INFOCUS

MACRO COMMENT

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Is equity market volatility set to increase?

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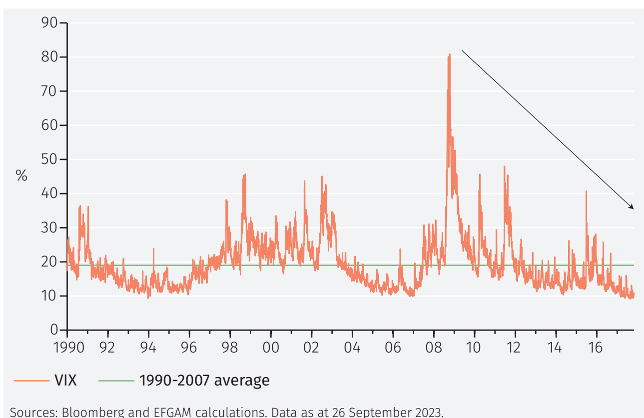
HIGHLIGHTED IN THIS PUBLICATION:

Following the Global Financial Crisis (GFC), volatility in US equity markets declined, encouraged lower by falling interest rates and the Fed's quantitative easing program. With the Fed having raised rates by a cumulative 525 basis points since March 2022 and now shrinking its balance sheet, could equity market volatility rise? In this edition of *Infocus*, Economist Sam Jochim investigates.

The Chicago Board Options Exchange's Volatility Index, also known as the VIX, is designed to produce a measure of constant, 30-day expected (implied) volatility of the S&P 500 equity market. It does so by aggregating a range of put and call option prices into a single number.[1]

Also known as the 'fear index', the VIX spiked in 2008 due to the GFC (see Figure 1). Since then, it has followed a declining trend, apart from some event-specific spikes. Between January 2013 and December 2017, the VIX averaged 14.8, below its pre-GFC average of 18.9. Furthermore, in May 2017 the 'fear index' closed at its lowest level since December 1993.

1. The VIX and its pre-GFC average

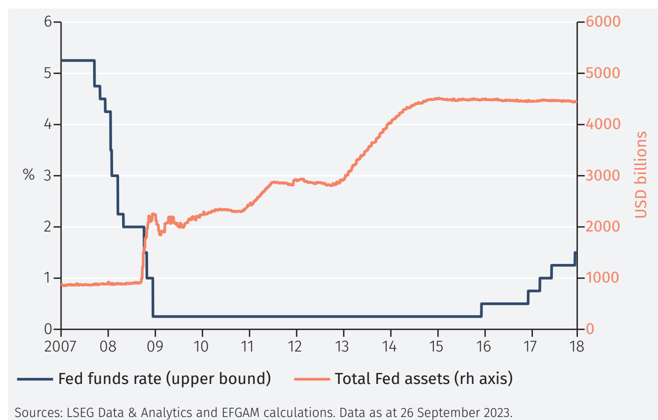


Sources: Bloomberg and EFGAM calculations. Data as at 26 September 2023.

One of the notable legacies of the GFC was the rapid shift to unorthodox monetary policy by the Fed and other central banks. From September 2007 to December 2008, the US central bank cut interest rates by a cumulative 500 basis points. It also began purchasing longer dated Treasury bonds and mortgage backed securities, massively increasing its balance sheet as part of its quantitative easing (QE) strategy (see Figure 2).

Unorthodox monetary policy is often cited as a possible cause for the decline in the VIX following the GFC.[2] In the US, it is also thought that QE has a larger impact on volatility than conventional monetary policy.[3]

2. Federal funds target rate (upper bound) and total Fed assets



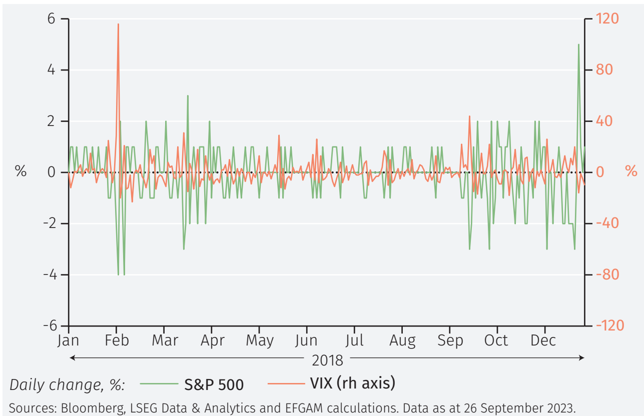
Sources: LSEG Data & Analytics and EFGAM calculations. Data as at 26 September 2023.

One mechanism through which expansionary monetary policy could have reduced volatility following the GFC is by lowering bond yields. As Treasury yields fall, the risk-free rate of return declines, and investors look elsewhere for returns. One way to do this is to write – or sell – options. Writing options generates premium and is a manifestation of the search for income in a low yield environment. As incrementally more options are written, there is an increased supply of implied volatility to the market, pushing it and the VIX lower.

Furthermore, as low market volatility persisted, short volatility products became increasingly popular. Investors sold implied volatility, taking the view that market conditions would remain benign. However, as volatility fell to near record lows in late 2017, volatility markets became crowded and vulnerable to a rapid repricing.[4] On 5 February 2018, the S&P 500 fell 4.1% and the VIX more than doubled in one day (see Figure 3). With many short volatility products losing up to 80% of their value in a single day, this event became known as Volmageddon.[5]

[1] https://www.cboe.com/tradable_products/vix/
[2] 'The VIX, the variance premium and stock market volatility', Bekaert, G. and Hoerova, M. (2014), *Working Paper Series 1675*. https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1675.pdf
[3] 'Financial effects of QE and conventional monetary policy compared', Weale, M. and Wieladek, T. (2022), *Journal of International Money and Finance*. https://doi.org/10.1016/j.jimonfin.2022.102673
[4] 'Volmageddon and the Failure of Short Volatility Products', Financial Analysts Journal. Augustin, P., Cheng, I. and Van den Bergen, L. (2021). http://dx.doi.org/10.2139/ssrn.3819342
[5] *Chaos Kings: How Wall Street Traders Make Billions in the New Age of Crisis*, Patterson, S. (2023). https://tinyurl.com/yc5uey6y

3. S&P 500 and VIX (daily change, %)



Sources: Bloomberg, LSEG Data & Analytics and EFGAM calculations. Data as at 26 September 2023.

Since the start of 2019, the VIX has averaged around 22, slightly above its pre-GFC average. However, this period includes a global pandemic and the start of the first war in Europe since World War Two. So far in 2023, the 'fear index' has averaged 17.6, slightly below its pre-GFC average.

It is important to note that for much of the time the VIX lies below its long-run average; implied volatility is skewed to the right. In other words, large spikes in volatility caused by tensions such as the first Iraq war in 1990 and 9/11 in 2001 raise the long-run average. In the absence of such tensions, implied volatility is below its long-run average for much of the time.

One way to account for this is to look at the median value of the VIX. Since 1990, the VIX has closed below its pre-GFC average 56.1% of the time while it has closed below its pre-GFC median value 49.6% of the time. The median value of the VIX in 2023 has been slightly below its pre-GFC median level (see Figure 4).

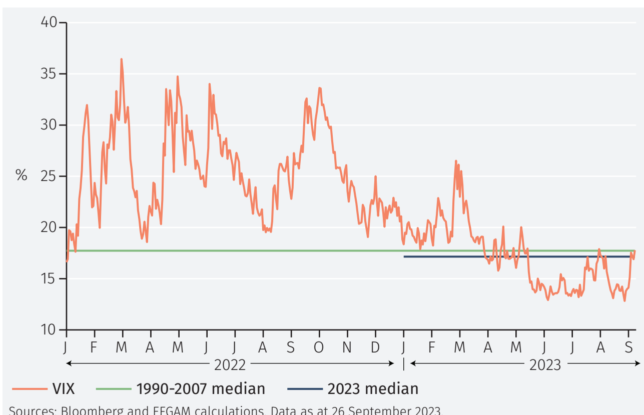
That expansionary monetary policy reduced implied volatility following the GFC raises an interesting question in the current context: will the return to a more normal policy environment lead to a rise in implied volatility?

Since QE had a larger impact on volatility than conventional monetary policy in the US, the speed at which the Fed reduces its balance sheet may be more important for future volatility than the level of interest rates. This could provide an explanation as to why implied volatility has remained below its pre-GFC average and median so far in 2023, despite interest rates being increased to pre-GFC levels. The moderation in the Fed's balance sheet has been milder by comparison.

It is difficult to assess the possible impact of a return to conventional monetary policy without holding an opinion on the level at which interest rates will eventually settle in the US, and the extent to which the Fed will reduce its balance sheet. Nonetheless, a possible rise in implied volatility could be an important consequence.

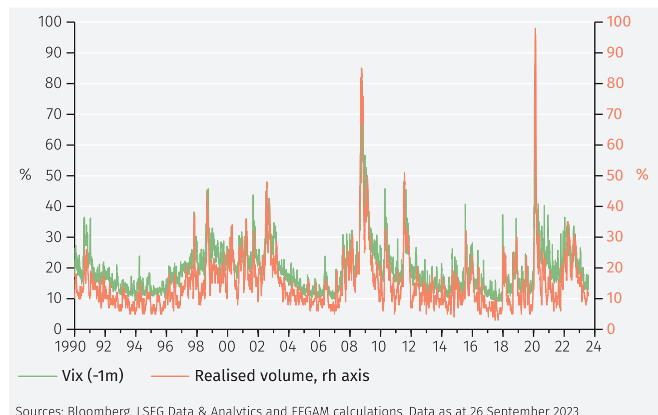
It is also interesting to compare implied volatility to realised volatility i.e., the market's estimate of future volatility versus actual historical volatility (see Figure 5). Since the VIX measures implied volatility for the next month, it is shown

4. The VIX and its long-run median



Sources: Bloomberg and EFGAM calculations. Data as at 26 September 2023.

5. S&P 500 1-month volatility and VIX



Sources: Bloomberg, LSEG Data & Analytics and EFGAM calculations. Data as at 26 September 2023.

with a one-month lag in Figure 5. Notably, implied volatility, as shown by the VIX, tends to trade above realised volatility. This can be viewed as the volatility risk premium. From January 1990 to August 2023 the VIX has traded an average of 1.45 times higher than the following month's realised volatility. Furthermore, the two measures have a correlation of 73%, highlighting that implied volatility is a good proxy for realised volatility.

In summary, the Fed's shift to expansionary monetary policy following the GFC played a role in the subsequent decline in US equity market volatility from 2013 to 2017. In 2023, the VIX has mostly traded below its pre-GFC average and median. With interest rates having been raised to pre-2008 levels and, perhaps more importantly, the Fed reducing its balance sheet, a rise in US equity market volatility is feasible.

[7] To test the robustness of the results to changes in the sample period, the VAR was also estimated on the sample period 2000Q1-2019Q4. The main difference compared to the full-sample results is that the estimated responses to shocks are less pronounced, although their statistical significance is not affected. The only exception is the response of US headline inflation to a shock to core inflation which in the shorter sample period is not statistically significant as opposed to the estimates based on the full sample.
Overall, this evidence suggests that the response of the variables to shocks may have intensified after the pandemic, but more data will be needed to test if that was the case.

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