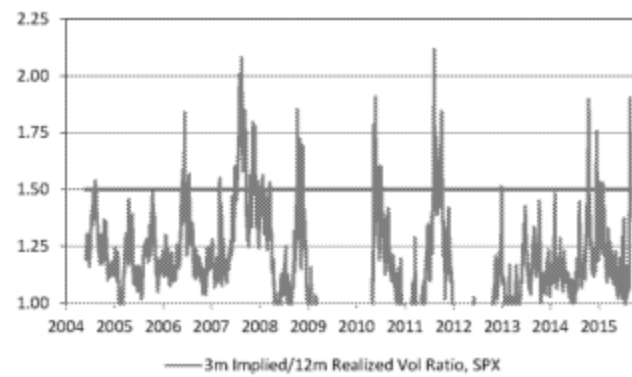




removed, 8%. This puts the current episode's maximum decline of 11% in good company with historical episodes. But other aspects of the historical record suggest that we may not out of the woods yet. For one, previous episodes of shocks to the volatility risk premium tend to last substantially longer than two weeks; they take an average of 50 days, or 38 days if the crisis-era episodes are excluded. (While there are some previous examples of "short" vol shocks in early 2007 and October 2014, these might be more appropriately viewed as early warning indicators for more extended periods of high volatility, and less as standalone examples.) Also, the equity markets have tended to hit rock bottom during these episodes an average of 30 days or so after implied volatility rises. The S&P 500 hit its low just four days after the vol shock, which seems out of line with historical patterns.

Figure 4: Equity implied volatility relative to realized vol



Source: Deutsche Bank

Figure 5: S&P level during elevated volatility episodes



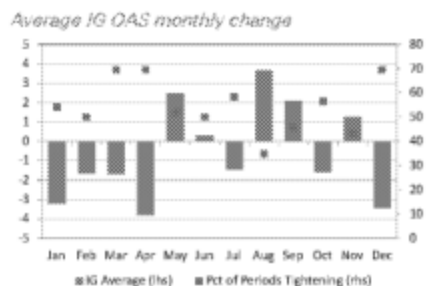
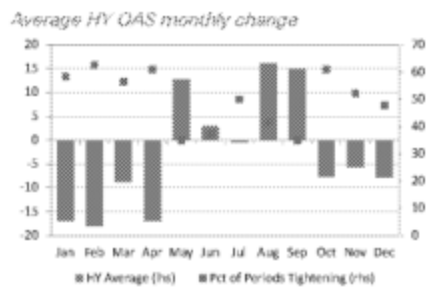
Source: Deutsche Bank

The shock to the VIX index can be attributed to three inter-related measures of equity volatility: the general level of at-the-money volatility relative to the trend of realized volatility, the premium for options expiring in the near-term (1m) relative to somewhat longer-expiry (3m) options, as well as the premium for out-of-the-money strikes over at-the-money strikes. An additional way to measure the magnitude of last week's equity market shock is to consider the elevated level of volatility risk premium, measured here as the degree to which option-implied volatility exceeds realized volatility. Finally, it's worth observing that credit markets are also participating in these developments. The implied-to-realized ratio on the CDX indices is also elevated, sitting in the 90th^h percentile over the last 3.5 years for 1m options on IG CDX, while the equity risk premium is in the 99th percentile over the same period.

Conclusions

Overall, we find market moves over the past week were in line with our expectations, directionally, although their speed, volatility, and reversals were certainly as much a surprise to us as they were to most other investors. We thought equities and other risk asset classes were much closer to what we perceive to be fair value at their bottom last Tuesday than they were following a retracement. Developments in China could have significant repercussions for broader EM universe, and we don't find EM credit spreads to be properly reflecting those consequences. We see main risks associated with EM credit assets being forced to re-price more substantially and having second-order effects on US credit markets. Additionally, historical evidence suggests that periods of extreme volatility similar to those witnessed over the past few sessions tend to exhibit propensity for aftershocks, usually lasting for weeks if not months.

Figure 6: Seasonality trends in HY/IG



Source: Deutsche Bank