

Q-Series®

What crowded positions are bubbling up in equity markets?

Equities

Global
Quantitative

The storm clouds are gathering

Unprecedented capital market conditions, quantitative easing and divergence in monetary policies have led to large flows of cheap money into equity markets globally, inflating thematic investment bubbles and increasing the risk of trade-crowding, in our view. We think key questions at the forefront of investors' minds are: where are these crowded trades forming and for how much longer can they be sustained?

A new investor toolkit

We introduce our new toolkit for reading the barometric pressure of these bubbles. This extends our earlier research and consolidates several data sets to give a more complete picture of crowding. Institutional holdings, return correlations within peer groups and sell-side sentiment combine to provide new insights into the short- and long-term effects of crowding.

Where are the bubbles and how much longer can they be sustained?

Purely from a quantitative point of view, our crowding barometer suggests that overbought bubbles have formed in US healthcare, Japan telecoms, Asia ex-Japan information technology and positive exposure to the US dollar; there have been consistent inflows and elevated sell-side sentiment in all these segments. Conversely, we see crowded selling occurring in energy sectors globally, with large active underweight positions and sell-side sentiment at their historical lows.

From a fundamental top-down view, UBS strategists agree with the findings

Our US strategist expects the trades on US dollar and US healthcare to start to unwind. Our Japan strategist believes there is limited upside potential for Japan telecoms. On the flip side, we think potential oil-price stabilisation plus substantial short covering, or improving commodity-related sentiment, could trigger a rebound in the energy sector.

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Executive summary

Why should we care about crowded trades?

We are in a world of artificially low interest rates. Given ample liquidity, cheap money has flooded into equity markets, leading to a microcosm of crowding within equity markets—trade positioning on the basis of a similar investment thesis. We believe the risk of crowded trades has become more imminent. Once these trades reach their critical value, or an exogenous shock occurs, we expect a sharp price reversal as investors unwind their exposure in tandem. In this report, we investigate crowding with regions (see page 12), popular investment themes (page 16), sectors (page 18) and styles (page 30).

How can we measure this?

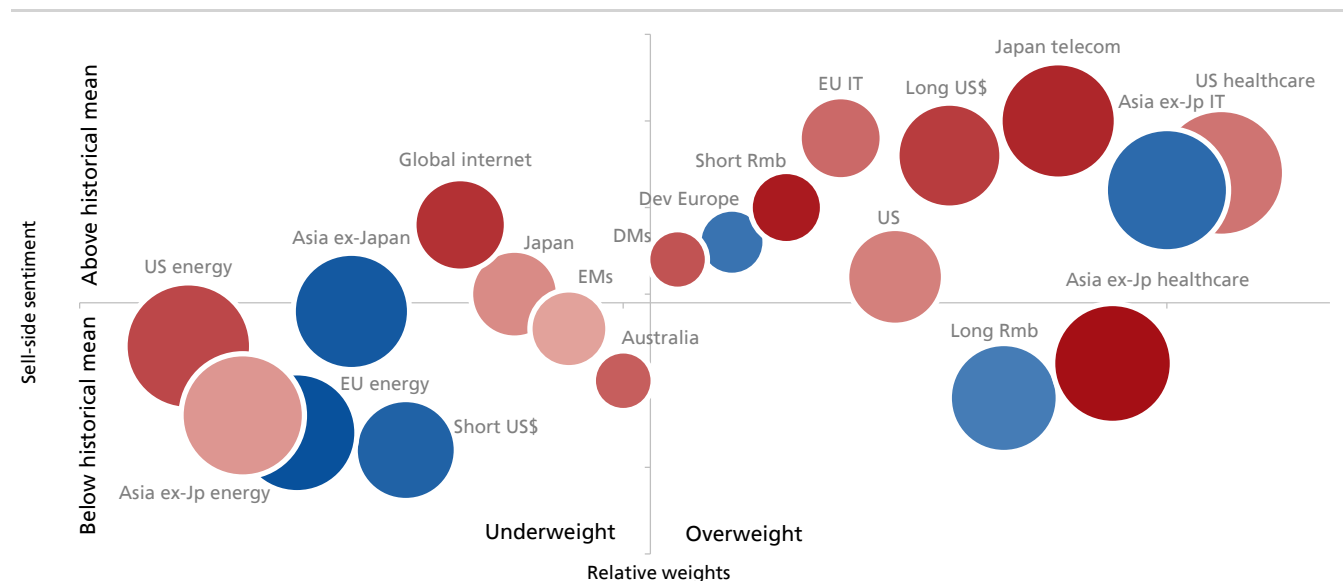
This report outlines our new quantitative framework for measuring crowding. This extends our earlier work on crowded trades by complementing several data sources and analysis techniques:

- **Active holdings.** We can directly measure whether asset managers are overweight or underweight investment themes¹, and whether their positions are increasing or decreasing, effectively capturing buy-side sentiment.
- **Market signal.** While active holdings are arguably the 'purest' source of buy-side sentiment, there are severe limitations to the real-world data: they are reported neither comprehensively, nor in a timely manner. Accordingly, we augment the holdings data with proxies inferred from market data, essentially looking at abnormal return correlations within peer groups to capture the stock co-movement caused by crowded trades.
- **Sell-side sentiment.** The relationship between sell-side sentiment and stock performance is not as direct as many analysts would like to believe. However, sell-side sentiment is still a strong driver of stock returns across global markets. The third component to our crowding toolkit is aggregate sentiment.

¹ This can be any region, country, sector, investment-style portfolio, or any other portfolio that we want to monitor.

Which positions are most crowded now?

Figure 1: Where are the bubbles?



Note: The size of the bubbles represents the transformed relative weights; their colour represents the crowdedness in the past quarter measured by PCI; blue means sell and red means buy. The darker the colour, the more crowded the investment theme.

Source: MSCI, IBES, FactSet, UBS Quantitative Research

We see overbought bubbles forming in US healthcare, Japan telecoms, Asia ex-Japan information technology and portfolios with positive exposure to the US dollar; we have observed consistent inflows and elevated sell-side sentiment in all these segments.

Conversely we see crowded selling occurring in energy sectors globally; active underweight positions and sell-side sentiment are at their historical lows.

Fundamentally, our US strategist suggests that the trades on the US dollar and US healthcare may start to unwind. Our Japan strategist believes there is limited upside potential for Japan telecoms. On the flip side, we believe potential oil-price stabilisation plus substantial short covering, or an improvement in commodity-related sentiment, could trigger a rebound in the energy sector.

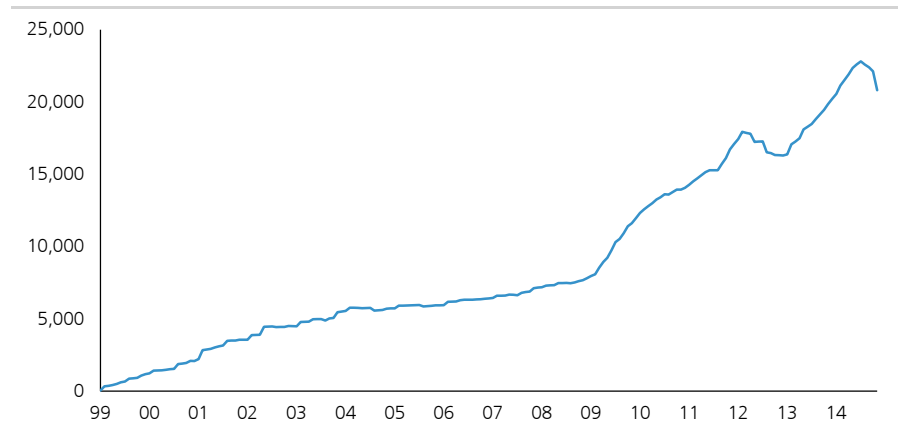
The elements of crowding

Active holdings

FactSet's ownership database provides information on active fund managers' holdings. It collects institutional investors' ownership data globally, which includes both terminated and active global equity securities. This data set starts from 1999 and currently covers about 37,800 funds globally.

We observe fund holdings on the FactSet database

Figure 2: Number of funds that reported holdings each month



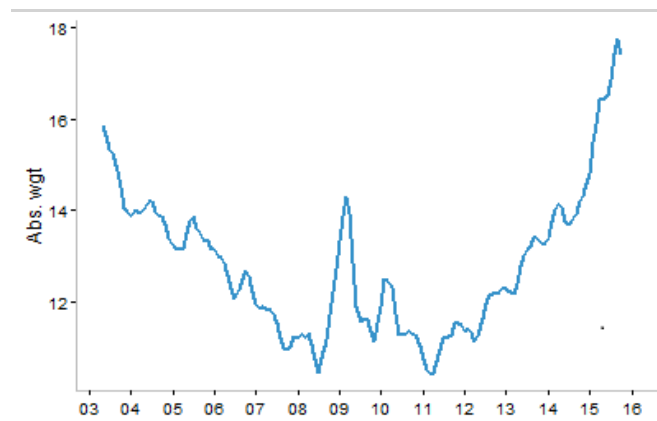
Source: FactSet, UBS Quantitative Research

Each month we form an **active trading portfolio** by aggregating positions across global active managers. Essentially, we sum up all the holdings in dollar value across all the active managers and calculate the weights of stocks in this active trading portfolio. We then aggregate the weights across different groupings, eg, regions, countries, sectors, investment styles. We then compare this weight with the relevant MSCI benchmark to form the relative weight.

We aggregate holdings across global managers to form an active trading portfolio and compare it with the benchmark

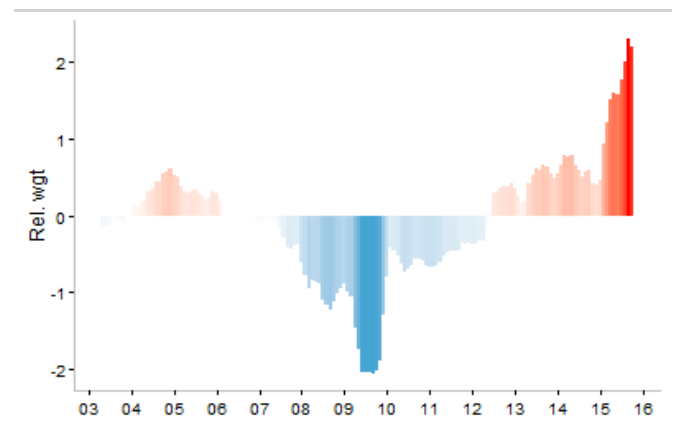
Figure 3 shows the weight of the US healthcare sector in the active trading portfolio. Figure 4 compares this weight with the weight of the sector in the MSCI US index. From late 2008 to early 2009, the absolute weight shot up to the roof, while the weight relative to the benchmark only increased marginally. Unlike last time, currently both the absolute and relative weights have reached historical highs—which rings a warning bell.

Figure 3: Weight of the US healthcare sector in the active trading portfolio



Source: MSCI, FactSet, UBS Quantitative Research

Figure 4: Weight of the US healthcare sector in the active trading portfolio relative to the benchmark



Source: MSCI, FactSet, UBS Quantitative Research

Performance-based Crowding Indicator (PCI)

Active holdings are arguably the ‘purest’ source of buy-side sentiment. However, there are severe limitations to the real-world data: it is neither comprehensively reported, nor reported in a timely fashion. Accordingly, we augment our holdings data with proxies inferred from the correlation among price returns.

The intuition behind this is straightforward; as investors crowd into an investment theme *on the basis of a similar information set*, stock peers exposed to the same theme tend to track together, which we could observe via increasing correlation of the price returns among them—dubbed their *average pairwise correlation*.

This concept forms the basis of our **PCI** (see Appendix for more details):

- 1) We scale the average pairwise price correlation by its dispersion. While the average measures the tendency of these stocks to move together, their dispersion captures the strength of this accord.
- 2) Changes in this correlation should be considered relative to the overall market level, which often fluctuates due to dynamics among other asset classes. For important (but dull) statistical reasons, we form a baseline correlation level using randomly generated portfolios containing the same number of stocks.
- 3) Some groupings may still have a consistently higher correlation than others. For example, the Hong Kong equity market is dominated by financials and experiences a higher ‘base level’ of correlation; a more diverse market like Japan experiences lower correlation. Accordingly, we also frame the indicator within its historical context.
- 4) We still need to capture the *direction* of the crowding—whether investors are rushing for the entrance or the exit. We extend our previous work by combining these correlations with the target portfolio's cross-sectional hit rates to estimate the direction of trading.

Holdings data is ideal in theory, but is delayed/incomplete in practice

Increased return correlation among comparable stocks

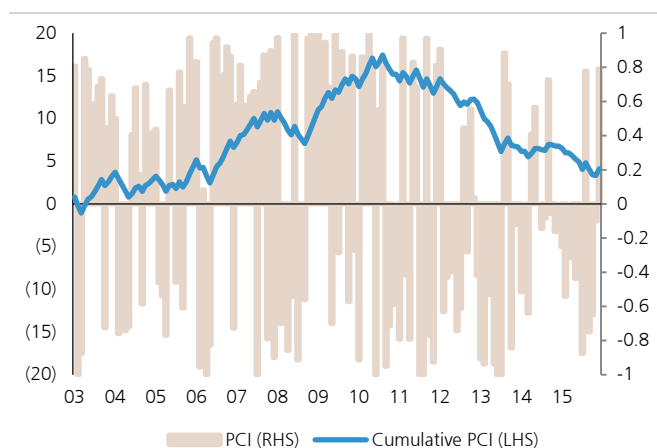
First, we scale average pairwise price correlation by dispersion

An uncorrelated baseline level

Framed in historical context

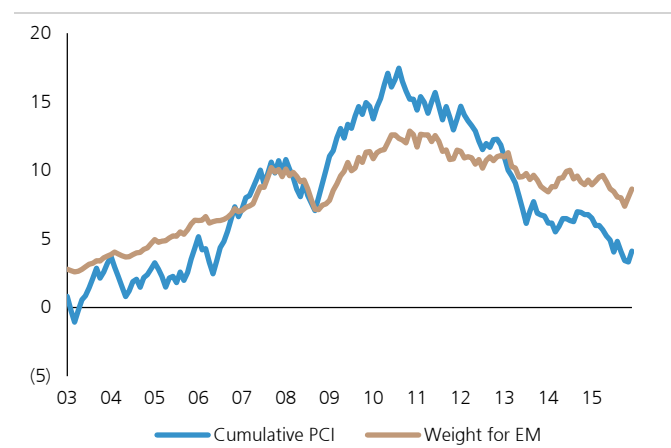
Are investors rushing for the entrance or the exit?

Figure 5: Performance-based Crowding Indicator (PCI)



Source: MSCI, UBS Quantitative Research

Figure 6: Cumulative PCI relative to weight in active trading portfolio



Source: MSCI, FactSet, UBS Quantitative Research

Above is the example for investment in emerging markets. We use the MSCI Emerging Markets index as a proxy. The cumulative PCI is a good supplement to holding data. It captures the peak in weights for EMs around the end of 2010 and the subsequent sell-off. Moreover, the monthly PCI can be used to time short-term performance reversal, which we will discuss in the Timing the cycle section.

Sell-side sentiment

The relationship between sell-side ratings and stock performance is perhaps not as direct as many analysts would like to believe. However, sell-side sentiment remains a strong driver of many return phenomena across global markets.

The third component in our crowding toolkit is coverage-weighted aggregate ratings²—consensus recommendation for each stock, aggregated at the portfolio level and weighted by the number of covering analysts.

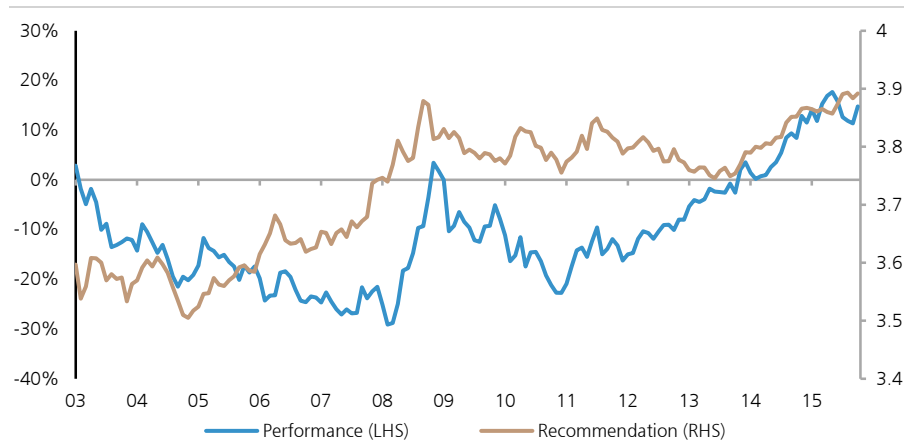
This is interpreted as a contrarian indicator; when consensus recommendations are unanimous, there is essentially no further room to upgrade/downgrade, and we expect to see reversion to the mean again. So, while not a 'smoking gun', coverage-weighted aggregate ratings serve as a useful and transparent overlay.

Figure 7 shows the US healthcare sector as an example. Recommendations peaked in late 2008, followed by a peak in relative performance roughly two months later; this was then followed by a two-year downward cycle. Currently, the indicator has reached a historical high, which could cause concern.

Accuracy aside, sell-side ratings are a useful indicator...

...of contrarian sentiment

Figure 7: Aggregate rating and relative performance of US healthcare



Note: Recommendation ranks from 1 to 5, with 1 indicating strong sell and 5 indicating strong buy.
Source: MSCI, IBES, UBS Quantitative Research

² Refer to Appendix for details on the calculation.

Timing the cycle

Timing the investment cycle is an elusive target of any investment process, and a particular shortcoming of systematic investment processes.

Short-term effects

The weights in our active trading portfolio represent a gradual, longer-term trend in positioning, as the holdings change relatively infrequently. Conversely, the PCI is a shorter-term signal that is useful for capturing mean-reversion effects.

In our earlier research³, we discussed how to use the PCI to time such short-term performance reversals. We showed that when the PCI breached a critical level, ie, when an investment style became too crowded, it tended to underperform in the subsequent month, which worked particularly well for price momentum strategies.

Here we further explore these effects. By overlaying the PCI with the cycle of active managers' positioning, we believe we could improve our ability to time this short-term reversal. For each target group of stocks, we divide the historical time period to distinct phases: an upward cycle when active managers increase their positions in target portfolio, and a downward cycle when active managers reduce their positions.

We find that buy-crowding within the divestment cycle (ie, reducing exposure to an investment theme), results in a much higher likelihood of a price reversal than during an investment cycle. Conversely, sell-crowding is much more likely to trigger a rebound in price during the upward cycle than the downward cycle.

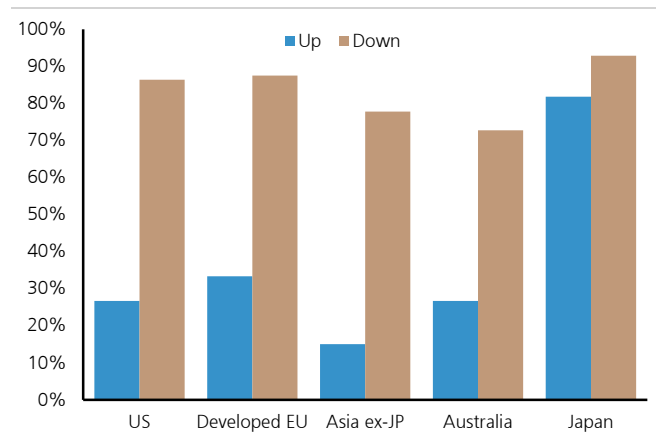
Our active trading portfolio captures long-term effects

Conversely the PCI captures short-term effects

We now condition the PCI on asset managers' positioning

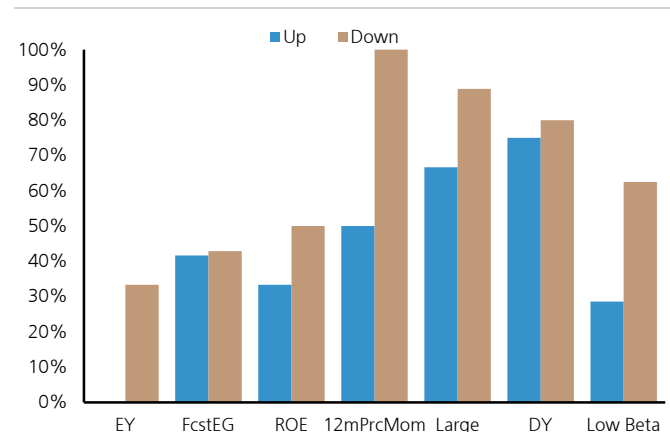
Buy-crowding amid a long-term divestment trend is likely to fizzle

Figure 8: Likelihood of underperformance following buy-crowding, by region/country



Source: MSCI, UBS Quantitative Research

Figure 9: Likelihood of underperformance following buy-crowding, by investment style



Note: EY = Earnings yield; FcstEG = Forecast earnings growth; 12mPrcMom = 12-month price momentum; DY = Dividend yield.
Source: MSCI, IBES, UBS Quantitative Research

Figure 8 shows the likelihood of country-level underperformance in the subsequent three months after the associated PCI score indicates buy-crowding⁴, conditioned on the investment (up) or divestment (down) part of the positioning cycle.

³ [Asia Quantitative General Research: Where are the crowded trades?](#), 16 January 2015.

⁴ We quantify this as the PCI breaching the 0.8 threshold.

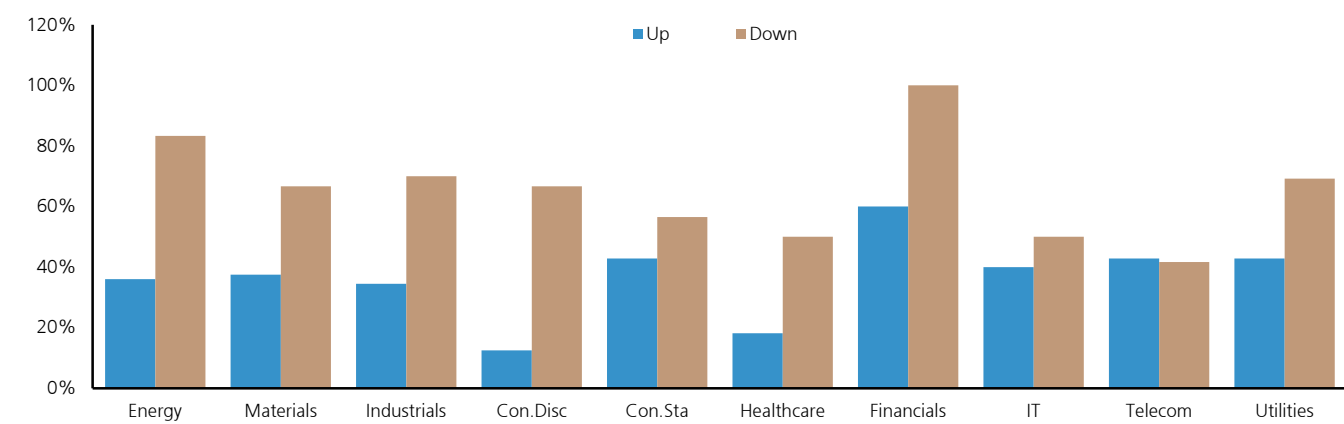
Take for example the US market: it underperformed the global benchmark only 27% of the time when the PCI indicated buy-crowding during periods in which asset managers were increasing their US exposure. However, when the PCI signal indicated buy-crowding during periods of divestment from US market exposure, the subsequent underperformance occurred 86% of the time.

Figure 9 shows the interacting effects of the crowding indicators within style baskets in the MSCI ACWI. Long-term momentum and low-beta exposure appear to benefit the most from conditioning within the positioning cycle; perhaps not surprising considering these are the typical trading exposure during risk-reversals.

Figure 10 shows similar effects within US sectors. The cyclical sectors—energy, industrials and consumer discretionary—all benefit from conditioning the higher-frequency crowding indicator within the context of its long-term positioning.

Cyclical styles/sectors benefit the most from overlaying crowding with the positioning cycle

Figure 10: Likelihood of underperformance following buy-crowding, by US sector

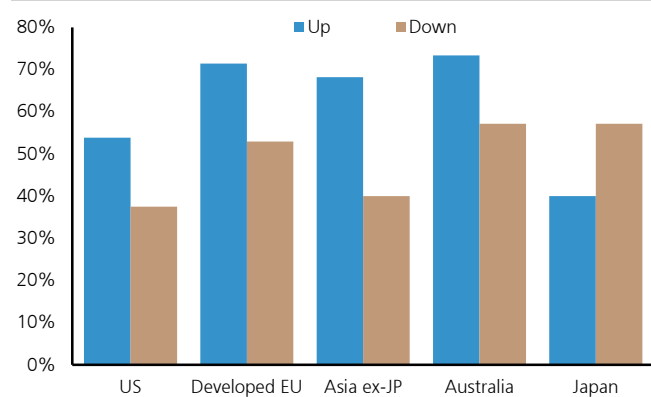


Source: MSCI, UBS Quantitative Research

On the flip side, we find a symmetric relationship in crowded selling. When the PCI indicates that crowded selling is occurring⁵, a 'relief rally' is far more likely during a period of increasing exposure to the investment theme.

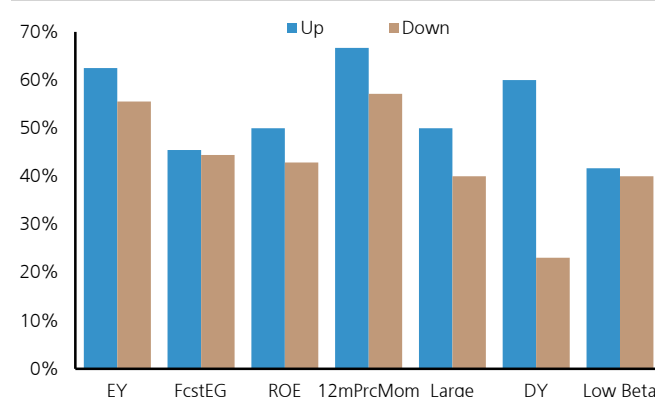
Crowded selling amid a longer-term investment trend is likely to revert

Figure 11: Likelihood of outperformance following sell-crowding, by region/country



Source: MSCI, UBS Quantitative Research

Figure 12: Likelihood of outperformance following sell-crowding, by investment style

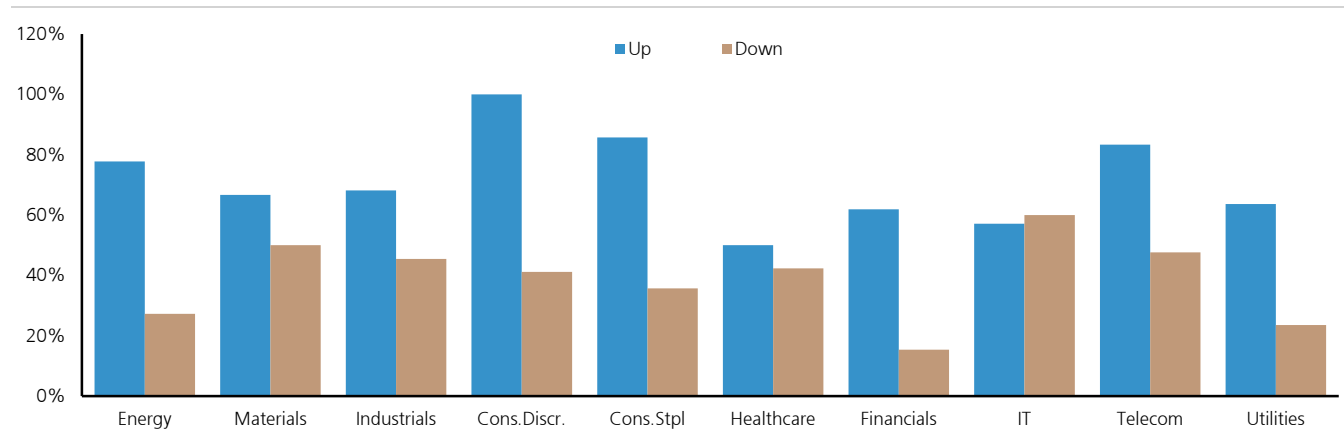


Source: MSCI, IBES, UBS Quantitative Research

⁵ We quantify this as the PCI breaching the -0.7 threshold, due to data coverage.

These effects are largely consistent globally, with the exception of Japan. As shown in Figure 11, the chance of subsequent outperformance following sell-crowding in Japan increases during a divestment trend, ie, short-term negative sentiment is trend-following.

Figure 13: Likelihood of outperformance following sell-crowding, by US sector



Source: MSCI, UBS Quantitative Research

Long-term effects

Short-term crowding effects aside, we think our crowding toolkit provides a useful indicator of longer-term reversals, as many of the indicators are inherently range-bound; their presence at extreme levels typically results in a structural reversal.

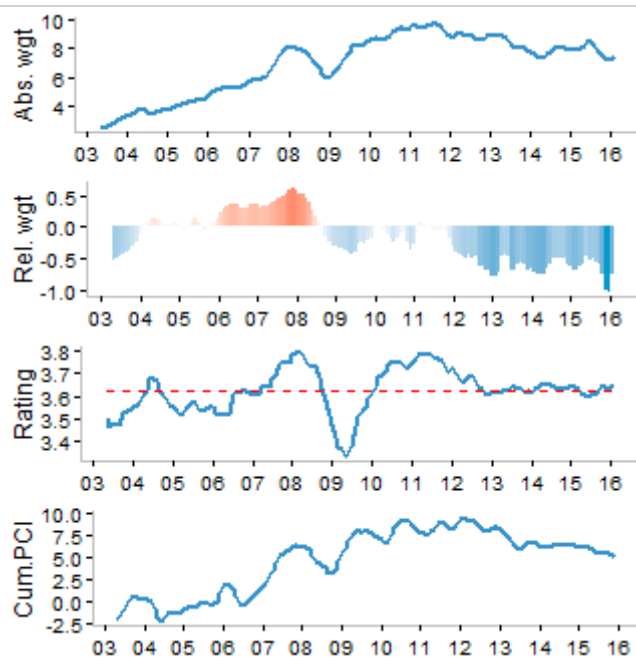
Figure 14 shows these effects in Asia ex-Japan. The top chart indicates that Asia became a more significant component of institutional portfolios from the time the data started until 2011. Essentially, this captures flows into Asia.

The second chart shows the extent of this positioning, in excess of the MSCI ACWI benchmark. In the years leading up to the GFC, there was significant overweight positioning in Asia. This has since reversed and investors have maintained largely underweight exposure, which is currently at a historical low. We believe the middling ratings for Asia stocks are of no great interest, but the PCI indicates that sustained overcrowded selling has occurred.

Range-bound indicators can provide context to long-term trends, in our view

Active positioning, sell-side sentiment and portfolio correlations at a glance

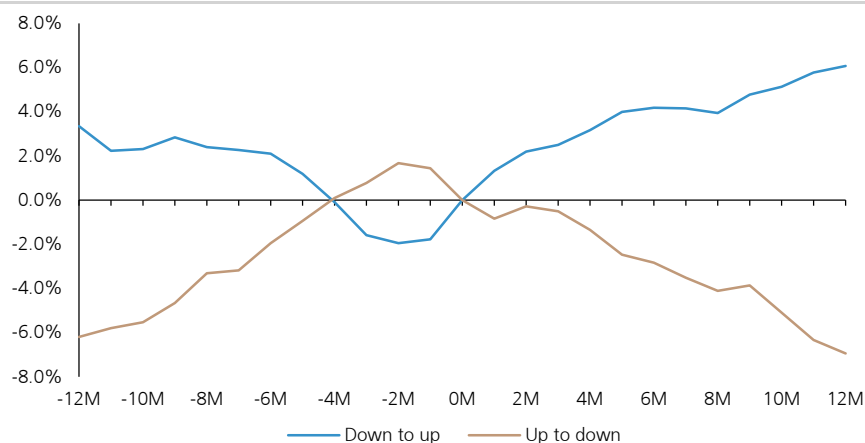
Figure 14: Asia ex-Japan



Source: MSCI, IBES, FactSet, UBS Quantitative Research

The event study in Figure 15 shows the 12-month performance around the inflexion point of the investment cycle. Due to the delay in holdings data in the real world, the performance actually started to turn about two months before the inflexion we define. Yet, the outperformance (underperformance) continues to run for at least 12 months after the inflexion point.

Figure 15: 12-month relative performance around the inflexion point



Source: MSCI, FactSet, UBS Quantitative Research

Where are the storm clouds gathering?

Putting all the measures together, we look for the investment themes that are close to the inflexion point of an investment cycle.

Figure 16: Are we close to the inflexion point of an investment cycle?

| | Relative weight | Relative weight (z-score) | Sell-side rating against long-term average | Cumulative PCI (z-score) | Last month's PCI | Close to inflexion point? |
|-----------------------------------|-----------------|---------------------------|--|--------------------------|------------------|---------------------------|
| Regions | | | | | | |
| Developed markets | 1.38 | -0.51 | 0.4% | 1.48 | -0.39 | |
| Emerging markets | -1.38 | 0.51 | -0.1% | -1.43 | 0.79 | |
| US | 3.72 | 0.50 | 0.3% | 1.71 | 0.24 | |
| Developed Europe | 1.76 | -0.45 | 0.5% | 0.96 | -0.24 | |
| Asia ex-Japan | -0.70 | -0.91 | -0.1% | -1.36 | -0.35 | |
| Australia | -1.26 | 1.21 | -1.7% | 0.52 | -0.03 | |
| Japan | -3.18 | 0.41 | 0.2% | -0.19 | -0.58 | |
| Themes | | | | | | |
| Internet | -0.52 | 0.16 | 0.6% | 1.37 | -0.10 | |
| Long US\$ | 0.97 | 0.78 | 3.1% | 2.06 | 0.15 | Y (Down) |
| Short US\$ | -0.30 | -0.26 | -8.7% | -1.40 | 0.74 | Y (Up) |
| Long Rmb | 0.53 | 0.84 | -3.7% | -0.64 | 0.00 | |
| Short Rmb | 0.20 | -0.44 | 0.9% | 1.12 | 0.45 | |
| Sectors | | | | | | |
| US energy | -1.02 | -1.61 | -0.1% | 0.19 | 0.38 | Y (Up) |
| US materials | 0.09 | -1.74 | 4.7% | 1.12 | -0.37 | |
| US industrials | 0.48 | 0.70 | -2.7% | 1.35 | 0.31 | |
| US consumer staples | 1.68 | -0.04 | 0.2% | 1.73 | 0.38 | |
| US consumer discretionary | -1.70 | 1.27 | -2.4% | 0.37 | 0.09 | |
| US healthcare | 1.70 | 1.59 | 1.7% | 1.64 | -0.79 | Y (Down) |
| US financials | 0.88 | -1.12 | 1.9% | 1.75 | -0.12 | |
| US IT | -1.29 | -0.85 | -0.5% | 1.81 | -0.26 | |
| US telecoms | -0.52 | -0.12 | 4.6% | 0.20 | 0.50 | |
| US utilities | -0.29 | -0.05 | 2.4% | 0.99 | 0.03 | |
| Dev Europe energy | -1.43 | -1.02 | -6.1% | -1.73 | 0.24 | Y (Up) |
| Dev Europe materials | -0.59 | -1.14 | 0.4% | -1.11 | -0.08 | |
| Dev Europe industrials | 0.89 | -1.25 | -0.2% | 1.32 | 0.21 | |
| Dev Europe consumer staples | 1.67 | 1.42 | -2.2% | 1.96 | -0.48 | |
| Dev Europe consumer discretionary | -0.42 | -1.53 | 3.2% | 0.52 | 0.62 | |
| Dev Europe healthcare | 0.55 | -0.25 | -3.4% | 1.19 | -0.96 | |
| Dev Europe financials | -0.54 | 1.01 | 3.0% | 1.46 | -0.30 | |
| Dev Europe IT | 0.68 | 0.16 | 8.3% | 1.72 | -0.38 | |
| Dev Europe telecoms | -0.35 | 1.37 | 0.9% | 0.90 | 0.69 | |
| Dev Europe utilities | -0.48 | -0.76 | 0.6% | -1.35 | 0.67 | |
| Asia ex-Jp energy | -0.75 | -1.60 | -3.7% | -1.19 | 0.42 | Y (Up) |
| Asia ex-Jp materials | -1.23 | 0.73 | -2.3% | -1.22 | 0.42 | |
| Asia ex-Jp industrials | -1.96 | 0.75 | -0.6% | -0.87 | -0.31 | |
| Asia ex-Jp consumer staples | 1.89 | -0.18 | 0.5% | -0.91 | -0.35 | |
| Asia ex-Jp consumer discretionary | 0.42 | -1.62 | 0.5% | -1.17 | 0.30 | |
| Asia ex-Jp healthcare | 0.62 | 1.37 | -1.6% | 1.62 | 0.79 | Y (Down) |
| Asia ex-Jp financials | -1.27 | -0.60 | 0.5% | -0.75 | -0.70 | |
| Asia ex-Jp IT | 2.66 | 1.46 | 1.7% | 0.55 | -0.09 | Y (Down) |
| Asia ex-Jp telecoms | 0.12 | 0.10 | 0.9% | -0.43 | 0.50 | |
| Asia ex-Jp utilities | -0.50 | -0.09 | -1.8% | -1.55 | -0.75 | |
| Australia resources | 4.20 | -0.28 | -5.2% | -0.55 | -0.03 | |
| Australia financials | -10.08 | -0.70 | 4.1% | -0.94 | -0.25 | |
| Australia industrials | 5.88 | 0.92 | -3.2% | 1.81 | 0.18 | |
| Japan energy | 0.23 | 0.06 | 4.5% | -0.34 | -0.53 | |
| Japan materials | -1.65 | 0.09 | -0.5% | -0.79 | -0.41 | |
| Japan industrials | -2.35 | -1.15 | -2.3% | -1.53 | -0.44 | Y (Up) |
| Japan consumer staples | -0.54 | -0.27 | 2.7% | 0.15 | 0.70 | |
| Japan consumer discretionary | 0.38 | 0.23 | 0.9% | -0.59 | 0.87 | |
| Japan healthcare | -0.33 | 1.30 | 2.6% | -1.10 | -0.69 | |
| Japan financials | 0.89 | -0.19 | -1.3% | -0.45 | 0.00 | |
| Japan IT | 2.00 | -0.91 | -0.6% | -0.50 | -0.55 | |
| Japan telecoms | 2.84 | 1.24 | 9.5% | 1.36 | 0.63 | Y (Down) |
| Japan utilities | -1.47 | 0.95 | -3.9% | -0.06 | 1.00 | |
| Styles | | | | | | |
| High earnings yield | -1.63 | -0.54 | -0.1% | -1.53 | -0.37 | |
| High dividend yield | -4.47 | -1.42 | 0.1% | -1.38 | 0.29 | |
| High forecast earnings growth | 1.77 | 0.87 | 0.9% | 0.50 | -0.11 | Y (Down) |
| High 12M price momentum | 2.74 | 0.85 | -0.1% | 1.31 | -0.38 | |
| High ROE | 1.80 | 0.81 | -0.2% | -0.01 | 0.39 | |
| Large caps | -2.97 | -0.46 | 0.5% | 1.19 | 0.97 | |
| Low volatility | -2.71 | -0.24 | 0.2% | 0.07 | 0.11 | |
| Low beta | -0.19 | 0.57 | 0.4% | 0.57 | 0.20 | |

Source: MSCI, IBES, FactSet, UBS Quantitative Research

Developed markets versus emerging markets

Developed markets (DMs) have been clear beneficiaries of flows, given the fallout from the end of the commodity super-cycle, global growth slowdown headlined by the potential for a 'dark skies' scenario in China⁶ and the divergence in central-bank policies. According to our strategy team, there have been flows out of commodity-exporting emerging markets (EMs), such as Brazil and Russia, while China has dealt with a more difficult transition to a consumer-driven economy.

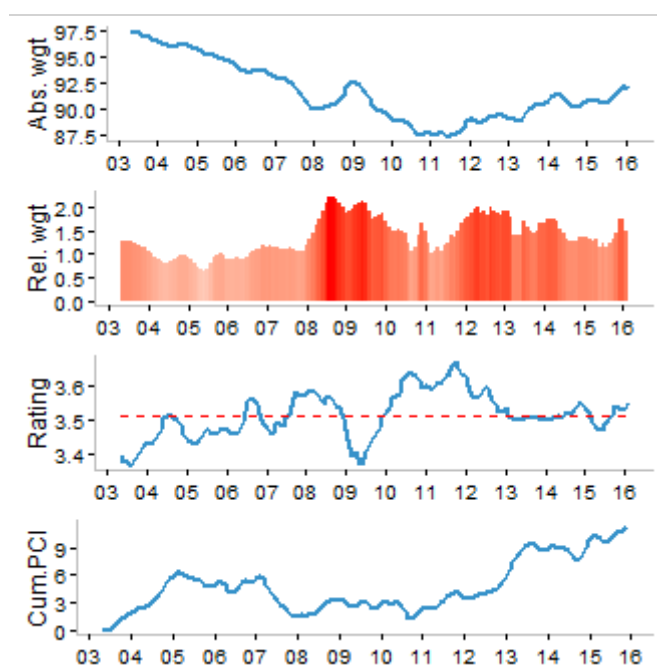
DMs have been clear beneficiaries of flows

The cumulative PCI in Figure 18 shows the extent of crowded selling in EMs since the Fed initiated Operation Twist, which also coincided with the underperformance of EMs during the same period. However, because this sustained crowded selling has been occurring within the context of a prolonged divestment from EMs, we believe this indicates that the EM sell-off is far from 'overdone'.

EM sell-off appears consistent with structural divestment

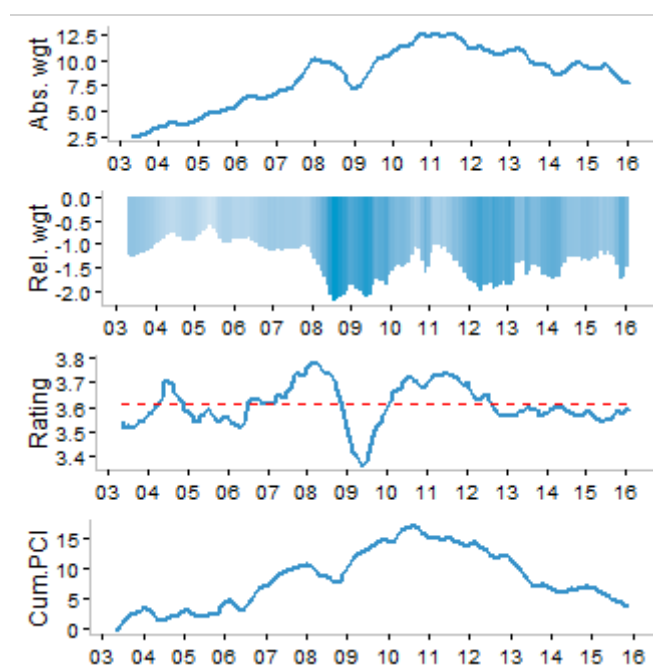
Also worth noting is that in both cases, middling sell-side ratings indicate that sell-side forecasts are erring on the side of caution.

Figure 17: Developed markets



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 18: Emerging markets



Source: MSCI, IBES, FactSet, UBS Quantitative Research

We note consistent relative overweight in DMs throughout the history of the data, likely a limitation of fund holdings coverage and benchmark weights. DM funds are disproportionately represented within the holdings data, and we think the free-float component of their MSCI weights may be more conservative than the holdings belie, which might systematically overstate their relative weight.

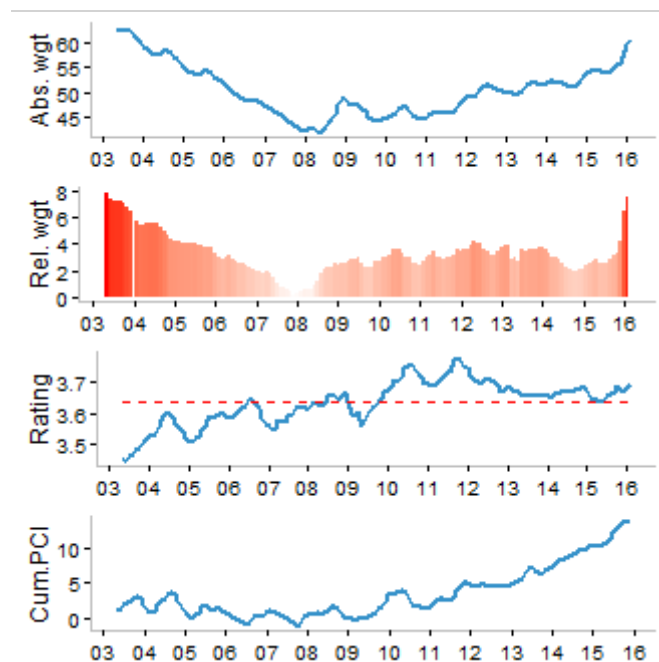
Data coverage may explain systematic DM overweighting

Divergence within developed markets

Within DMs, we see a clear preference. With the divergence in global central-bank policies, the US has seen consistent equity inflows. Yet, positioning in Europe, Japan and Australia have been more bearish (Figure 19-Figure 22).

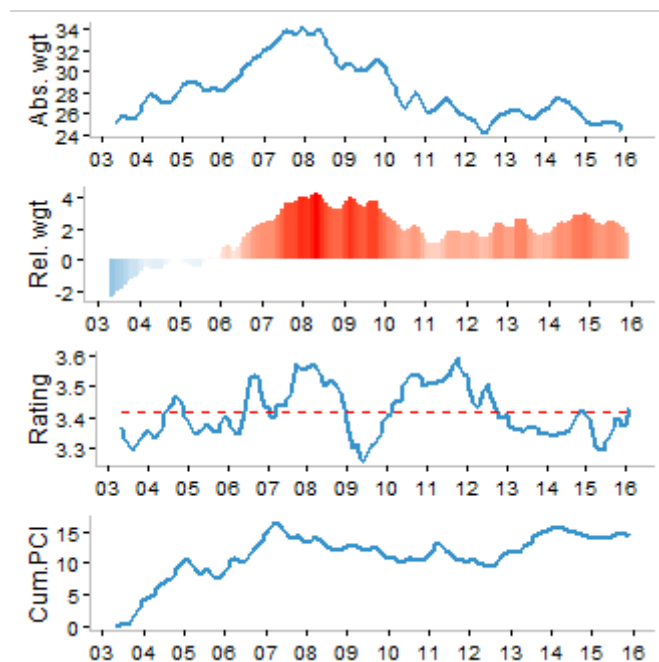
⁶ [Q-Series®: The Dragon's Tail: What Would a 4% China Do to World's Markets?](#), 21 December 2015.

Figure 19: US



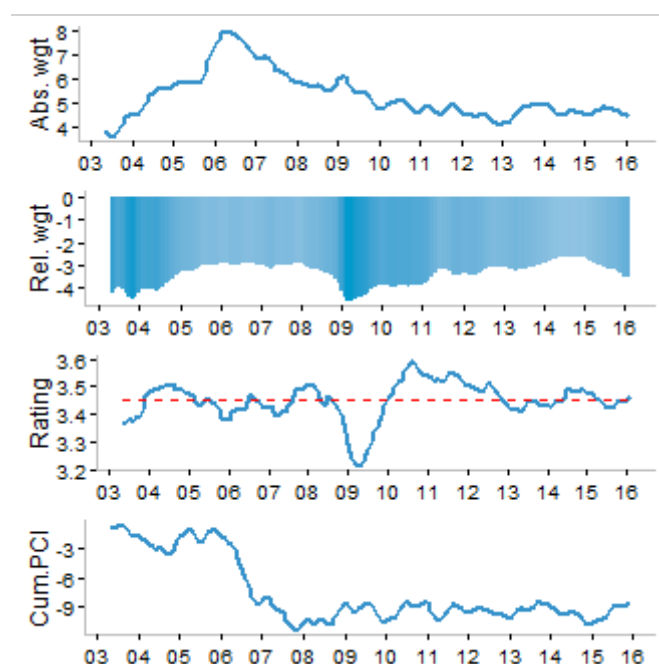
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 20: Developed Europe



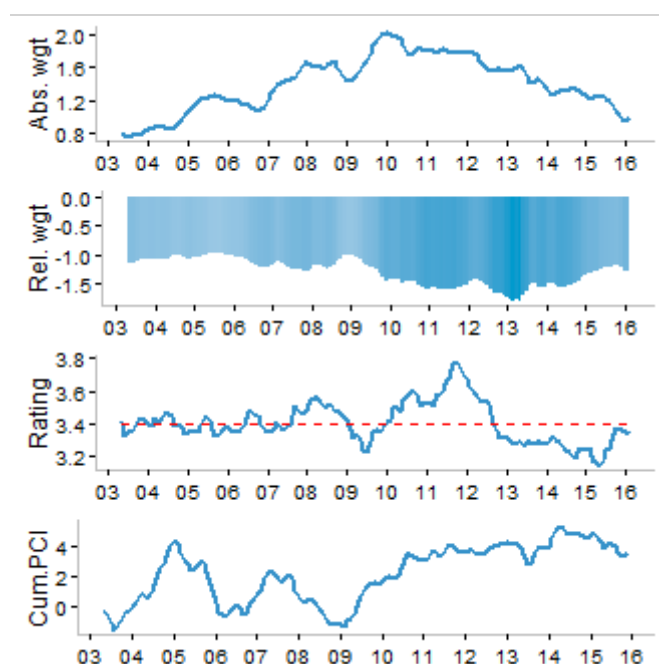
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 21: Japan



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 22: Australia



Source: MSCI, IBES, FactSet, UBS Quantitative Research

US-dollar appreciation

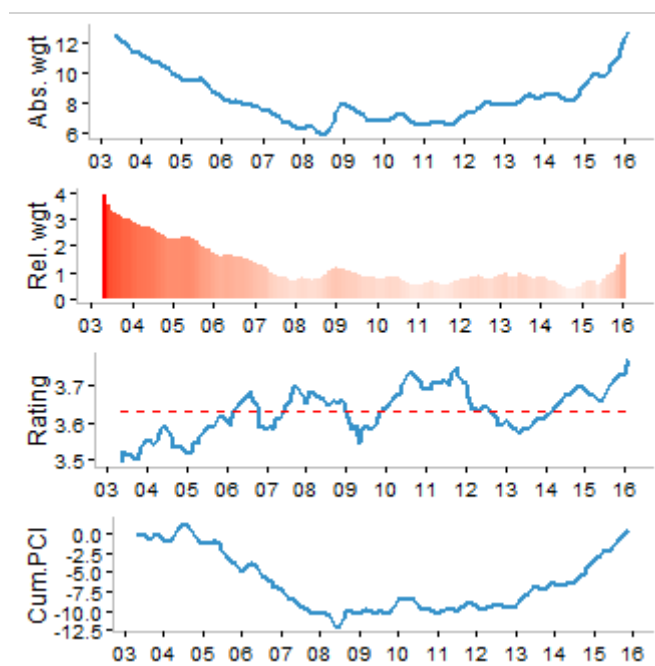
To model the effects associated with the US-dollar depreciation trade, we build two portfolios consisting of stocks with the highest and lowest betas to a trade-weighted US-dollar index.

Figure 23 shows strong inflows into long US-dollar equity exposure since 2008; however, this has been offset by an increased weighting in the benchmark. Net of the benchmark, the active positioning remained largely unchanged until 2015 and has seen a sharp upturn since. Conversely, negative exposure to the US dollar has declined steadily following the GFC and is materially underweight currently.

Perhaps a cause for concern, all indicators here are near the top of their historical ranges; sell-side ratings of names with positive US-dollar exposure are at an all-time high, while negative exposure has all-time low recommendations. The PCI shows that positive US-dollar exposure has been subject to prolonged buy-crowding and, conversely, negative exposure has been subject to prolonged sell-crowding.

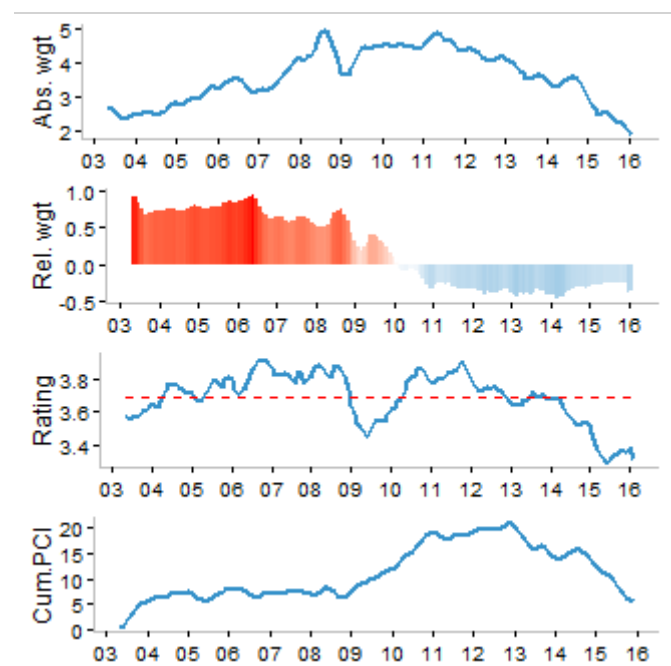
Positioning in positive US-dollar exposure is at extreme levels and subject to material crowding

Figure 23: Positive beta against the US dollar



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 24: Negative beta against the US dollar



Source: MSCI, IBES, FactSet, UBS Quantitative Research

From a fundamental perspective, the view that the US economic recovery was further along than the remainder of the DM world, and the expectation of sustained Fed tightening, likely resulted in an influx of capital into names that traded favourably in a strong US-dollar environment. However, the Fed's recent dovish rhetoric, and the selloff in the US dollar over the past several weeks, has likely provided the catalyst for DM equities to underperform their EM peers—a view that our EM equity strategist shares⁷.

Fed's dovish rhetoric and the selloff in the dollar in recent weeks may trigger DM underperformance relative to EM

In other words, our crowding indicator and fundamental evidence suggest that arguably one of the most popular macro trades (DMs over EMs) may have begun to unwind.

⁷ [Macro Keys: EM Equities Outperforming! Can This Be True?](#), 9 February 2016.

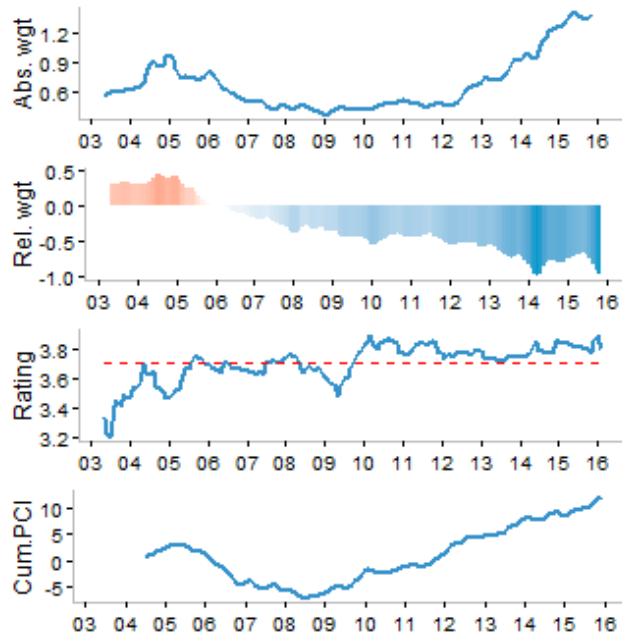
Other popular investment themes

Tech frenzy

The global technology sector has seen re-rating and heavy inflows, as shown in Figure 25. However, this positioning has been underweight net of the benchmark; active (institutional) managers appear more bearish than the recent rally suggests.

Sell-side sentiment has been pinned near the top of its historical range since 2010 and is otherwise not noteworthy, in our view. However, we believe the extent of crowded buying suggests that this sector is racing ahead of its long-term positioning, which has historically resulted in a pull-back.

Figure 25: Internet stocks



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Short energy

Crude oil's precipitous price decline has been the source tremendous investor attention, but this has been reflected in equity markets. Trends in Europe energy (Figure 28), Asia ex-Japan energy (Figure 34) and US energy (Figure 49) all indicate divestment from global energy sectors, on both a gross and net basis.

In Asia ex-Japan and particularly in Europe, this positioning has been accompanied by severe sell-crowding in recent history. The US has seen a relatively more benign rush towards the exits, though the relative price decline has been globally comparable.

Renminbi depreciation

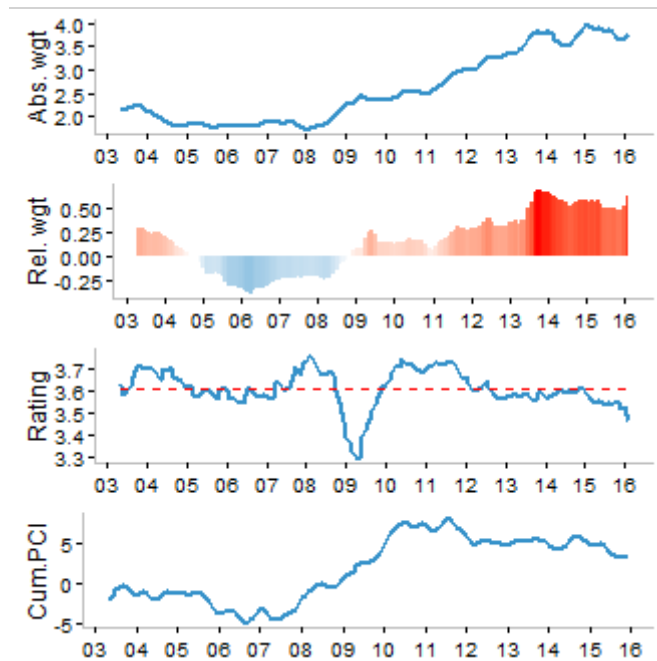
To model how equity investors position under the pressure of renminbi depreciation, we build two portfolios consisting of the highest and lowest betas to the Rmb/US\$ exchange rate. Figure 26 shows strong inflows into stocks with high positive correlation with renminbi since 2008, which was consistent with an increase in their weights relative to MSCI AC World. This trend started to reverse in 2015, amid concerns over a China slowdown and renminbi depreciation.

Long-term positive positioning trend started to turn in 2015...

Sell-side sentiment declined significantly during the GFC and rebounded sharply subsequently. However, it has been sliding downward since 2011, which largely coincided with panic-selling during the period.

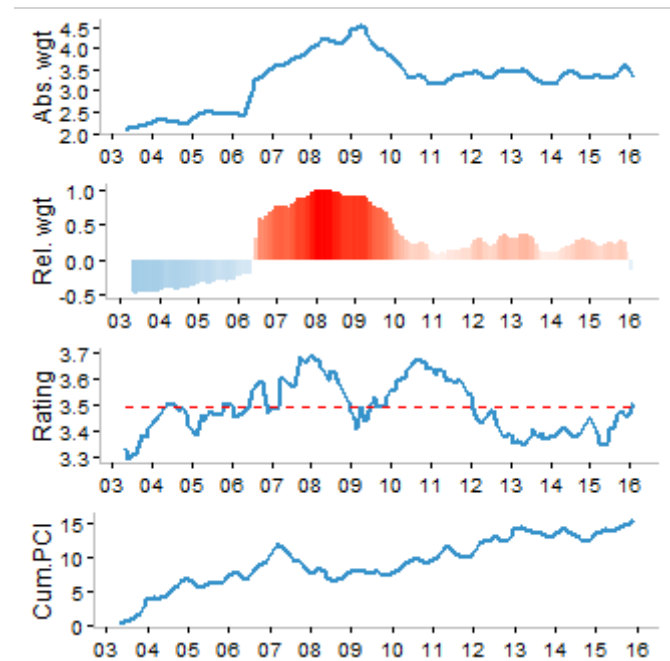
...and sell-side sentiment and performance have been trending down since 2011

Figure 26: Positive beta against Rmb



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 27: Negative beta against Rmb



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Conversely, bearish positioning on the stocks with large negative correlation with the renminbi peaked during the GFC and has largely flat-lined since. Sell-side sentiment was negative (on renminbi downside) for a long time and started to pick up in 2015. The PCI indicates a trend of buy-crowding on names with negative exposure to the renminbi.

Putting everything together, we believe the crowded trade on stocks with high positive correlation with the renminbi has started to unwind, and the crowded trade on stocks with large negative correlation with the renminbi has just started to gather pace.

Sectors

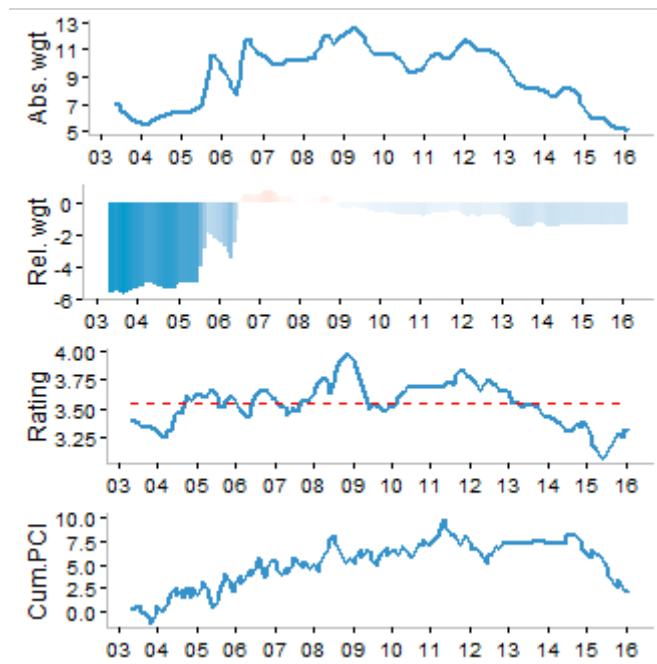
Developed Europe

From a fundamental perspective, we would agree that most European investors appear to be underweight energy and materials as EM commodity plays. The same seems true for utilities, but to a far lesser degree, given the sector's less direct exposure to commodity prices and the comparatively stable and regulated nature of its business.

Nick Nelson, Head of European Equity Strategy

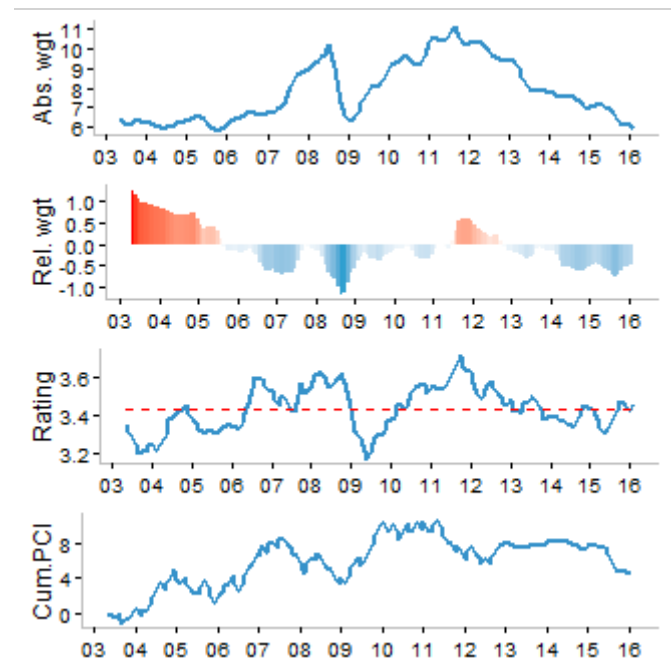
Karen Olney, Head of Thematic Strategy

Figure 28: Energy



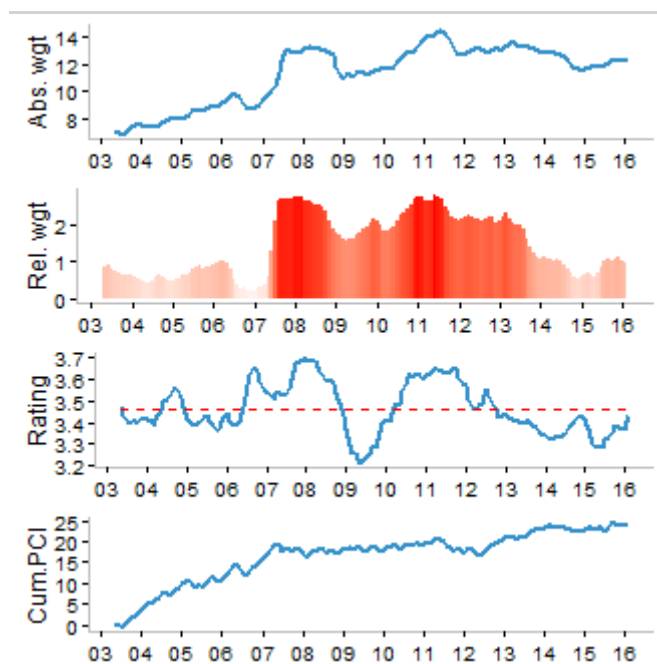
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 29: Materials



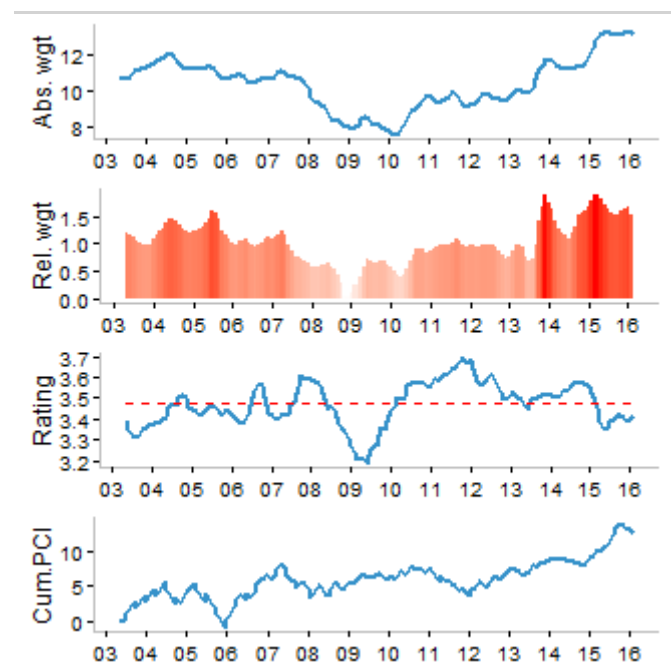
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 30: Industrials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 31: Consumer discretionary



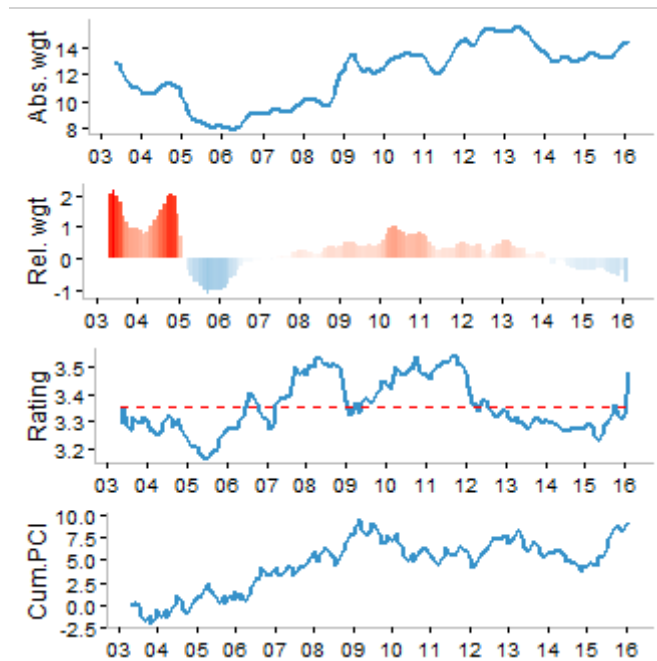
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Consumer discretionary has fared better than industrial cyclicals, as service-sector data has held up better than industrial surveys, and some sub-sectors, such as media, have performed well.

Underweight in consumer staples—a popular cash flow safe-haven for investors—is surprising

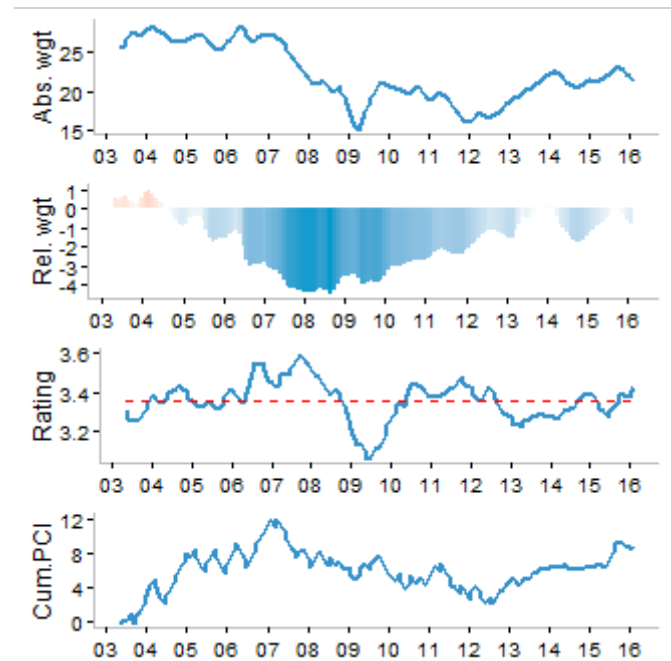
We are surprised by the data suggesting underweight in consumer staples, albeit marginally. Anecdotally, many investors have been hiding in this space for the relatively predictable cash flow and, until recently, dividend yields.

Figure 32: Consumer staples



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 33: Financials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

It is interesting to see the gap in underweight within financials closing so rapidly, as this is different to the message we have been getting from investors. Also, given banks have been the worst performing sector in Europe YTD, with a sharp fall in the last two weeks of January, we wonder if this data captures the most recent positioning. Within financials, many investors have expressed a preference for the insurance sector over the banks, which may not be reflected in these figures.

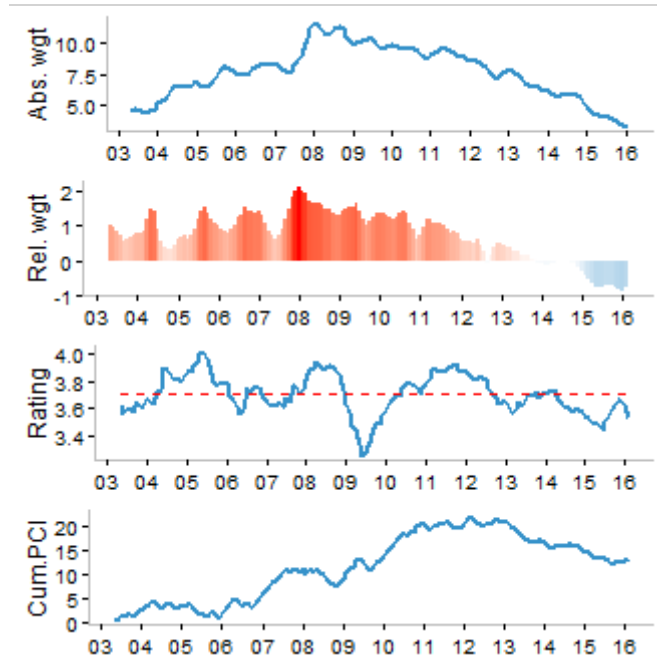
The underweight in financials is surprising; contrary to investor sentiment, albeit anecdotally

Asia ex-Japan

In Asia ex-Japan, investors have cut their energy holdings, as the oil price has come down. Positioning has been trending lower since the oil-price peak in 2008, but investor selling accelerated in 2015 on renewed oil-price pressure.

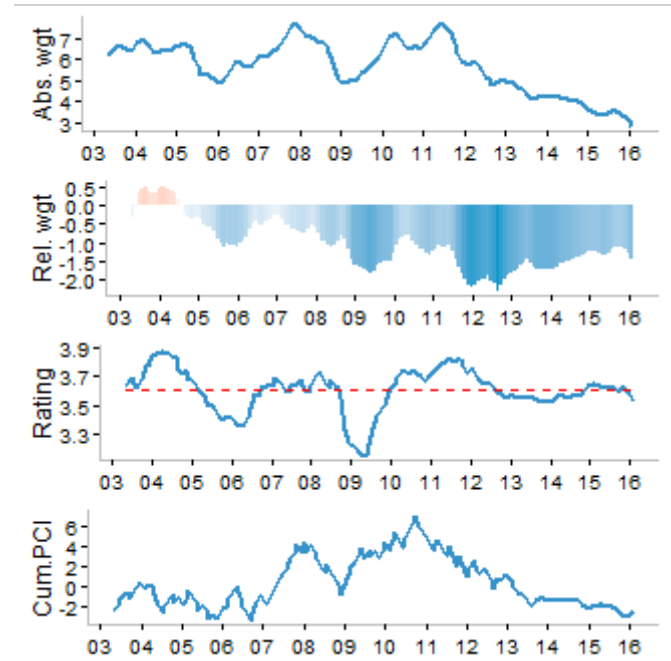
Matthew Gilman, Asia equity strategy

Figure 34: Energy



Source: MSCI, IBES, FactSet, UBS Quantitative Research

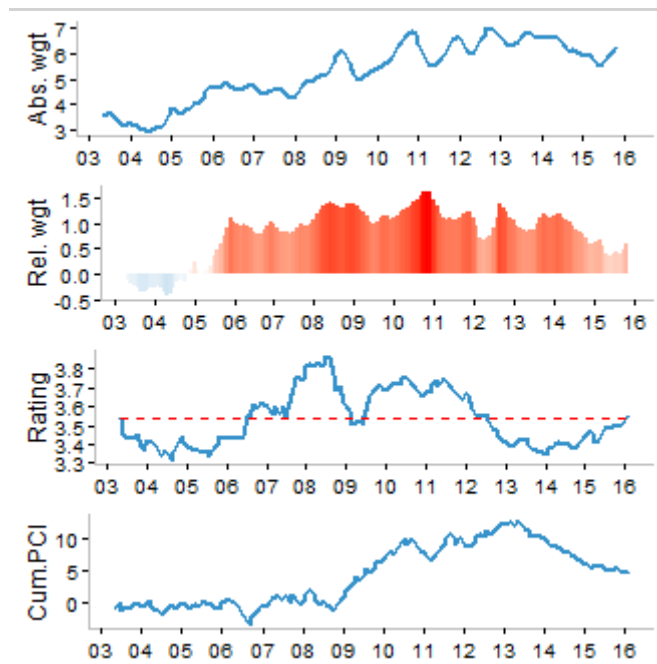
Figure 35: Materials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

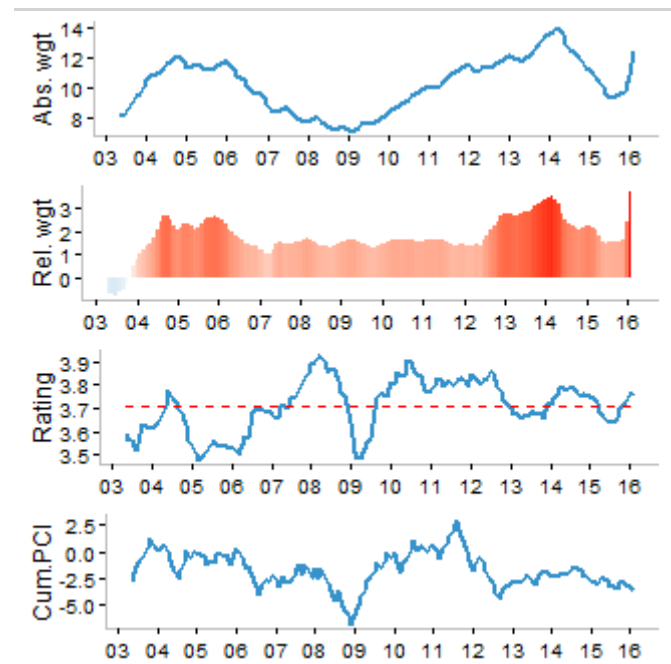
Similarly, investors have been running underweight positions in materials and industrials in recent years, as oversupply concerns and a slowdown in China's investment spending came to the fore.

Figure 36: Consumer staples



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 37: Consumer discretionary

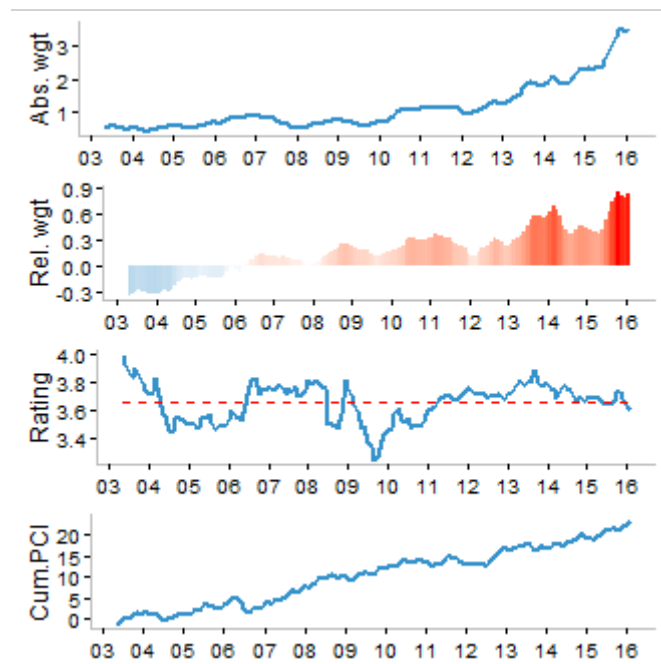


Source: MSCI, IBES, FactSet, UBS Quantitative Research

Instead, consumer stocks were favoured as structural growth stories in the slow-growth and low-yield environment after the GFC. Though more recently, as we approached an end to zero rates in the US and credit growth has begun to slow at the end of an Asian credit cycle, investors have reduced their positioning in the consumer sectors. China's anti-corruption clampdown has also contributed to slower growth in Macau gaming and luxury goods stocks in the consumer discretionary sector.

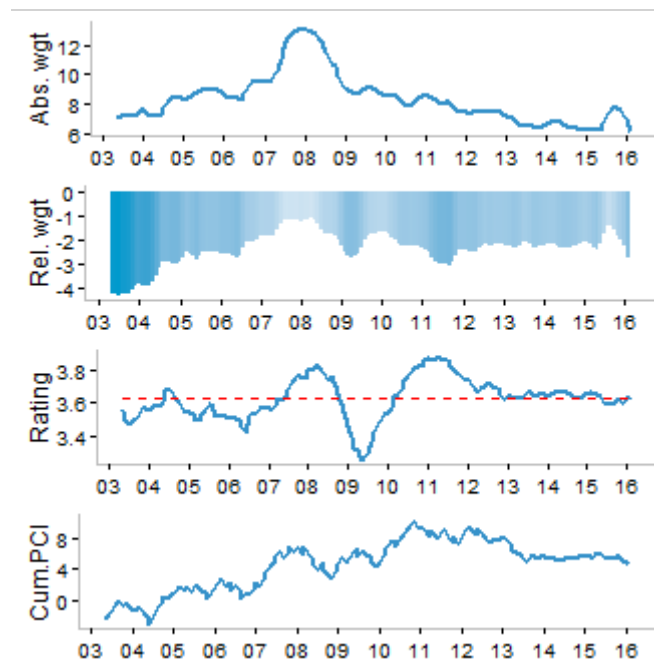
Divestment of consumer stocks at tail-end of Asian credit cycle

Figure 38: Healthcare



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 39: Industrials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Healthcare is now investors' preferred sector in the region, given that it is relatively insulated from Asia's growth slowdown and provides structural growth from demographic trends—ageing population, urbanisation and increased affordability.

Healthcare preferred, owing to demographic tailwinds

Japan

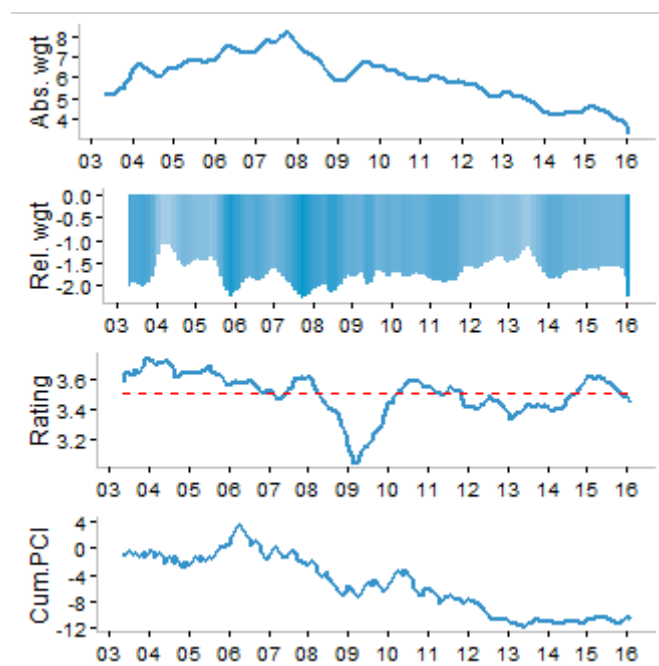
Investors' preferences for Japanese stocks are similar to the trends in other industrialised markets; investors are clearly underweight in manufacturing sectors and overweight in domestic demand-oriented sectors. However, we think the outlook that is apparent from factor levels and trends is interesting.

Tomohiro Okawa, Japan equity strategy

For example, Figure 40 shows the absolute weighting for materials has been trending down for a long time, but the relative weighting has rebounded slightly from a 2014 bottom, although it appears that momentum since 2015 picked up owing to the decline in oil prices.

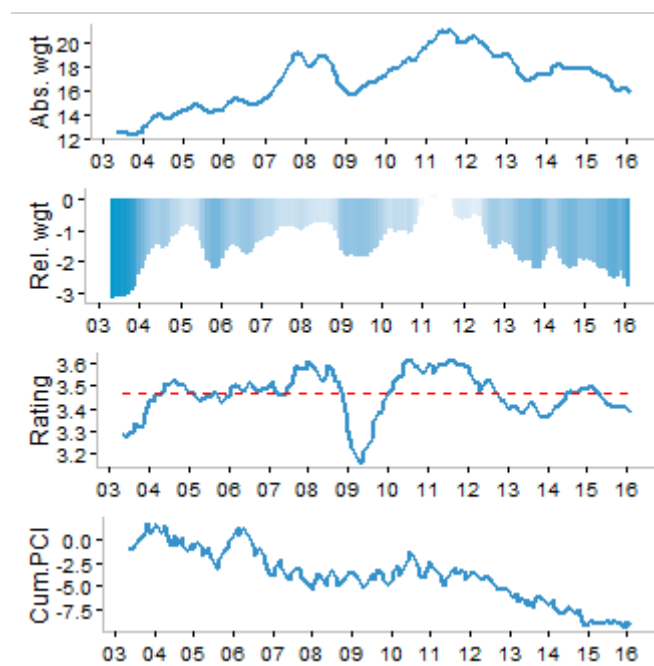
In addition, with the PCI hovering at all-time lows, quantitatively it has been a 'stay away' situation, but the downside risk looks lower than for other sectors, in our view. Meanwhile, the relative weighting of industrials, another cyclical sector, is at a record low and trending downward, and the outlook is not positive based on other figures also. Among sectors with similar characteristics, differences in investors' preferences are apparent.

Figure 40: Materials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

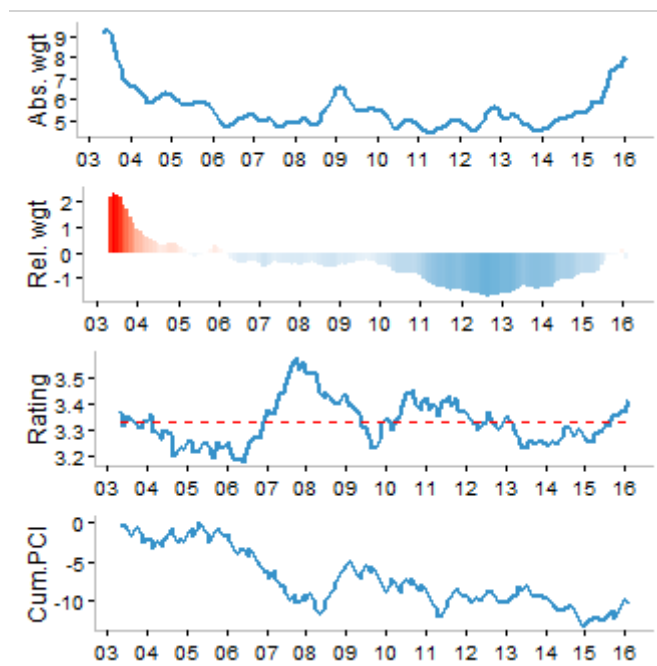
Figure 41: Industrials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

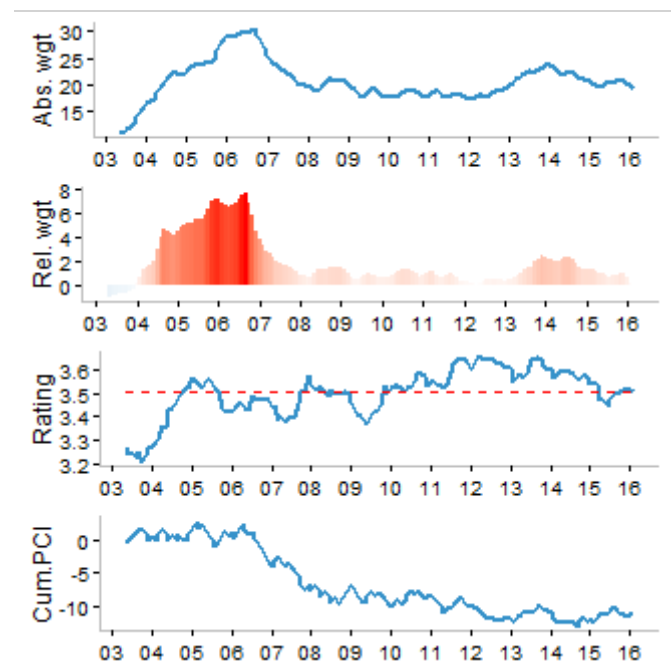
Domestic demand-oriented sectors have done well. Healthcare (Figure 42) has rebounded from a 2013 bottom, in terms of various factors. Healthcare is known for its high dividends, and we believe high expectations for capital returns to shareholders since the start of Abenomics in 2013 have probably attracted investors.

Figure 42: Healthcare



Source: MSCI, IBES, FactSet, UBS Quantitative Research

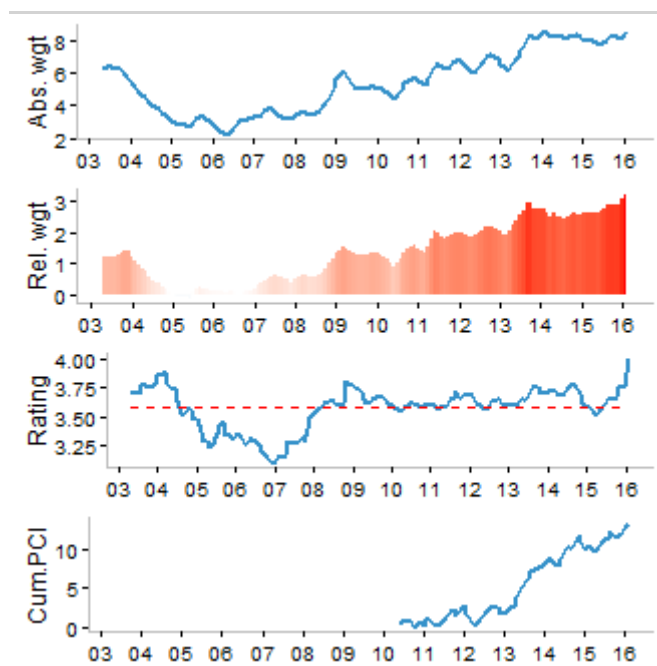
Figure 43: Financials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

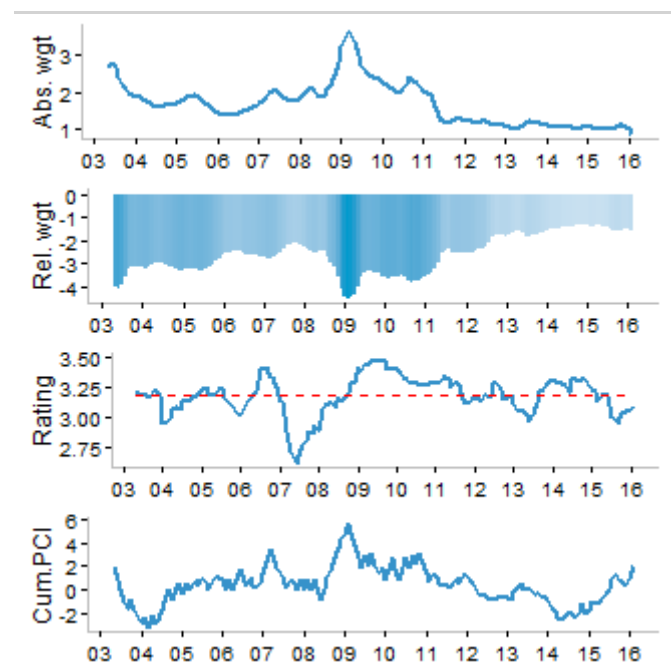
Figure 43 confirms that financials have been losing momentum with a post-financial crisis overweight peak in 2014, and we expect moves to avoid the sector to pick up, owing to the Bank of Japan's decision to adopt a negative interest rate policy. The overweight in telecom services continues, but all the figures are stronger than past levels, suggesting limited upside potential, in our view. However, given current market conditions, and telecom companies' sharp increases in share buybacks, we would not be surprised if the overweight in telecom continues in the short term.

Figure 44: Telecom services



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 45: Utilities



Source: MSCI, IBES, FactSet, UBS Quantitative Research

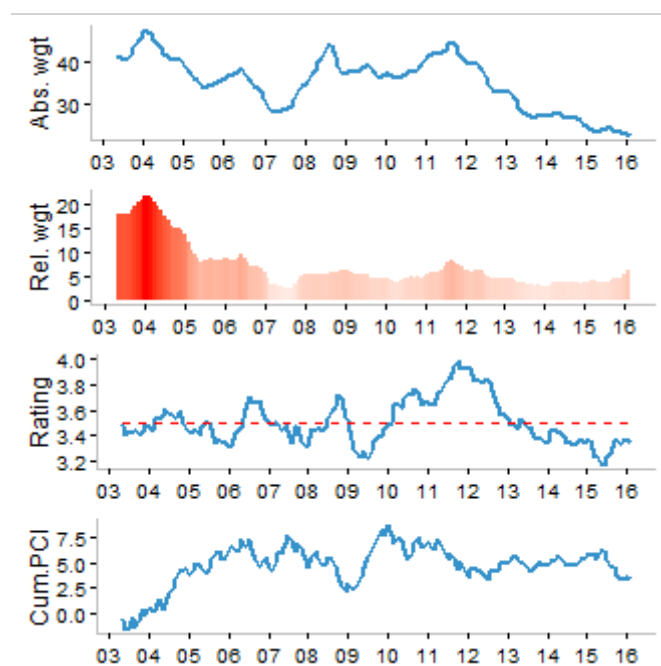
Australia

The resource sector has been under pressure for several years now, as commodity prices continue their reversion back to pre-boom levels, driving big earnings downgrades. In the past 12 months, performance of almost all mining and energy stocks has been poor, with the gold segment the only bright spot.

David Cassidy, Chief Strategist, Australia

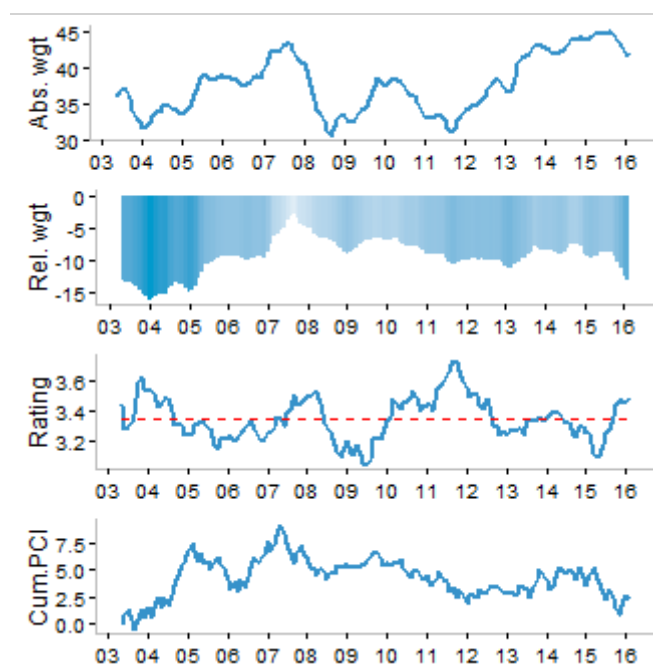
Performance in the Australian financials sector over the past year has been mixed. REITs have been the standout, as investors sought earnings safety and income security. After previous strong performance, the Australian banks have struggled in the past year, due to regulatory capital-based equity issuance and, more recently, the impact of the global banking sell-off. Diversified financials had a surprisingly good 2015, despite the disappointing equity-market return. Individually, strong earnings performance drove a number of stocks in the sector, although the industry has succumbed to selling pressure YTD.

Figure 46: Resources



Source: MSCI, IBES, FactSet, UBS Quantitative Research

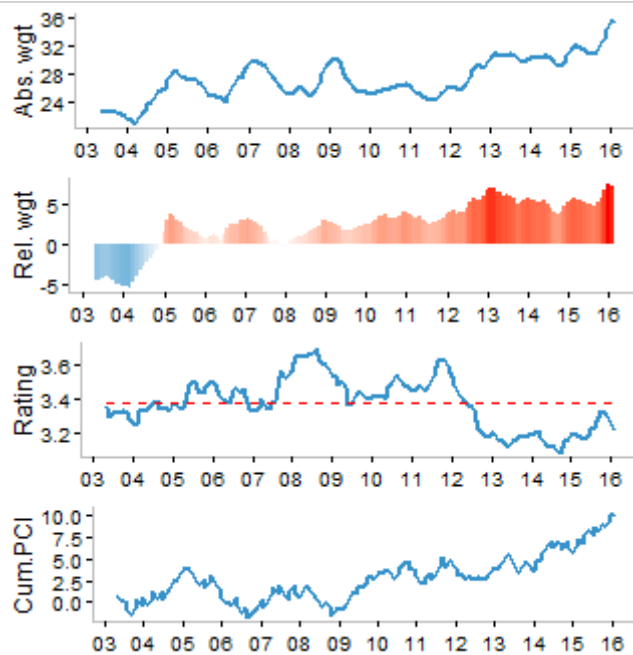
Figure 47: Financials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

The industrials ex-financials sector has outperformed over the past year, with investors seeking defensive growth and selected earnings momentum stories. While there has been some earnings pressure in pockets of the industrials sector (eg, consumer staples), generally profitability conditions have remained reasonably benign with the lower Australian dollar assisting a number of the big foreign-currency earners.

Figure 48: Industrials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

US

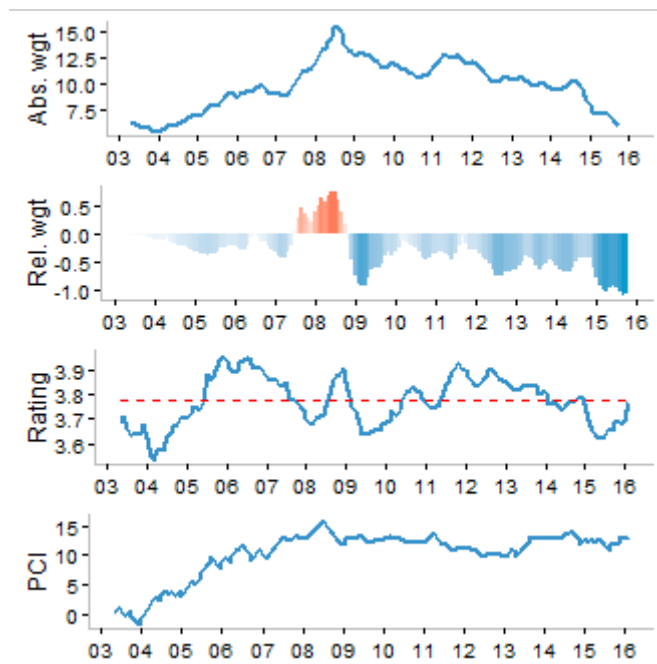
From a fundamental perspective, we would agree that heading into 2016, underweight energy and overweight healthcare appeared to be the two most crowded trades among US investors, albeit for varying reasons. While sentiment/exposure to commodity-related sectors has been tied to the precipitous decline in oil prices, sectors such as healthcare and consumer discretionary have benefitted from the ability to generate top-line growth in a slow-growth economic environment. Meanwhile, we believe a historically low-interest-rate environment and a strong US dollar affect the relative crowdedness of higher-yielding and FX-sensitive sectors, as utilities, telecom, consumer staples and industrials.

Julian Emanuel and Omar Elangbawy, US Equity and Derivatives Strategy

Given the collapse in oil prices over the past two years, and a significant amount of high-yield debt issuance in the energy space, the energy sector has been, unsurprisingly, the most 'crowded' short among US investors. However, the potential for oil-price stabilisation plus substantial short covering, or an improvement in commodity-related sentiment, could cause this trade to unwind rather quickly, in our view. Despite persistent pressure on oil prices YTD, the energy sector has outperformed the broader S&P500 index by 80bp.

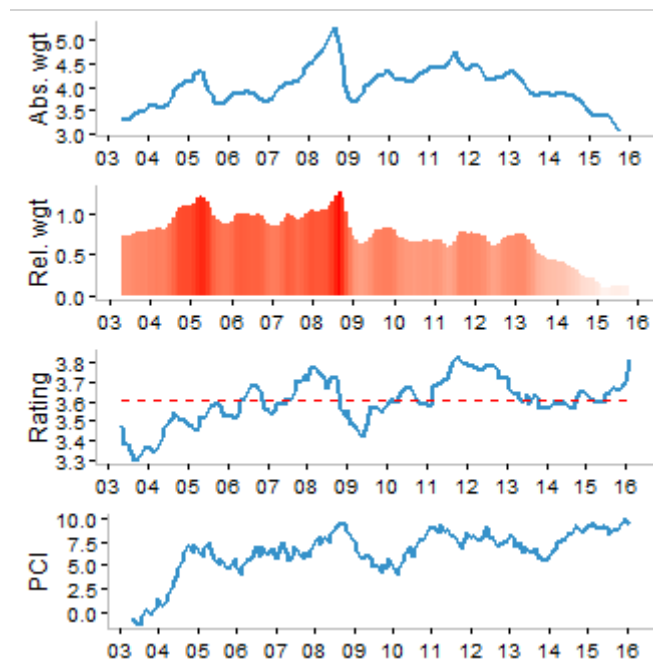
While the materials sector has also been impacted by commodity-price pressures, the rise in our sell-side indicator is potentially related to the mining and metals exposure of the sector, particularly gold, given the recent flight to safety in a volatile trading environment.

Figure 49: Energy



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 50: Materials

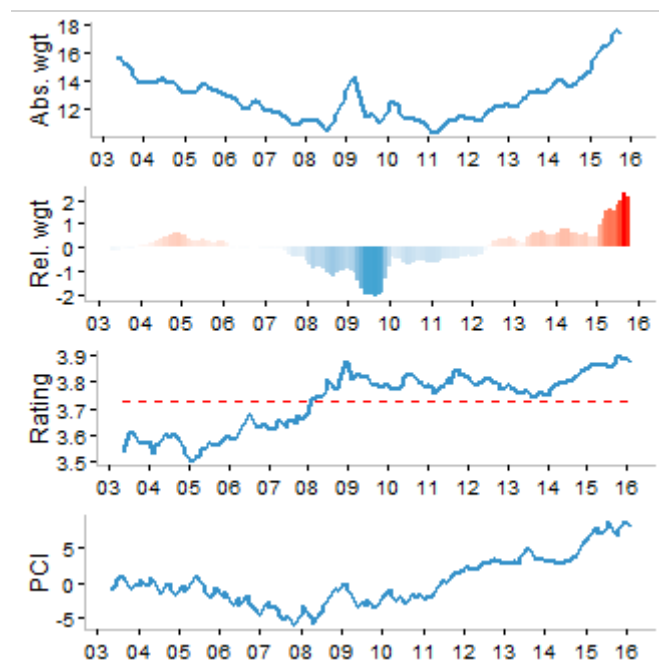


Source: MSCI, IBES, FactSet, UBS Quantitative Research

On the long side, healthcare has been the most crowded long but showed the first signs of reversal in August last year. Broadly speaking, we believe the sector benefitted from an ageing population, increased regulation (driving volumes higher), healthy corporate balance sheets (which drove M&A activity) and, perhaps most importantly, pricing power that resulted in ample top-line growth (in an environment characterised by limited revenue growth potential). However, as political rhetoric increased, with a substantial degree of attention focused on potential predatory pricing tactics in the pharma/biotech spaces, the healthcare sector has underperformed by more than 200bp since the start of the year.

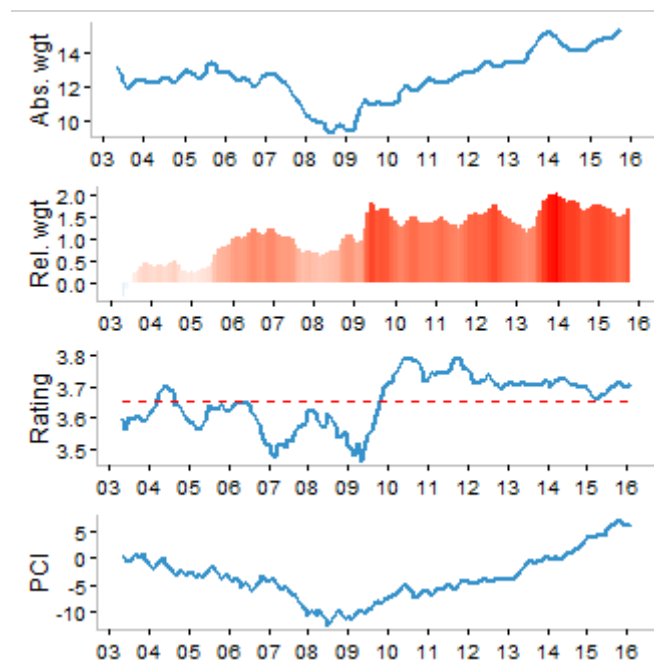
Like healthcare, we believe the relative overweight in consumer discretionary is due to its attractive top-line growth profile, particularly relative to the rest of the index. Nonetheless, in the face of rising volatility, US investors have been willing sellers of previous winners, likely explaining why the sector has underperformed the S&P500 by more than 150bp YTD, in our view.

Figure 51: Healthcare



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 52: Consumer discretionary

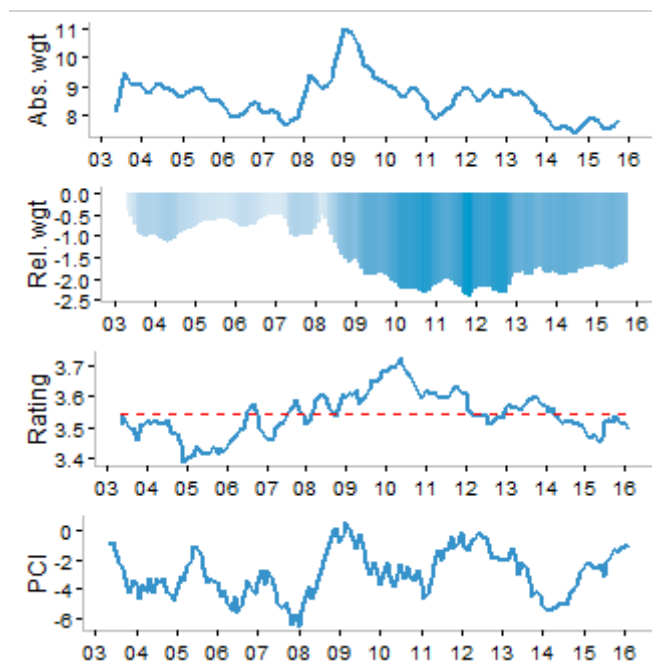


Source: MSCI, IBES, FactSet, UBS Quantitative Research

We think the ongoing US economic recovery since the financial crisis and the strength of the US dollar (given the headwind to multinational corporate earnings) largely explain the relative underweight in consumer staples over time. However, given the defensive nature of the sector, we would have expected this to have reduced/reversed in the current environment (the sector has outperformed by nearly 700bp YTD).

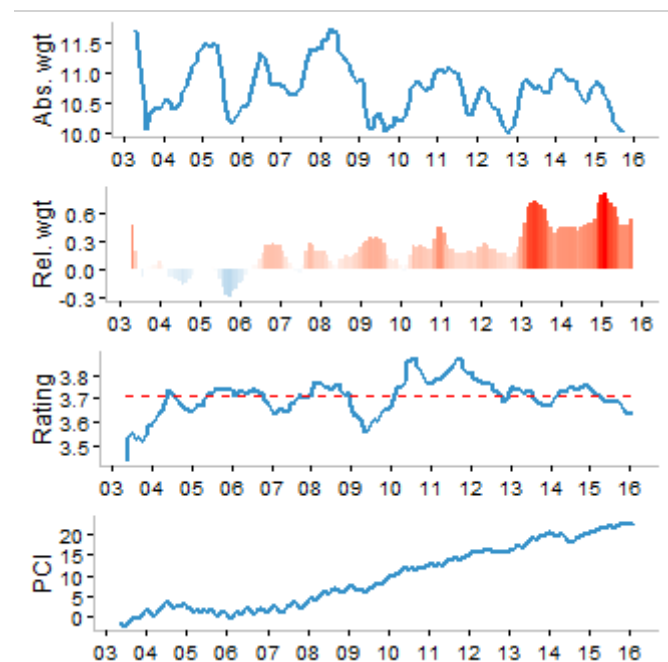
On the other hand, given dollar strength and oil-price weakness, the relative overweight in industrials also is not anecdotally apparent, in our view. This could be due to the degree of energy/materials underweight, or expectations for a reversal in US-dollar pressures and a cyclical recovery as oil prices stabilise.

Figure 53: Consumer staples



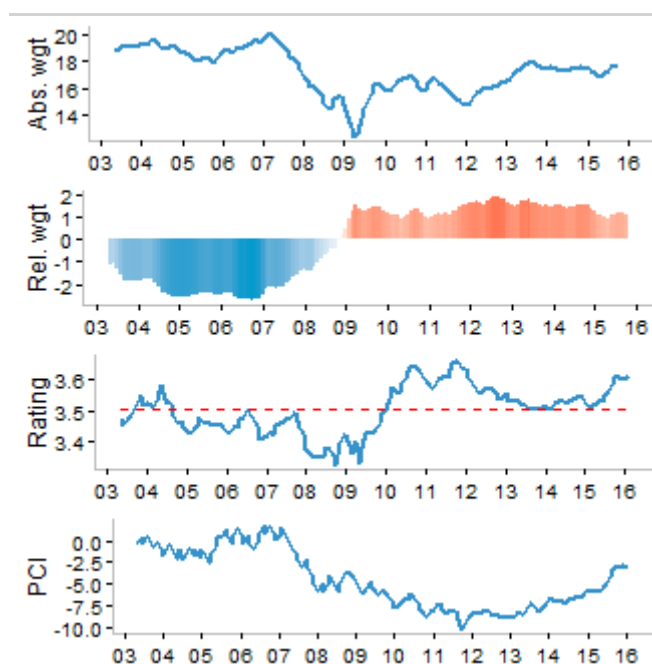
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 54: Industrials



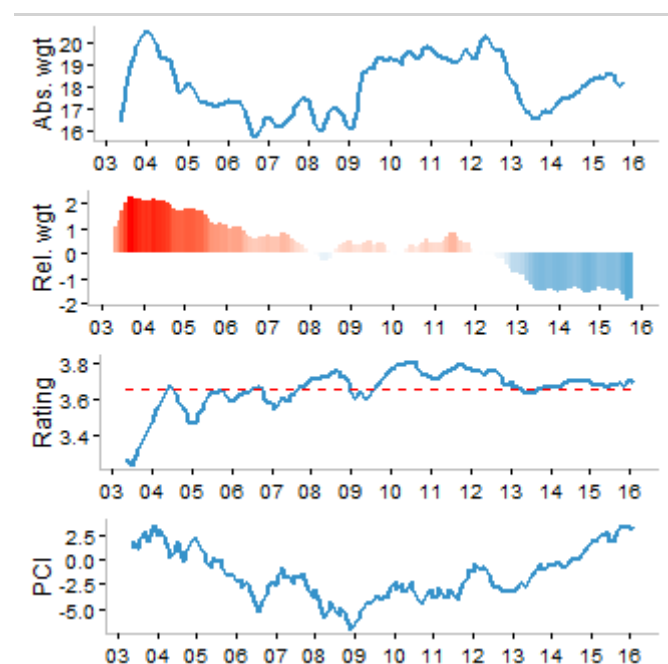
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 55: Financials



Source: MSCI, IBES, FactSet, UBS Quantitative Research

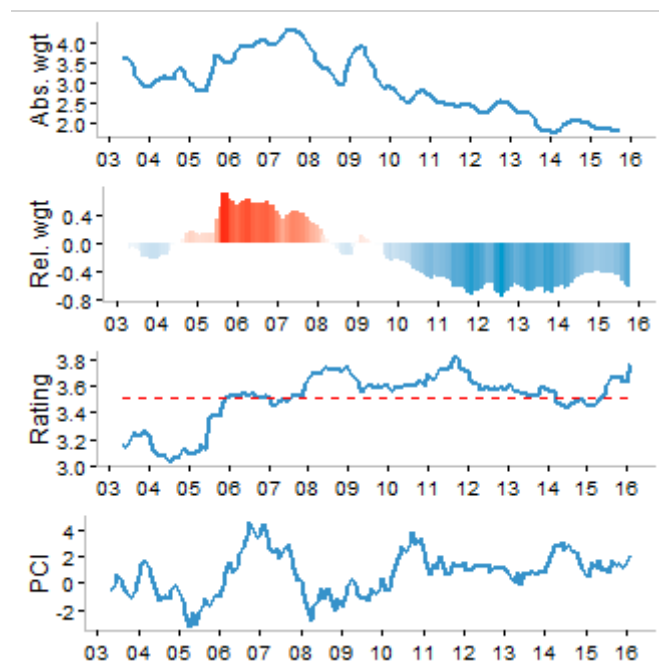
Figure 56: IT



Source: MSCI, IBES, FactSet, UBS Quantitative Research

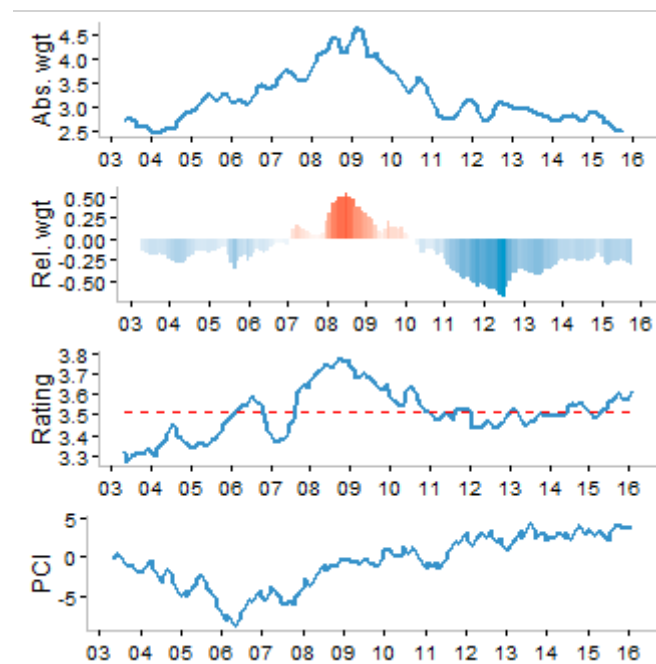
In an environment in which the US 10-year yield is below 1.8%, the defensive characteristics (ie, stability) and yields of the telecom and utilities sectors would lead us to expect a larger relative overweight in the current market. They have been the two strongest performing sectors YTD, outperforming the S&P500 index by nearly 14% and 12%, respectively.

Figure 57: Telecom services



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 58: Utilities

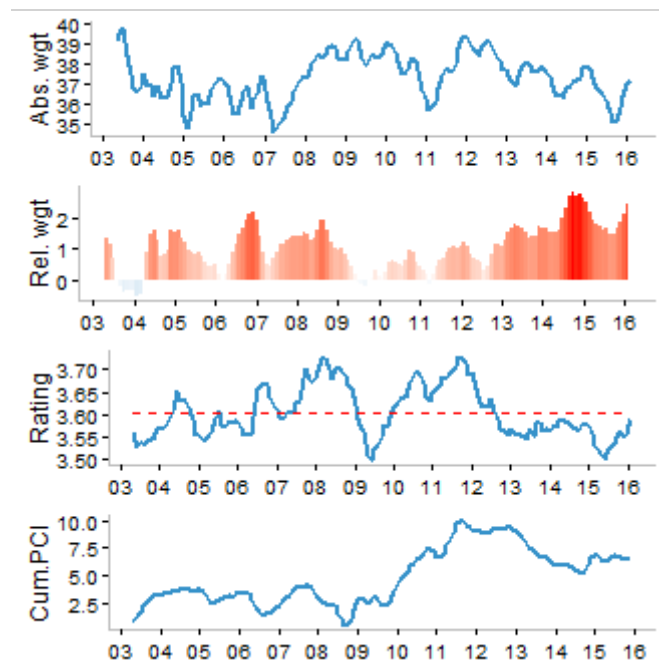


Source: MSCI, IBES, FactSet, UBS Quantitative Research

Investment styles

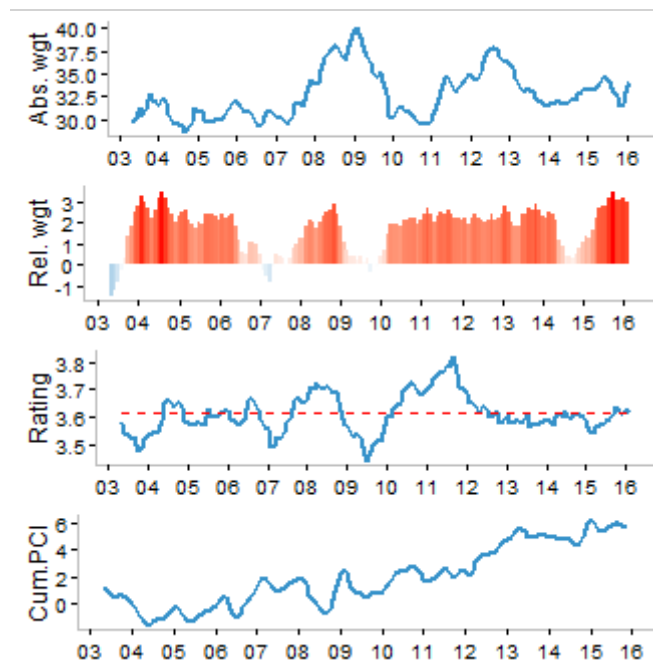
Investors have consistently favoured stocks with high ROE, strong price momentum and robust forecast earnings growth over value stocks throughout most of the history of the data set. The outperformance of these strategies during the past decade appears to justify this preference.

Figure 59: High ROE



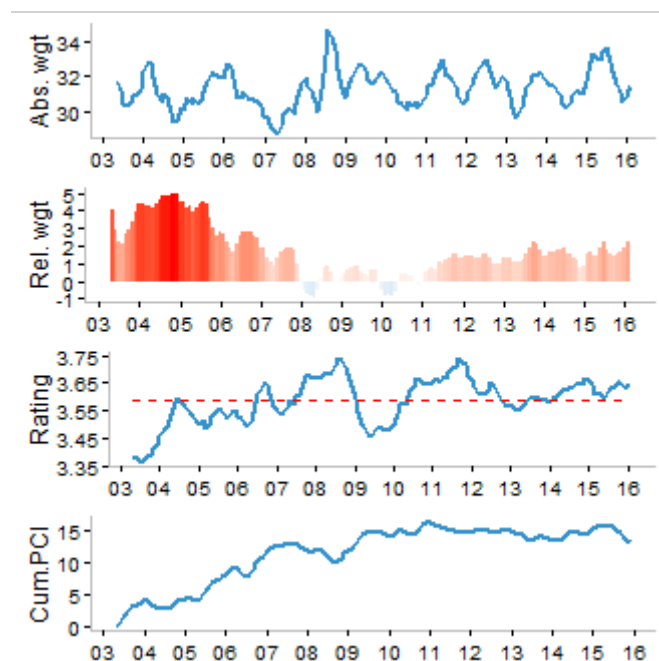
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 60: High 12-month price momentum



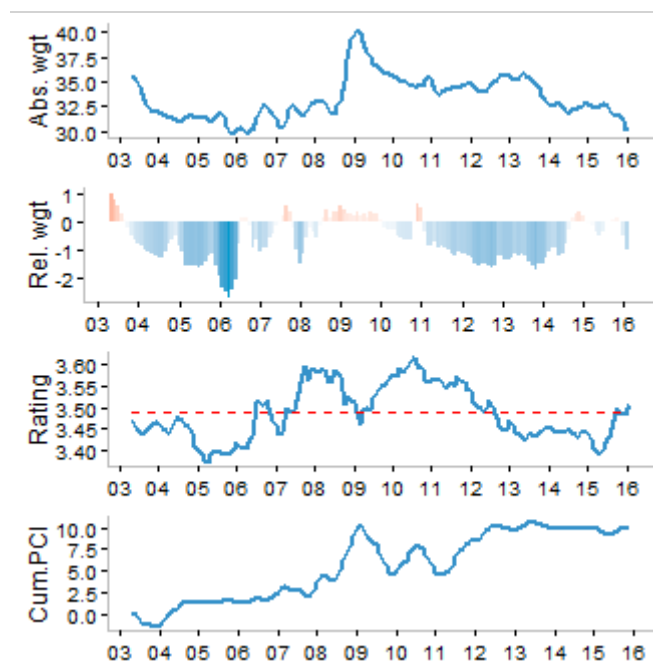
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 61: Forecast earnings growth



Source: MSCI, IBES, FactSet, UBS Quantitative Research

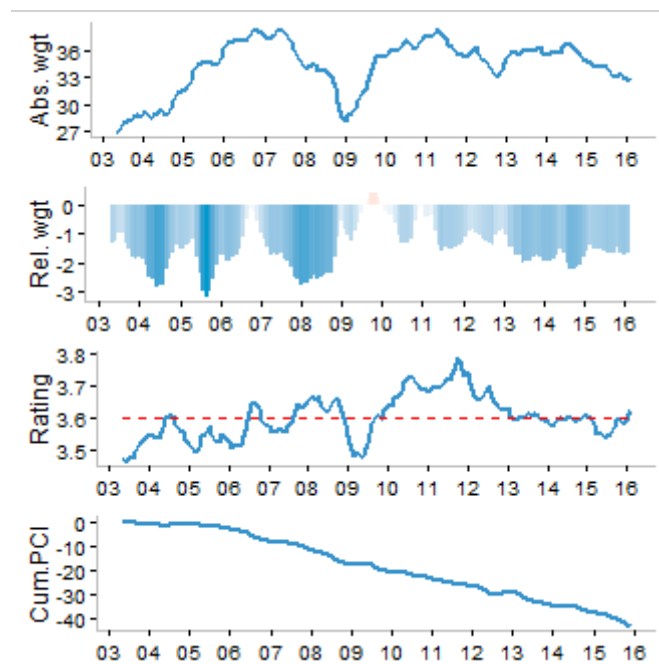
Figure 62: Low beta



Source: MSCI, IBES, FactSet, UBS Quantitative Research

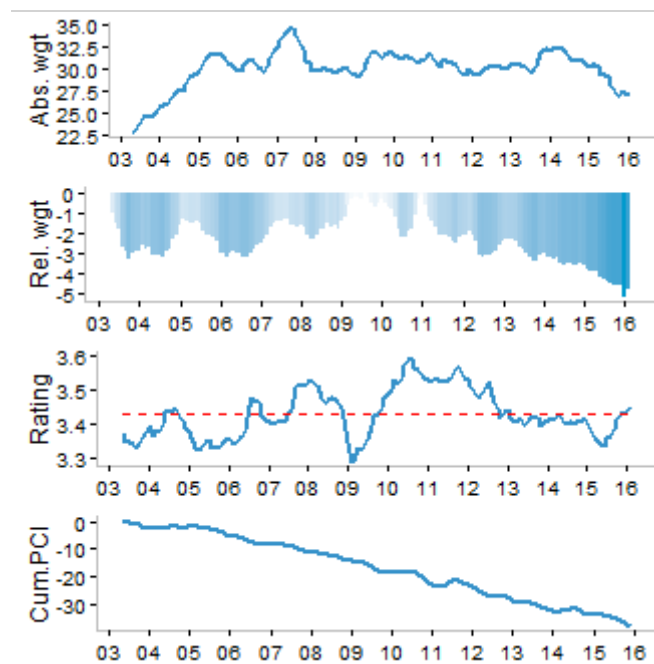
Low-beta stocks were neglected before the GFC and became popular during the crisis. As the market rebounded at the beginning of 2009, investors wound down their positions, but the style has returned to favour in the past few years.

Figure 63: High earnings yield



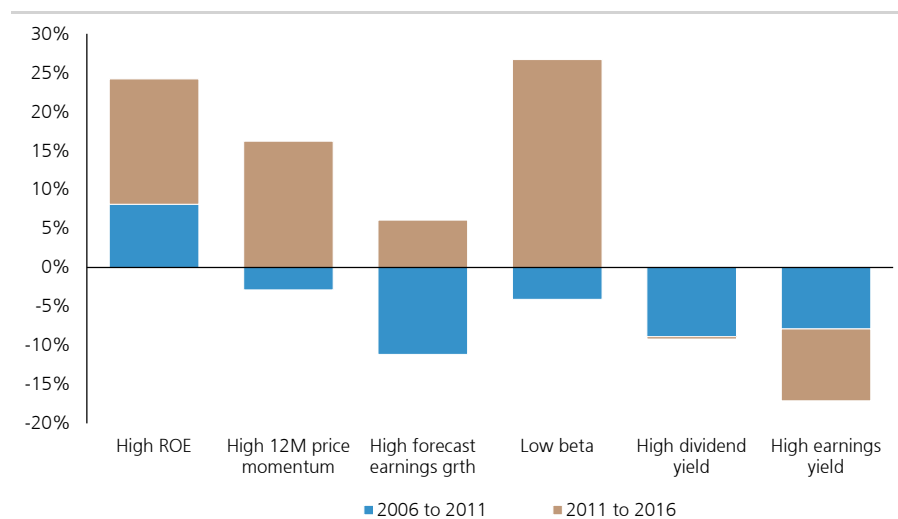
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 64: High dividend yield



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 65: Style performance over the past 10 years



Source: MSCI, IBES, UBS Quantitative Research

Appendix

Construction of the active trading portfolio

Specifically, the weight of stock i trading at price p in this portfolio at month t is:

$$w_{it} = \frac{p_{it} * \sum_j \# \text{ shares held by fund } j}{\sum_i (p_{it} * \sum_j \# \text{ shares held by fund } j)}$$

This essentially represents the total amount of the stock held by institutional asset managers, as a percentage of their total holdings (or more precisely, the managers whose holdings are captured in the ownership database).

PCI

At the end of each month, we calculate the PCI for each of the target basket in the following steps:

1. At the end of month t , we calculate the pairwise correlation for the basket (denoted as r_{ti} , where $i = 1, 2, \dots, n$, and n is the number of pairs), using the past one month's daily relative returns (relative to benchmark)
2. Apply the Fisher transformation to the correlations

$$R_{ti} = \text{arctanh}(r_{ti}) = 0.5 * \ln\left(\frac{1 + r_{ti}}{1 - r_{ti}}\right)$$

3. Compute the mean of the transformed correlations, R_{ti} , across all pairs of stocks in the target basket and adjusted the mean by dispersion of the transformed correlations (denoted as $FMPC_t$)

$$FMPC_t = \frac{\text{mean}(R_{ti})}{\text{stdev}(R_{ti})}$$

4. Generate 1,000 random portfolios with the same number of stocks as the target basket, and repeat steps 1 to 3 for these 1,000 random portfolios (denote as $MMPC_{tj}$, where $j = 1, 2, \dots, 1000$)
5. Calculate the market relative z-score:

$$Z_t = \frac{(FMPC_t - \text{mean}(MMPC_{tj}))}{\text{stdev}(MMPC_{tj})}$$

6. Calculate the monthly hit rate, H_t , of the target basket as the percentage of stocks in the basket that outperformed the market during the month. Define months with $H_t \geq 50\%$ as buy and $H_t < 50\%$ as sell.
7. Calculate the percentile of the monthly Z_t using its past 60 months' history, conditioned on the directions of the trades, which finally forms the Performance-based Crowding Indicator, PCI_t . More precisely, if it is buy at month t , calculate the percentile of Z_t with respect to all the Z_{t-i} , $i \in 1, 2, \dots, 59$ where $t - i$ months were also defined as buy. Likewise when month t is defined as sell.

Coverage-weighted aggregated ratings

At the end of month t , we calculate the coverage-weighted aggregated ratings for a portfolio as:

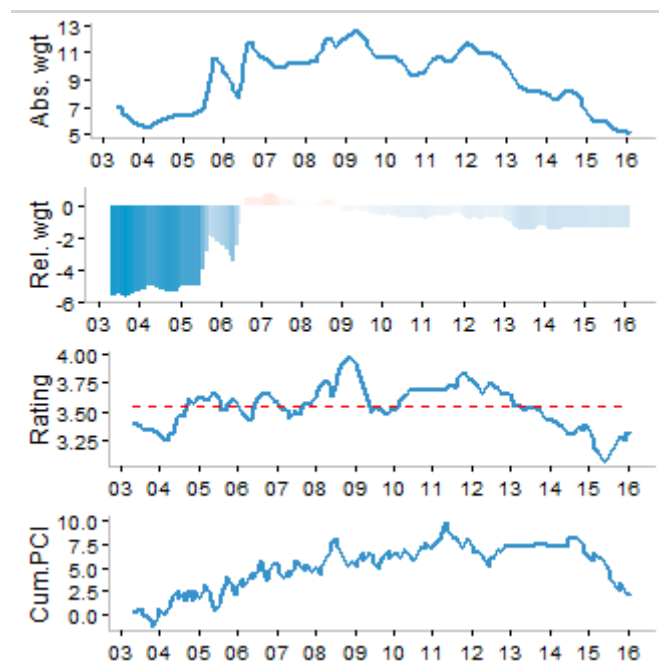
$$R_t = \frac{n_{ti} * r_{ti}}{\sum_i (n_{ti} * r_{ti})}$$

where r_{ti} is the consensus rating for stock i in month t ; n_{ti} is the number of analysts contribute to the consensus rating for stock i in month t .

Supplementary charts

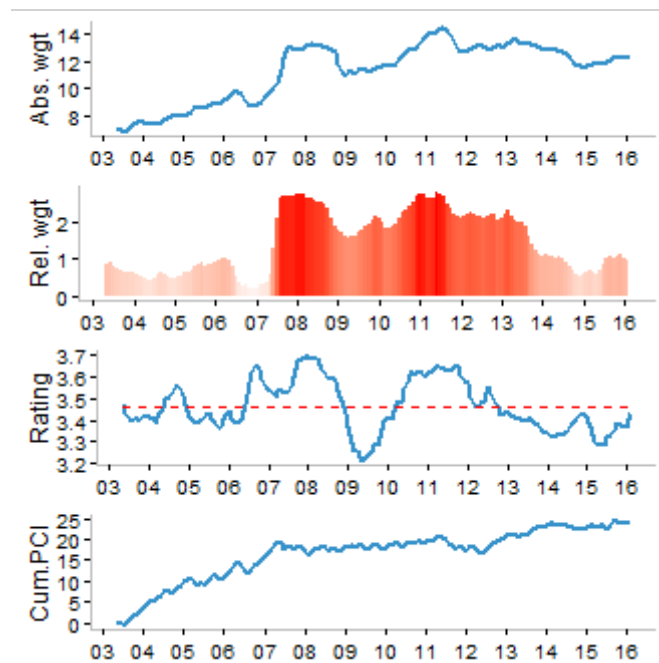
Developed Europe

Figure 66: Energy



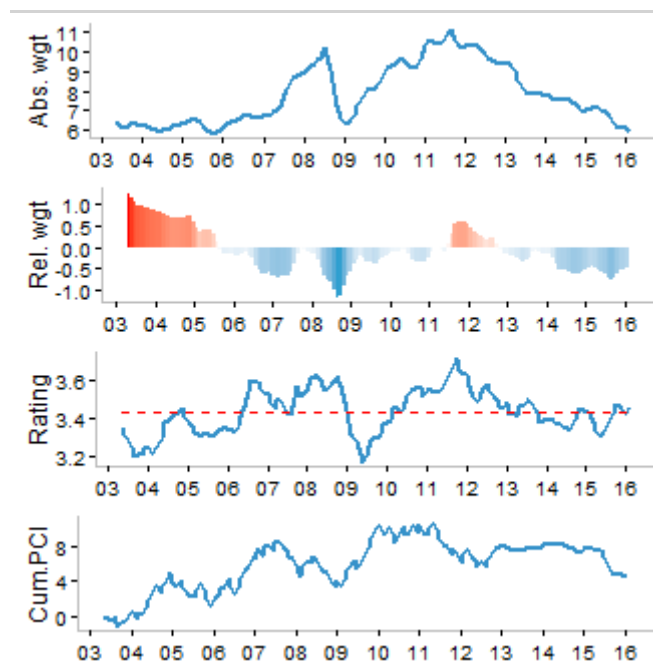
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 68: Industrials



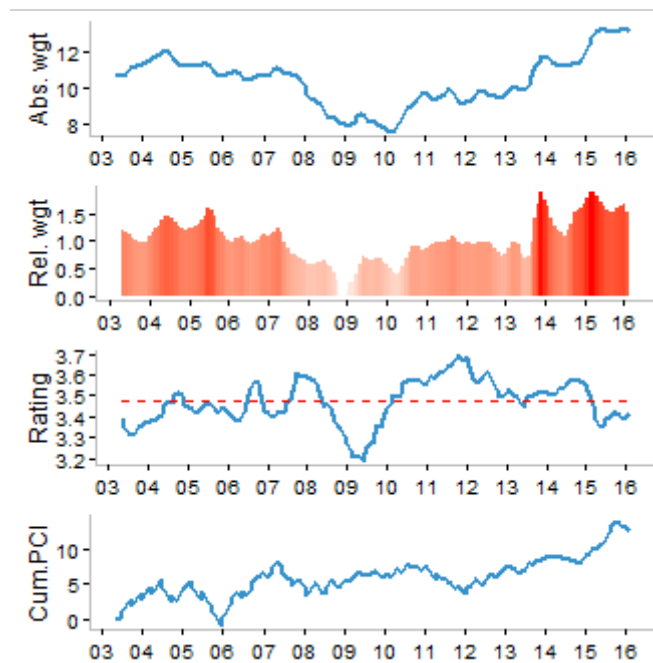
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 67: Materials



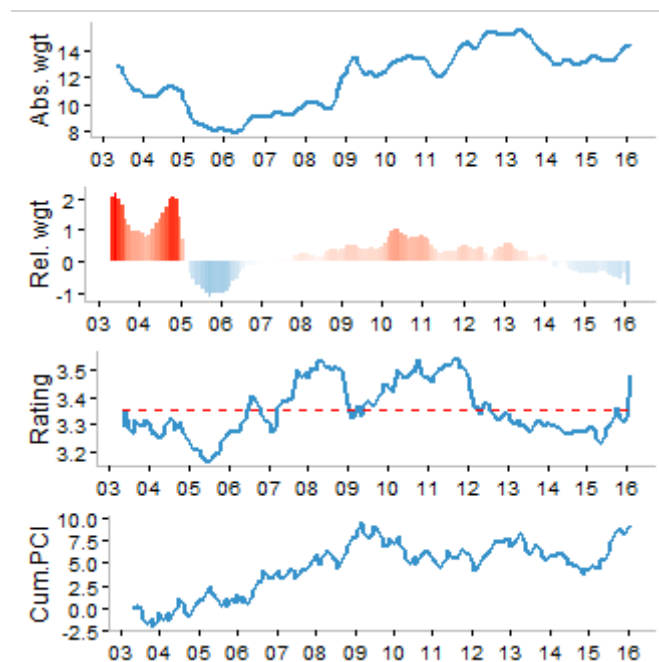
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 69: Consumer discretionary



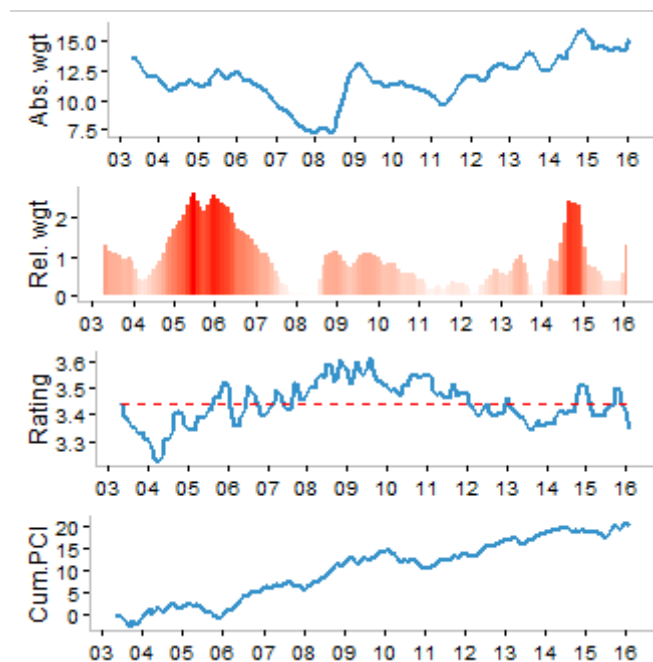
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 70: Consumer staples



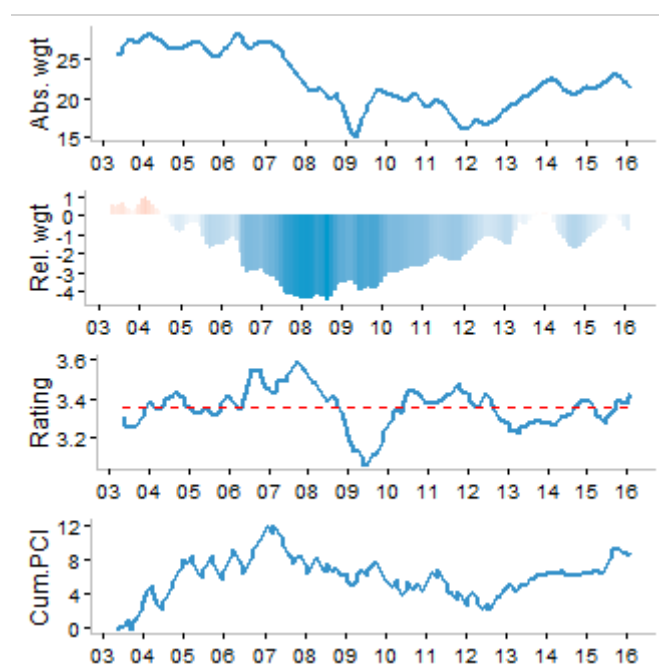
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 71: Healthcare



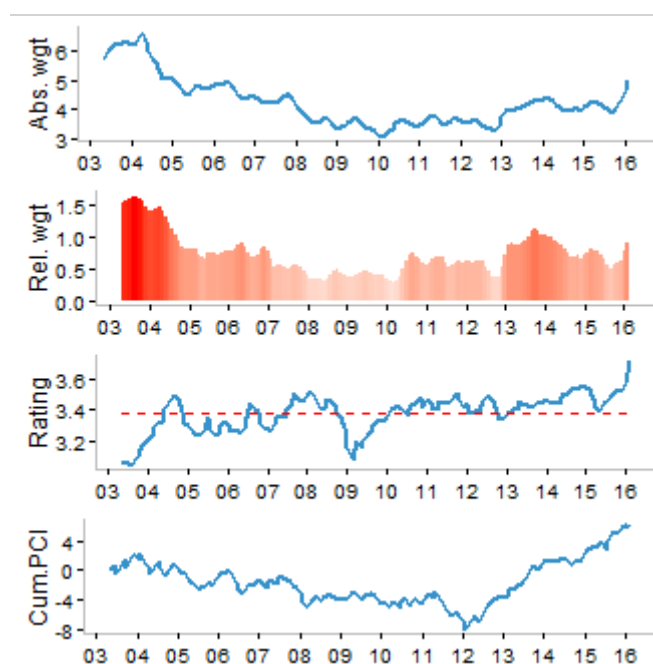
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 72: Financials



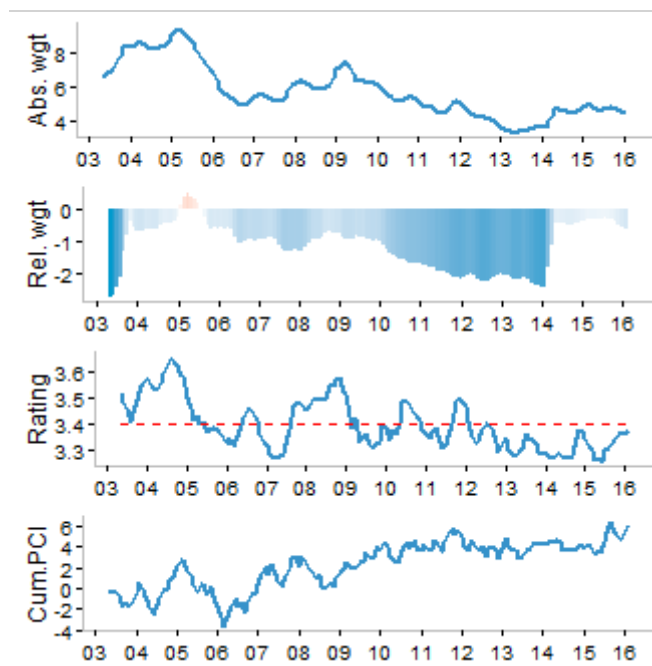
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 73: IT



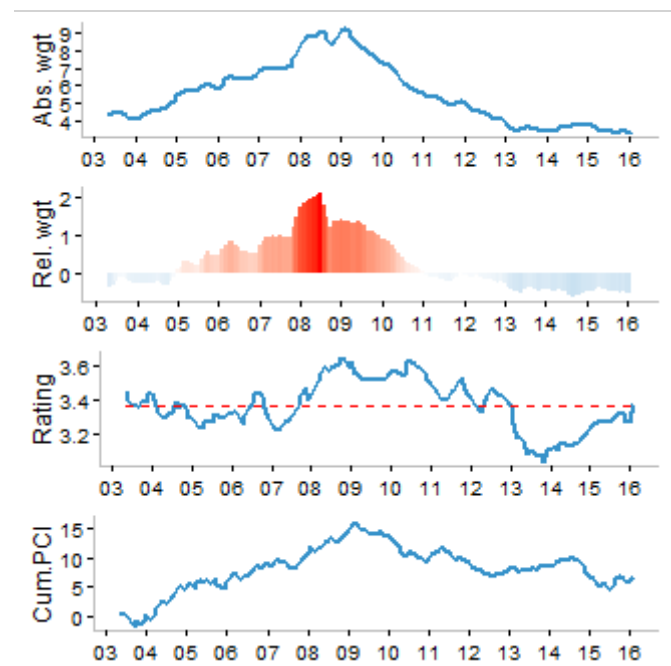
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 74: Telecom services



Source: MSCI, IBES, FactSet, UBS Quantitative Research

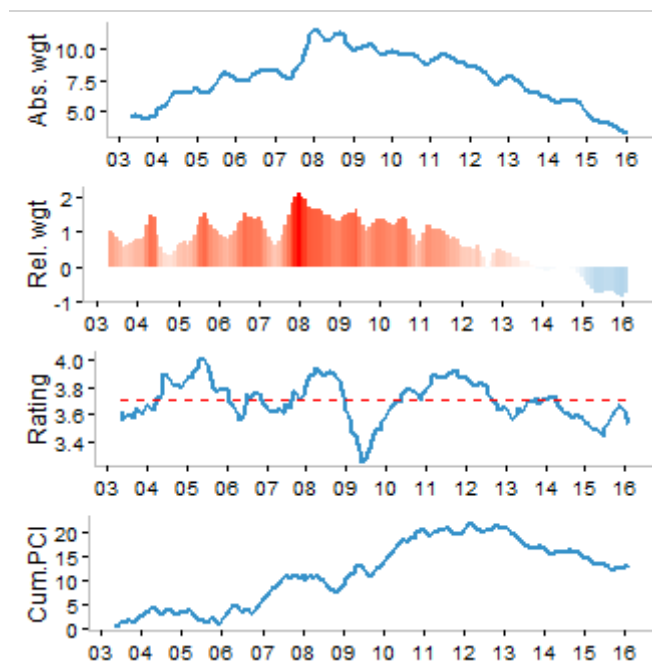
Figure 75: Utilities



Source: MSCI, IBES, FactSet, UBS Quantitative Research

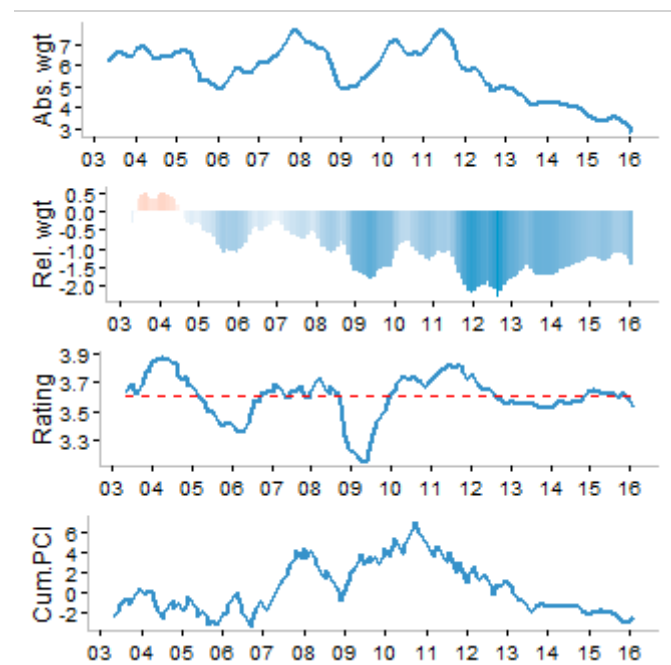
Asia ex-Japan

Figure 76: Energy



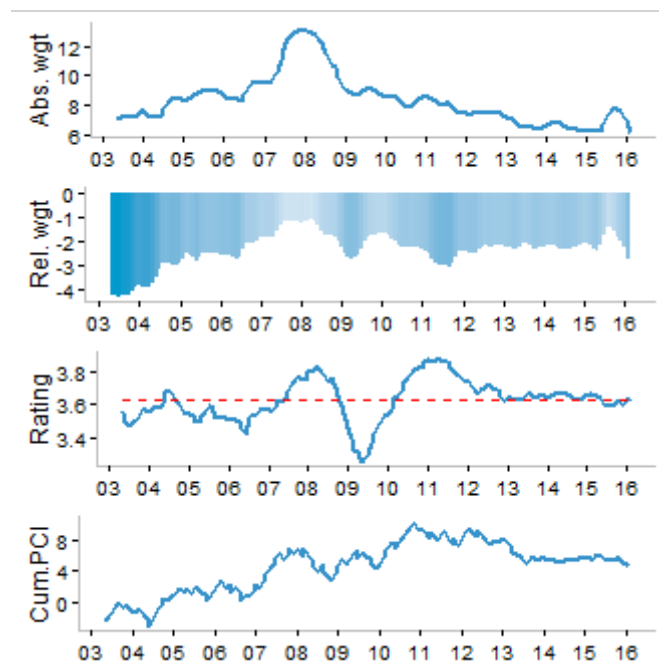
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 77: Materials



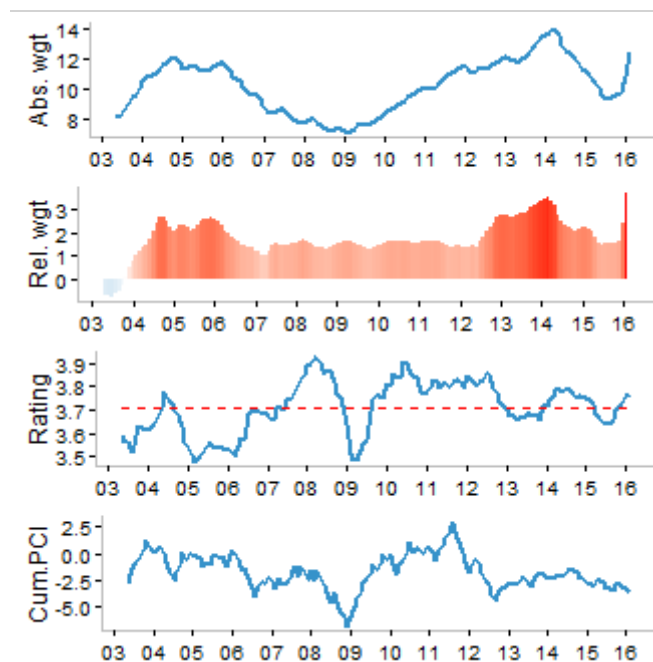
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 78: Industrials



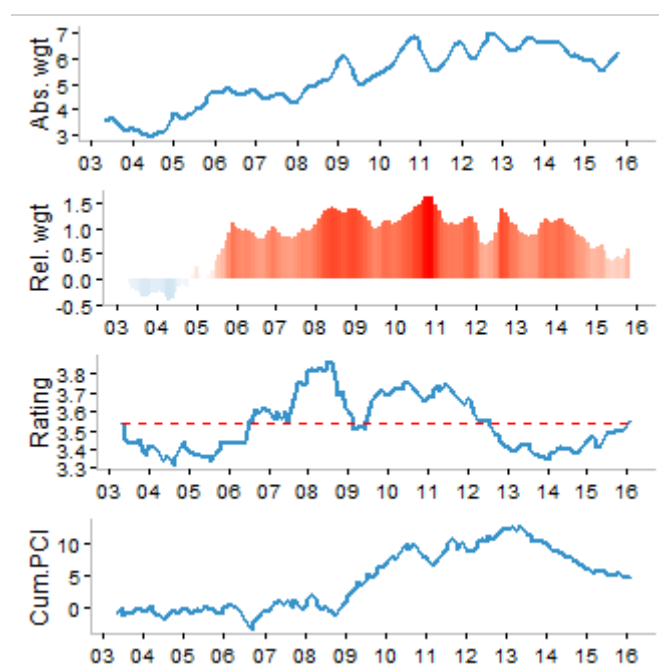
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 79: Consumer discretionary



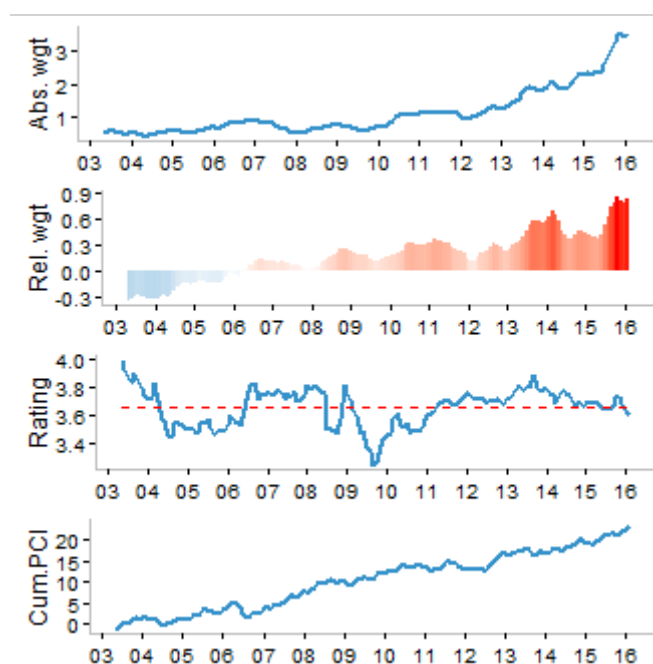
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 80: Consumer staples



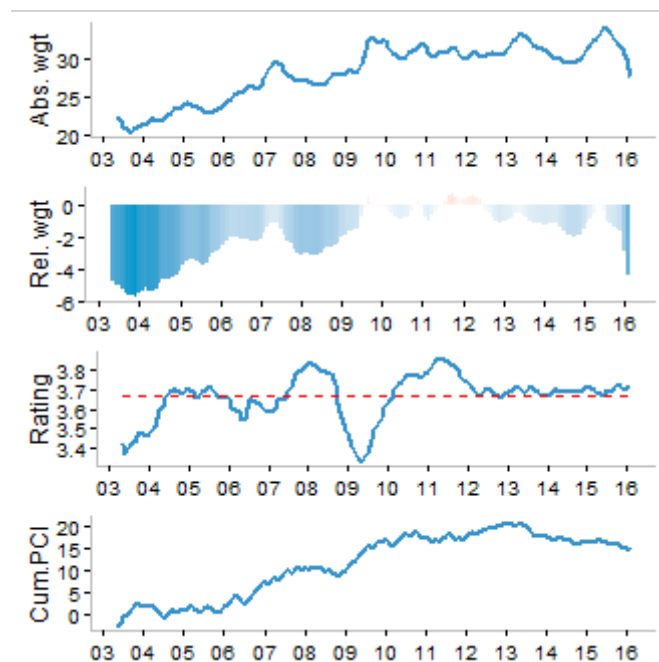
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 81: Healthcare



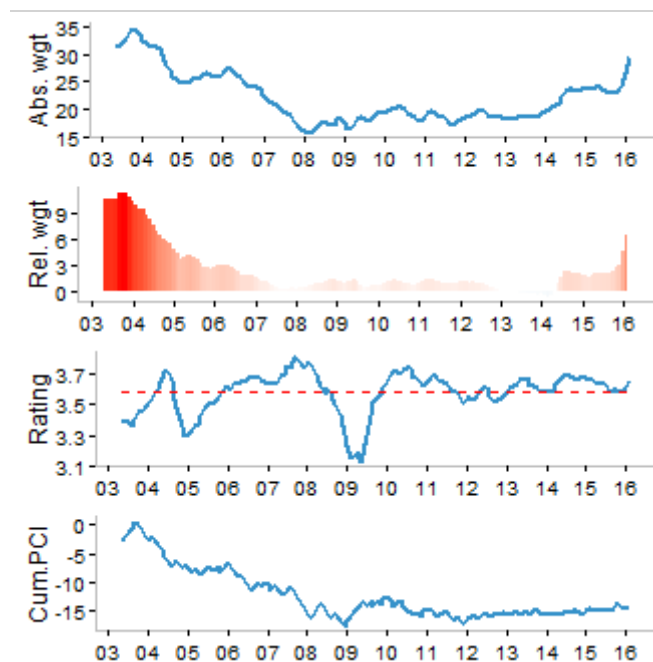
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 82: Financials



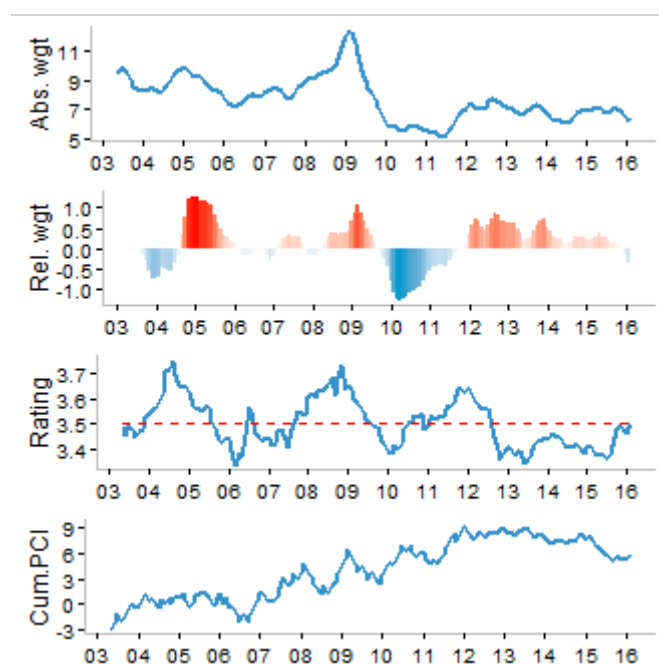
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 83: IT



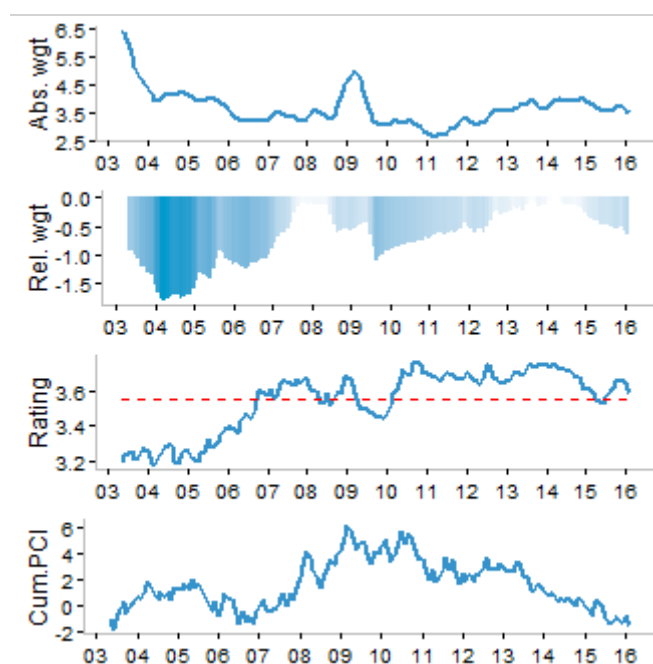
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 84: Telecom services



Source: MSCI, IBES, FactSet, UBS Quantitative Research

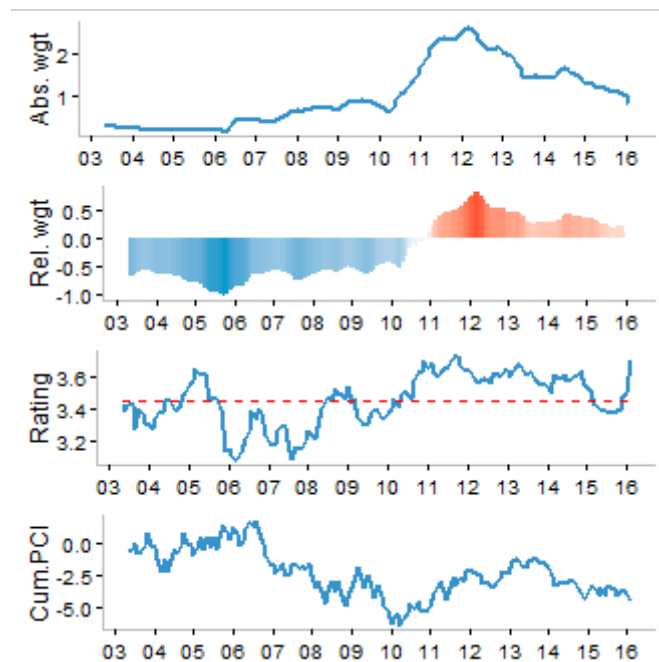
Figure 85: Utilities



Source: MSCI, IBES, FactSet, UBS Quantitative Research

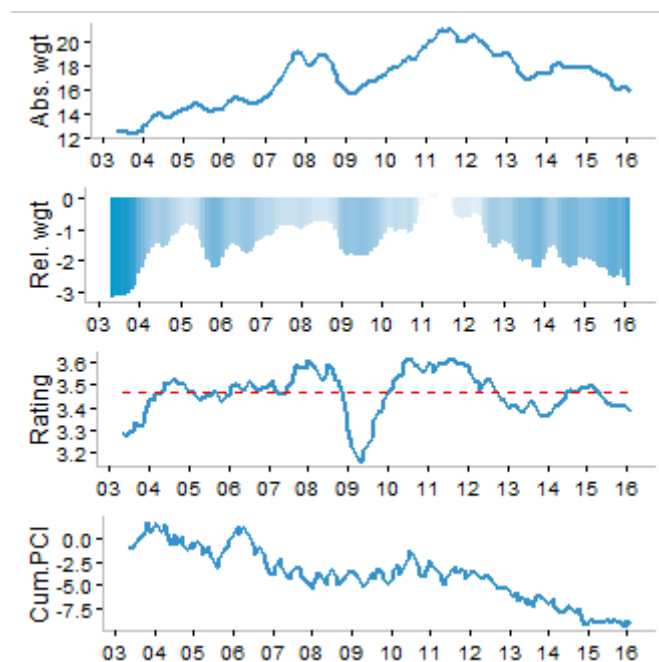
Japan

Figure 86: Energy



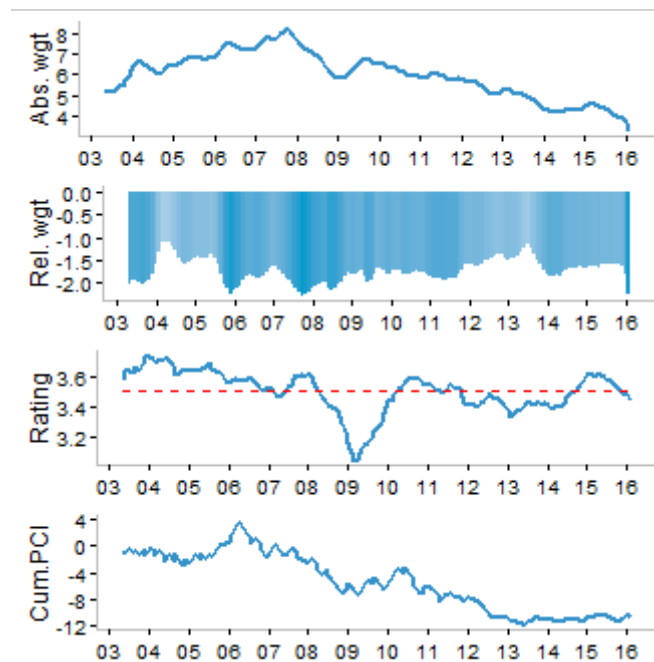
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 88: Industrials



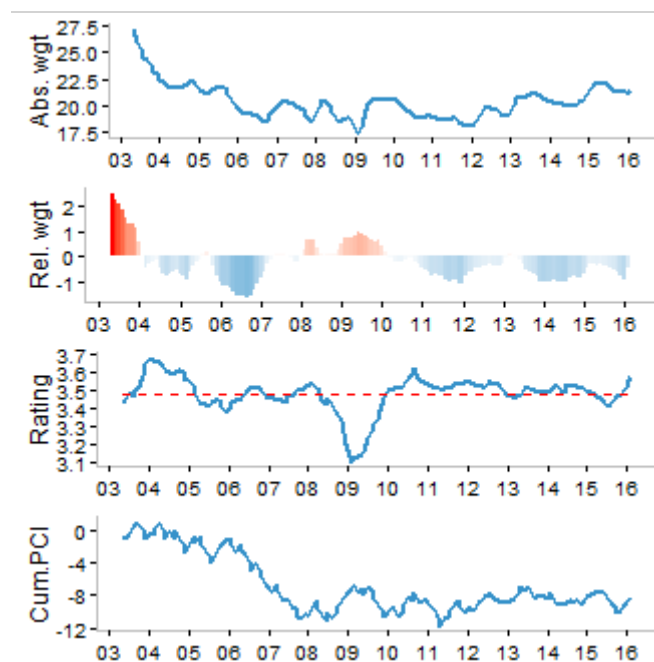
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 87: Materials



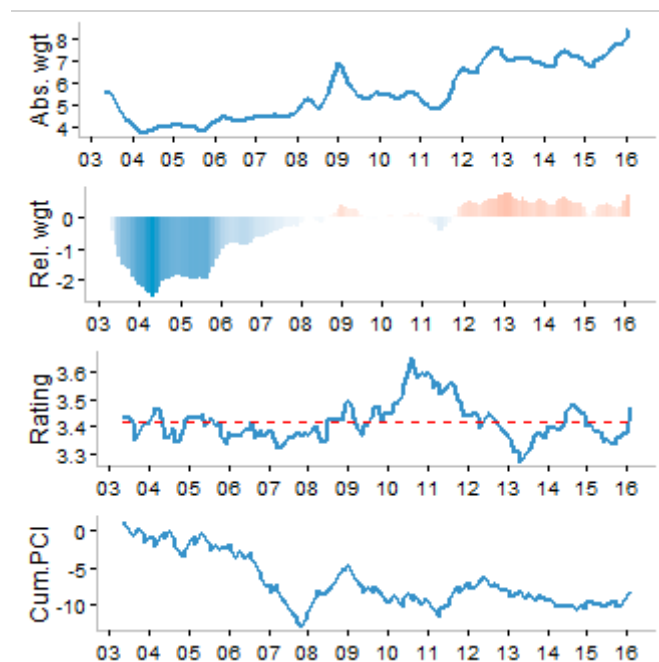
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 89: Consumer discretionary



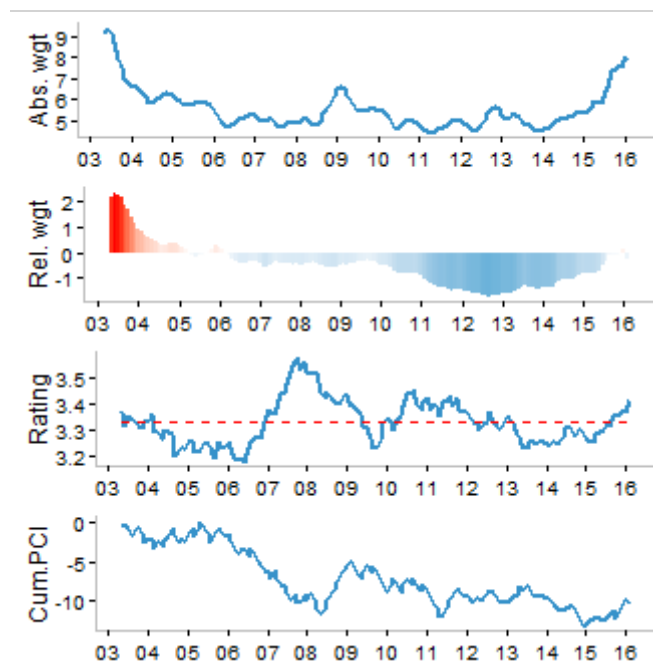
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 90: Consumer staples



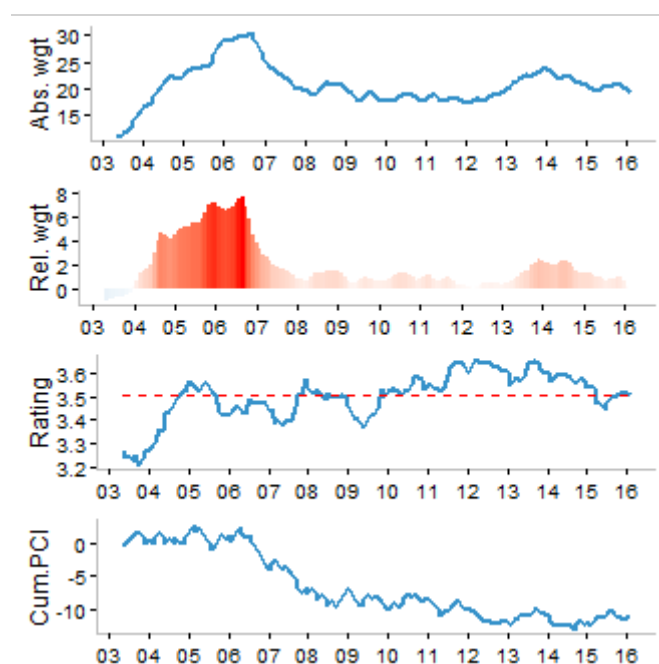
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 91: Healthcare



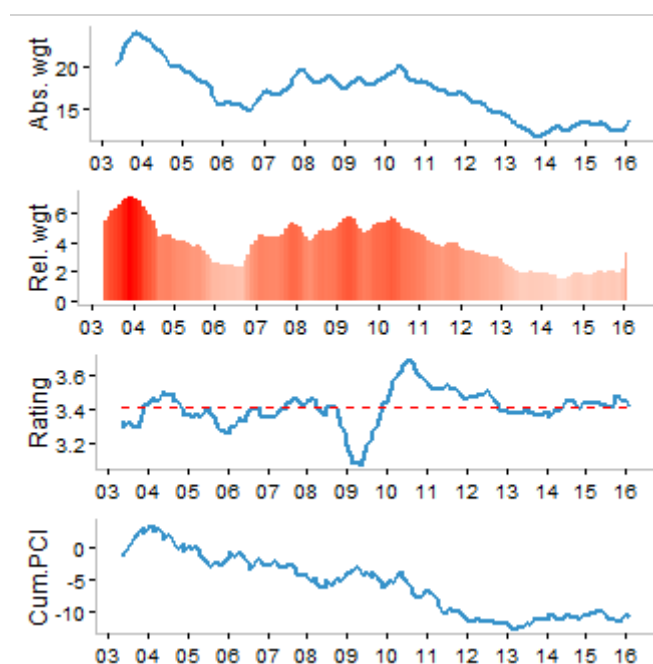
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 92: Financials



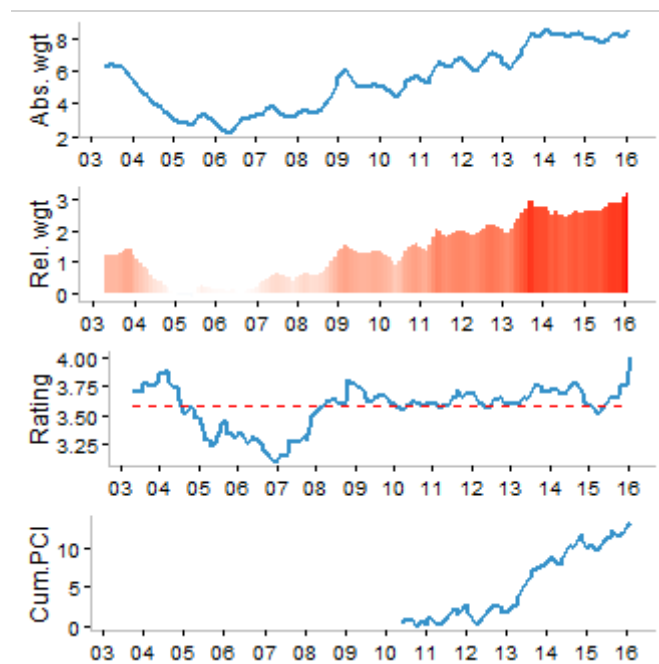
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 93: IT



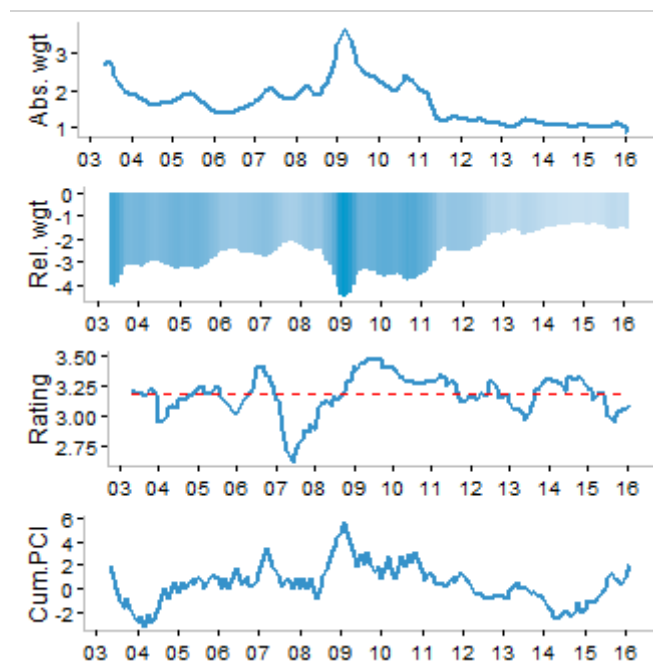
Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 94: Telecom services



Source: MSCI, IBES, FactSet, UBS Quantitative Research

Figure 95: Utilities



Source: MSCI, IBES, FactSet, UBS Quantitative Research

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|-------------------|---|-----------------------|--------------------------|
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| Neutral | FSR is between -6% and 6% of the MRA. | 39% | 28% |
| Sell | FSR is > 6% below the MRA. | 12% | 22% |
| Short-Term Rating | Definition | Coverage ³ | IB Services ⁴ |
| Buy | Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event. | <1% | <1% |
| Sell | Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event. | <1% | <1% |

Source: UBS. Rating allocations are as of 31 December 2015.

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