

# **Quantitative Easing, Changes in Global Liquidity and Financial Instability**

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## **Quantitative Easing, changes in global liquidity and financial instability**

**Abstract:** This paper argues that Quantitative Easing (QE) led to significant changes in the global financial system, which, are not conducive to greater financial stability. Through a policy of reserve accumulation, QE disconnected base money from the money supply and deposits from loans. Jointly with the deleveraging process of global banks, QE contributed to restrain the supply of bank credit growth throughout the world. Also global banks continued to expand their trading on the basis of opaque instruments such as derivatives. Moreover, by altering the relative profitability of investing in different assets, QE exerted a positive effect on the performance of the international bond market. This not only spilled into emerging market economies expanding the debt of both the financial sector and the non-financial corporate sector but also has reinforced the role of the asset management industry in financial markets. Due to its concentration and interconnectedness, illiquidity, and pro-cyclicality the asset management industry poses important risks to financial stability.

**Keywords:** Quantitative easing, financial system, global banks, asset management industry

**JEL classifications:** E12, E42, E44, E51

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## **Introduction**

At the end of 2008 the United States implemented a monetary policy strategy known as Quantitative Easing (QE). This lender-of-last resort intervention aimed at lowering long-term interest rates to spur aggregate demand and promote economic growth. QE can hardly be said to have accomplished its intended effects on the real economy. Instead, QE contributed to induce important changes in the global financial system with potential negative effects on financial stability.

Through a policy of reserve accumulation QE produced an unprecedented increase in the balance sheet of the Federal Reserve which disconnected base money from the money supply, and banks' deposits from their loans. Other major central banks, including the European Central Bank and the Bank of Japan followed similar monetary policy strategies.

In combination with the deleveraging process and decline in profitability of global banks following the Global Financial Crisis (2007-2008), these policies contributed to restrict bank lending throughout the world. Cross-border bank lending, which had averaged a combined rate of growth of 16% for the United States, the Euro Zone and Japan for the period 2001-2008, decreased to 4% in the period 2010-2015.

QE policies not only affected the level of global liquidity but also its composition by changing the relative profitability of investing in different assets through the portfolio rebalancing channel. Portfolio rebalancing refers to a decline in the risk premium (the difference between the expected return on an asset and the risk free rate of interest) of an asset produced by changes in its net supply.

Portfolio rebalancing aimed at a decline in interest rates throughout a broad range of assets easing financial conditions in the economy and spurring aggregate spending through increased long-term borrowing and wealth, and balance sheet effects. While there is no clear cut evidence linking the portfolio rebalancing channel to aggregate spending, the empirical evidence shows that by changing the relative profitability of assets, it contributed to improve the performance of global capital markets including that of the global bond market and its importance as a source of finance.

The combined lending of the United States, Europe and Japan to non-residents through the bond markets increased from US\$ 1.8 trillion in 2000 to US\$ 3 trillion at the end of 2008 reaching US\$ 6 trillion by December 2015. Since the beginning of QE policies the share of international bond markets in total lending has risen steadily from 40% to 48% of global credit to non-residents.

Developed economies account for the lion's share of the international bond market. However, developing economies, and in particular Latin America and Asia, have become the most active and dynamic actors since the implementation of QE. Developed countries stock of

international debt issues grew on average 21% during 2000-2008 dropping to 0.23% in the period 2009-2015. Contrarily, in the case of developing economies, the stock of international issues expanded by 8% and 12% for the same periods.

These changes have not been conducive to the creation of more stable global financial system.

First, as part of their strategy to recover their pre-crisis levels of profitability, banks have increased their holdings of riskier financial instruments such as derivatives that were central to the onset of the crisis. Second, the greater dependency of global banks on instruments such as derivatives and on institutions such as corporate and investment banking has strengthened their degree of interconnectivity. Third, the increasing importance of the bond market has been accompanied by a growing external debt of some emerging market economies. Fourth, the growth of the bond market is underpinned by the asset management industry which poses a number of important risks to financial stability due to its concentration and interconnectedness, illiquidity, and pro-cyclicality.

This paper is divided (at this stage) into seven sections. Sections two to four focus on QE and its impact on the level and composition of global liquidity. Section five describes the importance of the bond market. Section six discusses the implications of the changes in the financial system for financial stability. Section seven concludes.

## **QE: the disconnection between money base and money supply and between banks deposits and loans**

Following the start of trouble in the subprime mortgage market in mid-2007 the Federal Reserve decided to lower the Federal Funds rate (FF rate). Between July 2007 and the collapse of Lehman Brothers (LB) in 2008, the FF rate declined from 5.26% a 1.81%. Following the LB episode the FF rate declined further to reach a low of 0.16% by December of that same year. At the zero-bound, the short term interest could not be reduced any further and the Federal Reserve opted for an unconventional policy of large asset purchases or Quantitative Easing (QE).

QE consists in large-scale asset purchases, treasuries and mortgage related securities (LSAP), by the FED from the financial system. The purpose of the QE is to ease monetary policy by lowering long-term interest rates. As simply put by Bernanke (2013), p. 104:

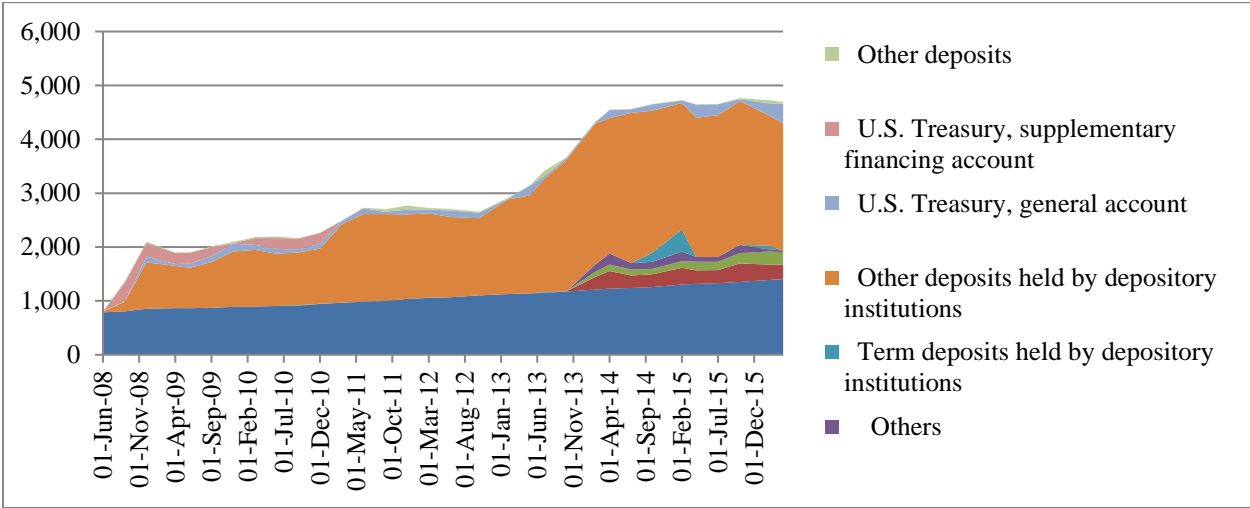
“Why are we buying these securities? This is, by the way, an approach that monetarists such as Milton Friedman have talked about. The basic idea is that when you buy Treasuries and GSE securities and bring them onto the balance sheet that reduces the available supply of those securities in the market. Investors want to hold those securities and they have to settle for a lower yield...So by purchasing Treasury securities, bringing them onto our balance sheet, and reducing the available supply of those Treasuries we effectively lowered the interest rate of longer-termed Treasuries and GSE securities as well. Moreover to the extent that investors no longer having available Treasuries and GSE securities to hold in their portfolios, to the extent that they are induced to move to other kinds of securities, such as corporate bonds, that also raises the price and lower the yield on those securities. And so the net effect of these actions was to lower yields across a range of securities. And as usual, lower interest rates have supportive, stimulative effects on the economy.”

The QE policy lasted for roughly six years and consisted in three major rounds of large-scale asset purchases. These are QE1 (December 2008-March 2010), QE2 (November 2010-June 2011), and Q3 (September 2012-December 2013). Through the implementation of the first round of QE the FED bought up to US \$1.3 trillion dollars in agency mortgage-backed securities (MBS) and agency debt and US\$ 300 billion in Treasury Securities. QE2 consisted in the purchase of US\$ 600 billion of longer-term securities. Finally, Q3 consisted in the purchase US\$ 1.7 trillion in longer-term and mortgage based securities.

The purchases of, US treasuries, debt securities and mortgage backed securities (an increase in the FEDs asset side) was financed by crediting the current account of the agents that sold securities to the FED. This involved an increase in former's excess reserves at the FED (and thus by definition in the monetary base) so that the rise in the FEDs liabilities matched the increase in its assets.

The reserves of private depository institutions at the FED (“Other deposits held by depository institutions” in Figure 1) increased significantly after the start of QE. In the two years prior to the start in Q1 the level of bank reserves at the FED hovered at US\$20 billion. By December 2008, the level of reserves increased to US\$ 800 billion and surpassed US\$ 1 trillion dollars in 2011, stabilizing around US\$ 2 trillion by 2013 (US\$ 2.3 trillion in the first half of 2016). The reserves of depository institutions represent more than 50% of the FED liabilities.

Figure 1  
Federal Reserve. Selected liabilities (US\$ billions). June 2008-April 2016



Source: On the basis of the Financial Accounts of the United States. Federal Reserve Bank (2016)

Prior to the start of the first stage in QE, the agents that held treasury bills included mainly, foreign residents, state and local governments, households (hedge funds and private equity funds), money market funds, private pension funds, state and local government retirement funds, federal government retirement funds, US chartered commercial banks and life insurance companies (roughly 95% of the total) (see table 1). Due to the fact that these institutions do not have an account with the FED, the sale of treasury securities and agency mortgage backed securities was carried out through primary dealers (either US chartered banks or through foreign banks operating in the United States).<sup>1</sup>

<sup>1</sup> See Choulet, 2015.

Table 1  
United States Treasury Securities by holder (Percentage of the total) 2007-2016

Sectors	2007	2008	2009	2010	2012	2014	2016	2012-2008	2014-2008	2016-2008
Rest of the world	46.6	51.3	47.2	42.4	43.4	42.7	40.9	<b>-7.9</b>	<b>-8.6</b>	<b>-10.5</b>
Monetary authority	14.5	7.5	10.0	9.7	13.0	17.1	16.0	5.5	9.6	8.5
State and local governments	10.3	7.5	7.5	5.7	4.7	4.3	4.6	<b>-2.8</b>	<b>-3.2</b>	<b>-2.9</b>
Households	5.2	4.0	11.2	10.5	7.4	5.8	7.0	3.3	1.8	2.9
Mutual funds	3.5	3.0	3.2	4.0	4.4	4.7	5.5	1.4	1.8	2.6
Money market mutual funds	3.5	9.1	5.2	3.3	3.6	2.9	3.5	<b>-5.5</b>	<b>-6.2</b>	<b>-5.6</b>
Private pension funds	3.3	2.9	2.3	1.9	2.3	2.2	2.1	<b>-0.6</b>	<b>-0.7</b>	<b>-0.8</b>
State and Local Government Retirement Funds	2.8	2.3	2.0	1.5	1.3	1.2	1.0	<b>-1.0</b>	<b>-1.1</b>	<b>-1.3</b>
Federal government retirement funds	1.7	1.8	1.5	12.1	11.1	11.2	11.1	9.3	9.4	9.3
ABS Issuers	1.7	1.1	0.7	0.4	0.2	0.2	0.2	<b>-1.0</b>	<b>-1.0</b>	<b>-1.0</b>
US chartered commercial banks	1.4	0.8	1.6	2.1	1.9	2.9	2.8	1.1	2.1	2.0
Property-casualties insurance companies	1.4	1.0	1.1	0.9	0.7	0.7	0.6	<b>-0.3</b>	<b>-0.3</b>	<b>-0.4</b>
Life Insurance Companies	1.4	1.7	1.7	1.5	1.4	1.3	1.3	<b>-0.3</b>	<b>-0.4</b>	<b>-0.4</b>
Nonfinancial non-corporate business	1.2	0.8	0.6	0.5	0.4	0.4	0.4	<b>-0.4</b>	<b>-0.4</b>	<b>-0.4</b>
Nonfinancial corporate business	0.8	0.5	0.6	0.5	0.3	0.3	0.2	<b>-0.2</b>	<b>-0.2</b>	<b>-0.3</b>
Foreign Banking Offices in the US	0.6	0.6	0.7	0.6	0.6	0.4	0.5	0.0	-0.2	0.0
Exchange traded funds	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.1	0.1	0.2
Government Sponsored Enterprises	0.3	0.3	0.5	0.8	0.5	0.4	0.6	0.3	0.2	0.3
Credit Unions	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.0	0.0	0.0
Bank holding companies	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Savings Institutions	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Closed-end funds	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Banks in US affiliated areas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brokers and Dealers	-1.2	3.0	1.6	0.9	1.9	0.4	0.6	-1.1	-2.6	-2.4

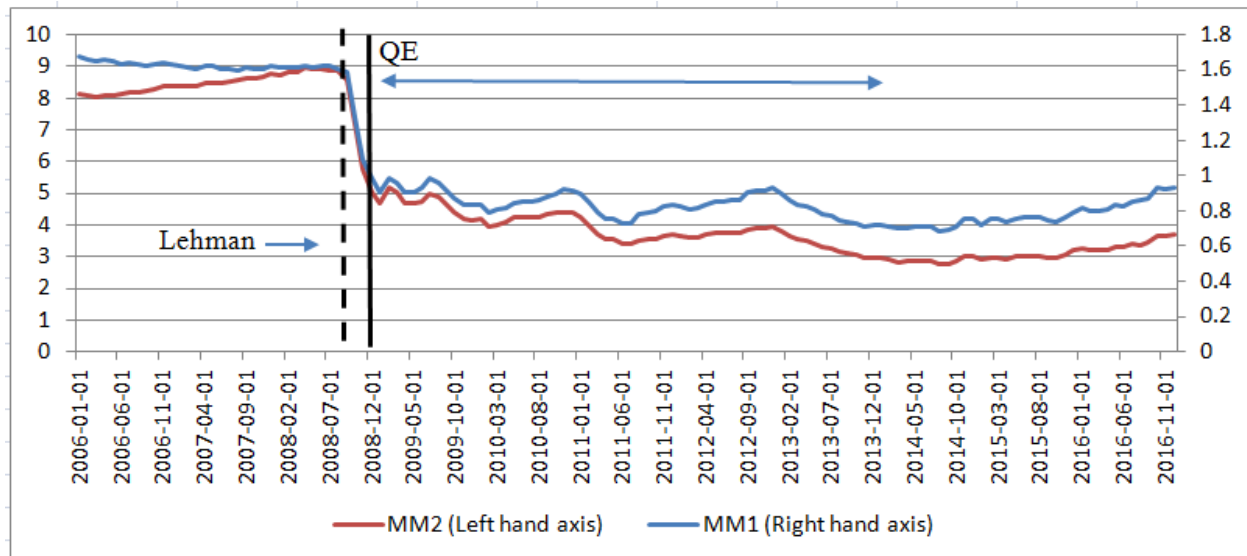
Source: On the basis of the Financial Accounts of the United States. Federal Reserve Bank (2016)

The sharp increase in reserves and thus in high powered money (MB) was not reflected in a proportionate rise in the money supply (MS). In fact QE seemed to have reinforced the decline of the money multiplier caused by the collapse of Lehman Brothers in September 2008.

Figure 2 shows the M1 and M2 money multipliers on a monthly basis from January 2006 until January 2016. Between January 2006 and August 2008 the M1 and M2 multipliers averaged 1.63 and 8.48 (with standard deviation of 0.01 and 0.29).

After the collapse of Lehman Brothers in September 2008, both multipliers dropped to 1.33 and 7.20 in October, and to 1.09 and 5.75 in November. After the start of QE in December, the M1 multiplier fell below one suggesting that it became a 'money divisor.' For its part, during the period following the implementation of QE the M2 multiplier registered maximum and minimum values of 5.2 and 2.8 with an average of 3.6.<sup>2</sup>

Figure 2  
United States M1 and M2 money multipliers. January 2006-January 2016. Monthly Data



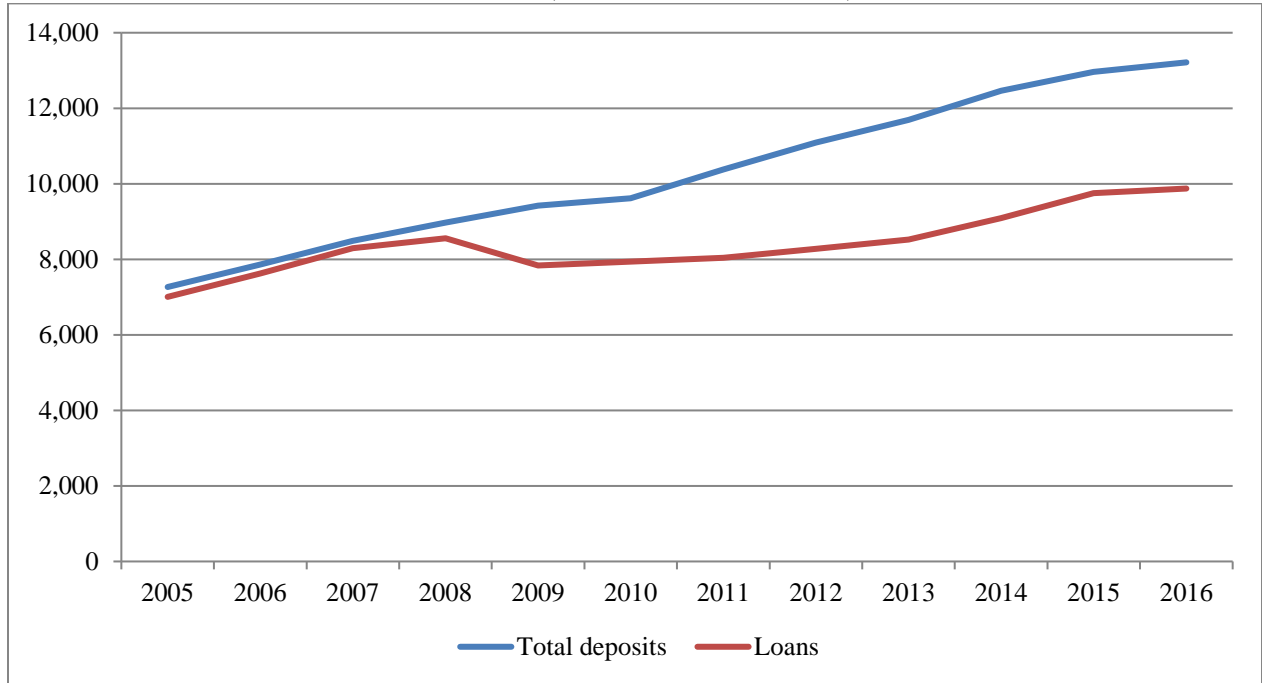
Source: On the basis of FRED (2016)

Moreover, following QE, not only was the monetary base (MB) disconnected from the money supply (MS), but also the stock of loans became disconnected from banking deposits. As shown in Figure 2, between 2005 and 2007, the growth in deposits kept pace with that of loans. However, after 2008 there is a clear disconnect between loans and deposits as the latter clearly out spaced the former.

<sup>2</sup> See, <https://fred.stlouisfed.org/series/MULT>. As the end of 2016, the value of the M1 multiplier was still below one.



Figure 3  
 United States total deposits and loans of private depository institutions  
 2005-2016 (US\$ billions of dollars)



Source: On the basis of the Financial Accounts of the United States. Federal Reserve Bank (2016)

The disconnection between base money and money supply and between loans and deposits can be shown with simple monetary accounting identities of the central bank and the banking system in the aggregate.<sup>3</sup> The simplified central bank balance sheet identity states (in terms of discrete changes denoted by the symbol  $\Delta$ ) that assets (A) equal to the sum of bank's reserves (R), currency in circulation (CU) and government deposits (GD). The aggregate balance sheet of the banking system states that reserves (R) plus loans (L) and bond holdings (BH) equal to deposits (D) and Equity (E). Formally,

$$(1) \Delta A_{CB} \equiv \Delta R_{PDFI} + \Delta CU_{CB} + \Delta GD_G \quad (\text{Balance sheet of the central bank})$$

$$(2) \Delta R_{PDFI} + \Delta L_{PDFI} + \Delta BH_{PDFI} \equiv \Delta D_{PDFI} + \Delta E_{PDFI} \quad (\text{Aggregate balance sheet of the banking system})$$

<sup>3</sup> This provides a simplified example since it takes into account only the relationship between the FED and the banking system. As explained in the paper the institutions, such as money market funds, that held the majority of assets purchased by the FED could not trade with the FED. As a result the banks acted as an intermediary between those institutions and the FED. The inclusion of three accounting identities (FED, banks and say money market funds) make the example more realistic without changing the basic messages of our simplified case. See, Standard and Poor's Ratings Services (2013).

Where, the subscripts CB, PDFI and G, denote central bank, private depository institutions and government respectively.

According to identity (1), for a given level of government deposits (that is assuming  $\Delta GD_{LG}=0$ ), an increase in central bank assets ( $\Delta A_{CB}$ ) must be reflected in an increase in reserves ( $\Delta R_{PDFI}$ ).<sup>4</sup> This operation appears on the balance sheet of the financial system as a decline in bond holdings that will be matched by an increase in its reserves at the central banks ( $\Delta^{-}BH_{PDFI} = \Delta R_{PDFI}$ ). As a result there is no reason to expect that an increase in the monetary base of the central bank driven by the rise in reserves ( $\Delta R_{PDFI}$ ), as in the case of QE, be followed by a concomitant increase in the deposits of the banking system ( $\Delta D_{LPD}$ ) and thus in the money supply.

Also, using the same accounting logic, it can be shown that there is no reason for an increase in the monetary base to translate into an expansion of loans. Loans are created out of the thin air. When banks lend and increase their assets they create at the same time a concomitant liability (a deposit) on their balance sheet. When banks are required to hold reserves these are supplied by the central bank.<sup>5</sup> The fact that loans create deposits and not the other way around means that the amount of loans cannot exceed the amount of deposits. But the amount of deposits can exceed that of loans (as shown in figure 3 above).

## **QE and its impact on global liquidity**

QE not only had a direct impact on the creation of liquidity within the United States but also at the world level. This is due to the fact that the financial institutions that acted as primary dealers to the FED during the QE operations are global banks (also known as highly complex financial institutions) and it is these global banks that drove the liquidity expansion that occurred prior to the Global Financial Crisis (2007-2008).<sup>6</sup>

The available evidence for treasury bill auctions for QE2 shows that the primary dealers involved the global banks including, Goldman Sachs, Morgan Stanley, Barclays Capital, JP Morgan, Credit Suisse, BNP Paribas, Royal Bank of Scotland, Deutsche Bank, Royal Bank of Canada, Merrill Lynch, Citigroup, HSBC, UBS, Nomura, Mizuho, SG Americas, Daiwa Securities Group, Cantor Fitzgerald, and Jefferies.<sup>7</sup> The combined assets for this set of banks reached US\$ 13 trillion dollars in 2003 increasing to US\$ 28 trillion by 2007. This represented 42% and 57% of the world's money supply (Figure 3)

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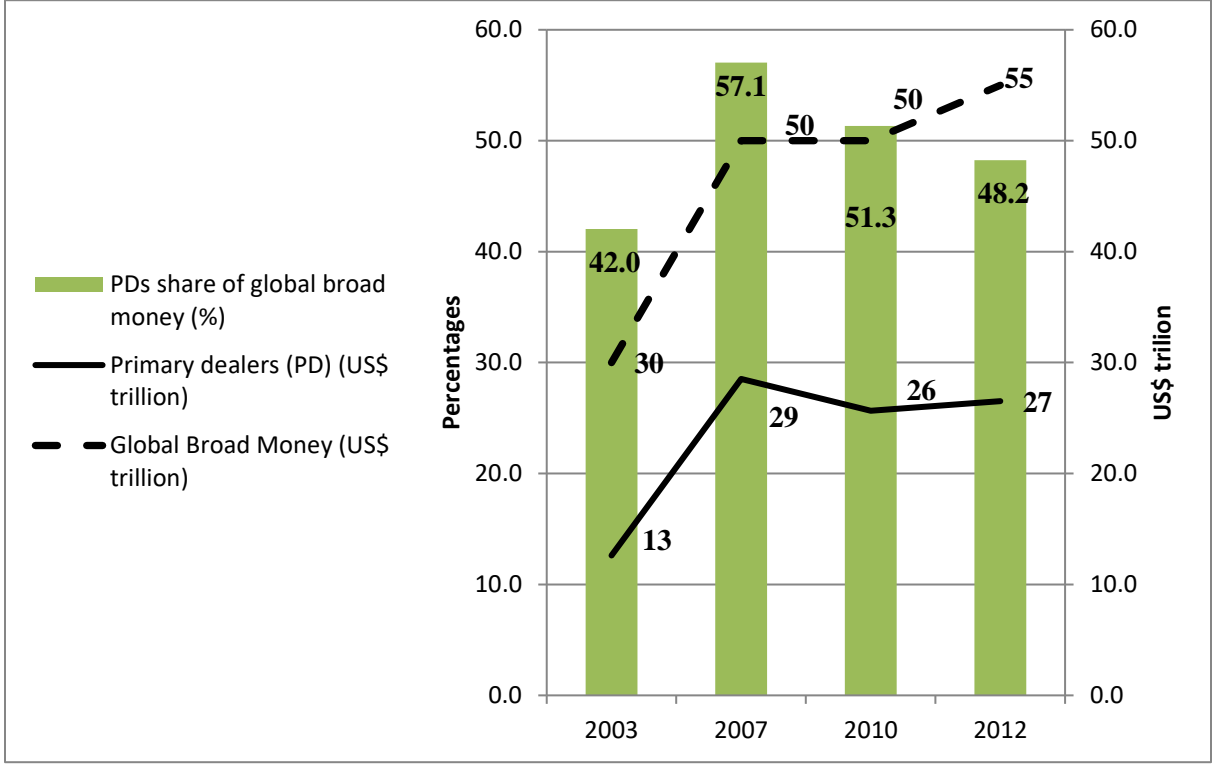
<sup>4</sup> This example is based on the FED's balance sheet. During the implementation of QE government deposits did not vary significantly. The items that changed the most are reserves of depository institutions and Federal Reserve notes in circulation. These increased from US\$ 867 billion to 1.2 trillion between the end of 2008 and the beginning of 2014.

<sup>5</sup> This is the Post Keynesian argument that money supply is endogenous. See for example Lavoie (2016).

<sup>6</sup> This period has been termed by Shin (2016) as the first phase of global liquidity.

<sup>7</sup> See Song and Zhou (2014).

Figure 4  
 Global broad money supply, assets of commercial banking primary dealers (US\$ trillion dollars),  
 and share of primary dealers' assets in global broad money supply (%) (2003-2012)



Source: On the basis of Bloomberg (2016) and Chung at al. (2014)

Table 2 shows that the combined deposits of these financial institutions increased in line with the behavior of aggregate deposits. Moreover their combined deposits represented more than 70% of the system's total deposits in 2010 and 2011.

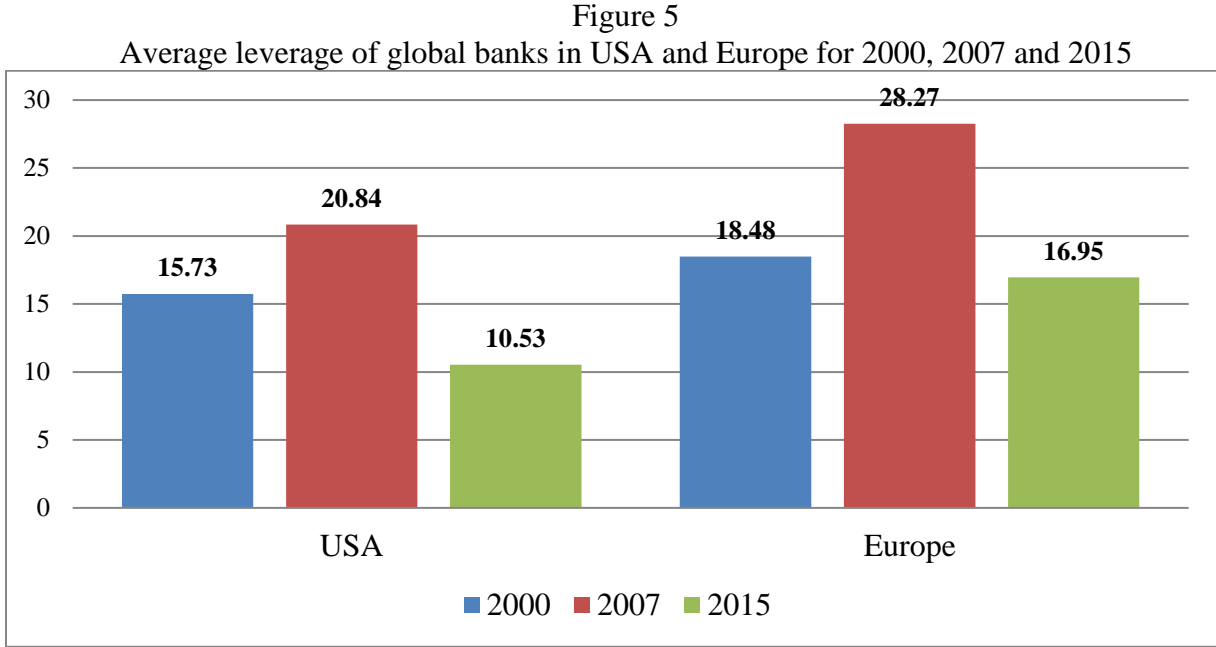
Table 2  
 United States. Comparison between total deposits of private depository institutions and deposits of primary dealers of Treasury Securities (2008-2015)

Year	Total deposits of private depository Institutions of the US US\$ billions	Total deposits of primary Dealers US\$ billions	Change in total deposits of private depository Institutions of the US US\$ billions	Change in total deposits of primary dealers US\$ billions	Change in the deposits of primary dealers as % of the change total deposits	Deposits of primary dealers as % of total deposits
2008	8,969.8	7,030.2	...	...	...	78.4
2009	9,423.1	7,103.5	453.3	73.3	16.2	75.4
2010	9,620.1	7,200.8	650.3	170.6	26.2	74.9
2011	10,380.8	7,638.9	1,411.0	608.7	43.1	73.6
2012	11,093.0	8,038.8	2,123.2	1,008.5	47.5	72.5
2013	11,695.1	8,336.8	2,725.3	1,306.6	47.9	71.3
2014	12,460.9	7,974.3	3,491.1	944.1	27.0	64.0
2015	12,963.8	7,691.3	3,994.0	661.0	16.6	59.3

Source: On the basis of the Financial Accounts of the United States. Federal Reserve Bank (2016) and Bloomberg (2016).

The impact of QE policies on global bank liquidity was reinforced by two other factors. First, after the Global Financial Crisis, global banks followed a significant process of deleveraging. This is illustrated in figure 4 and in the annex which show leverage for the major global banks of the United States and Europe for the period 2000 to 2015 (see annex). whose assets amount to US\$ 70 trillion dollars.

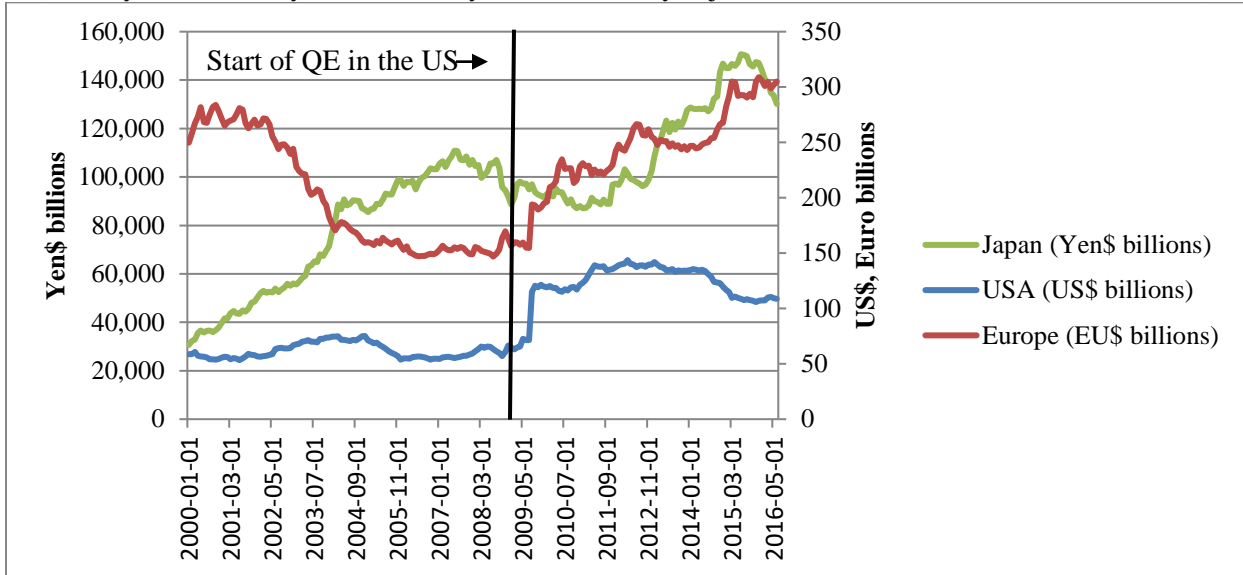
Figure 5 shows that from 2000 to 2007 leverage in US banks increased on average from 15.73 to 20.84 decreasing to 10.53 by 2015. European banks follow a similar path. From 2000 to 2008, European banks increased their average leverage from 18.48 to 28.27 and then decreased their average leverage to 16.95 in 2015.



Source: authors’ own on the basis of Bloomberg (2016)

Second, in line with FED policies, other major central banks in the world including the European Central Bank (ECB) and the Bank of Japan (BOJ) also witnessed a significant increase in banks’ reserves. Figure 6 shows the evolution of reserves of private depository institutions at the Federal Reserve, the ECB and the Bank of Japan. In all three cases the stock of reserves increased after the start of quantitative easing (QE) in the United States.

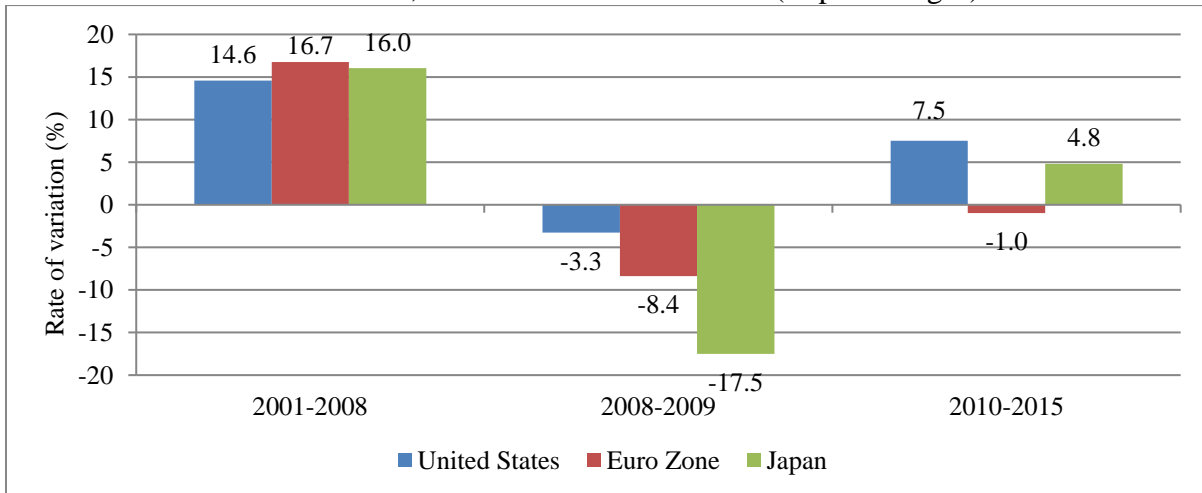
Figure 6  
Reserves at the Federal Reserve, European Central Bank and Bank of Japan  
(January 2000-January 2016, monthly data, seasonally adjusted in billions of US\$, Euro\$ and Yen\$)



Source: On the basis of Federal Reserve, European Central Bank and Bank of Japan Data.

The increased stock of reserves coupled with the deleveraging by global banks produced a decline in bank lending throughout the world. The available data shows that between 2001-2008 and 2010-2015, the rate of growth of cross-border bank lending declined from an average of 14.6%, 16.7%, 16.0% to 7.5%, -1.0%, and 4.8%, for the United States, Euro Zone and Japan (Figure 7).

Figure 7  
Rate of growth of bank lending for the United States, Euro Zone and Japan  
2001-2008, 2008-2009 and 2010-2015 (In percentages)



Source: On the basis of BIS (2016a)

## QE and portfolio rebalancing effects

QE policies not only affected the levels of global liquidity but also its composition through the portfolio rebalancing channel. Portfolio rebalancing refers to a decline in the risk premium (the difference between the expected return on an asset and the risk free rate of interest) of an asset produced by changes in its net supply.

In the case of treasury bonds the risk premium is mainly explained by the term premium, i.e., the excess return that investors require to bear the interest rate risk of holding long-term bonds instead of a series of short-term bonds. Long-term bond prices have a higher sensitivity to interest rate changes than short-term bonds.

The fall in the term premium is reflected in the decline in the long-term yields of treasury bills and also, eventually, in the yields on other assets thus bidding up their prices. In this way the portfolio rebalancing effect leads to decline in interest rates throughout a broad range of assets (including corporate bonds and equities) easing financial conditions in the economy and aggregate spending through increased long-term borrowing and wealth and balance sheet effects (Beckworth and Hendrickson, 2011; Bernanke, 2013).

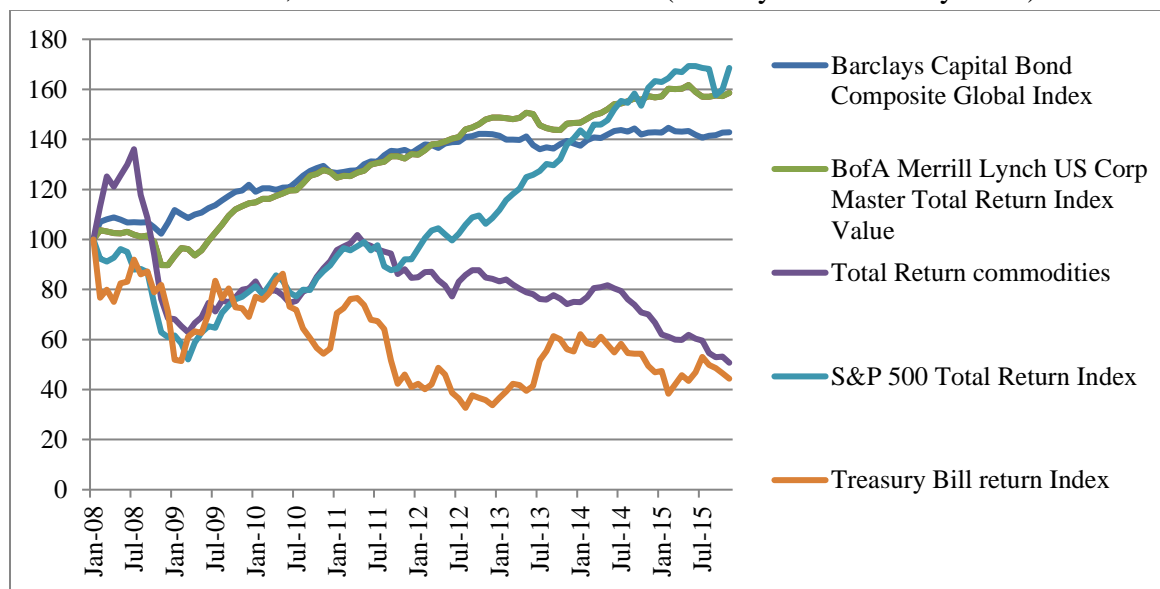
The portfolio rebalancing effect is compatible with different theories and is associated more recently with the preferred-habitat theory (Nelson, 2011). This theory holds that investors are risk averse, markets are segmented and that assets are imperfect substitutes (investors have a preference for assets with given maturities).<sup>8</sup> Under these conditions a purchase program such as that undertaken by the Federal Reserve for an asset with a long-duration such as a treasury bill or fixed income security creates a shortage for the “local supply” of that asset with that given maturity (‘the market for that assets clears at a lower equilibrium quantity and higher price (i.e., lower yield’) D’Amico et al., 2012). In turn the resulting change in relative rates of return leads investors to substitute low yielding assets with higher yields (Gagnon et al. 2011).

The evidence regarding the portfolio channel is mixed. Nonetheless a number of studies show a negative relationship between LSAP and the treasury term premium and a positive relation between LSAP and the return on other assets including bonds in general, corporate bonds and, to some extent, also commodities. In fact the available evidence indicates that the LSAP gave a boost to the bond market.

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<sup>8</sup> As put by Kohn (2009, p. 4): “...the degree to which assets of different types and maturities are imperfect substitutes is central to understanding the large-scale asset purchase...of the Federal Reserve.”

Figure 8  
 Barclays and Merrill Lynch Bond Indices, S&P 500 total return index, Treasury Bill return index, total return on commodities (January 2008-January 2016).



Source: FRED (2016)

Figure 8 above computes the evolution of indices for the returns on bonds (Barclays Capital and Merrill Lynch), stock market (S&P 500), commodities and treasury bills for the period running from January 2008 to January 2016 on a monthly basis and normalized at 100 in 2007. The data show a declining trend in the Treasury bill index. The index fell by 51% between both data points. At the same time both the Barclays and Merrill Lynch bond indices rose by 51%.

This finding is consistent with McKinsey and Company (2013) who find that between 2007 and 2012 the aggregate bond index increased, on average, by 37%, and 29% in the United States, the United Kingdom and in the Euro Zone respectively. Also our data show that stock market index expanded by 61%. Finally the commodity return index increased between the end of 2008 and the middle of 2011 and thereafter declined.

### The growing importance of the international bond market

Due in part to the mechanism describe above the slack in bank lending was filled by the global bond market. Over the past decade, between 1995 and 2014, the global bond market has quadrupled in importance increasing its outstanding volume from US\$ 20 to \$86 trillion dollars.

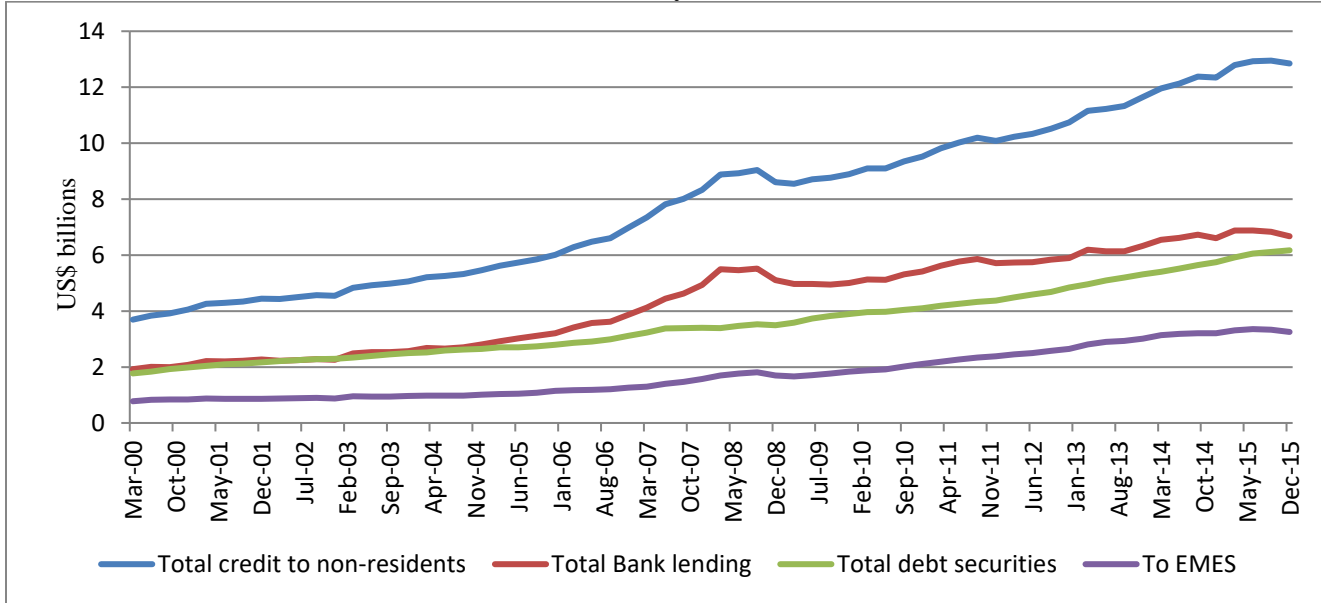
As a result, it has also widened its gap with the global stock market. In 1995 and 2014, the outstanding volume in the global bond market out spaced, the capitalization of the global



equity market by US\$ 2 and \$20 trillion respectively. Similarly bond markets are more dynamic than equity and have become much more important to the real economy as a source of finance. Available data show that between 2000 and 2014 the average daily trading volume in the United States bond expanded from US \$358 to \$730 billion. Contrarily the average daily trading volume for equities was US\$ 129 and \$126 billion in both years respectively.

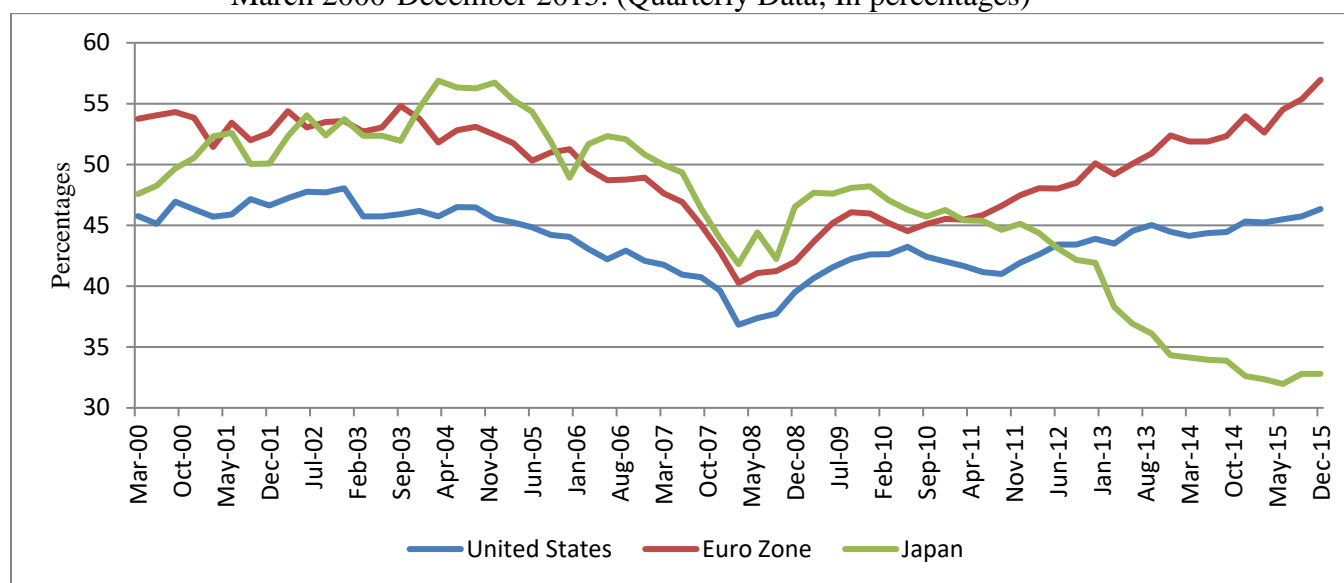
The performance of the global bond market is reflected in its growing importance as a source of finance. Available data for the period 2000-2015 for the United States, the Euro Zone and Japan show that their combined lending to non-residents through their respective bond markets increased from US\$ 1.8 trillion in 2000 to US\$ 3 trillion at the end of 2008 reaching US\$ 6 trillion by December 2015. Since the beginning of QE policies by the FED and the accumulation of banks reserves by the FED, the European Central Bank and the Bank of Japan, the share of international bond markets in total lending has risen steadily from 40% to 48% of global credit to non-residents (Figure 9).

Figure 9  
Global credit to non-residents, bank lending, debt securities and United States credit to Emerging Market Economies  
March 2000-December 2015. (Quarterly Data; US\$ Billions of dollars)



Source: On the basis of BIS (2016a)

Figure 10  
Share of United States, Euro Zone and Japan in global bank lending  
March 2000-December 2015. (Quarterly Data; In percentages)



Source: On the basis of BIS (2016a)

The growth of the global bond market is a result of an increase in both the sovereign and corporate segments. Available evidence shows that between 2000 and 2015, the market size of the sovereign and corporate debt markets expanded from US\$ 14 to \$41 and \$19 to 46\$ trillion dollars respectively. Developed economies account for the lion's share of both bond markets.

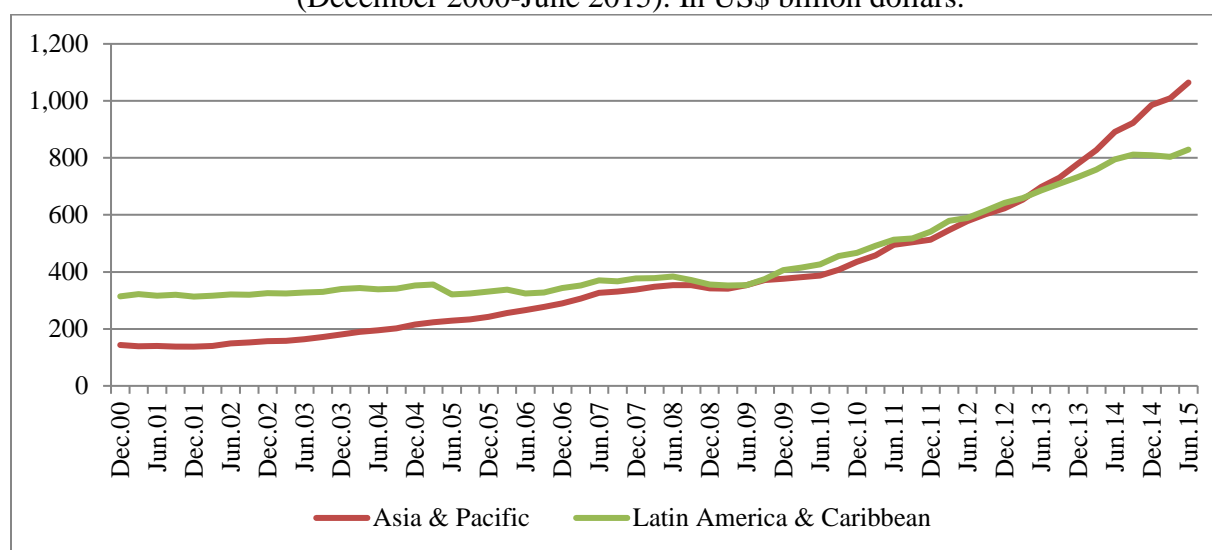
Developed economies account for global bond market (99% and 97% of the total) and from 92% of the global corporate bond market. However, within developed economies, the global bond market has become less concentrated over time (i.e. it has become more 'truly' global). In 1995, the United States held 80% of the volume outstanding in the global bond market (followed by the United Kingdom with 8%). In 2014, the United States reduced its participation to 57% and other developed economies such as the United Kingdom and especially Japan increased their share of the global bond market (10% and 13% respectively for 2014). Similarly the United States reduced its share of the global corporate bond market from 51% in 2004 to 44% in 2013. The disparity in the share of developed and developing economies bond market narrows when the comparison excludes financial firms.

However, developing economies have increased their participation in total and international debt securities. Between 2000 and 2014 emerging market economies increased their stock of total and international from roughly 500 and 600 US\$ billion to roughly US\$ 7 and 4 trillion respectively. Nonetheless in terms of relative importance the share of developing

countries is much higher in the international than in the global debt market (13% and 16% of the international bond market and 1.5% and 8.3% of the global bond market for 2000 and 2014).

An analysis of the available data by developing region shows that Asia and the Pacific, and Latin America and the Caribbean, have the largest shares of outstanding international debt issues followed by developing Europe (36%, 30% and 20% of the total respectively for 2014). A more detailed analysis encapsulated in figure 11 shows that, consistently with the analysis developed in the above sections, both regions increased significantly their stock of international debt securities following the implementation of QE.

Figure 11  
Stock of international debt issues of Asia and the Pacific and Latin America and the Caribbean (December 2000-June 2015). In US\$ billion dollars.



Source: On the basis of BIS (2016b)

At the country level the most important issuers of international debt include China, Brazil, Russia, Mexico, South Korea, Turkey and India (16%, 12%, 9%, 7%, 7%, 4% and 3% of the total).

The decomposition at the sector level also shows that there are clear common regional trends, but also, significant differences among the different developing regions. In all cases, the government sector has lost relative importance as an issuer of international securities. Between 2000 and 2014, the share of the stock of international securities held by the government declined from 72%, 45%, 81.7% and 19.3% to 34.8%, 24.7%, 45.2% and 11.3% of the total for Latin America, Africa and the Middle East, Europe and Asia and the Pacific respectively.

Table 3

Average share of international debt issues by developing regional by sector  
2000-2014 (In percentages)

	2000	2005	2010	2012	2014
<b>Latin America</b>					
Banks	6.2	5.4	10.2	14.8	14.3
Other Financial Corporations	6.2	13.5	18.8	19.7	20.9
Non-financial corporations	15.2	12.6	21.6	26.5	30.0
Governments	72.4	68.6	49.4	39.0	34.8
<b>Africa &amp; Middle East</b>					
Banks	3.2	13.9	11.9	15.2	19.3
Other Financial Corporations	19.7	33.1	37.8	36.5	34.6
Non-financial corporations	32.0	22.6	24.7	24.1	21.4
Governments	45.1	30.4	25.5	24.2	24.7
<b>Europe</b>					
Banks	2.0	9.5	19.5	25.5	28.6
Other Financial Corporations	15.5	17.6	20.4	16.3	14.7
Non-financial corporations	0.8	6.2	9.6	10.1	11.4
Governments	81.7	66.7	50.6	48.1	45.2
<b>Asia &amp; Pacific</b>					
Banks	25.9	25.8	30.6	32.3	35.0
Other Financial Corporations	21.2	24.9	30.9	31.8	35.2
Non-financial corporations	33.6	30.0	22.4	20.9	18.6
Governments	19.3	19.2	16.0	15.0	11.3

Source: On the basis of BIS (2016b)

Contrarily the bank sector gained in importance. Between 2000 and 2014, the share of the stock of international debt issues increased from 6.2%, 3.2%, 2.0% and 25.9% to 14.3%, 19.3%, 28.6% and 35.0% of the total for Latin America, Africa and the Middle East, Europe and Asia and the Pacific respectively. The sector “other financial corporations” witnessed a similar behavior.

The most notorious differences among regions arise when analyzing the evolution of the non-financial corporate sector. Between 2000 and 2014 its share in the total stock of outstanding securities increased for Latin America and Europe while it decreased for Africa and the Middle East and Asia and the Pacific (15.2% and 30%; 32% and 21.4%; 0.8% and 11.4%; 33.6% and

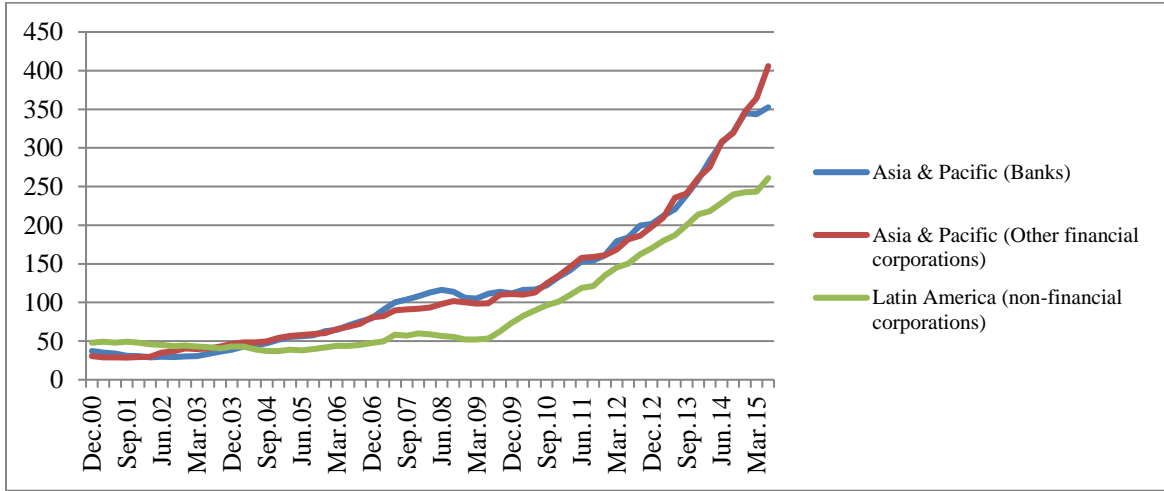
18.6% respectively). Moreover in the case of Latin America, it has become the most important issuer of securities after the government (30% and 34.8% respectively).

In the cases of the sectors that experienced the largest debt increase, the financial sector and the non-corporate financial sector (for Latin America) debt issuances are in their large majority high yield and investment grade which reflects, on the demand side, “increased risk appetite and search for yield” by international investors (Teldulkar & Hancock, 2014). As argued above, this appetite for risk was driven, to a great extent, by QE policies.

On the supply side, high commodity prices and favorable exchange rate levels were key determinants of the increase in the external debt of the non-financial corporate sector in the case of Latin America. In the case of Asia, the fact that banks did not experience the sharp drops in profitability registered in the cases of the USA and Europe following the Global Financial Crisis (see table 4 below), may have contributed to increased debt levels in that sector.

This is reflected in the fact that for the financial sector (banks and other financial corporations) in the case of Asia (which is the region that saw the largest increase in the stock of debt securities of this sector) and the non-financial corporate sector (in the case of Latin America) the stock of debt issues expanded at much greater pace following the implementation of QE. Between 2000 and 2008 and between 2009 and 2014 the stock of international debt issues for both of the above sectors and both regions increased by US\$ 84, 72, 8 and 247, 306, 209 billion dollars.

Figure 12  
 Stock of international debt issues of Asia and the Pacific and Latin America and the Caribbean (December 2000-June 2015). In US\$ billion dollars.



Source: Authors’ own on the basis of BIS (2016)

**Changes in the global financial landscape and the potential for financial instability**

The monetary policy response to the global financial crisis in combination with its impact on global banks, have had four important impacts that can contribute to financial instability.

First, the deleveraging process witnessed by global banks and other large financial institutions was accompanied by a significant decline in their profitability levels. Table 4 below shows the median rate of return on assets and on equity (ROA and ROE) for a representative sample of Latin American, United States, European and Asian banks classified by asset volume for the periods 2000-2007 and 2010-2015.

As clearly demonstrated by the data, United States and European banks show a systematic decline in profitability for all asset levels considered between both periods. On average, between 2000-2007 and 2010-2015, ROA decreased for United States banks from 1.2 to 0.8 and ROE from 15.5 to 7.7 (representing roughly a 50% decline in profitability). For Europe, ROA decreased, on average, from 0.6 to 0.2 and ROE from 14.4 to 4.9 (representing roughly a 66% decline in profitability).

Moreover, in the case of the United States the largest decline in profitability and more specifically in ROE occurred in the segment of the banks with the largest asset levels (more than US\$ 1 trillion in assets and those whose volume of assets are between US\$ 100 billion and US\$ 1 trillion). For Europe the largest decline in ROE also occurs for the largest asset holders (above US\$ 1 trillion dollars).

This state of affairs has prompted banks, and more to the point the largest banks (i.e., the global banks) to look for alternative strategies to increase their levels of profitability. According to the available and limited evidence banks, and more precisely global banks, have changed their business strategy. Currently global banks have reduced the number of countries in which they operate, their number of offices and branches and the variety of the financial products they offer. They have also chosen to concentrate their business on the wealthiest.

But at the same time some of these institutions have increased their holdings of riskier financial instruments such as derivatives that were central to create the financial fragility that set the basis for the Global Financial Crisis (2008-2009). As put by Onaran (2016)

“The transformation of Citigroup, and similar changes at HSBC Holdings Plc and other global banks, isn’t just about cutting expenses. It’s also about looking for greater returns by focusing on their richest customers high net-worth individuals, large corporations and institutional investors....But in serving those clients, the bank (Citigroup) has bulked up on trading, a business that helped get it into trouble before. It doubled the amount of derivatives contracts it has underwritten since the crisis to \$56 trillion The company which used to make most of its profits from consumer banking, now gets the majority from corporate and investment banking.”

Second the greater dependency of global banks on instruments such as derivatives and on institutions such as corporate and investment banking means has strengthened their degree of interconnectivity. Following the methodology of Shin (2010) preliminary indicator of interconnectedness for a sample of selected United States and European banks was computed. The indicator shows the percentage of funding that banks obtain from within the financial system. The computations show that prior to the Global Crisis the percentage of funding intra-financial system was 62% for the largest 20 banks (in terms of assets) and this figure increased to roughly 70% in the aftermath of the crisis. A similar result is obtained for the 15 largest European banks (intra bank funding represent 63% and 68% of the total).

Table 4

Median return on assets, return on equity, and leverage, of Latin American, American, European, and Asian banks, grouped by size of total assets for the year 2015

		Latin American banks <sup>c</sup>			U.S. banks <sup>d</sup>			
		More than 100 billion	Between 20 billion and 100 billion	Less than 20 billions	More above than 1 trillion	Between 100 billion and 1 trillion	Between 25 billion and 100 billion	Less than 25 billion
2000-2007 <sup>a</sup>	ROA	1.9	1.3	1.6	1.0	1.2	1.3	1.2
	ROE	25.4	19.4	14.0	16.7	16.1	13.9	13.2
2010-2015	ROA	1.5	1.8	1.7	0.5	0.8	0.8	1.0
	ROE	17.3	19.6	14.9	6.8	8.5	7.2	8.2
		European banks <sup>e</sup>			Asian banks <sup>f</sup>			
		More than 1 trillion	Between 300 billion and 1 trillion	Less than 300 billion	More than 1 trillion	Between 300 billion and 1 trillion	Between 100 billion and 300 billion	Less than 100 billion
2000-2007 <sup>b</sup>	ROA	0.7	0.6	0.5	0.6	0.9	1.1	0.9
	ROE	16.3	13.7	13.2	13.7	17.1	14.4	12.5
2010-2015	ROA	0.2	0.3	0.2	1.1	1.0	0.9	0.7
	ROE	4.7	5.7	4.2	17.1	14.9	11.6	9.0

<sup>a</sup> 2006-2007 for Latin American banks with total assets over US\$ 100 billion

<sup>b</sup> 2004-2007 for Asian banks with total assets over US\$ 1 trillion, and 2003-2007 for Asian banks with total assets under US\$ 1 trillion

<sup>c</sup> Number of banks with total assets over US\$ 100 billion: 5; Number of banks with total assets between US\$ 20 billion and US\$ 100 billion: 12; Number of banks with total assets under than US\$ 20 billion: 23

<sup>d</sup> Number of banks with total assets over US\$ 1 trillion: 7; Number of banks with total assets between US\$ 100 billion and US\$ 1 trillion: 12; Number of banks with total assets between US\$ 20 billion and US\$ 100 billion: 15; Number of banks with total assets under than US\$ 20 billion: 24

<sup>e</sup> Number of banks with total assets over than US\$ 1 trillion: 9; Number of banks with total assets between US\$ 300 billion and US\$ 1 trillion: 13; Number of banks with total assets under US\$ 300 billion: 24

<sup>f</sup> Number of banks with total assets over than US\$ 1 trillion: 8; Number of banks with total assets between US\$ 300 billion and US\$ 1 trillion: 13; Number of banks with total assets between US\$ 100 billion and US\$ 300 billion: 16; Number of banks with total assets under US\$ 100 billion: 39

Source: authors' own on the basis of Bloomberg (2016)

Third, the increasing importance of the bond market has been accompanied by a rise in the external debt of developing economies and in particular of Asia and Latin America.

Available data for Asia and Latin America shows that between 2008 and 2014, their international debt securities stock increased from US\$ 342 billion to 1 trillion dollars and from US\$355 to 800 billion dollars respectively (BIS, 2016b).

As explained above, at the sector level, debt affects in particular the financial sector in the case of Asia and the non-financial corporate sector in the case of Latin America. In this region, the non-financial corporate sector faces significant challenges as a result of the recent sharp declines in commodity prices which remain low in comparison to the levels prevailing prior to the Global Financial Crisis, and also due to the depreciation of local currencies.

In a context of greater indebtedness, falls in the prices of commodities affect firms specializing in these products by increasing their financing costs and reducing their ability to meet their obligations. The situation may be compounded yet further if they have contracted external debt obligations secured against the commodity produced and exported. Higher costs and lower revenues reduce profitability, and when combined with a deteriorating asset situation this can increase the risk of default. If the response to this situation involves production and investment cutbacks in sectors with large ramifications across the rest of the production fabric, harmful macroeconomic consequences may ensue.

Like commodity price changes, the depreciation of local currencies can affect firms' financial situation. Depreciation not only raises debt service costs, and thence outgoings, but also swells liabilities by increasing the local-currency value of outstanding debt. If the collateral for the debt is likewise denominated in local currency, depreciation will also cause this asset to lose value. This can give rise to a mismatch such that the firm has to purchase currency to balance its accounts. Depending on its size and importance in the market and the number of firms behaving in this way, currency purchases can create further pressure for devaluation of the nominal exchange rate, ultimately increasing the external debt of the firms operating in the non-tradable goods sector.

Fourth, the importance of the international bond market has added an additional layer of complexity to the financial system in terms of institutions, behavior and the transition mechanism from the financial to the real economy. This is related to the nature of the financial industry and activity underpinning the bond market, the asset management industry.

Asset management is an agency activity which consists in managing assets on behalf of institutional or retail end-investors. This contrasts with commercial banks which act as principals. As an agency activity clients rather than the asset manager bears responsibility for losses and gains. Banks accept deposits with a liability of redemption at par (OFR, 2013).

Yet asset manager activities are increasingly inter-wined with those of the rest of the financial system. As put by OFR: "...some types of asset management activities are similar to those provided by banks and other nonbank financial companies, and increasingly cut across the financial system in a variety of ways. For example, asset managers may create funds that can be



close substitutes for the money-like liabilities created by banks; they engage in various forms of liquidity transformation...and they provide liquidity to clients and to financial markets.”

The investment vehicles of the industry include mutual funds, exchange-traded funds, money market funds, private equity funds and their management companies (IMF, 2015). Assets under management are roughly estimated at more than US\$ 90 trillion dollars which surpasses world GDP (roughly US\$ 78 trillion) and represents more than 30% of total global assets.

The asset management industry poses a number of important risks to financial stability. These can be classified in three broad areas: concentration and interconnectedness, illiquidity, and pro-cyclicality.

The asset management industry is as concentrated as that of the global banks. Data available for 2012 show that, the top 10 companies have roughly US\$ 20 trillion assets under management. By comparison for the same year the assets of the top 10 global banks are estimated at US\$ 25 trillion (Haldane, 2014). Note however that the asset management industry is not disconnected from the global banking industry. Indeed some of the major global banks are also the most important asset management firms.<sup>9</sup>

The illiquidity risk is reflected in the growth of alternative as opposed to traditional investments on the asset side of asset management firms. Alternative investments include hedge funds, real estate, infrastructure but also commodity funds which are important for developing economies including those of Latin America. Alternative investments represented US\$3.2 trillion in 2005 and US\$ 7.2 trillion in 2013 (8% and 12% of global assets under management). More importantly alternative investments represent 25% of the asset management revenues. It is expected that by 2020, this share will rise to 40% of the total (Baghai et al. 2015). Similarly specialized mutual funds (including high yield bond and emerging market funds) have witnessed significant growth since 2008 (40% annually which is above that experienced by the global mutual fund industry) (Haldane, 2014). The increasing importance of alternative investment in total assets and as a generator of revenue reflects in part greater appetite for risk and search for yield.

Pro cyclicality occurs both at the investor and at the fund manager end levels. Investors tend to rely on evaluation strategies (such as relative return benchmarking and index tracking) in order to ensure that managers act on the interest of the investor (Rajan 2005). Also fund managers salaries can be linked to benchmarking and tracking performance (IMF, 2015).

These are incentives to accentuate pro cyclicality. Indeed these can lead to excessive risk taking; to investors readjusting the composition of their portfolios according to the relative

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<sup>9</sup> The major asset manager firms include, Blackrock, Alliance, Vanguard, State Street, Fidelity, AXA, JP Morgan Chase, Bank of New York Mellon, BNP Paribas, Deutsche Bank. JP Morgan Chase, Bank of New York Mellon, BNP Paribas, Deutsche Bank are also some of the major global banks.

performance of a given fund; and to portfolio managers mimicking the behavior of their peers.<sup>10</sup> Unrestricted redemption rights or even restricted redemption rights provide an additional source of pro cyclicality.

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<sup>10</sup> According to estimations by the IMF (2015, p. 108) for U.S.-domiciled “70 percent of the variance of funds’ flows into assets is attributable to manager’s decisions, with the remaining 30 percent attributable to end investors.”

## Conclusion

QE policies are of monetarist inspiration. Ben Bernanke, following Milton Friedman and of whom he was a student, was convinced that the Great Depression was caused by monetary forces. More specifically, he held on to the monetarist view that the key factor that converted the 1930s recession into a depression was a sharp contraction in the money base. As a result, in order to avoid a repetition of the same event in 2008 following the collapse of Lehman Brothers and to boost aggregate demand and growth, the Federal Reserve expanded the monetary base and relaxed the terms on which it made credit available to the economic system.

In contrast to this view, heterodox economists such as Minsky, view lender-of-last resort interventions as contributing to the instability that characterizes capitalist economies. Minsky argued that while lender-of-last resort interventions (jointly with government deficits) are necessary to abort a severe crisis, these lead to inflation (Minsky, 1986).

But he also argued that the development and lender-of-last resort intervention lead to the acceptance of new ways of financing activity that can be a part of the disruptive elements of the subsequent boom.

This paper follows and expands this latter line of thought. More specifically it argues that lender-of-last resort interventions, such as QE, led to significant changes in the financial system and at the same time it reinforced the old ways of financing economic activity. These are the channels through which QE has contributed to sow the seed of future instability.

On the one hand, QE promotes the accumulation of reserves which disconnects base money from the money supply and deposits from loans. Jointly with the deleveraging process of global banks, quantitative easing contributed to a large extent to restrain the supply of bank credit growth throughout the world. However, this did not deter some of the global banks to continue to expand their trading based on opaque instruments such as derivatives.

On the other hand, by altering the relative profitability of investing in different assets, QE had a positive effect on the performance of the international bond market. This not only spilled into emerging market economies expanding the debt of both the financial sector and the non-financial corporate sector but also has reinforced the role of the asset management industry in financial markets. Due to its concentration and interconnectedness, illiquidity, and procyclicality the asset management industry poses important risks to financial stability. It also presents an important challenge for financial regulation.

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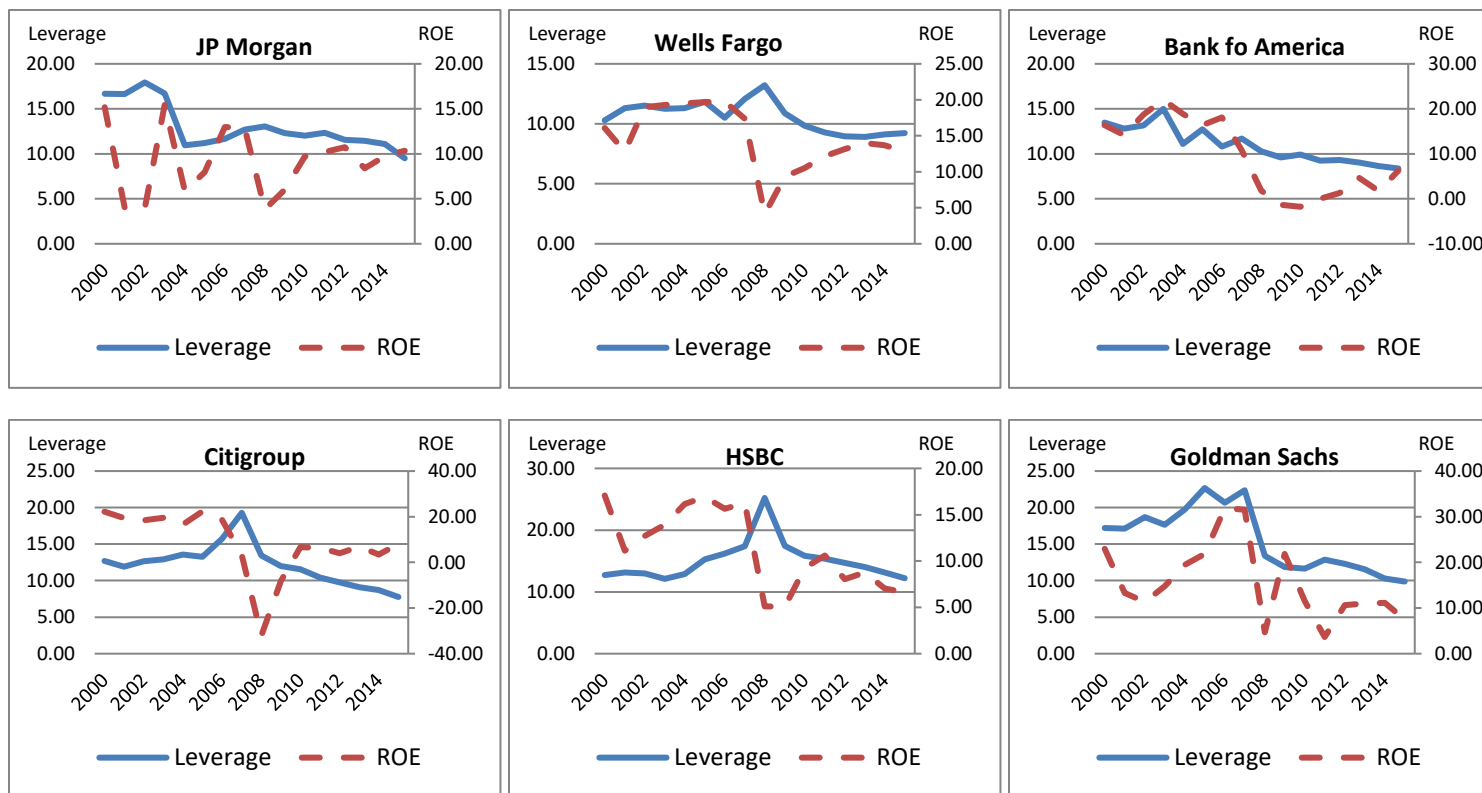
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## Annex

Figure A1 : Leverage and ROE for Global Banks in the United States (2000-2015)<sup>11</sup>



<sup>11</sup> The source for all the figures is Bloomberg (2016)

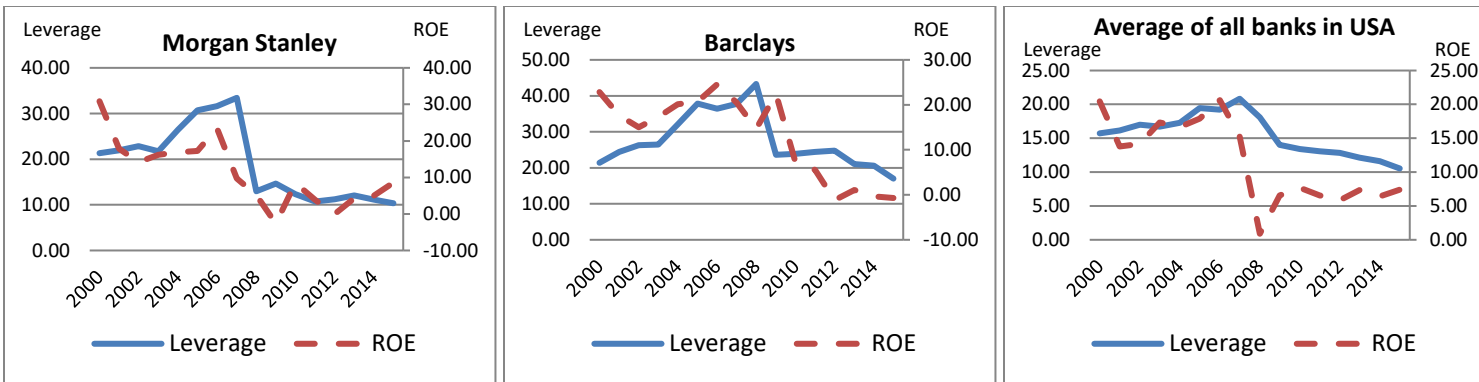
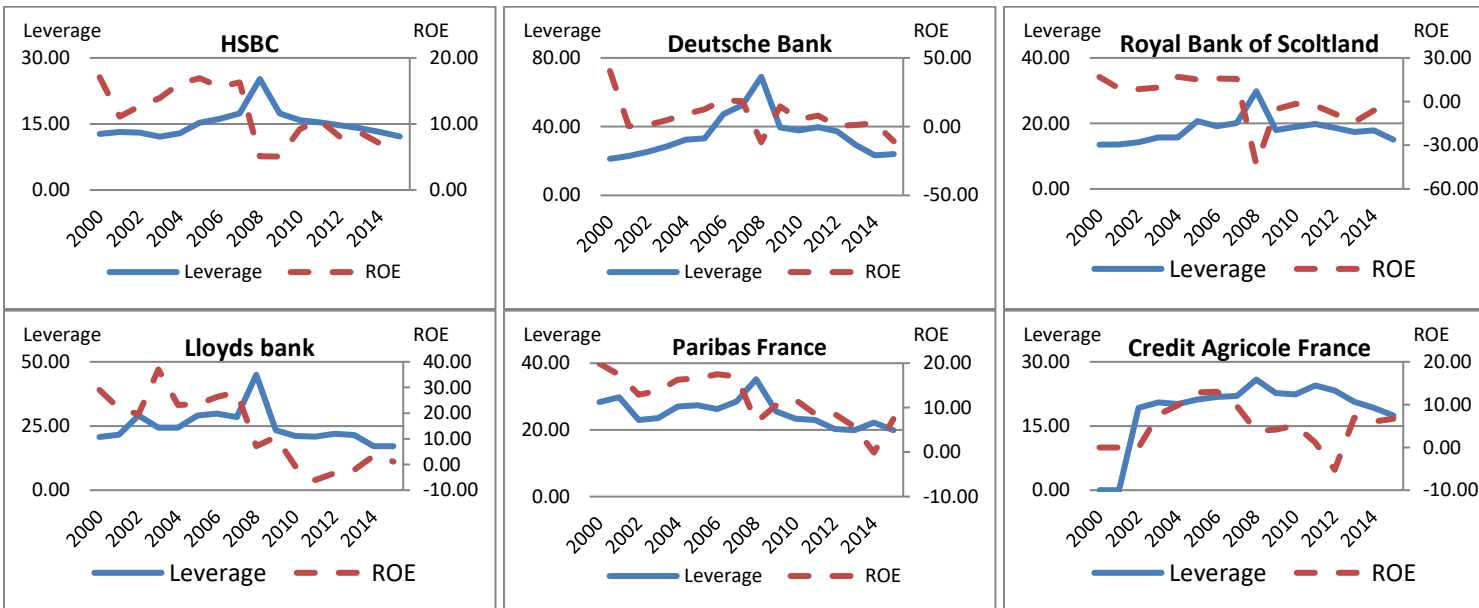
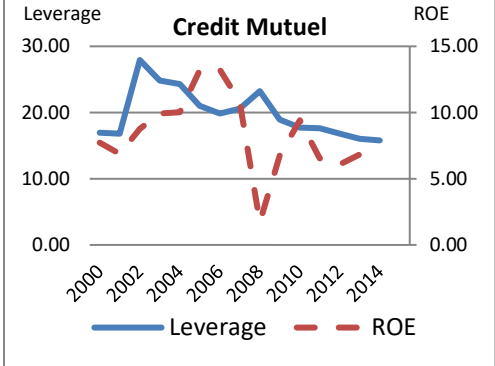
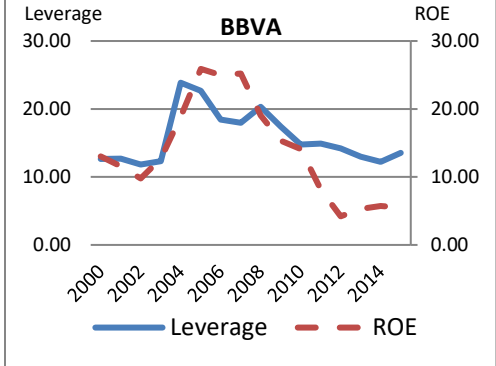
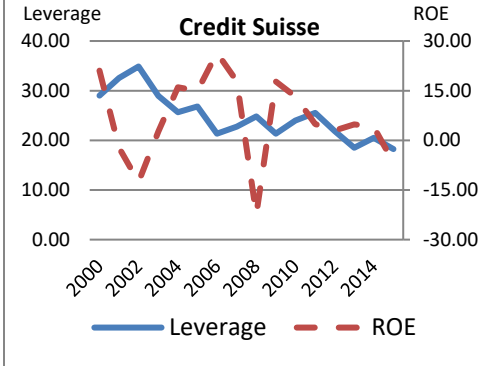
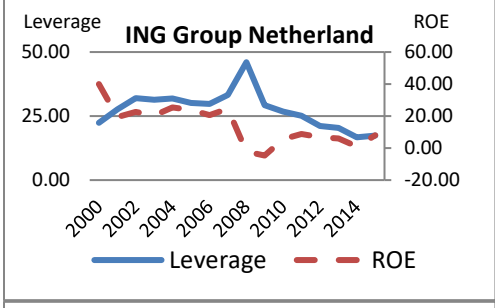
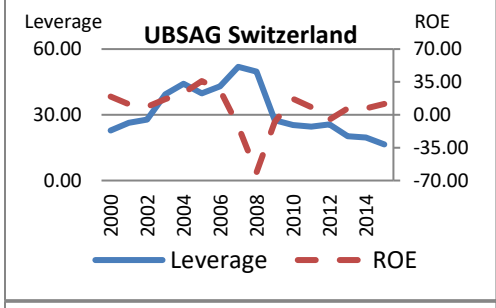
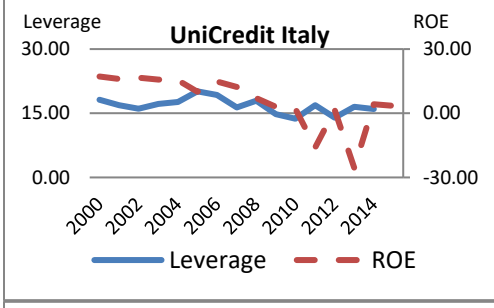
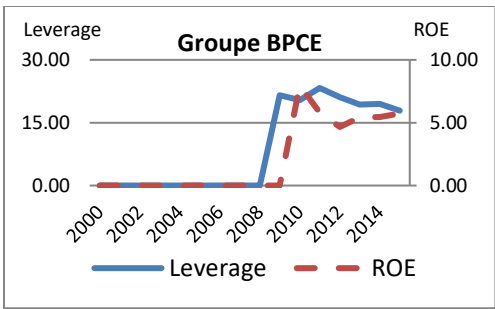
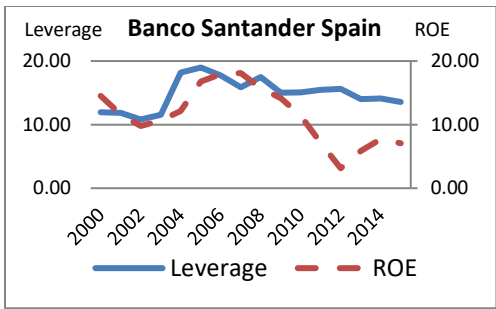
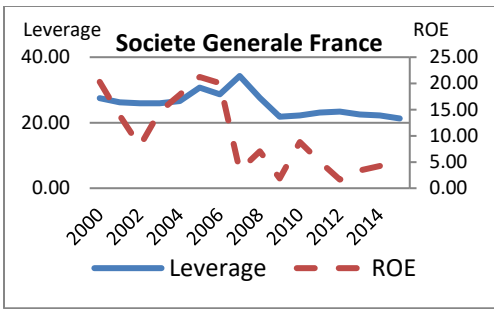


Figure A2: Leverage and ROE for Global Banks in the Euro Zone (2000-2015)







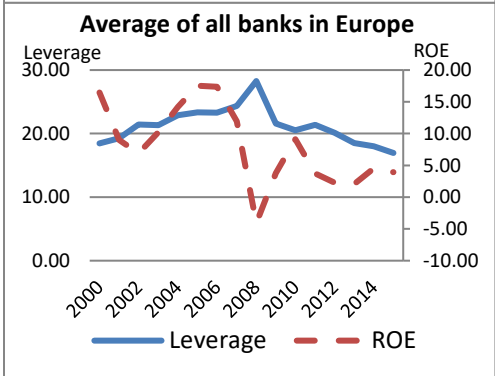
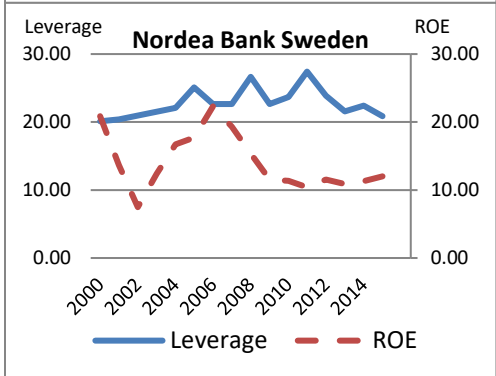
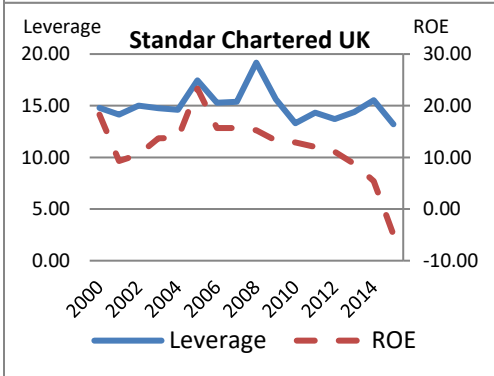
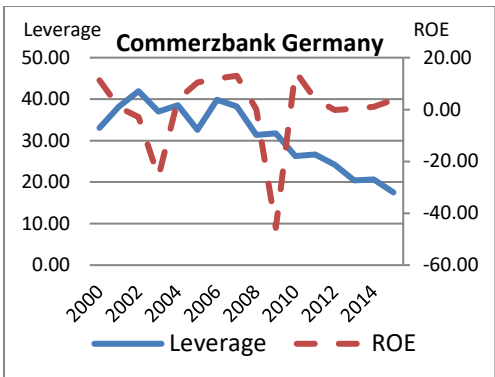
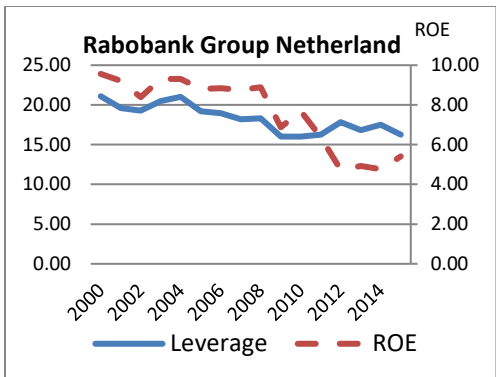
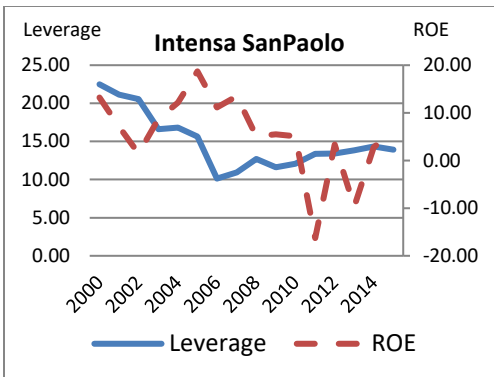


Figure A3: Leverage and ROE for Global Banks in Asia (2000-2015)

