FINANCIAL MARKETS

# Volatility, a key element in the global financial scenario

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**It is of key importance to track volatility in financial markets, principally because of its impact on real activity.**

**Our Global Volatility Index (GVI-BBVA) aims to synthesise, in a single variable, the dynamics of financial market volatility in a more comprehensive way than the indicator normally used, the VIX.**

**Throughout 2015, against a backdrop of notable divergence in growth between regions, and in which the central banks of the main developed economies will continue to play leading roles, it will be vital to track volatility on a global scale.**

## 1. Why is financial volatility important?

Monitoring the volatility in financial markets is of key importance, since it acts as a proxy for the degree of uncertainty that economic agents feel about the future and, as such, for their risk appetite. It can also become a leading indicator of financial instability, insofar as sharp and sustained bouts of volatility can anticipate or even unleash episodes of panic on the markets. Keeping volatility low for a long period, on the other hand, may be an indicator of undervaluation of risks and, as such, of a likely increase in financial fragility.

Ultimately, volatility can have a substantial impact on real activity[1]. A number of studies have demonstrated that particular measurements of volatility can be very useful in helping to predict economic activity. Against this backdrop, the BBVA-GAIN global activity indicator[2], which provides high frequency predictions of world activity, includes, among other variables, BBVA's global volatility indicator GVI which was built by BBVA Research and which is presented in this paper. The GVI-BBVA indicator was incorporated into the BBVA-GAIN index (instead of other financial indicators such as FSIs[3]) because including this indicator improves the fit of the activity indicator, since it is more sensitive to global volatility events.

What has this indicator done in the last two years? At the beginning of 2013, once the debt crisis in Europe had stabilised, financial tensions were moderate, tending to converge to pre-crisis levels. However, from the second quarter of 2013 onwards, coinciding with the change in the Federal Reserve (the Fed)'s tone in its statements about the possibility of beginning to taper its third round of quantitative easing earlier than expected, there was high volatility in financial markets for a time, which was reflected neither on the VIX, the indicator most used as a proxy for global volatility, nor on the other FSIs. Once this episode was over, volatility at the end of 2013 and during the first three quarters of 2014 stayed exceptionally low. But at the beginning of the fourth quarter last year, the succession of poor economic news, mainly in Europe, as well as uncertainties about the recovery of global growth, unleashed increased volatility which, just as during the 2013 episode, was only partly picked up on the VIX but was tracked by BBVA's GVI.

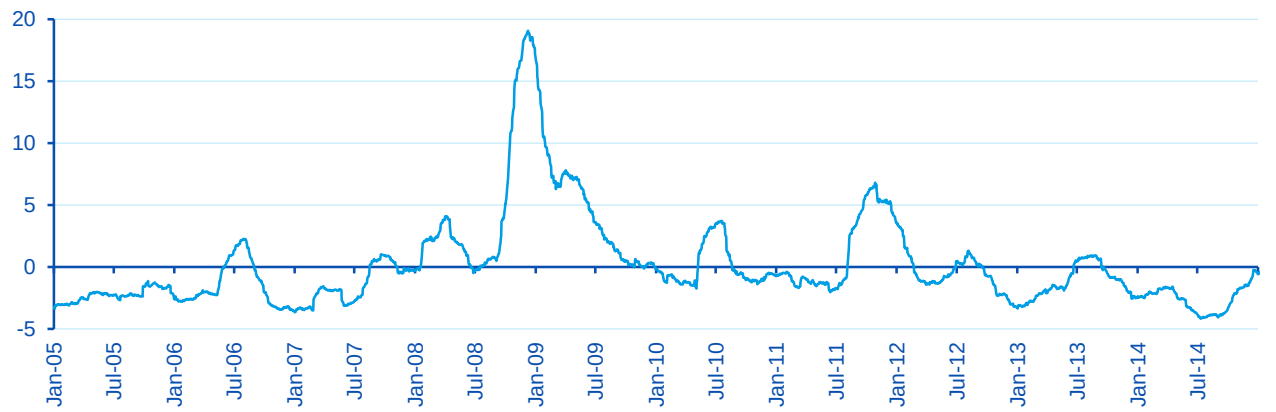
1: BIS Quarterly Review, September 2014, International banking and financial market developments, Volatility stirs, markets unshaken
Zeynep Senyuz, Marcelle Chauvet, and Emre Yoldas. (2012), What does financial volatility tell us about macroeconomic fluctuations?
2: Martínez-Martín, J (2013), BBVA Global Activity Index (BBVA-GAIN). Tracking indicators for global activity in real time
3: FSIs: Financial Stress Indicators. See BBVA Research Observatorio Económico: Tensiones financieras y actividad económica en EEUU y la zona euro (in Spanish only).

2015 looks to be particularly challenging in terms of tracking financial markets, and particularly their volatility, since the increasing divergences between countries, both in terms of growth and monetary policy, are likely to result in increased but heterogeneous volatility in the markets. In this context, having more sensitive volatility indicators, not only at a global level, but also by regions and assets, is critical for, depending on what sparks off a specific increase in volatility, it may affect a region or particular type of asset more intensely than others. Time will tell whether these tighter and more defined indicators show divergences that can be exploited in terms of better activity indexes.

## 2. The Global Volatility Index (GVI-BBVA): an alternative measure for global volatility

The GVI created by BBVA Research endeavours to capture in a single variable the dynamics of the volatility of financial markets in a more comprehensive fashion than the indicator which is generally used, the VIX. The aim is to extract a factor which represents the shared variation in the different markets and regions, and which provides information that is useful in forecasting economic activity[4].

Figure 1
**Global Volatility Index (GVI-BBVA)**

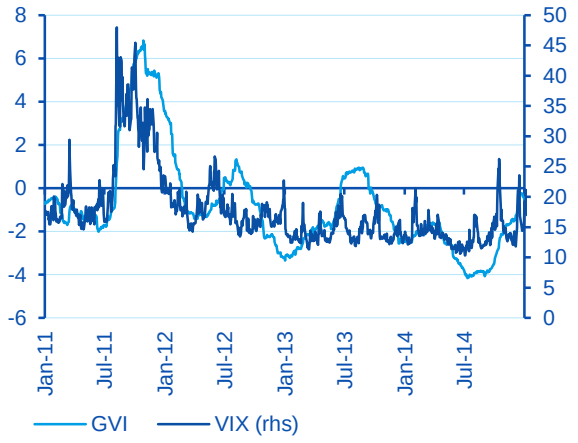



Source: BBVA Research, Datastream and Bloomberg

In the case of the VIX, its scope is limited, since the index measures the implied volatility of the S&P 500 stock market index. We should point out at this juncture that the correlation between the BBVA's GVI and the VIX from 2004 to 2009 was 90%; while between 2010 and 2014 it was 75%. However, when we look at the most recent period (2013 to 2014), this correlation falls significantly, to 30%. Therefore, although for a long period the VIX can indeed be viewed as a representative index of the volatility of financial markets, it has not been so in the last two years. It could be said that, depending on the periods we are looking at, the VIX has been either underestimating or overestimating the underlying volatility in financial markets. Likewise, FSIs also have their limitations as measures of volatility, since, as indicators which incorporate risk indicators as well as volatility, the gradual easing off of these characteristics as the crisis recedes and recovery starts to come into sight, eclipses the volatility events.

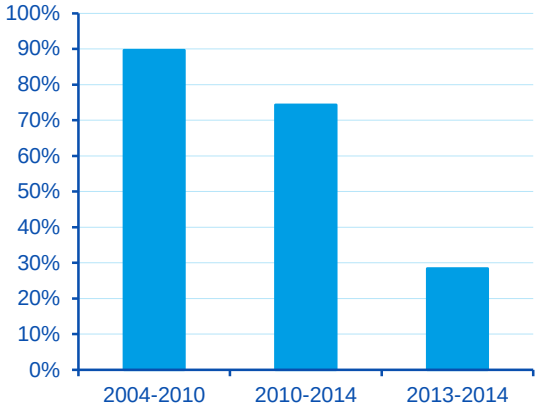
4: The GVI includes a wider spectrum of assets (variable income, fixed income, currencies and credit) and of geographies (both developed and emerging). See appendix.

Figure 2
**GVI-BBVA and VIX**




Source: BBVA Research, Datastream and Bloomberg

Figure 3
**GVI-BBVA (correlation with the VIX)**




Source: BBVA Research, Datastream and Bloomberg

Since the crisis began, the GVI-BBVA showed a similar pattern to that marked by the VIX. But, in 2013 and 2014 there were two episodes of upticks in volatility which the GVI-BBVA registered and the VIX did not. The first was in 2013, in the early months of that year, when there was a significant increase in global volatility which was only partly reflected in the VIX. This increase in global volatility, which in contrast was picked up by the BBVA's GVI, was linked to uncertainty about what the main central banks would do and the impact of their actions on markets: i) the launch of a massive quantitative easing programme by the Japanese central bank, and ii) subsequently, and with a very significant impact, the change in the Fed's communication strategy, as mentioned earlier, about the possibility of beginning to taper its third round of QE earlier than planned. This was how the uncertainty over a possible reduction in global liquidity generated an increase in global volatility.

Once this episode of volatility at the end of 2013 was over, and for the first three quarters of 2014, both indicators were unusually low. These ultra-low levels were due in part to reduced macro-economic uncertainty, but also to the exceptionally accommodative monetary policy of the main central banks, which had played a key role in driving volatility to these record lows. In particular, monetary policy has had a direct effect on the lower volatility in fixed income markets, since the reduction in interest rates to record lows in the key geographic areas has put a limit on the breadth of interest rate movements, particularly in the short end of the curve, via the reduction in the risk premium. Monetary policy has also had an important impact in reducing volatility through the change in communication on the part of the Fed and the European Central Bank (ECB), which now have a forward guidance policy which reduces uncertainty about future monetary policy and, as such, anchors interest rate expectations.

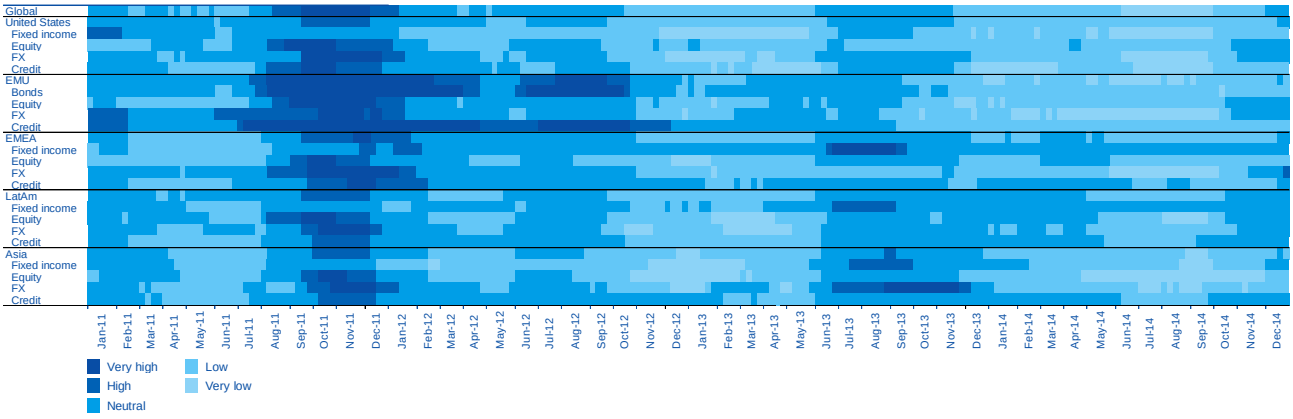
The second episode of an uptick in volatility took place very recently, in October 2014. On this occasion, the increased volatility was associated with the succession of poor economic figures, mainly in Europe and particularly in Germany, as well as the increasing doubts about the recovery of global growth, all on top of geopolitical risk events. Again, on this occasion, the VIX only partly picked up on this behaviour, and did so in a transitory manner. For its part, the GVI showed a more sustained increase in volatility, abandoning the unusually low levels (not seen since the beginning of 2007) it had been enjoying prior to 4Q14. This difference in performance between the VIX and the GVI highlights how the BBVA index is capturing volatility in a more comprehensive way, through more regions and more assets and that, as such, it is important to monitor it.

## 3. The GVI-BBVA, a breakdown by geographies and assets

A specific shock which triggers a generalised increase in volatility on the financial markets does not have to affect different countries and regions equally, nor need it affect different assets in the same way. Against this backdrop, just as it is important to have a global volatility index, it is also useful to have sub-indexes that are aggregated by regions and assets, in order to track more effectively how each of them is affected by particular events. This is particularly important in the light of the increasing maturity of certain emerging financial markets, which are gradually growing in importance. In order to monitor volatility by regions and assets, we have created some volatility sub-indexes, with a methodology similar to that used when building the GVI[5].

This approach enables us to assess different responses to one-off episodes. For example, when the debt crisis broke out in Europe, and particularly at one of its hottest moments, before Mario Draghi, the President of the ECB delivered his “whatever it takes” speech, the European markets generally, and particularly the debt and CDS (credit default swaps) markets, were the most affected. Another clear example occurred in mid-2013: after the Chair of the Fed, Ben Bernanke, said that “in the next few meetings we could take a step down in our pace of purchases”, the markets started to discount the rapid withdrawal of stimuli by the Fed. In this environment, the emerging markets were the hardest hit, and within them, exchange rates and debt suffered more volatility.

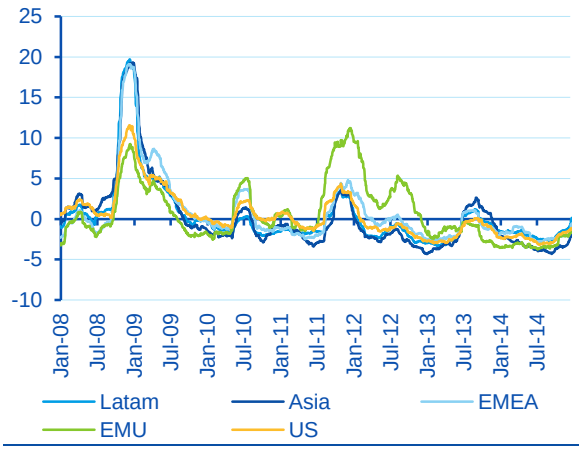
Figure 4
**Volatility Map**




Source: BBVA Research, Datastream and Bloomberg.

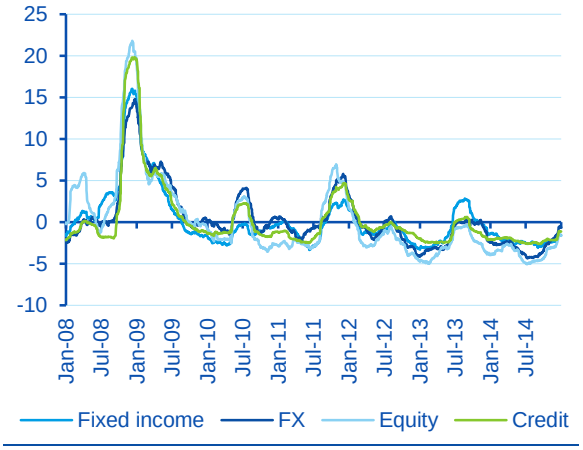
5: See appendix

Figure 5
**Sub-index: areas**




Source: BBVA Research, Datastream and Bloomberg

Figure 6
**Sub-index: assets**




Source: BBVA Research, Datastream and Bloomberg

What can we expect in the future? Over the course of 2015, in an environment of major divergences between regions in their rates of growth, and one in which the central banks of the main developed countries will continue to play leading roles, with the Fed normalising its monetary policy, and while the ECB continues with its accommodative policies, it will be particularly interesting to monitor this global volatility index, as well as the respective sub-indexes, because of the impact it could have on economic growth.

## Appendix. Constructing the indexes

The global volatility index (GVI-BBVA) was constructed using analysis from its principal components, a statistical method which analizes the factors responsible for co-circulation of various variables. We assumed that volatility was the principal factor influencing this co-movement, and created an index by extracting this factor (the first principal component).

We calculated the volatility at 60 days of the daily variation in the following variables for Japan, China, the US, Germany, Spain, Italy, Mexico, Brazil, Turkey and Poland:

- Fixed income: 10-year sovereign debt yields.
- FX: measured as a reference currency / US dollars (USD), the number of USD needed to buy 1 unit of reference currency. (jpyusd, cnyusd, eurusd, mxnusd, brlusd, tryusd, plnusd).
- Variable income: the most important stock exchange index in each country.

In order to combine these different variables, they were standardised, and the first principal component of these variables was then calculated.

The sub-indexes were built in a similar way to the GVI-BBVA, in five major areas:

- US
- EMU: Germany, France, Netherlands, Belgium, Spain, Italy, Ireland and Portugal.
- EMEA: Czech Republic, Hungary, Poland, Russia and Turkey
- LatAm: Brazil, Chile, Colombia, Mexico and Peru.
- Asia: China, India, Indonesia, Korea, Malaysia, the Philippines, Thailand and Taiwan

Each area consists of the following assets (one per country)

- Fixed income: 10-year sovereign debt yields.
- FX: measured as a reference currency / US dollars (USD), the number of USD needed to buy 1 unit of reference currency. (Jpyusd, cnyusd, eurusd, mxnusd, brlusd, tryusd, plnusd.)
- Variable income: the main stock exchange index in each country.
- Credit: Five-year CDS. (Except for the US, where we have included the Baa spread)

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