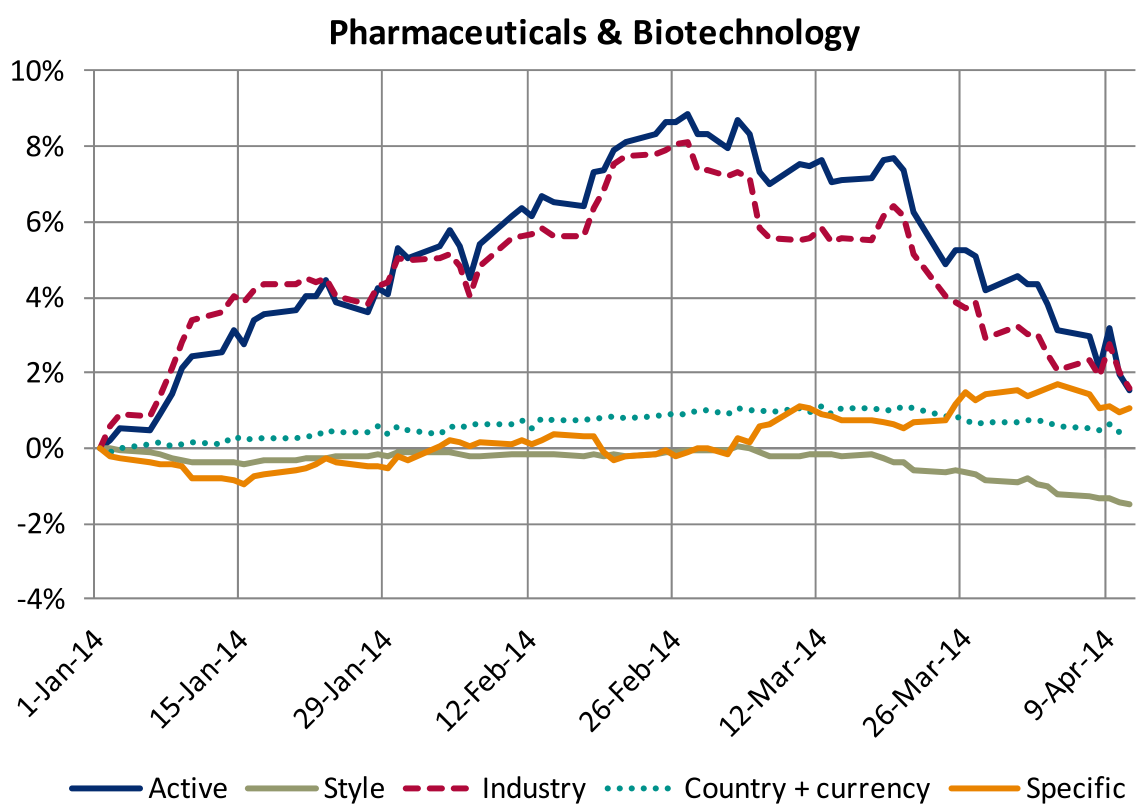
Industry Group Performance Attribution Using GEM3

We now consider performance attribution for these industry groups relative to the ACWI IMI. We attribute active returns to the GEM3 factors and stock-specific contributions. We focus on Pharmaceuticals & Biotechnology and Software & Services, the two industry groups hit particularly hard.

In Figure 3, we see that the active performance of Pharmaceuticals & Biotechnology is mainly driven by GEM3 industry factors; their contribution rose until the end of February, and declined steadily since then. Style factor contributions were flat until mid-March, and have turned negative since then.

During the week of April 4 through April 11, stock-specific contributions fell 55 bps, mainly due to the decline of Pfizer, AbbVie, and Roche. In the same week, industry factors dragged down performance by 40 bps. At the same time, style factors contributed -30 bps, mainly because of the underperformance of the Momentum factor.

Figure 3: Year-to-date return attribution of the active returns of Pharmaceuticals & Biotechnology GICS industry group, relative to the ACWI IMI, January 1, 2014 – April 11, 2014.

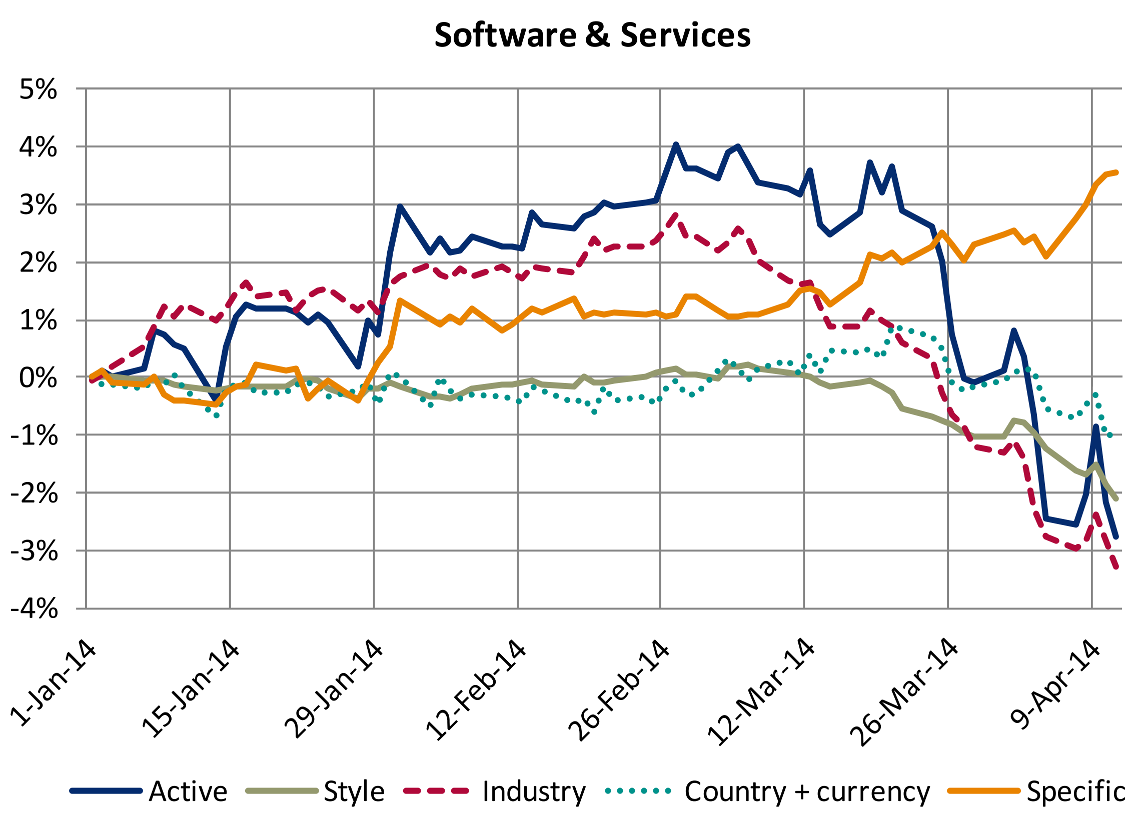


In Figure 4, we turn to the Software & Services industry group. As with Pharmaceuticals & Biotechnology, the active performance was mainly driven by industry factors, which again showed a rise until late February and a steady decline since then. Style factor contributions were flat until mid-March, and have turned negative since then.

Specific contributions in this industry group were large, 3.5 percent, mainly due to large stock-specific returns from Facebook and Google in late January, and from Microsoft in mid-March.

During the week of April 4 through April 11, style factors appeared to drive the sell-off more than industry factors. For example, industry factors lost 55 bps, while style factors lost 88 bps, mainly due to the negative contributions of the Beta, Residual Volatility and Momentum factors. Stock-specific returns, on the other hand, added 1.5 percent, mainly due to Facebook and IBM.

Figure 4: Year-to-date return attribution of the active returns of Software & Services GICS industry group relative to the ACWI IMI, January 1, 2014 – April 11, 2014.



Which Industry and Style Factors Drove the Sell-Off?

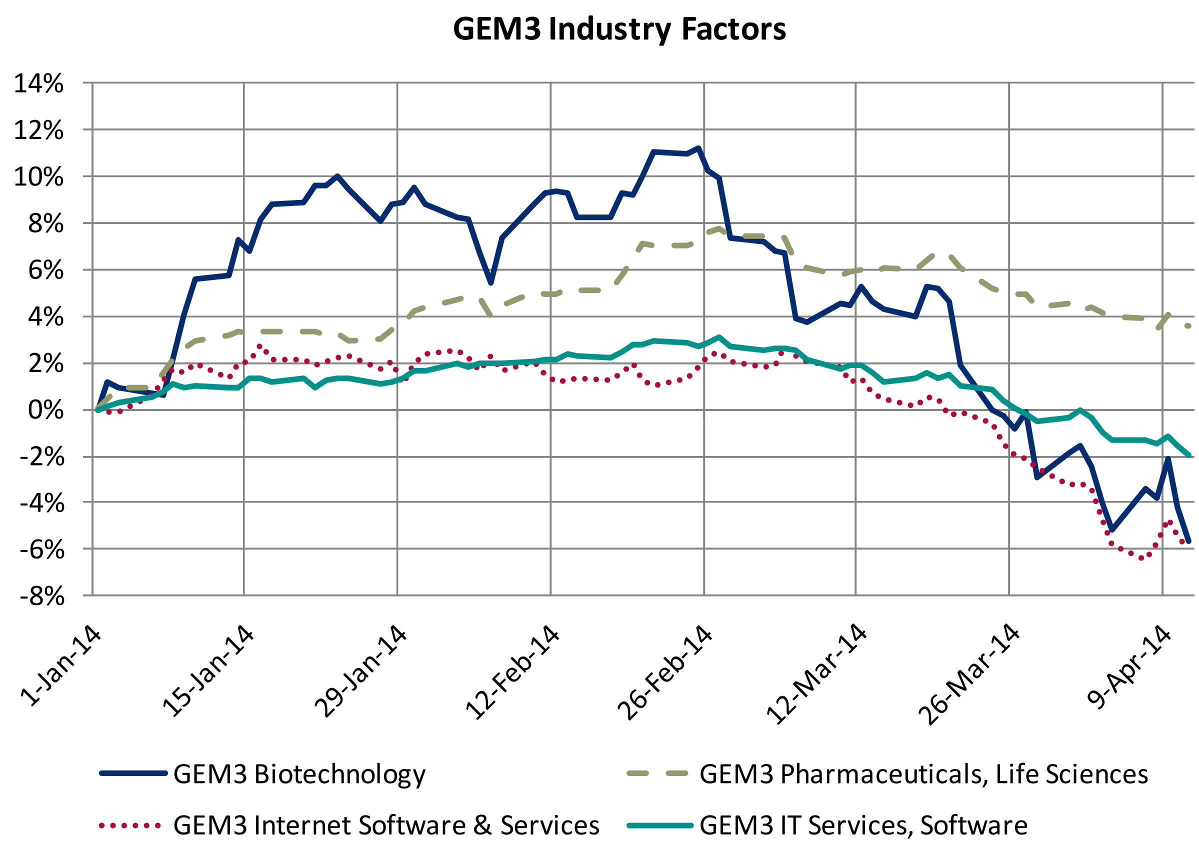
In this study, we see that the GEM3 industry factors are the major drivers of underperformance in these two industry groups: Pharmaceuticals & Biotechnology and Software & Services. We now want to look deeper at the GEM3 industry factors driving the underperformance.

Under the Pharmaceuticals & Biotechnology industry group there are two corresponding GEM3 industry factors: 'Biotechnology' and 'Pharmaceuticals, Life Sciences.'

Under the Software & Services industry group there are two corresponding GEM3 industry factors: 'Internet Software & Services' and 'IT Services, Software.'

As Figure 5 shows, the four industry factors in question exhibited similar behavior recently. They started the year outperforming, in some cases modestly, with the GEM3 Biotechnology factor peaking at 11 percent in late February. From March onward, the industry factors started to decline, and now only the Pharmaceuticals industry factor has a positive year-to-date performance of roughly 3.5 percent.

Figure 5: Year-to-date return of GEM3 industry factors spanning the Software & Services and Pharmaceuticals & Biotechnology GICS industry groups, January 1, 2014 – April 11, 2014.

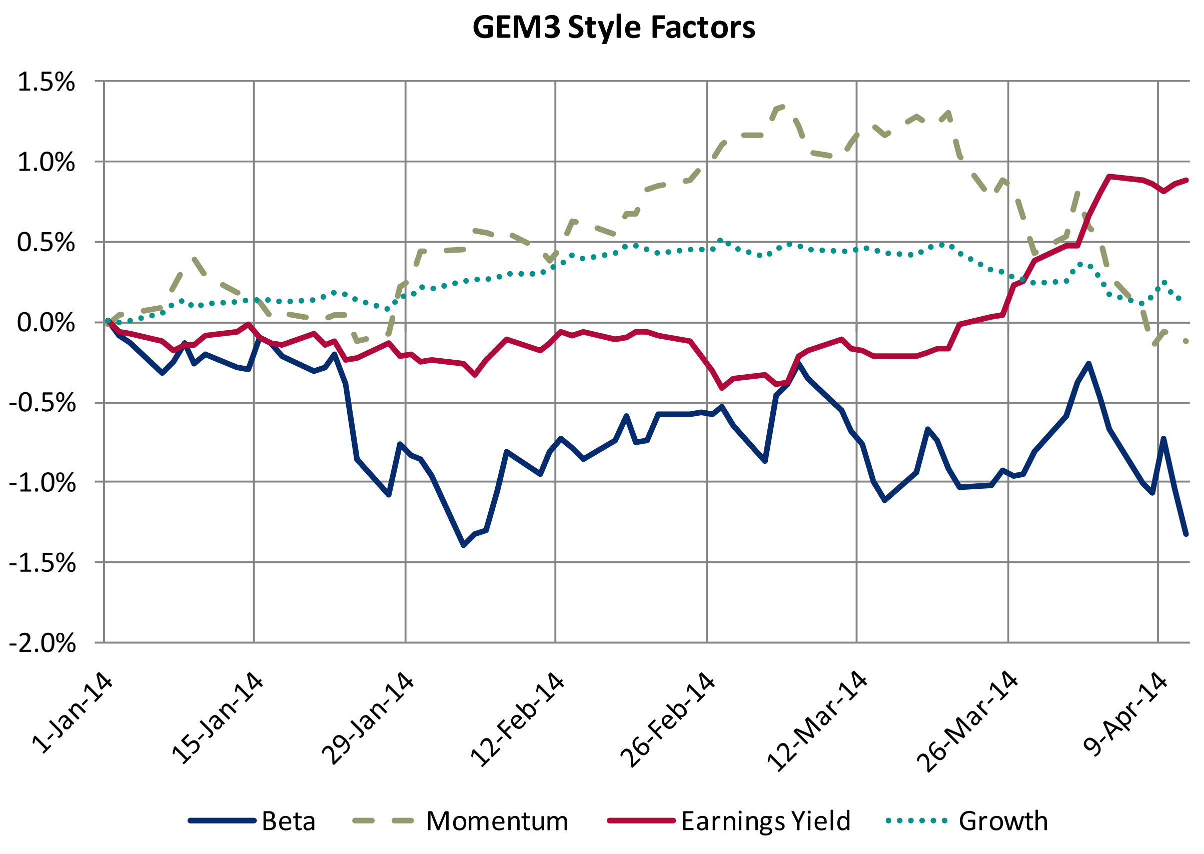


Now we turn to the GEM3 style factors. In Figure 6, we show the cumulative performance of four style factors: Beta, Growth, Momentum and Earnings Yield.

While Momentum started to underperform in early March, the Earnings Yield factor started to outperform at around the same time; this observation from GEM3 has not been widely observed by market commentators.

In the financial news, the recent sell-off episodes have been linked to the underperformance of growth and high beta stocks. We found that the Growth factor did show a pattern similar to that of Momentum, but on a more modest scale; namely, it rose in the first half of the period but started to decline in early March. Although the Beta factor had several days with large drawdowns during the same period, overall, it has declined less, which limited its potential contribution to portfolio returns.

Figure 6: Year-to-date return of select GEM3 style factors, January 1, 2014 – April 11, 2014.



Portfolio Exposures and Factor Returns

The effect of GEM3 factors on GICS industry groups depends on 1) exposures of constituent assets to the factors, and 2) returns of the factors. In Table 1 we show the exposure of the five GICS industry groups to the four GEM3 style factors, as of the end of February 2014.

Exposure to Beta was small and negative in all industry groups, except for Software & Services, where it reached 0.14. As events in March and April unfolded, Beta exposures became somewhat more positive, but because of the relatively flat return to the Beta factor in March and April, it did not have a large effect on the return of the industry group portfolios during that period.

Pharmaceuticals & Biotechnology and Software & Services had the largest positive exposures to the Momentum factor (0.40 and 0.39, respectively) and the largest negative exposure to the Earnings Yield factor (-0.45 and -0.39, respectively). These industry groups' positive exposure to the Momentum factor (which had negative returns) and negative exposure to the Earnings Yield factor (which had positive returns) combined to drive the negative contribution to return (from style factors) since March.

The exposure to the Growth factor was negligible, with the exception of the Software & Services and Semiconductors industry group (0.35 and 0.37, respectively), but the small returns to the Growth factor since March resulted in a small contribution.

Table 1: Style exposures of the industry groups, and their largest stocks, as of February 28, 2014.

	Exposure as of February 28				
Industry Group	Beta	Momentum	Earnings Yield	Growth	Largest Stock
Health Care Equipment	-0.29	0.21	-0.21	0.00	United Health
Pharmaceutical & Biotechnology	-0.06	0.40	-0.45	-0.04	Johnson & Johnson
Software & Services	0.14	0.39	-0.39	0.35	Google
Technology Hardware	-0.16	0.18	0.20	0.37	Apple
Semiconductors	0.00	-0.06	0.03	0.08	Samsung

In Table 2, we collected weekly returns to the World factor, as well as to the four style factors and four industry factors mentioned earlier. We also present standardized weekly returns (or z-scores), which account for the different volatilities of the factors, and allow a more apples-to-apples comparison of their performance.

The World and Beta factors had relatively large negative returns only in the second week of March and second week of April. The Momentum factor, on the other hand, declined five weeks out of six (although these declines were not particularly significant, since the largest negative z-score was -1.88 during the last week of March). In contrast, the Earnings Yield factor had a strongly positive performance during the last week of March and first week of April (z-score of 2.92 and 3.49, respectively).

During the last week of March, the Growth factor showed the opposite behavior, and realized one of the largest risk-adjusted drops (z-score of -2.57). This may be an indication that investors started to rotate from growth to value stocks during this period.

Finally, the four industry factors showed a decline during almost all weeks in the study period. The most significant losses occurred during the last week of March, which continued into the first week of April for the Internet Software & Services factor.

Table 2: Weekly factor returns, GEM3S model, with z-scores above '2' in absolute value highlighted.

	Return (%) Week Ending						Z-score Week Ending					
Factor	3/7	3/14	3/21	3/28	4/4	4/11	3/7	3/14	3/21	3/28	4/4	4/11
World	0.37	-2.60	0.94	0.81	1.15	-2.27	0.29	-1.96	0.70	0.61	0.85	-1.67
Beta	0.29	-0.76	0.09	0.22	0.14	-0.66	0.82	-2.13	0.24	0.63	0.39	-1.82
Momentum	-0.10	0.10	-0.13	-0.61	-0.14	-0.41	-0.31	0.31	-0.40	-1.88	-0.40	-1.11
Earnings Yield	0.18	-0.03	0.19	0.40	0.52	-0.02	1.34	-0.24	1.42	2.92	3.49	-0.10
Growth	-0.02	-0.02	0.00	-0.19	-0.07	-0.02	-0.24	-0.27	0.03	-2.57	-0.96	-0.27
Biotechnology	-3.38	0.55	-2.34	-4.66	-2.34	-0.54	-1.87	0.29	-1.24	-2.36	-1.07	-0.24
Pharmaceuticals, Life Sciences	-1.29	-0.03	0.05	-1.57	-0.44	-0.39	-2.06	-0.04	0.07	-2.34	-0.61	-0.52
Internet Software & Services	-0.02	-1.55	-0.52	-2.44	-3.37	-0.26	-0.02	-1.60	-0.53	-2.48	-3.21	-0.22
IT Services, Software	-0.61	-0.88	-0.14	-1.55	-0.80	-0.68	-1.29	-1.83	-0.29	-3.08	-1.46	-1.18

Conclusion

Recently, market observers noticed several rounds of sell-offs in information technology and health care stocks. The reason for these large drops remained largely unclear, especially given the backdrop of slowly but steadily improving economic data. Commentators also tried to attribute these losses to movements in common factors, and spoke of a possible sell-off in momentum, growth or high beta stocks.

In this Global Market Report, we looked at the performance of the GICS industry groups in the Health Care and Information Technology sectors since the beginning of 2014, and analyzed the drivers through the lens of the GEM3 model.

Financial news has highlighted declines in the health care and information technology sectors; however, the industry groups within these sectors were not uniform in their behavior during the recent sell-off period. For example: Software & Services and Pharmaceuticals & Biotechnology underperformed steeply, while Semiconductors have had a great year so far.

We found that this behavior was mainly driven by the performance of the four GEM3 industry factors spanning these GICS industry groups: 'Biotechnology,' 'Pharmaceuticals, Life Sciences,' 'Internet Software & Services' and 'IT Services, Software.'

Furthermore, we found that the most important negative style contributions to the decline since March 2014 came from the Momentum and Earnings Yield factors. We also found that the recent large drops in the Software & Services and Pharmaceuticals & Biotechnology industry groups were part of a broader decline that had started as early as the first week of March. The GEM3 model allowed us to look deeply at the factors driving this event, and understand what really happened in the recent "Tech Wreck."

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