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Economic Watch

Financial Scenarios

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Economic Analysis

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Economic Scenarios

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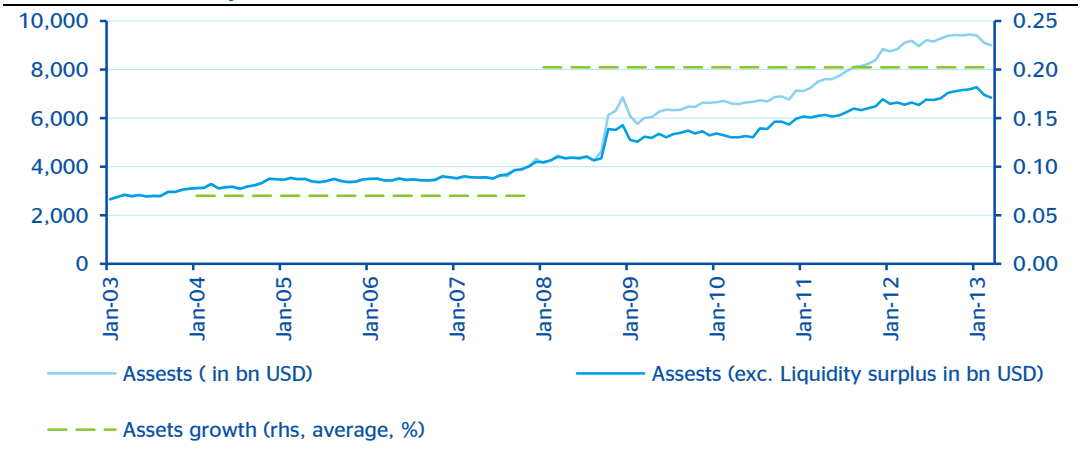
Q&A about QEs

- Conventional transmission channels of monetary policy stop working when rates are close to zero
- Unconventional measures can be classified in three groups: pure quantitative easing (QE), targeted purchases and forward guidance
- Recent QEs implemented by central banks combine all three unconventional measures. There is a heated debate among economists about the effectiveness of each of these channels
- The balance sheets of the BoE, BoJ, ECB and the Fed have skyrocketed since 2009, surpassing 20% of GDP (and heading to 60% in Japan)
- QEs have reduced long term interest rates significantly while effectively avoiding deflation. Equity, high yield bonds and emerging markets have benefited from most QE announcements
- The "normalization" of central banks´ balance sheets is not exempt of risks: untangling all three measures contained in actual QEs is vulnerable to abrupt and disorderly changes in expectations

Chart 1
Balance sheets of major central banks (USD bn)



Source: Bloomberg and BBVA Research

Why have central banks resorted to quantitative easing and other unconventional measures?

Normal times and conventional policy

In recent times, monetary policy has been typically managed by central banks´ buying and selling of short-term government bonds, an activity aimed at controlling current and expected short term interest rates. The reasoning is that these rates, together with risk premia, determine the yield curve, which in turn affects the real economy through five well-established channels:

- Interest rate channel: This is the traditional and major effect, where the price of a unit of currency today relative to a unit of currency "tomorrow" determines consumption and investment behavior, by altering relative prices between present and future goods.
- Wealth channel: A change in rates also affects net worth (value of assets held and the present value of income) which in turn also affects consumption and investment behavior.
- Balance sheet channel: A change in net worth also facilitates credit when, in imperfect markets, net worth can be collateralized.
- Bank lending channel: A change in rates affects the stock of deposits, which is important collateral when banks leverage funds and consequently lend. It is a channel similar to the balance sheet channel but applied specifically to banks (both channels fall under the rubric of "credit channels").
- Exchange rate channel: Due to arbitrage, a change in rates will, other things equal, affect exchange rates, and consequently affect competitive advantage and external demand.

These well-known channels are challenged when interest rates reach zero, a time when the opportunity cost of holding money disappears.[1] Central banks under such conditions are described as having reached the zero interest rate bound (ZRB).

ZRB and unconventional measures

In times of near-zero nominal interest rates, the traditional channels of expansionary monetary policy cease to work. Interest rates cannot be lowered any further and consequently a weak economy risks falling into deflation. Major central banks have been faced with the above situation since the financial crisis in 2008 and have thus looked for alternative tools to boost their economies. These tools can be grouped into three distinctive categories: quantitative easing (QE), targeted purchases and forward guidance.

Quantitative easing -- as initially defined when implemented in Japan in 2001 -- refers to targeted increases in the aggregate assets/liabilities of central banks. However, some central banks have actually raised their balances not by purchasing Treasury bills (the natural and less-distorting candidate in a “pure” QE approach) but by purchasing specific assets such as asset-backed securities (ABS) and long-term assets. Thus the definition of QE has evolved to encompass targeted purchases, which are policies focused on the type of assets being acquired by the central bank. The term has thus evolved from characterizing a tool focused on the level of assets in central banks´ balance sheets to a tool that also focuses on the composition of these assets.

The third measure, forward guidance, consists of communication by a central bank aimed at signaling the likely future path of policy rates. Central banks have been slowly incorporating forward guidance in their policy announcements, though reluctant to make any explicit

1: More exactly, with short-term interest rates equal to the interest rate paid on banks´ reserves.

commitment that can constrain their options in the future. In normal times, policy consistency has led to policy predictability. But in turbulent times predictability is eroded, and the benefits of any explicit commitment (such as backing the currency, sustaining liquidity or supporting the financial sector more broadly) outweigh any costs. The latest adopters of such explicit communication strategy have been the ECB and the BoE. On July 4th 2013, the ECB officially announced that its policy rates would be tied to the "subdued outlook" for inflation over the medium-term, "broad-based weakness" in the real economy, and "subdued monetary dynamics". That same day, the BoE stated that long-term yields had "overreacted" to previous statements by the Fed (in other words, that markets had wrongly priced-in future monetary policy). The Fed adopted forward guidance ten years earlier -- when Alan Greenspan stated that "policy accommodation can be maintained for a considerable period" -- and has since evolved to its current format, which includes thresholds for inflation and unemployment.

Quantitative easing, as implemented by central banks, has also included aspects of forward guidance. Although central banks have stopped short of any explicit commitment, quantitative easing announcements have been accompanied by suggested timelines of the monetary expansions, thus guaranteeing a horizon for zero interest rates before reverting to "normal" policy rules.

The implementation of QE is unchartered territory. Despite significantly changing the physiognomy of central banks´ balances, its impact on the real economy is permanently questioned and the channels through which it might boost aggregate demand are under intense scrutiny. This Economic Watch looks at the nature, impact and expected outlook of QE, as implemented in four major central banks: the Federal Reserve (Fed), European Central Bank (ECB), Bank of England (BoE) and Bank of Japan (BoJ).

How can QE affect the real economy? (the framework)

Pure QE: an old debate

The effectiveness of QE is at the center of yet another heated debate among economists, with some praising QE as the most important policy initiative for pulling major economies out of the crisis, and others judging these measures completely irrelevant. For QE advocates, the reasoning behind the implementation of a pure QE strategy is that supply of monetary base (i.e., the size of central banks´ balance sheets) can have an impact on the real economy through channels other than interest rates. This "monetarist view" states that an expansion of central banks´ balances increases money supply (i.e., broader measures of liquidity), which in turn increases nominal expenditure. There are well-known economic identities and ample empirical evidence that link balances, money supply and output but, as QE detractors point out, causality is another story. First, the economic identities linking these variables are true as long as other parameters (money multiplier and velocity of money) remain constant. And second, economic theory validates these links only under assumptions that are less likely under the zero interest rate bound.[2] According to its detractors, QE will not even generate inflation because the neutrality of money (which states that money creation should translate mostly into future inflation) is true only in the long run, while QE strategies are short-term policies which are reverted once a central bank finds itself again wanting to increase interest rates (or at least not willing to reduce them).

2: Zero-interest rates are a consequence of demand for reserves reaching a point where their opportunity cost (liquidity premium) is zero. In other words, the "price" of liquidity is zero, which is another way of saying that its supply is unlimited (just like air) and thus demand is totally elastic (Keynes´s liquidity trap). As a consequence, money supply is divorced from central bank balances and the expansionary channel is broken (as the economy will not be affected (determined) by changes in central banks´ balance sheets.

Targeted purchases: more consensus, but how to manage them?

With respect to QE´s targeted purchases, advocates emphasize that this strategy pushes up the price of the assets being purchased, strengthening the balances of economic agents invested in those assets while forcing those same investors to look for alternative investments (this is also known as the "portfolio channel"). In particular, central banks can hold up the value of stressed assets by playing the role of purchaser of last resort, and thus avoid a deleveraging cycle (in which weakened balance sheets in financial institutions reduce the supply of credit and further weaken those balance sheets). This rationale was clearly in the minds of policy makers when central banks started purchasing ABS and long-term bonds.

Moreover, by targeting long-term assets, QE would affect long term yields. Consequently, such purchases would be tantamount to simulate the effects of traditional credit channels (including the hotly debated exchange rate channel), but without resorting to changes in current or future short-term policy rates.

Yet the above mechanism is better exploited through an explicit commitment to play a role of purchaser of last resort (and not by just sustaining a predefined and time-limited level of purchases). The ECB announcements/commitment with the OMT program was a clear example of augmenting the impact of the portfolio channel at an exceptional time -- when the risk of euro breakup was being priced in European periphery debt.

On the other hand, QE detractors rightly point out that, under complete markets, there is no reason why these targeted purchases would affect the value of financial assets. Take, for example, long-term bonds: their value should be determined by "adding up" *(i)* the expected short-term interest rates from now until the bond´s maturity date, with *(ii)* a measure of risk associated to the uncertainty of such future rates (term risk). But targeted purchases do not affect short-term interest rates during or after ZRB: rates remain at zero under ZRB, and targeted purchases are reverted after ZRB according to the central bank´s "Taylor Rule".[3] Thus, price of long term bonds would only be altered because of some market imperfections or a change in the risk scenario.

Forward guidance within QEs: a risky change in paradigm

Quantitative easing might be working through a third mechanism: an implicit commitment to keep rates low for a period longer than the one dictated by the central banks´ Taylor Rule. In turn, by altering expectations on when rate hikes will start, QE might be effectively controlling the yield curve. But for this to be true, central banks need to credibly signal its future actions. This is not an easy task; central banks may signal that they are willing to apply a dovish policy for an "extended" period of time (implying that interest rates should remain low past the turning point dictated by their traditional Taylor Rule); but who can guarantee that once the turning point arrives, central banks will not behave in the way they have always done? Once the ZRB is not binding, central banks would not be willing to alter their Taylor Rule, as it is the pillar of their credibility as anti-inflationary institutions. A case in point is the BoJ past experience with QE: during the last decade it reverted to their Taylor Rule as soon as the ZRB was not binding.

Quantitative easing might be providing the needed credibility to such extended dovish stance. Central banks (IMF too) have been actively asserting that accumulated long-term assets cannot be reduced rapidly without risking financial disruption. In other words, central banks will be forced to keep rates low, past their comfort zone. But it is too early to know if economic agents are reacting to such communication and if central banks will be actually guided by such principles when the time comes.

3: A Taylor Rule is a function that approximates the behavior of a central bank. It indicates how much a central bank is willing to move interest rates as a function of perceived GDP growth and inflationary pressures.

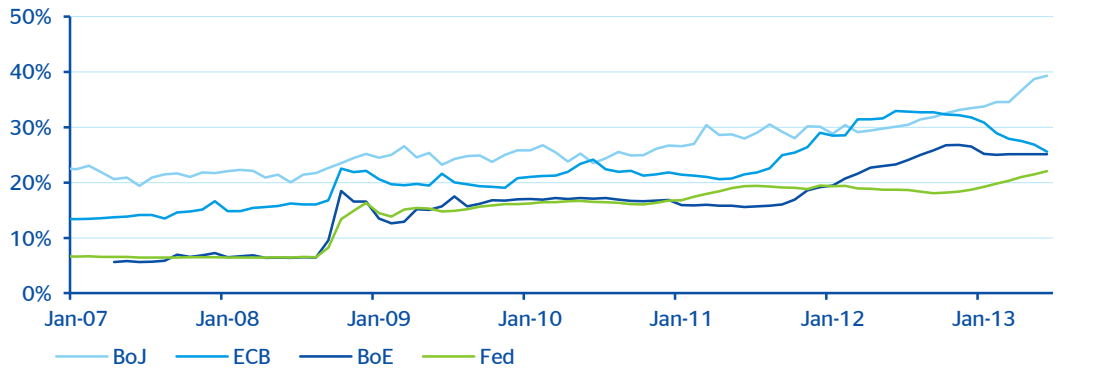
How have current QEs evolved since implementation in different central banks?

Central banks of the main advanced economies have been implementing unprecedented quantitative easing programs since 2008 as a way to deal with the most important financial crisis since the Great Depression of 1930.

Implementation has differed across central banks, which have framed their policy according to their specific objectives and economic structures. The Federal Reserve and the Bank of England have designed their QE programs mainly through bond purchases, with the stated goal of facilitating credit by supporting the value of undervalued collateralized assets. The European Central Bank has focused on direct lending to banks as a way to support inter-bank flows and facilitate credit. While the Bank of Japan -- the precursor of QEs earlier in the decade -- initially shared both means and objectives with the ECB, but it slowly shifted its focus towards bond purchases and finally, in April 2013, it announced a major shift of paradigm: committing to purchase large quantities of long-term government bonds while targeting a 2% inflation rate.

These unprecedented monetary measures have considerably changed the size and the composition of these central banks' balance sheets. The Fed's QE programs have been the largest in absolute terms, but the BoJ programs have been the largest as a percentage of domestic output. Since these policies have been implemented, total assets of these central banks have almost tripled since 2007, mainly through government securities, bank loans, and mortgage-backed securities. At the beginning of 2013, total assets of these four central banks amount to USD 5.5 trn: the BoJ has the largest balance sheet with respect to the size of the economy at around 35% of Japan's national output (and which, as explained in the box, will reach 60% of GDP by the end of 2014), the ECB, the BoE and the Fed follow with assets equivalent to 28%, 25% and 20% of their respective GDPs.

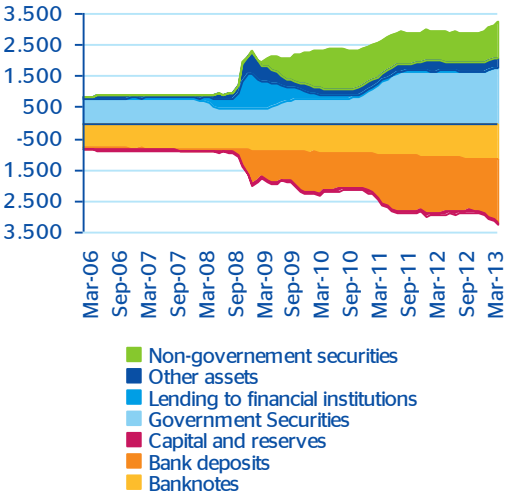
Chart 2
Central bank balance sheet as % of GDP



Source: Bloomberg and BBVA Research

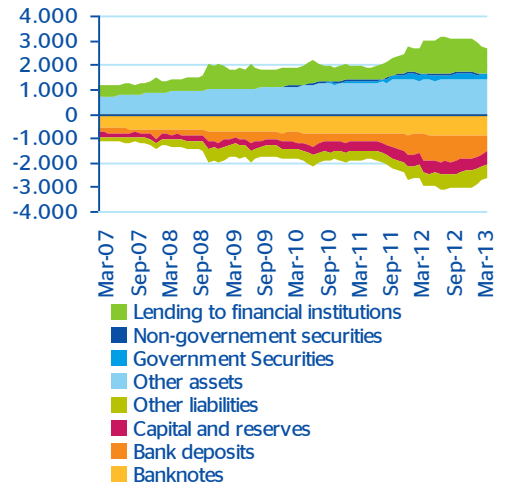
Asset composition of these central banks relates to the financial structure of each economy. The Fed and BoE have focused on purchasing larger amounts of bonds (as in their countries bond markets are relatively more dominant), meanwhile the BoJ and ECB have increased their assets through bank loans (reflecting the relatively greater importance of banks in these regions). Specifically, in March 2013 the BoE held 25% of its government´s debt, the Fed and the BoJ held close to 10% and the ECB held around 2.5% of the overall outstanding sovereign debt of peripheral euro area countries (Greece, Ireland, Italy and Spain). On the flip side, lending to financial institutions within the ECB´s and BoJ´s asset structures represented 38% and 16% respectively of total assets (in contrast, the Fed and BoE held almost no bank loans in that period).

Chart 3
Fed assets (USD billion)



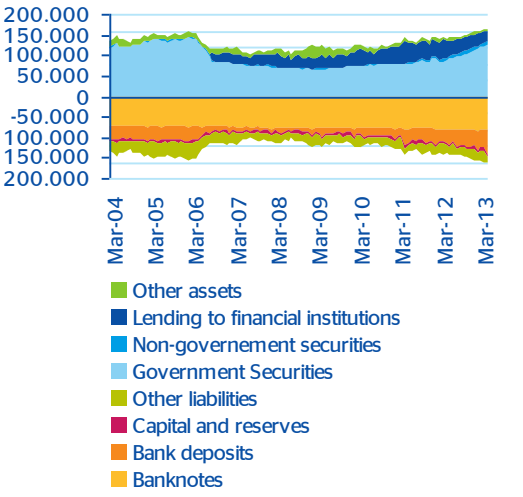
Source: Bloomberg and BBVA Research

Chart 4
ECB assets (EUR billion)



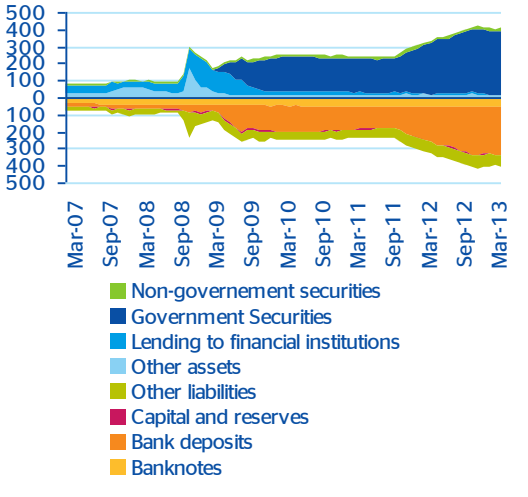
Source: Bloomberg and BBVA Research

Chart 5
BoJ assets (Yen billion)



Source: Bloomberg and BBVA Research

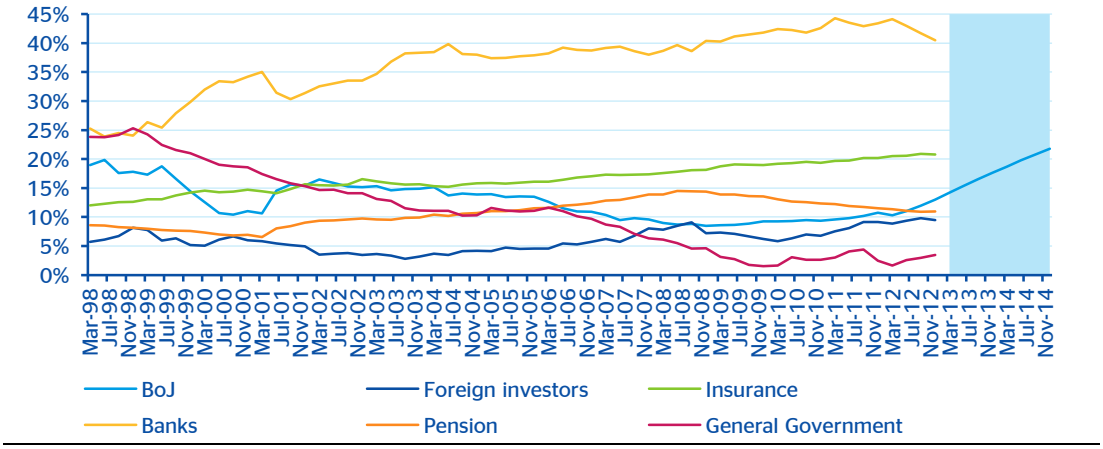
Chart 6
BoE assets (Pound billion)



Source: Bloomberg and BBVA Research

More recently, at its April monetary policy meeting, the Bank of Japan (BoJ) announced the introduction of "Quantitative and Qualitative Monetary Easing (QQE)", with the objective of achieving a CPI inflation target of 2% (YoY) at the earliest possible time (time horizon of about two years). The BoJ has also changed its main operating target from the uncollateralised overnight call rate to the monetary base, which should be doubled in two years -- against outstanding Japanese government bonds (JGB) and exchange-traded funds. In particular, the ECB has committed to increase the monetary base at an annual pace of about 60-70 trillion yen. The BoJ has also committed to extend the average maturity of JGB purchases from slightly less than three years at present to about seven years.

Chart 7
JGB holders* since 1998



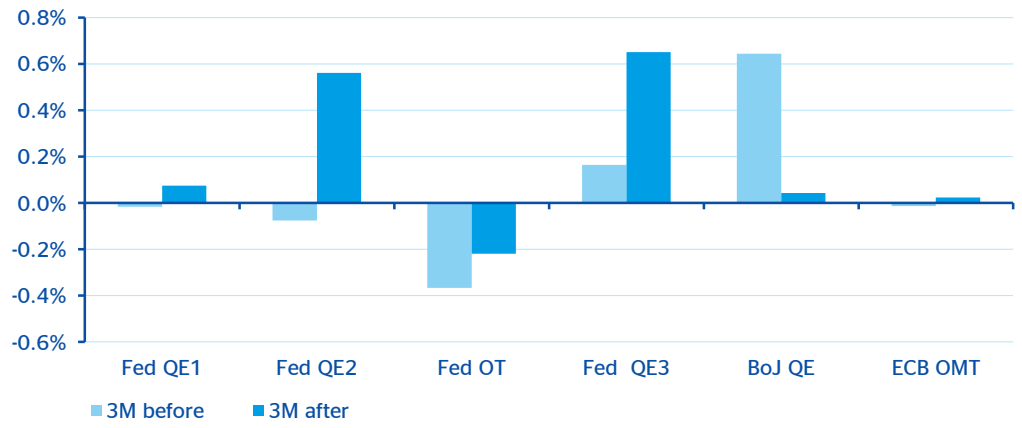
* Including T-bills and FILP bonds
Government sector include fiscal loan fund while excluding public pension funds which is included in pension
Source: Haver and BBVA Research

How much have recent QEs affected financial markets?

Whether through changes in expectations of future policy, changes in asset prices associated with market imperfections, or a reduction in systemic risks of targeted sectors, investors have changed the composition of their portfolios following the announcement of QEs, automatically reassigning risks and reallocating assets.

In the initial months following the announcements of QEs by the Fed, investors adopted a "risk-on" behavior, which has biased global flows towards equity and against bonds. But this bias has not lasted long, disappearing after a few months. The chart below shows countries´ net flows toward equity funds before and after the most important QE announcements. Equity flows have mostly benefited from the announcements, although not during Operation Twist (which was focused on the bonds markets) and, paradoxically, during the BoJ´s latest announcement (which coincided with equity prices braking records). Bond flows exhibited a downward trend before the Fed´s first announcement, while significantly reducing the rate at which they dropped afterwards. These flows also benefited with the announcement of Operation Twist and the BoJ latest announcement.

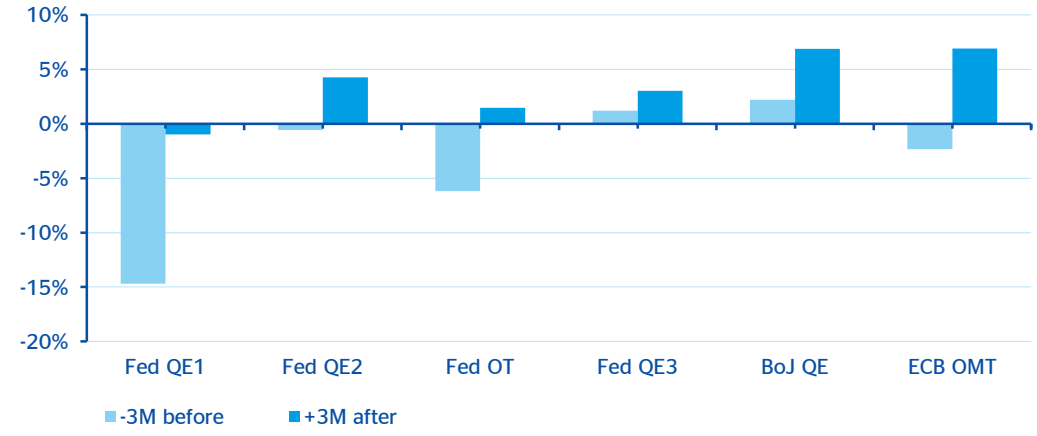
Chart 8
Net country flows toward equity funds after different QEs



Source: BBVA Research

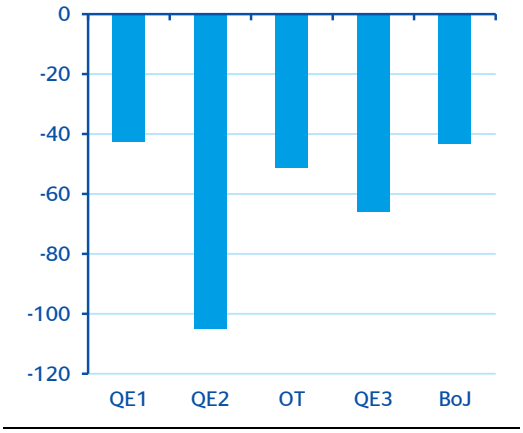
Change in flows has led to change in prices. As the chart below indicates, equity indexes improved significantly in the months after each announcement. The risk-on behavior has also manifested in a spread reduction of high risk assets (such as high yield bonds in the US and emerging market bond indexes).

Chart 9
Average stock index performance (three months before and after QE announcements)



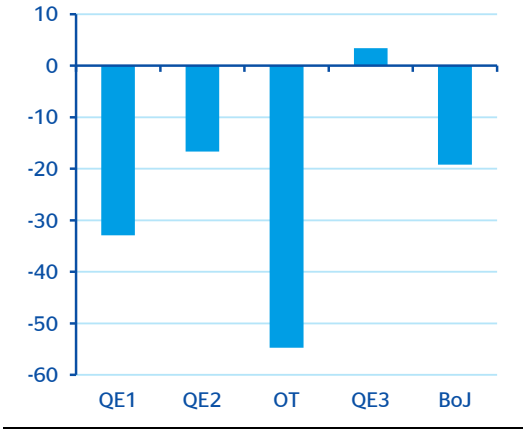
Source: BBVA Research

Chart 10
US high yield spreads (bps. chg. three months after QE announcements)



Source: BBVA Research

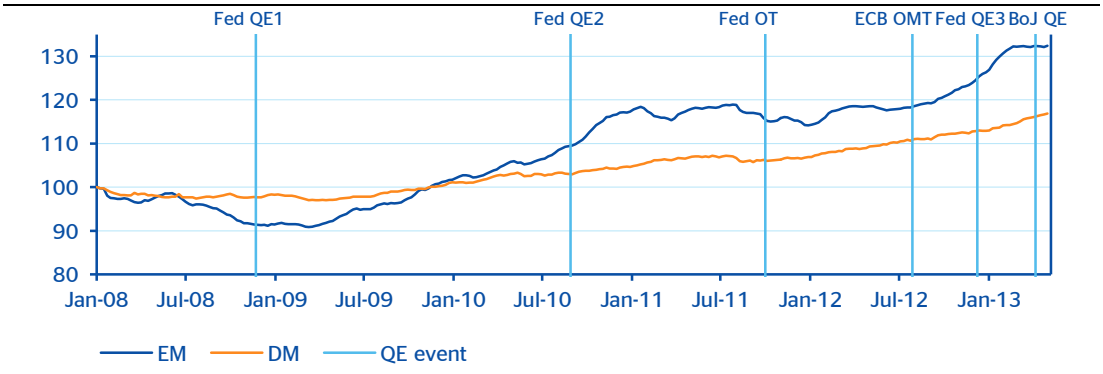
Chart 11
EMBI global spreads (bps. chg. three months after QE announcements)



Source: BBVA Research

In terms of geographic destination, in line with the prevailing risk-on stance since 2009, net flows towards emerging markets have increased more than to developed economies (chart 5), although such bias seems to have vanished in 2013. Furthermore, the Fed´s first and third QE are the only announcements that can be linked to a change to a positive trend of these flows.

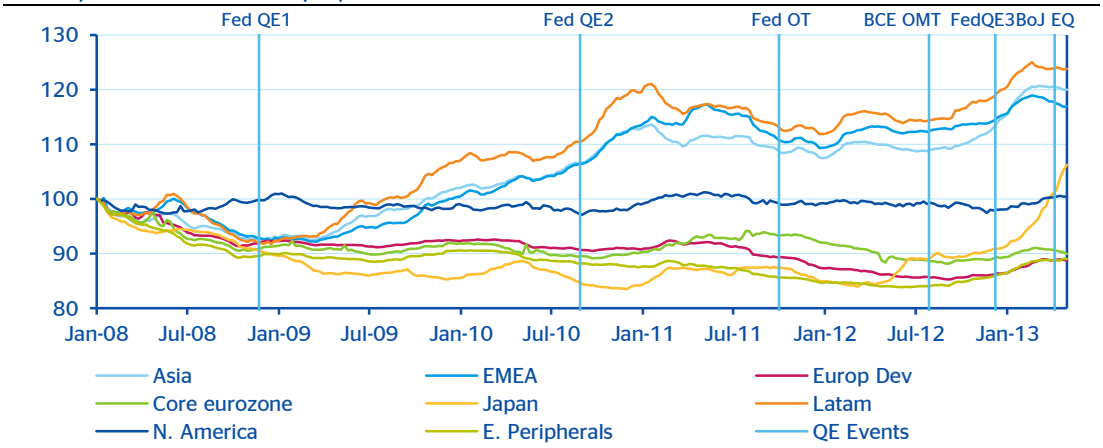
Chart 12
Country net flows toward bond and equity funds in emerging and developed market funds (accumulated)*



*January 1st= 100
Source: BBVA Research

The impact of QE announcements on investors' appetite for emerging markets is better manifested in investors´ net flows toward equity funds (as shown in the chart 6). But again, the Fed´s first and third QE announcements stand out in their precipitating stronger net flows toward equity funds in Asia, Latam and EMEA. Furthermore, flows toward equity funds in peripheral countries increased after Mario Draghi announced the OMT program in June 2012 and they have strengthened since BoJ announced its last QE program.

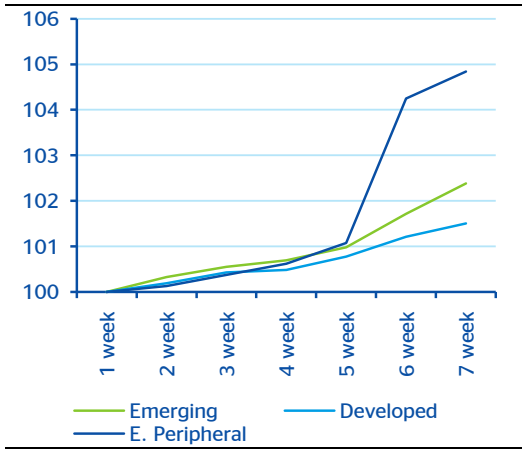
Chart 13
Country net flows toward equity funds*



*Accumulated January 1st 2008=100
Source: BBVA Research

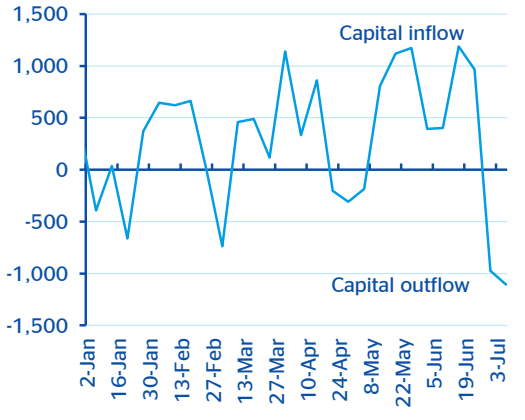
In Japan, the latest announcement of the BoJ generated an aggressive and extensive risk-on effect in global markets, as financial markets betted on Japanese investors´ increasing appetite for risk abroad. Yet, despite early evidence that Japanese investors had started to look for yield abroad (Chart 8), flows have reverted back to Japan.

Chart 14
Net Country flows toward bond funds (since BoJ QE) (100=March 27 2013)



Source: BBVA Research

Chart 15
Japan's net purchases of foreign bonds (JPY bn, weekly data)

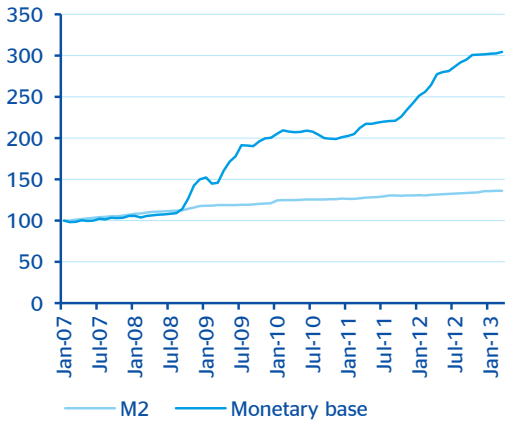


Source: MOF and BBVA Research

How have QEs affected the real economy?

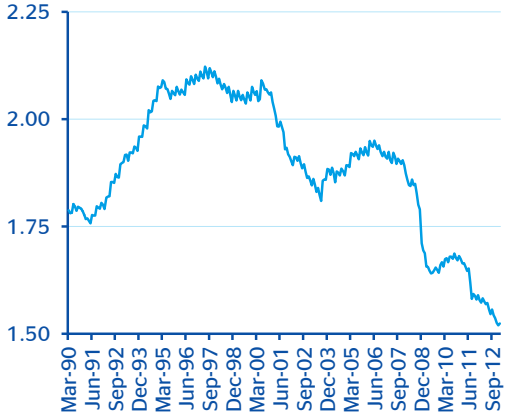
It is important to highlight that QE policy measures implemented by all four central banks have resulted in significant increases in the monetary base, although, as Keynes would have predicted, none of them has led to substantial increases in broader monetary aggregates (chart 9). Furthermore, the velocity of money (linking money supply with nominal output) has fallen significantly (chart 10).

Chart 16
M2 and monetary base (average of indices for the Fed, BoE, BoJ and ECB)



Source: Bloomberg and BBVA Research

Chart 17
US: Velocity (i.e. GDP/Money Supply (M2))



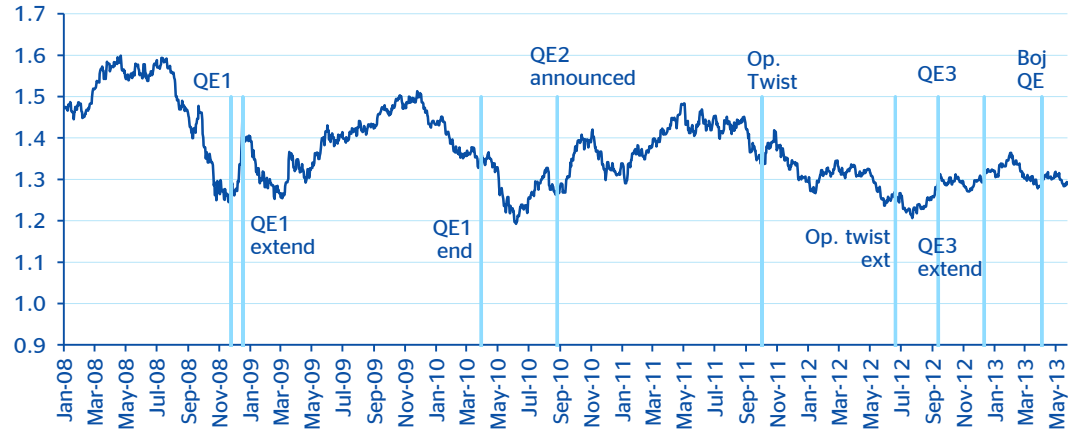
Source: Bloomberg and BBVA Research

As mentioned initially, the effect of QE on the real economy remains a contentious issue. Empirically, the domestic response depends on the counterfactual considered for each of the countries analyzed. Empirical studies go from no effect to large effects (in the US, up to 120 bps of GDP growth for US 600bn of Treasury purchases and, according to several studies,[4] a median of a 5bp increase in 10Y yields for every US 100 billion dollars purchased in recent QEs). Furthermore, the analysis gets murkier when disentangling the effects of "pure" QEs (size of central banks´ balances) from the effects of targeted purchases (composition) and the effects from changes in expectations about future policy. What is clear is that the effect of expectations about future policy -- as demonstrated by Draghi´s famous intervention in July 18, 2012 -- is anything but small.

The evolution of this debate is not innocuous; in particular if policy makers are convinced that QE works through the exchange rate channel (as suggested by the evidence shown in chart 11). There is a large literature on the beggar-thy-neighbor effect of monetary policies based on such channel: they surely increase exports but, if the policy is successful in increasing income, they will also boost imports. Empirically, the effect on net exports tends to be small. But that does not mean that all countries benefit similarly: while importers to the country in question will benefit, direct competitors will not. Voices have been raised calling such policies a threat to current trade agreements. This is a risk worth keeping in mind: quantitative easing, if extended and associated with currency devaluations and gains through competitiveness, risks evolving into currency wars that may hinder commerce and global growth.

4 For a comprehensive view, see: Andrew Foerster & Guangye Cao, 2013. "Expectations of large-scale asset purchases," Economic Review, Federal Reserve Bank of Kansas City, issue Q II.

Chart 18
Dollar euro exchange rate



Source: Bloomberg BBVA Research

Effects of QE3 on GDP: an exercise on elasticities

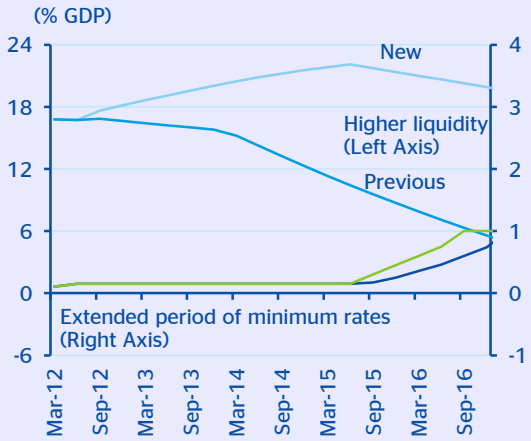
To estimate the impact that the change in the Fed's policy will have on growth, unemployment and inflation in the US, we use the quantitative tool created by the Oxford Economic Forecasting (OEF model). The determination of this impact results from comparing a scenario (see chart 1) in which interest rates are left in place and at the same time changes in the monetary base are contingent on the quantitative expansion indicated by the Fed, compared with a scenario with no such condition—that is, one in which the model, depending on its structure, points to the most likely direction of the variables.

As shown in chart 9, the OEF model estimates a significant impact, although one that increases in particular starting in 2014, despite the fact that growth in fact begins in late 2012. Taking 2016 as a horizon, we should stress that the impact predicted by the model in terms of economic activity would be a cumulative 3.2 pp, while the unemployment rate would decrease by 2.6 pp from an average of about 8.0% in 2012[5].

The growing dynamic of impacts pointed by the OEF model may be explained by the accumulation of liquidity brought about by the program, compared with short-term interest rates that remain at very low levels—a situation that magnifies the encouragement for investment and therefore spurs the labor market although, in the latter case, with somewhat of a delay.

In addition, despite the massive liquidity injection that the QE3 program entails, the cumulative impact on inflation may be less than 1.0 pp over the next four years. This boost to inflation—a priori limited—is consistent with the fact that the interest rate scenario does not change until the end of the period, between 2014 and 2015, and the increase in liquidity recorded since 2009 has not translated into an upturn in actual or expected inflation. This holds all the more true if the current assumed quantitative expansion is an average of previous posted rates of expansion. In any event, regarding the situation going forward, it should be considered that the factors of production have also less maneuvering room to respond.

Chart 19
QE3 and the extension of the target interest rate policy (% GDP)



Source: BBVA Research

Chart 20
Estimated impact in the US economy of QE3 and extension of the rates policy guidance

Source: BBVA Research and OEF

5: It is worth noting that QE3 is an open ended program, it will be maintained as long as needed to reach and unemployment rate around 6.5%. Then, QE3 shock and unemployment response have an interdependent relationship than could not be identified properly by the used econometric model.

Open questions

In recent years, unconventional monetary policy has been the main driver of financial markets. In particular, the Fed´s announcements have had a substantial impact on debt markets, leading to a general reduction in global yields and a rise in value of equity and other risky assets. The BCE, BoE and BoJ have followed suit. Avoiding deflation and keeping down long-term interest rates have been unquestioned successes, but maintaining these policies pose potential costs to the economy: market distortions, inflationary pressure and risks to financial stability.

As previously observed, benefits have tend to decrease with each new QE implementation, while concerns on potential costs have increased. How to assess if costs of QE policies have outweighed their benefits? The answer to this question is being addressed by monitoring activity, inflation and asset prices. Up to now, all these variables have been aligned, but what if inflation or asset bubbles arise while activity remains weak?

A second question will arise once policy makers agree on exiting QEs: how should a central bank act to move away from such exceptional conditions? Exit strategies remain "unchartered territory", and central banks will walk a tightrope when trying to control long term yields (the old trade-off between "commitment" and "flexibility"). In particular, there is the risk that these economies end in a low-growth equilibrium, in which early signs of economic recovery are dampened as markets equate such recovery to a revival of orthodox monetary policy (and thus to a rise in long term yields). The level of success in responding to these challenges will in big part determine global growth in the years to come.

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