

ARE THE EFFECTS OF UNCONVENTIONAL MONETARY POLICY ON FINANCIAL MARKETS CAUSING BUBBLES?

DANIEL LACALLE

*Author of "Escape from the Central Bank Trap",
"The Energy World Is Flat" and "Life In The Financial Markets"*

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SUMMARY: I. INTRODUCTION. II. FINDINGS. III. FEDERAL RESERVE QUANTITATIVE EASING. IV. ECB. V. BANK OF ENGLAND. VI. BANK OF JAPAN. VII. CONCLUSIONS. VIII. REFERENCES.

Abstract

Cheap money can become very expensive in the long run. Unconventional monetary policies have been the main tools of central banks to tackle the economic crisis. In this paper we aim to understand whether these policies have created distortions in the financial markets and if we can be concerned about the creation of "bubbles", considering whether quantitative easing has impacted financial asset classes' valuations beyond reasonable fundamentals. I conclude that there is empirical evidence of inordinate expansion of multiples and that central bank policy makers should include "financial market inflation" as well as consumer price indices (CPI) in their assessment of inflation expectations. I believe that this should be an essential analysis to avoid unintended consequences in the future, and a possible next financial crisis that central banks will be unable to face with the same tools of the past.

Keywords

QE; interest rates; crisis; financial markets; monetary policy; money supply; debt; risk.

JEL Classification: G1, E5

I. INTRODUCTION

The severity of the 2008 financial crisis was unforeseen by many. What was clearly missed by many analysts was how interdependent different markets were. The estimates of maximum impact of the housing crisis in the real economy and financial markets was clearly underestimated, and the domino effect became evident as panic spread across the world through the realization that excessive debt and risk were not symptoms of a single market, but a widespread problem that permeated numerous sectors and countries.

In effect, the origin of this crisis, like every other financial crisis in history, was the accumulation of risk that came after a prolonged period of lowering interest rates (Cooper, 2008).

Financial crises are not generated in assets that the public or economic agents perceive as risky, but in those where the consensus perceives safety. In 2008 it was housing; in 2017 it may be bonds (as I explain in “Escape from the Central Bank Trap”, 2017).

In the first five months of 2017, central banks bought \$1 trillion in bonds and stocks, on pace for a \$3.6 trillion for the year, according to Bloomberg, the highest figure since the start of the financial crisis in 2007, and the largest figure seen in a period where there is no recession or crisis.

If we analyze the mistakes in forecasting and impact of the crisis, we can reach an approximation of how optimistic the most advanced models tend to be, because usually accumulation of risk and the impact on all asset classes in the financial world are highly complicated to estimate. For example, models as used in the financial system stress tests have historically been unable to predict the rapid deterioration of balance sheets and core capital ratios from a single event.

If we analyze the results of the different stress tests carried out in the financial sector, it is important to understand how difficult it has been to predict the weakness and velocity of deterioration seen in some of the banks, particularly in Europe. The vast majority of bank failures we have seen since 2008 were in banks that actually passed these stress tests with

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adequate results in all scenarios. For the European Central Bank (ECB), current macro stress testing tools have difficulties capturing the non-linear character of systemic events and the various feedback mechanisms between banks and between the banking sector and the real economy that such events usually entail.

Many alternative tools have been analyzed to avoid the impact of financial markets on the real economy. The IMF analyzed, in the US case as normalization of monetary policy began, that some asset sales may be preferred to a large reverse repo program (RRP) when trying to control short-term rates as tightening began, allowing the Federal Reserve to reach its monetary policy liftoff objectives with minimal footprint on market plumbing (Singh, 2015).

However, we cannot ignore the impact on capital flows to other countries. Monetary policy in the large economies has an unquestionable impact on emerging and frontier markets (EFEs), and the boom and bust cycles that some of these economies have seen in the past can be traced back to a lack of understanding of the impact on capital flows of expansionary policies in the US, and what has been known as “the sudden stop” on emerging markets once normalization starts. Financing long term projects in local currency with short term capital flows in foreign currency is clearly one of the mistakes of the past that many of these economies have learned, as proven by the surprisingly low loss of foreign exchange reserves in the commodity price collapse seen between 2013 and 2016.

While the tightening cycle was expected to proceed smoothly, studies find “there are relevant risks of a disorderly adjustment of market expectations that could lead to a significant decline in emerging and frontier economies capital flows. For example, a 100 basis point jump in U.S. long-term yields could temporarily reduce aggregate capital flows to EFEs by up to 2.2 percentage point of their combined GDP” (Arteta et al, 2015).

The correlation between US expansionary policies and emerging markets is also evident. “Expansionary US QE shock has significant effects on financial variables in emerging market economies. It leads to an exchange rate appreciation, a reduction in long-term bond yields, a stock market boom, and an increase in capital inflows to these countries. These effects on financial variables are stronger for the “Fragile Five” countries compared to other emerging market economies” (Bhattarai et al, 2015).

This example shows that monetary policy is not irrelevant and can

generate shock waves throughout many economies. As such, financial markets need to be the center of attention for policy makers.

Stock and bond markets exuberance tend to be overlooked as risks because they can easily be justified by improved sentiment, earnings estimates rising, macroeconomic imbalances shrinking, and therein lies the reason why major changes in valuation multiples must be constantly reviewed. It can be very easy, as we have seen in the past fifty years, to confuse excessive financial asset price inflation with investor confidence. We, as economists, tend to forget perverse incentives.

For example, market practitioners perfectly understand concepts like “buy junk” when monetary policy is expansionary and particularly when central banks increase their balance sheet by large percentages of the economy’s GDP per annum. Stocks and bonds with poor fundamentals will rise dramatically in price, even if their solvency and liquidity ratios are not improving, in the face of much lower sovereign bond yields.

We, as economists, also underestimate the risks that financial markets accumulate through the “search for yield” policy. Investors will take increasingly more risk, particularly in bonds, in order to shield their portfolios from constantly lower yields in the safest bonds. In this search for yield, it is not rare to see that investors might not fully grasp the extent of the risk that is being added to their portfolios because fundamentals might not be improving at the speed at which expansionary monetary policies affect the price and yield of low-risk bonds. In essence, yields fall much faster than the pace of fundamental improvement.

These factors tend to be alerted by market practitioners that follow price signals and analyze valuations on a daily basis. It is not strange that financial crises have been predicted more accurately by fund managers than mainstream analysts, even within the financial sector. We tend to analyze markets from a much more benign perspective, believing that risks will be mitigated by providing enough liquidity and confidence through communication. However, as the 2008 crisis showed, it does not happen quite as models and academics tend to perceive.

The “pain threshold”, or the ability of investors to take losses and seize the opportunity of a market correction, is generally misunderstood when considering risk, and is extremely difficult to predict. Additionally, tolerance for volatility is likely to diminish as monetary policy becomes looser, because investors acknowledge that they have been adding more risk than what they usually tolerate, and market corrections fail to become a buying opportunity due to the level of risk that portfolios already have.

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These are some of the factors that may generate a negative domino effect in markets. Furthermore, as risks tend to be evidenced first in banks, either in the rise in non-performing loans, weakening of margins or outlook on capital requirements, it becomes very easy to generate a spill-over effect on other sectors.

First, the financial sector finances the real economy, and large negative surprises on the banking system are likely to generate concerns about the overall state of the economy.

Second, leverage at the investor level makes it more difficult to tolerate swift moves in financial asset prices. Margin debt tends to provide a very relevant signal of the level of risk in financial markets, or, at the very least, a clear indication that investors have a significant leveraged exposure to markets (Mislinski, 2017). Some may say this is a sign of confidence, others of risk. However we want to see it, it is definitely a sign that, in case of a correction, the overall ability of investors to buy in weakness is diminishing.

Third, spill-over effect reaches many asset classes. In the case of banks, hybrid debt instruments, contingent convertibles (Avdjiev et al, 2013) and other complex instruments used to strengthen the balance sheet in periods of economic improvement can become negative multiplier effects in a process where investors are running to safety. The collapse in a convertible leads to a big loss in the equity markets, which can bring an index down and create ripple effects to the companies that share the same markets, type of financing and exposure.

This does not mean that the market is behaving irrationally, but the very likely possibility that trouble in banking is seen as a symptom of a wider, much more serious concern on the overall economy.

The fourth and final risk of monetary policy impact on financial assets is that it may cloud the ability of investors to perceive value opportunities. As multiples and valuations soar, once the effect of monetary policy disappears, investors may find it difficult to adequately understand what is cheap or expensive after years of monetary policy-driven market rallies. When we see that the correlation between the Federal Reserve's balance sheet growth and the S&P500 Index rise is close to 95%, it is not difficult to see why financial assets fall or rise dramatically on news that might not necessarily impact fundamentals.

The problem can be that, even if the expansionary policy continues, either due to investor concerns about its effectiveness or due to the

evidence of excess risk in many asset classes, the impact of a large financial market fall can spill over to the real economy.

The correlation between monetary policy and markets is clear. In every case analyzed, the evidence indicates that expansionary policy increases ex-post stock returns, and exposure to monetary policy increases an asset's ex-ante return (Thorbecke, 1997).

The impact of the European Central Bank asset purchase program (APP) on asset prices was sizeable albeit the programme was announced at a time of low financial distress. Previous literature found that a large impact of asset purchases tended only to happen in periods of high financial distress. This was not the case in Europe. The authors explain this apparent puzzle by showing how the low financial distress, while indeed weakening certain transmission channels, has reinforced other channels because of its interplay with the asset composition of the programme. Targeting assets at long maturity and spanning the investment-grade space have supported the duration and the credit channels. At the same time, the low degree of financial stress prevailing at announcement of the programme, while weakening the local supply channel, has facilitated spill-overs to non-targeted assets (Altavilla et al, 2015).

This is an important conclusion, because it shows that asset classes reflect substantially more than the mere fundamentals, hence the need to monitor these impacts to avoid a perverse incentive that leads investors to increase exposure to asset classes that are well priced or even expensive, driven by a single basic argument: the central bank is buying, therefore it is an opportunity to buy more regardless of fundamental valuations.

It is clear that there is a positive relationship between unconventional monetary policy and liquidity conditions. The impact of unconventional monetary policy measures (UMPMS) implemented since 2008 in the United States, the United Kingdom, Euro area and Japan—the Systemic Four—on global monetary and liquidity conditions is clear. Overall, the results showed positive significant relationships (Korniyenko et al, 2015).

However, the impact on financial markets tends to be seen by most academic papers as a side effect without relevant risks (Bernanke et al, 2004), something that history has shown to be quite the opposite.

In the case of Japan, the Bank Of Japan (BOJ) seems to have an extraordinary effect in financial markets. In 2016, it was the largest buyer of Japanese stocks, according to official figures. The value of the BOJ's ETF purchases reached 4.3 trillion yen (\$36.5 billion) in 2016, up 40% from 2015, according to the BOJ and the Tokyo Stock Exchange. According to

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data compiled by Bloomberg and the Financial Times, the BOJ is a top 10 shareholder in 90% of stocks listed on the Nikkei 225, and owns more than 2.5% of the entire market cap of the Topix index.

The casual analyst may see this as a buying opportunity that is supported by a recovery in the economy, but central banks and investors cannot ignore the risks, if multiples soar simply from the actions of the central bank. That is why it is necessary to be constantly monitoring if the asset purchases are justified by fundamentals and secondary demand is robust, or comes just as a driver of financial asset price inflation.

Any prudent analysis will tell us that the risk of driving asset prices above fundamentals is more than elevated, with the subsequent probability of an aggressive fall when that “artificial” demand ends or becomes part of the liquidity. We must acknowledge the risk that those asset purchases simply become part of said liquidity and markets get used to that extraordinary demand, generating diminishing returns.

While in the US 2016, corporations were the largest source of equity demand, purchasing \$450 billion of US equity through buybacks and cash M&A (net of share issuance), in Japan it was the central bank that led the demand for equities.

In the US, on the other side, corporates were the primary source of US equity demand. This can explain why the impact of the Federal Reserve actions in the S&P 500, where correlation between the Federal Reserve balance sheet and performance of the index was 90% between 2008 and 2015, continued after tapering and rate hikes happened. Management of short-term liquidity allowed markets to offset the impact of QE (quantitative easing) as corporates used excess cash generated by the liquidity injections to buy-back shares and increase dividends. This proves to be a valuable lesson for central banks when assessing risks of exiting monetary policy: The need to keep an eye on secondary markets and have a strong total shareholder return policy in the corporate sector that provides a cushion to the risk of aggressive corrections when monetary policy normalizes. If there is not a clear fundamental case in earnings, margins and shareholder policy, and a well analyzed demand in secondary markets, there can be a very evident probability of abrupt collapses in financial markets and systemic risk spread.

Even assuming that corporates can offset the impact of policy normalization through buybacks, we must also understand that buybacks might only have a temporary effect, and at the end of the day, central banks might fear a larger impact on financial assets as “price defending”

mechanisms start to fade away while margin debt and risk accumulation reach elevated levels.

Prior to 2009, misses or beats in earnings would push the stock market, and multiple expansion depended on improved cash flows, margins and growth. However, since 2009, analysts at Deutsche Bank conclude that stock prices have not been driven by earnings but instead by macro, including the Federal Reserve policy.

By holding interest rates low, investors –in the “search for yield” policy described earlier, have deployed increasingly more capital into risky assets. This process pushed equity valuations and house prices to historic high levels.

However, the so-called wealth effects of higher stock prices and higher home prices have been weak, and this in turn can explain the modest improvement in growth despite massive monetary stimulus, and prudent consumer reaction, driving savings ratios higher. Analysts at Deutsche Bank conclude that the Federal Reserve –and I would add all major central banks– now have a high valuation and low growth problem.

The wealth effect can no longer push economic growth higher because most citizens are still recovering from the 2008 crisis, real wages remain stagnant and job security is unclear despite low unemployment rates, which makes investors save more and take very conservative decisions. Indeed, stocks and bonds account for less than 10% of families’ wealth (Ritzholt, 2014), and home prices are not a source of improvement of perceived wealth when families either find themselves with a mortgage and wages rise below inflation, or simply cannot afford to buy.

Even assuming the history of correlation between monetary policy and the wealth effect raises questions. The IMF (Ludwig and Sloock, 2002) quantified the different impact of stock and house prices on consumption using data for 16 OECD countries, and found that the long-run impact of an increase in stock prices and house prices is in general higher in countries with a market-based financial system. The sensitivity of consumption to changes in stock wealth is about twice as large as the sensitivity to changes in housing wealth. Splitting the sample into the 1980s and 1990s shows that both countries with a market-based financial system and countries with a bank-based financial system moved toward a higher degree of responsiveness of consumption to changes in stock prices and house prices. However, even in this analysis, it is shown that the impact is disproportionately limited to the size of policy measures. Why? (Ludwig et al, 2002).

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The vast majority of employees and consumers have only modest investments in equities. 80% of US families hold less than a 10 percent stake in the stock market, according to Bloomberg. In the case of Europe and Japan it is actually lower.

The additional concern is that central banks may have reached an inflection point where monetary policy has become ineffective. With rates pushing real negative levels and central bank balance sheets reaching 25 up to a 100% of GDP of their countries in current estimates, policy makers may have run out of ammunition because they are no longer able to push inflation or stock prices higher, and the transmission mechanism to the real economy remains poor, driving weak gross capital formation and money velocity. This is the conclusion in many working papers; that non-conventional monetary policy worked very well in the beginning but the positive effects of additional non-conventional monetary policy are small and diminishing.

The discussion about real negative interest rates and pushing the zero bound (Jackson, 2015 or Rogoff, 2014) continues to miss the perverse incentives it creates to increase debt beyond reasonable means, divert allocation of capital to short term liquid financial assets and the risk that this creates. Garbade and McAndrews of the Federal Reserve Bank of New York warn that “if interest rates go negative, we may see an epochal outburst of socially unproductive—even if individually beneficial—financial innovation. Financial service providers are likely to find their products and services being used in volumes and ways not previously anticipated, and regulators may find that private sector responses to negative interest rates have spawned new risks that are not fully priced by market participants” (Garbade et al, 2012).

Inflation in multiples includes private equity and infrastructure. If we look at market transactions in 2017, infrastructure assets of all kinds are being sold at multiples that move between twelve and eighteen times EBITDA (Earnings Before Interests, Tax, Depreciation and Amortization). The multiple expansion generated in infrastructure assets coincides exactly with the policy of keeping low rates and high liquidity from central banks. In a period when interest rates have fallen more than six hundred times, multiples paid for infrastructure assets have increased five-fold, according to Bloomberg.

Demand for infrastructure, like bonds, is intrinsically linked to financial repression. Faced with the search for yield, with 8.6 trillion dollars of bonds at negative rates at the end of March 2017, according to Bloomberg

and Fitch Ratings, investors look for relatively safe assets, with stable cash flows and acceptable returns, at almost any price.

These multiples may appear justified because demand is high and supply is limited, and as analysts we tend to ignore multiple expansions as something that, if wrong, will be corrected by market forces. However, when this trend of high multiples and increased leverage permeates to different asset classes and sectors, an abrupt change in sentiment can cause significant ripple effects to a multitude of areas of the real economy.

We are unable to isolate the effects of excessive risk and, more importantly, previous analyses of value at risk and concentration have proven to be optimistic, to say the least. Analyzing, for example, non-performing loans as a percentage of total can be misleading because of the speed at which these troubled loans increase once a credit event or a change in the economic cycle occurs. Additionally, the housing, renewable, tech and energy busts that we have seen in recent years have always included a domino effect on sectors and economies, impossible to isolate.

Given the frustrating result of the most complex and detailed macro analysis and stress testing, and the evidence of large effects on the real economy, families and businesses of financial imbalances and excess concentration of underestimated factors, I believe it may be a mistake to underestimate the risk that builds in financial markets. I believe that central banks, in their assessment of the economy should err on the side of caution. By adequately estimating the much higher impact of financial markets on the real economy than models may imply, avoiding “*ceteris paribus*” mistakes, central banks will be able to be more accurate at predicting relevant changes in the economy, and, more importantly, understand better what tools can be truly effective to help the economy solve its imbalances.

II. FINDINGS

“Bubbles” are rarely analyzed in scholar papers. The main reason is because the term can be subjective, and seldom do analysts see it until it has happened. That is why it is a term that market practitioners understand better than academics. A market practitioner tends to monitor not just prices, but variations in valuations from different metrics, to understand if these valuations are justified by fundamentals, or driven by artificial demand created –in the case in study– by central banks.

Bubbles occur when the price of an asset or group of assets rises to an

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extreme level, far beyond its fair market value. What causes an asset's price to rise to such heights? One reason is a glut of excess cash in the system. Another is extremely strong demand (Patton, 2015).

Therefore, to gage whether central banks create the current possible bubble we must understand if demand in the market is enough to offset the impact of central bank purchases.

Let us look at the figures.

III. FEDERAL RESERVE QUANTITATIVE EASING

Since the Federal Reserve started its quantitative easing, financial markets have risen considerably above earnings, cash-flows and forward guidance of companies. The Federal Reserve implemented three quantitative easing (QE) programmes, in 2008, in November 2010 and on October 2012.

In this period, the S&P 500 has risen +149.30%. In the meantime, real wages in the US and GDP per capita have increased by a small fraction of that figure.

If we look at each of the programmes, the results vary:

- QE1 to QE2 +22.57%
- QE2 to QE3 +23.27%
- QE3 to today +69.05%

In terms of multiple expansion, we find the following as most relevant:

- Price to Earnings at the beginning of:

QE1 was 13.47

QE2 was 15.20

QE3 was 14.72

Today, 21.46

- Dividend Yield stayed broadly unchanged. However, as mentioned before, share buybacks are a strong driver of market performance. Dividends and buybacks made up more than 100% of operating earnings between 2015 and 2016. In 2016, for example, S&P 500 companies spent \$127 billion per quarter in stock buybacks. The all-time high was \$172 billion in the third quarter of 2007:

QE1, 2.74%

QE2, 1.95%

QE3, 2.15%

May 2017, 2.02%

• EV/EBITDA or Enterprise Value (debt plus equity) relative to earnings before interest, tax, depreciation and amortization is a broader, more robust measure of valuation than PE, and showed the following figures at the beginning of each program:

QE1, 7.79

QE2, 8.19

QE3, 8.06

May 2017, 11.21

There is a clear evidence of expansion of multiples that increased as normalization of monetary policy was delayed, with the Federal reserve delaying rate hikes and keeping its balance sheet despite 4.5% unemployment and 2% GDP growth.

Analyzing results by sector may help us understand whether the expansion of multiples is justified or a function of high liquidity and abnormally low rates. If we look at the S&P 500 by selected sectors, we can see that:

Sales Growth (top two highest growth sectors, two lowest):

- +8% Health Care
- +6% Consumer Services
- -16% Oil & Gas
- -5% Technology

Net Income Growth (top two highest growth sectors, two lowest):

- +17% Utilities
- +7% Health Care
- -77% Oil & Gas
- -3% Basic Materials

In the period, the US ten-year bond yield fell from 3.95% to 1.72% at the beginning of QE3. In May 2017 it was 2.25% despite inflation at 2.5% and core inflation (CPI) at 1.7%.

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Five-year government bond yields:

- At the start of QE1, 2.833%
- At the start of QE2, 1.168%
- At the start of QE3, 0.639%
- May 2017, 1.79%

Furthermore, one of the striking findings of our analysis is that high yield and investment grade bonds soared, and stand in May 2017 at the lowest yield in thirty five years, despite the debt repayment capacity not improving, and default rates stable since 2011, according to Moody's (Corporate Default and Recovery Rates).

Anyway we want to analyze the above mentioned data, loose monetary policy has driven asset valuations significantly above fundamentals and fair market value. The only metric in which stocks appear relatively inexpensive is compared to sovereign bond yields, which are suppressed by expansionary policies.

In any analysis, there is a clear correlation between monetary policy and asset price inflation, and as such the risks of a large correction and spillover effect as policy normalizes, is quite evident. Ignoring this risk or believing that it is an acceptable one to take due to the other positive results of expansionary policies can be very dangerous due to the likelihood of significant impacts on the real economy, whether it is directly related or indirectly exposed to the abrupt drop in prices of financial assets and their impact on a highly leveraged, high margin debt market.

IV. ECB

One of the main differential elements of the quantitative easing policy of the ECB relative to the US is that, when we analyze the impacts on markets, we must also acknowledge the fact that European companies rarely undertake the buyback and dividend strategies of US corporates, so excess liquidity translates in a different way to financial assets. Equities in the Eurozone did not reflect a similar inflation of multiples, explained as well by the nature of the businesses of the main components of the indices. Indeed, European large caps tend to be concentrated in banking, utilities, telecommunication and industrial conglomerates and integrated energy stocks. These are sectors that always warrant lower multiples due to a more stable and mature nature of their cash flows on most cases, and

low return on capital employed (ROCE) relative to their cost of capital (WACC).

The Eurozone also has more direct links between the financial sector and the real economy. While in the US, less than 20% of the real economy is financed through banks, in the Eurozone this figure is close to 80%, according to the ECB. Therefore, risk in the financial sector generates a disproportionate effect on small and medium enterprises and families. The transmission mechanism of monetary policy has remained linked to large banks, many of them with direct and indirect government links, generating in many cases a problem of “crowding out”, by which governments accumulate a disproportionate amount of available credit while families and businesses have limited access to affordable loans (Broner et al, 2014).

As such, the Eurozone has not seen such a large expansion in multiples as the one seen in the US, but the concentration of risk has shifted to the bond markets. Peripheral countries sovereign bond yields stand in May 2017 at the lowest level recorded in history, despite relevant economic imbalances, elevated debt and deficits. It is more than questionable that investors would acquire these bonds at the prices registered in 2017 if the ECB were not the main buyer of fixed income assets.

The ECB started its quantitative easing programme in March 2015, at a time when Eurozone economies were already recovering and reducing debt and unemployment. The asset purchase programme is equivalent to 7% of Spain’s GDP per annum. Since then until May 2017, purchase of public debt by the ECB in the major economies, according to the ECB’s own figures (Details on the Public Sector Purchasing Program, ECB, 2017), can be summarized as:

- Germany: 368.08 billion euros, or 24% of all repurchases.
- France: 293.7 billion euros, or 19% of all repurchases.
- Italy: 255.3 billion euros, or 16% of all repurchases.
- Spain: 182.546 billion euros, or 12% of all repurchases.

This means that the ECB now owns almost 17% of Germany’s total public debt, 17% of France’s, 12% of Italy’s and around 16% of Spain’s total debt. However, according to its bylaws, the ECB cannot own more than 33% of a country’s sovereign debt. At this pace, this limit will be achieved in two years, while deficits, debt refinancing requirements and economic imbalances remain challenging, which leads to the question: Are countries prepared to absorb an increase in sovereign bond yields

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when the quantitative easing programme ends? In the case of Italy, Spain or other peripheral countries, it is clearly a relevant challenge. Even if we did not assume any sell-off or radical change in sentiment, similar to crisis levels, a country such as Spain would have net refinancing needs of forty to fifty billion euros per annum. If bond yields rise to inflation-plus-levels, and that is not even considering systemic risk or other concerns, it could mean an increase in debt costs of up to 700 million euro per year. This is, of course, considering no change in the bullish sentiment about growth, deficit reduction and unemployment.

The risks of making the ECB a buyer of bonds that can only continue buying is exemplified by the not-surprising increase in bond yields when the ECB is not present in issuances.

Around 85% of the ECB's QE has been destined to sovereign debt. The remaining 15% has been used for private sector instruments, fundamentally corporate debt. Even though the percentage of the asset purchase program is small, it becomes a very large part of the demand of net financing of some corporates. Furthermore, the ECB has acquired bonds of high quality investment grade companies, most of which had absolutely no problem in issuing bonds in the middle of the financial crisis at very reasonable yields (it was rare that these AAA rated corporates would issue at more than 180 basis points above mid-swaps).

It is, therefore, extremely important for the ECB and policy makers to analyze secondary demand because it is very possible that the current supply that is absorbed by ECB purchases simply will not be offset by private investor demand when the central bank finishes its support.

The evidence of a risk of a bubble in bonds is clear when we analyze the debt repayment capacity improvements of some countries. Even though countries like Italy, Spain, France or Portugal have reduced deficits significantly, it is more than unlikely to believe that –when the ECB finishes– these issuers will be able to achieve yields that are in real terms close to the US 10-year bond. I very much doubt that there would be any analyst or investor that would consider Eurozone bonds with a premium to US 10-year sovereign bonds in real terms. And this can be easily categorized as a bubble.

Some commentators may believe that the reason why prices are so high in sovereign debt of Eurozone countries is the prospect of Eurobonds. Even if we assumed the unlikely scenario of a Eurobond programme in as little as two years' time, it is almost inconceivable to believe that these would trade at the same yield as Germany. Without discussing the obvious

perverse incentives that a Eurobond programme would entail of driving some countries to higher deficits, the reality is that it would be impossible to implement by the time the ECB maximizes its sovereign debt capacity and that, in any case, it shows that current prices in sovereign debt are hardly justifiable by fundamentals.

Considering the systemic risks in the financial sector and the cross-impact between sovereign debt and per capita GDP growth (Checherita et al, 2010), corporates and banks, it would be advisable to put a very detailed analysis of the secondary market demand as one of the priorities of policy makers. If not, the risk of a significant fall in markets from ignoring asset inflation can have unintended consequences, as we saw in 2011, in the real economy.

The solution is not to extend the ECB's quantitative easing programme, but to prove that the prices are justified by fundamentals, because it may be the case that sovereign issuers benefit from an extension, but secondary markets will react avoiding financing the real economy. With close to 1.3 trillion euro in excess liquidity, the ECB needs also to analyze the status of the Euro as a reserve of value. If confidence in the guidance, transmission and limit of monetary policy fades, it may have significant undesired effects on all the economy. Considering that after two years of quantitative easing, non-performing loans in the Eurozone banks remain at 900 billion euro, it would not be advisable to neglect the risk of a large financial crisis triggered by the current inflation in bond prices.

In the period since the ECB started, equities have seen a different performance than in the US, and the explanation comes from the mature nature of the businesses, weak growth and lower total shareholder return policies.

- Euro Stoxx 50 -3.64%
- DAX +3.49%
- CAC 40 +5.14%
- FTSE MIB -8.60%
- IBEX35 -2.27%

If we look at multiples, the Euro Stoxx 50 shows that the ECB policy has supported already high valuations, not inflated them further:

- Price to Earnings has fallen slightly from 22.19 to 20.02
- EV/EBITDA 8.38 to 8.31

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Top and bottom sales growth sectors also show a wide performance, driven mostly by energy prices:

Growth in Sales

- +38% Consumer Services
- +33% Technology
- -30% Utilities
- -13% Oil & Gas

The Eurozone index has posted a poor growth of flat earnings in the period, but again, differences are relevant between sectors:

Earnings

- +15% Consumer Services
- +14% Health Care
- -28% Oil & Gas
- -7% Consumer Goods

Ten year sovereign bonds already collapsed before the actual programme was implemented due to the famous words of Mario Draghi, "we will do whatever it takes" in July 26, 2012.

- Germany fell to 0.33%
- France to 0.77%
- Italy to 2.12%
- Spain to 1.55%

The worrying trend of negative yielding bonds can be seen in the 5-year bonds:

- Germany -0.158%
- France -0.158%
- Italy 0.867%
- Spain 0.346%

But if there is a worrying trend it can be seen in the high yield iTraxx index, which soared since QE was implemented +11.95% while cash flow generation and debt repayment capacity, according to Fitch Ratings, remained weak.

V. BANK OF ENGLAND

The Bank of England started its asset purchase programme in March of 2009, which has driven the following performances:

FTSE since March 2009 rose +97.06%.

From March 2009 to January 2010 the Bank of England purchased 200 billion sterling in sovereign bonds, almost 14% of GDP.

Since August, the repurchase programme increased to 435 billion sterling.

The FTSE Index multiples also rose significantly, with P/E from 17.31 to 34.90.

A closer look at top and bottom growth in sector shows the following.

Sales

- +21% Technology
- +14% Financials
- -14% Oil & Gas
- -12% Basic Materials

Earnings

- +22% Health Care
- +22% Technology
- -40% Oil & Gas
- -17% Financials

10 year sovereign bond

- Yield fell from 3.56% to 1.01%

5 year sovereign bonds

- Yield fell from 2.54% to 0.455%

The case of the FTSE is also relevant because the large increase in multiples comes in an index that is very exposed to energy and mining.

It would be worth noting that the Bank of England does keep a constant eye on secondary markets, and –like the president of the ECB– constantly warns of data points that can be difficult to explain. However, it is worth noting again that the central bank becomes a disproportionately high demand of the bond issuances of the Treasury.

VI. BANK OF JAPAN

If there is an example that shows why it is important to monitor the risk of excess impact on financial markets it is the Bank of Japan. It has conducted a ZIRP (zero interest rate policy) for more than two decades and subsequent monetary stimulus. Between 2001 and 2006 it increased its balance sheet by 300 billion US dollars, only to resume in 2012 with an even more aggressive expansionary policy.

The Nikkei index between 2001 and 2006 rose +25.81%, and since the start of the “three arrow” QQW (quantitative and quality easing) in 2012 until May 2017 it has risen +129.93%.

As in Europe, Japan’s index is predominantly comprised of mature, large conglomerates with low earnings growth and moderate returns:

- While P/E has remained similar from 20.18 to 18.86 since 2012
- EV/EBITDA soared from 6.49 to 9.39

However, earnings in the Nikkei by sector showed a very weak growth, in fact a negative trend:

Top and bottom two sector in growth of Sales

- +2.84% Financials
- +1.37% Consumer Services
- -10.6% Utilities
- -10% Oil & Gas

Earnings Growth

- +71% Basic Materials
- +52% Telecommunications
- -22% Utilities
- -16% Technology

10 year bond yields fell since 2012 from 0.992% to 0.034%

5 year-bonds fell since 2012 from 0.34% al -0.121%

The Bank of Japan owns as of May 2017 more than 40% of all outstanding bonds of the country.

VII. CONCLUSIONS

It is impossible to say today that central banks do not create distortions in the financial markets. In any way we analyze the data presented in this study, loose monetary policy has generated unquestionable and disproportionate financial asset inflation. Defenders of the alleged real economy benefits of these policies constantly refer to the debated wealth effect and the larger positive impacts relative to the risk in financial markets, given that inflation remains low in the real economy. However, inflation in financial assets is very real and, at the very least, extremely worrying.

The main reasons why it may be a concern are:

On one side, it is hard to find support for the prices and multiples seen in financial markets in a secondary market if the central bank does not intervene, making policy makers hostages to the risks that their own policies have accumulated in financial markets where even the most advanced analyses of value at risk and correlation have historically failed to predict the severity of financial crises and downturns.

As extreme unconventional monetary policies become less of an extraordinary tool and more a norm globally, the expected positive results of the measures produces diminishing returns in the real economy while it creates disproportionate effects in financial markets.

Considering the evidence presented in this paper, it is advisable that policy makers pay a much deeper attention to real demand in secondary markets and extreme changes in capital flows to gage the risks of generating a wider problem –another financial crisis– while trying to create inflation and credit growth, which may not happen due to other more important trends such as technology disinflation, ageing of population and efficiency.

Even if we considered the “wealth effect” as valid, or assume that financial asset inflation is an acceptable side effect of a broader policy, history and experience show us that despite the apparent lack of harm, unforeseen and large negative effects multiply when a financial crisis starts. Central banks and policy makers must take exceptional precautions and, instead of ignoring or trying to justify valuations, provide enough clarity in forward guidance and reporting about the possible risks involved in extreme valuations of assets purchased by the central bank or indirectly impacted by those purchases.

It is not the objective of this paper to provide solutions, which may

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come from Taylor rule implementation and a systematic sterilization programme attached to quantitative easing, as well as the more obvious of not conducting such programmes at all. On the contrary, the objective of this paper is to alert of the very significant consequences of perpetuating financial asset inflation, creating an artificial demand and a sense of false security in investors that may be forced to acquire riskier assets for diminishing yields.

The world is gradually exiting the worst crisis since the Great Depression, but imbalances such as high debt, weak growth and large deficits remain. If we do not monitor the risks of bubbles accumulated in financial assets –especially sovereign bonds– from expansionary policies, the risk of falling into another financial crisis is high, but the fact that the world would do so with virtually no tools to combat it is not a probability, it is a certainty.

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