



# A story of global financial deepening

Lubomíra Gertler

*Size of banks' balance sheets has been globally on the rise. This contribution attempts to inspect the underlying reasons and changes in size and concentration. Decomposition of total assets to GDP ratio of the top global financial institutions is used to portray the scale of excessive asset growth across different periods and balance sheets sizes.*

It is hard to believe that the colloquial term "too big to fail" has not been with us forever. In fact, it only gradually entered into the financial vocabulary in mid-1980's and became more frequently used in 1990's after liberalization of banking industry both in the U.S. and Europe. The context of the term became apparent following a series of domestic and cross-border bank mergers, increasing popularity of financial innovations in the industry and explosion of international linkages, all leading to a dramatic pick up in banks' balance sheets; horizontal holdings being substantial part of it. Thus, number of financial institutions became systemically important.

Before the onset of financial crisis, financial deepening has been predominantly viewed as a natural phenomenon in the context of economic development and a precondition of dynamic economic growth. The link from open capital accounts to greater increase in financial depth and economic growth has been prevailing in economic literature already from late 1990's (e.g. see Klein and Olivei, 1999). Reasons were obvious and findings robust.

Free capital mobility provided better opportunities for higher return on savings, or to borrow at more favourable conditions. Exposure to more competition both domestic and international forced credit institutions to adopt modern international standards and therefore improving financial system efficiency. Backed by dynamic technological development, banks were able to exploit newly introduced financial innovations on a much broader scope of financial services (including investment activities). Increasing leverage and size of the banks' balance sheets allowed for more frequent mergers and acquisitions, which made the net winners of this process to enjoy extra economies of scale. These improvements in efficiency increased capacity to generate new domestic savings and to promote further capital inflows. No doubt that all these gains to financial intermediation had positive effect on economic activity.

On top, by providing financial products and services, financial markets allow for intertemporal allocation of savings and investments. It is therefore no surprise that this market was experiencing dynamic upswing in the environment of low real

interest rates, increasing investment activity and rapid development of new markets.

However, increasing leverage in combination with intensive trade of financial instruments both domestically and internationally gradually turned the context of banking deregulation from drivers of economic growth to risks of exposure and contagion when turbulences in summer 2007 emerged. In this period (often referred to as peak of economic activity before the current crisis), some financial institution turned out to hold assets of higher volume than their host countries GDP, while high leverage was making them vulnerable to unforeseen events. In the same time, financial investments parked often in non-transparent financial products and portfolios raised worries of contagion.

Sudden turn in risk assessment has raised several questions. Has financial deepening been excessive? How did the structure of banks' balance sheets change in the course of this process? What were its dynamics and drivers in different countries? This article attempts to bring some insight into this area based on individual banks' balance sheets information across Europe and the U.S.

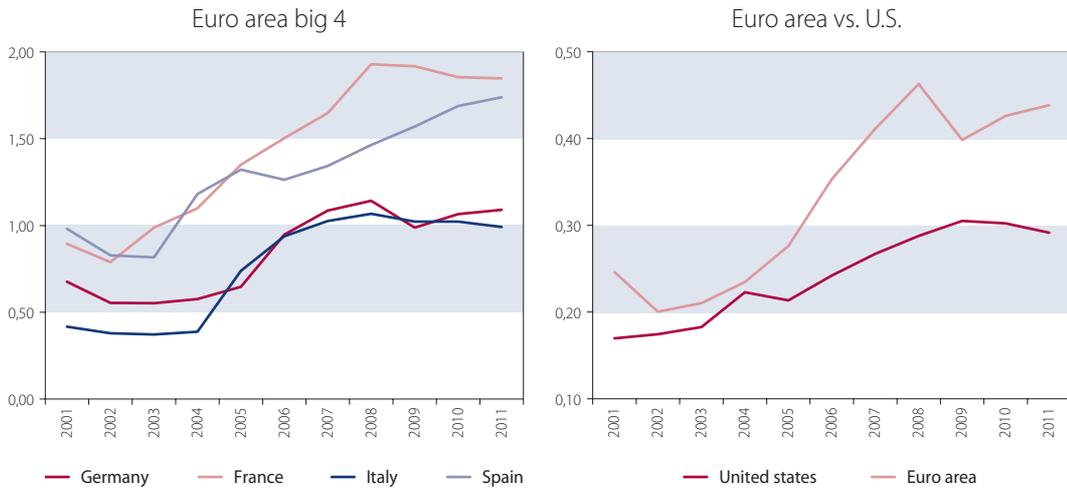
In the first section we discuss developments of financial deepening throughout time, look to excessive gains in assets of individual banks and compare the expansion of balance sheets both on individual bank level as well as on the aggregated level in the euro area and the U.S. Observing top largest banks we briefly touch upon signs of concentration of so called systematically important institutions. In the second section we engage in a simple decomposition analysis of the assets to GDP ratio to see which factors and in what extent have contributed to the financial deepening before and after the crisis.

## 1. FINANCIAL DEEPENING ACROSS TIME

Living through the current financial crisis we have learned a lesson that financial deepening indeed drives the economic growth, but benefits are not unconditional. Risks of too much finance started to materialise mainly through the concentration of banks assets. Increasing frequency of mergers and acquisitions and free cross-border activities in the banking sector in the last decade gave rise



Figure 1 Two largest banks as a share of a host country GDP



Source: Bloomberg and Eurostat.

Note: Sum of two largest banks' assets as a share of GDP in relevant countries is expressed on the vertical axis.

to financial institutions growing often close to the size of their host economies. Looking at the largest Europe based banks<sup>1</sup>, there were just 6 financial institutions with total assets exceeding 50% of their host economies in the EU, while this number has risen to 18 in 2011 (six of them exceeded the size of their host economy in 2011).

Concentration has been clearly on the increase across different countries, which may also be documented by the share of two largest banks total assets on GDP of its host countries. Within the last 10 years the ratio doubled across the board. In Italy and France, the two largest banking groups' assets account to about 180% of GDP (Figure 1).<sup>2</sup>

Ever again it pays benefits if euro area could have been considered as a single economy. If bank assets concentration is recomputed to euro

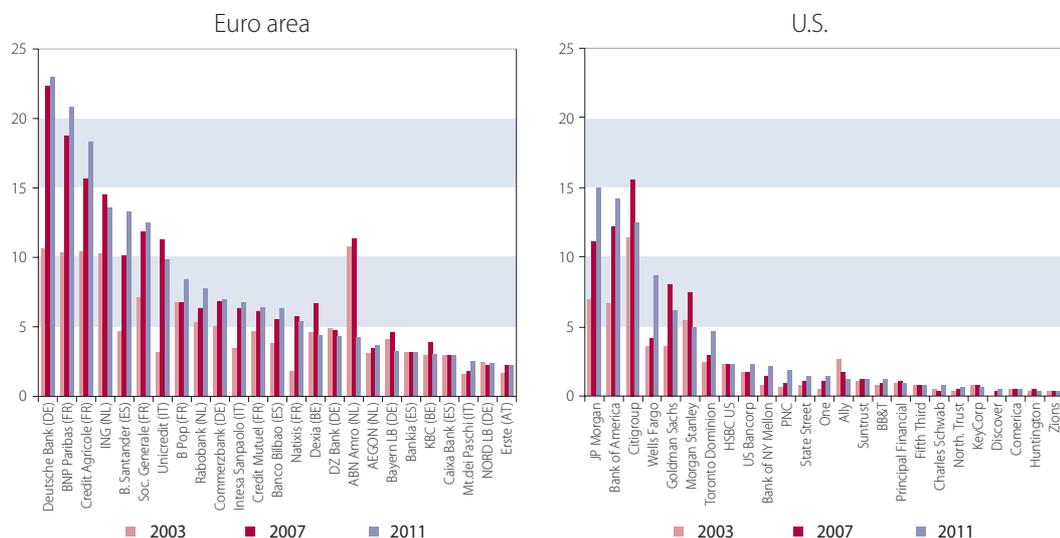
area economy, the share of the two largest banks collapses to less than 50% of GDP. This approach is however questionable, since government policies, crisis resolution mechanisms are still not completed, robust and efficient on the euro area level as it is the case in the U.S. If we however abstract from this and embark on this comparison, the two largest banks' assets concentration in Europe is still somewhat higher than in the U.S. (Figure 1).

Looking at the individual banks balance sheet history, one can learn that this is not only the case of top two institutions as sketched above, but the case runs much more structural. A large increase in concentration was mainly driven by already large financial institutions and may well be seen on the snapshots of individual banks' ba-

<sup>1</sup> Swiss banks are excluded from this count. However, the two largest Swiss based banks (UBS and Credit Suisse) have each been exceeding the size of Swiss economy by large margin already many years ago. Currently (to the end of 2011), combined total assets of these two institution account for 420% of Swiss GDP.

<sup>2</sup> The two largest banks in Slovakia possess total assets of about 30% of GDP. Despite quick convergence of Slovak economy before the crisis, this ratio remained remarkably stable across time.

Figure 2 Share of total assets to GDP across 25 top banks in euro area and the U.S.

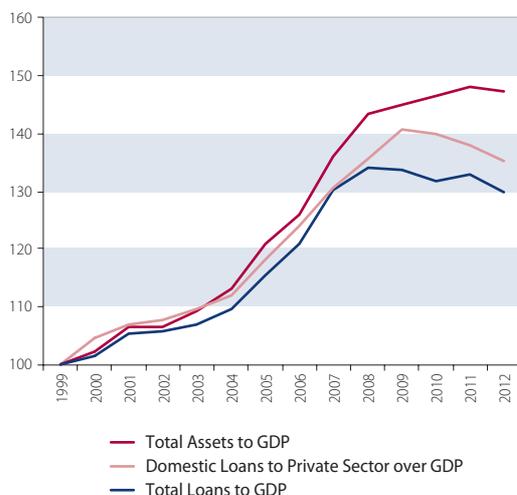


Source: Own calculation based on Bloomberg and Eurostat.

Note: Values are expressed in percentage points of GDP and ordered by size in descending order in 2011.



**Figure 3 Financial institutions share of total assets and loans to GDP in euro area**



Source: Own calculation based on Bloomberg and ECB.  
 Note: Shown in percentage points of GDP. Ratios are normalized to 100 in 1999.

lived. Mostly traditional banking of European entities (with few noticeable exceptions) makes deleveraging process often lengthy and loan portfolios being captured by consequences of economic slowdown.

Figure 3 documents that loans have been the prominent driver of bank balance sheets expansion in Europe. As all figures up till now suggest, the main upward shift occurred between the years 2003 and 2007/2008. In absolute values total assets to GDP of banking sector increased by 64 percentage point of euro area GDP, while total loans by 40 percentage points of GDP, roughly the same as deposits. It must be said however, that notable exceptions apply due to differentiated asset structure of individual banks.<sup>7</sup> The rest of the expansion on both sides of the aggregated consolidated euro area balance sheets (7% of total assets) can be in average equally attributed to other assets and remaining liabilities, i.e. predominantly financial instruments traded or held for investment purposes.

As may be seen on Figure 4, expansion of the U.S. balance sheets was not primarily driven by loans, but mostly by other factors. The top 5 financial institutions by assets grew by 17 percentage points of GDP between 2003 and 2007, while loans in the same group grew only by five. It came only in the later stage that green and/or infrastructure projects within economic stimulus package launched by the U.S. government in 2009 were channelled through the top institutions, making loans to GDP ratio of these top five bubbling up to 40% – even much higher than in Europe. However, they likely remained in the game due to their dramatic asset expansion before the crisis, while becoming systemically important and so central to emergency operations by Federal reserves at the peak of the financial crisis.

Irrespective to drivers, quick expansion in balance sheets accompanied by increasing leverage became the source of vulnerability of banking sector in times of crisis. Any uncertainties about financing ability of financial institutions originating either from their internal asset structure and transparency or the economy of operation had an impact and could contain portfolios of its business partners and/or trigger deposit withdrawals. Adverse shocks to a major bank could be transmitted across the financial system quicker and in greater extent, since fast growing banks usually grew quicker than its capital base.

Fast growing large banking groups became systemically important. Such institutions have also been officially labelled so – as so called “systemically important financial institutions” (SIFIs). Status of SIFI is being attributed to certain institutions and annually updated by Financial Stability Board (FSB). As argued earlier, the list closely coincides with ranking by total assets as it is portrayed in figure 2.<sup>8</sup> Even though no official definition has been settled, one could go for one to the speech of P. Praet<sup>9</sup> given at the Financial Regulation Conference in 2011, calling SIFIs institutions, “whose

lance sheet size portrayed in Figure 2. It shows a large build-up of balance sheets size relative to GDP between 2003 and 2007 (and in some specific cases also between 2007 and 2011) predominantly in top 15 European banks. In the U.S. this is the case on significantly lower scale, although some of the banks within top 10 also almost doubled its relative size within 8 years of observations.

Relative size of balance sheets in the U.S. banking sector is visibly lower. This has much to do with the fact that share of loans to total assets is smaller in the U.S. than in the euro area.<sup>3</sup> This is traditionally so, because private sector in Europe is funded largely via banks, while funding of non-financial corporations in the U.S. comes mostly from the securities market<sup>4</sup> and also more than half of all household financing comes from private asset backed securities issuers and/or mortgage pools backed by government sponsored enterprises and agencies<sup>5</sup>. This market based share increased even more after the onset of the crisis. After accounting for this diversification of funding in the U.S., total credit to GDP in the U.S. by far outweighs the one in the euro area<sup>6</sup>. The bottom-line is that traditional banking in Europe (i.e. banks being the main source of private sector funding) combined with credit boom of the last decade made large European financial institutions to expand their balance sheets mostly on the grounds of credit. On the other hand, expansion of the U.S. balance sheets has been fuelled mostly by other factors, mainly related to marketed debt instruments (so called hybrid banking).

Since debt markets are capable of flexible price adjustments, deleveraging of expanded balance sheets have capacity to contract faster than those with more intensive share of loans. More reliance on debt markets makes volatility usually painful in short term, but if managed through, then short-

3 According to flow of funds (published by Federal Reserve Board) and ECB Balance Sheet Items share of loans in total assets of financial institutions was 63% in the euro area and only 40% in the U.S. at the end of 2011.

4 See more in ECB Monthly Bulletin, October 2010, p.62.

5 See more in ECB Monthly Bulletin, April 2009, p.77.

6 According to the World Development Indicators database, domestic credit to private sector in the U.S. was 193% of GDP while only 132% in the euro area in 2011. Loans to private sector from banks (mortgages, consumer credit and other loans and advances) however amount only to 104% of GDP in the U.S., the rest (some 88% of GDP) relates to other credit market instruments related financing.

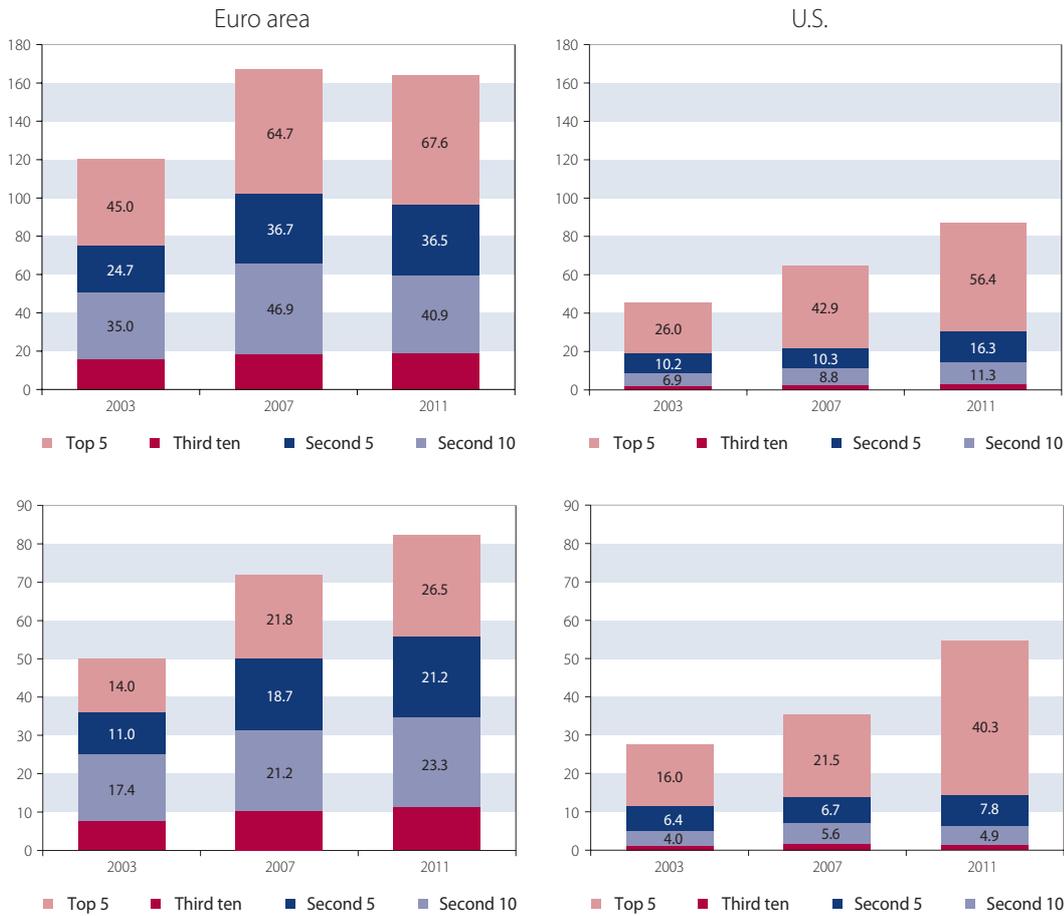
7 E.g. Deutsche bank, despite experiencing the largest expansion of balance sheets across all observed banks, loans did not expand as quickly since main focus of the bank is with investment activities.

8 Ten euro area based and eight U.S. based banks are currently on the list. In the context of the figure 2 (i.e. bank ranking by total assets as of 2011), nine out of ten euro area based SIFIs belong to the top ten group, and seven out of eight in the U.S.

9 Currently member of the ECB Executive Board, that time Basel Committee Member and Executive Director in National Bank of Belgium.



Figure 4 Top banks ratios to GDP (total assets – top, total loans – bottom)



Source: Own calculation based on Bloomberg and Eurostat.  
 Note: Values are expressed in percentage points of GDP. Each block represents an aggregate of banks assets (loans) in a certain size bracket.

disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity".

In general, a bank decision about the size of its balance sheets is driven by its perception of risk, which is given by expected disturbances to the economy and expectations about government policies. In other words, precedence of being "too big to fail" would impair the prudence in this respect and would retain profit attainment the primary goal while playing down the risks originating from excessive exposure.<sup>10</sup>

There have been attempts to assess negative effects of too much finance already much earlier. Already on the brink of the last decade Easterly et al.<sup>11</sup> found that if financial depth exceeds certain threshold, it materialises in higher volatility of output if. However, higher volatility does not necessarily mean worse economic development, just more dynamics across time. The consequence of this finding has to be revisited in the perspective of current economic environment where both financial systems and extremely open economies are very much cross-border dependent and any volatility is being transmitted in stronger and qu-

icker manner. More specific evidence of negative relationship between financial depth and economic growth when financial depth exceeds certain threshold (close to 100%) is also documented in the recent study by Arcand et al. (2011). Such evidence would suggest presence of a bell curve shape and therefore at some point also existence of an optimum financial depth. Thus in the ideal world, once a country achieves certain (optimum) level of development of its banking sector, it would require having capacity to grow just within the means of its output rather than being engaged in too much finance. Such development is however yet in uncharted waters of observed economic data.

## 2. DECOMPOSITION OF FINANCIAL DEEPENING

Up until now, all measures used above were normalised to the level of nominal GDP and showing how much excess growth financial institutions absorbed over certain time. However, it is difficult to assess if this is too much or too little when no benchmark is available. Economic research in financial deepening is suggesting that financial depth has macroeconomic consequences. For in-

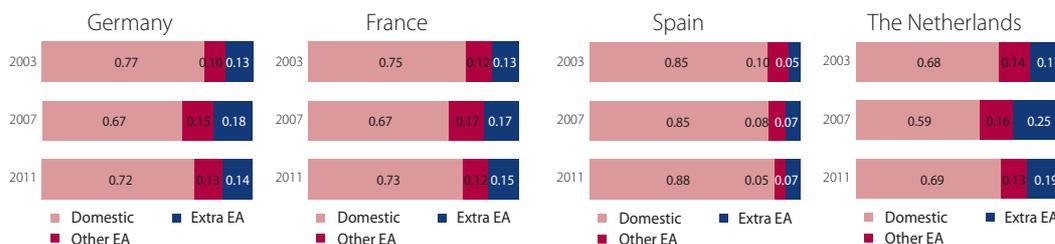
<sup>10</sup> Recently, academics have already embarked on modelling these processes. One of the most recent general equilibrium models in this field (by Gertler, Kiyotaki and Queralto, 2011) does consider riskiness of banks' balance sheet structure endogenous, where reduction of incentive to take risk is going through benefits from credit policies that stabilize financial markets. However, riskiness takes structural context here and addresses liabilities side of balance sheets in the form of incentive to issue short term securities.

<sup>11</sup> Easterly, Islam, and Stiglitz (2001) find that a convex and non-monotone relationship between financial depth and the volatility of output growth starts increasing when credit to the private sector reaches 100% of GDP.





Figure 5 Weights according to asset holdings



Source: ECB Balance Sheet Items statistics.

12 The former is certainly true for ING (NL), Dexia (BE) or Unicredit (IT) which expanded their activities to number of converging economies in Europe. The latter is true e.g. for Spanish big banks, which sourced predominantly a boom of their own economy. Conversely, Deutsche Bank had expanded their activities mostly to Asia and the U.S. rather than fast growing economies in Europe.

13 MFI stands for Monetary and Financial Institutions, a notion used in the euro area balance sheets items statistics.

stance, Khan (2001) finds links of financial deepening and inflation, and as discussed earlier, Klein and Olivei (1999) find positive effects of financial depth for economic growth. Unfortunately, financial statements are available only with little history, which is not sufficient to shed light into these relationships using time series dimension. However, we can show how individual components of financial deepening contributed to the process before and after the crisis.

The analysis aims to separate three components of asset to GDP ratio (and credit to GDP ratio): (i) real GDP growth, (ii) inflation and (iii) nominal asset (credit) growth. By doing so, one is able to identify how excess asset expansion or excess credit growth compares to the assumed strong underlying output growth and increases in prices.

It is up to consideration which country output growth and prices are relevant for specific bank operations (host country output and prices or euro area wide output and prices). On one hand we have argued that banks are becoming ever more active cross-border and hence it would be appropriate to consider euro area wide economic growth. Existence of single market and one monetary policy plays in favour of this argument, since some top banks in core countries were clearly reaping benefits of fast converging economies in the peripheries and earning significant amounts of profits in businesses beyond their host countries (in their daughter institutions, or expatriate subsidiaries or branches). On the other hand, many largest banking groups have been focusing only on their home market within the euro area, or/and rather having activities in another continent.<sup>12</sup>

To account for this variability of banks' activity, macroeconomic variables are weighted according to the geographic area, in which counterparty holders of MFI<sup>13</sup> assets are located. More specifically, we inspect holdings of loans, securities and shares other than equity booked by financial institutions according to geographic domicile of their holders. For the share of domestic holdings, domestic economy macro-variables are used, for the share of holdings in other euro area countries, euro area less domestic economy aggregate is used and for the share of holdings outside the euro area, the aggregate of remaining 10 EU countries is used.

The share of holdings is not constant in time; therefore appropriate annual weights are attributed throughout time. For illustration, almost 90% of all Italian MFI assets are held domestically, while in case of Belgium this share ranged between 35 and 55% throughout the last decade. These two opposite cases are also the examples of the most constant share and the most variable one. Figure 5 shows the weights used in the four economies, which are domicile to the 5 top banks by total assets. These weights are then used to model an approximation of economic environment where the banks are operating. Different markets achieve different performance, therefore, such mixture attempts to approximate opportunities stemming from different geographic scope of activities.

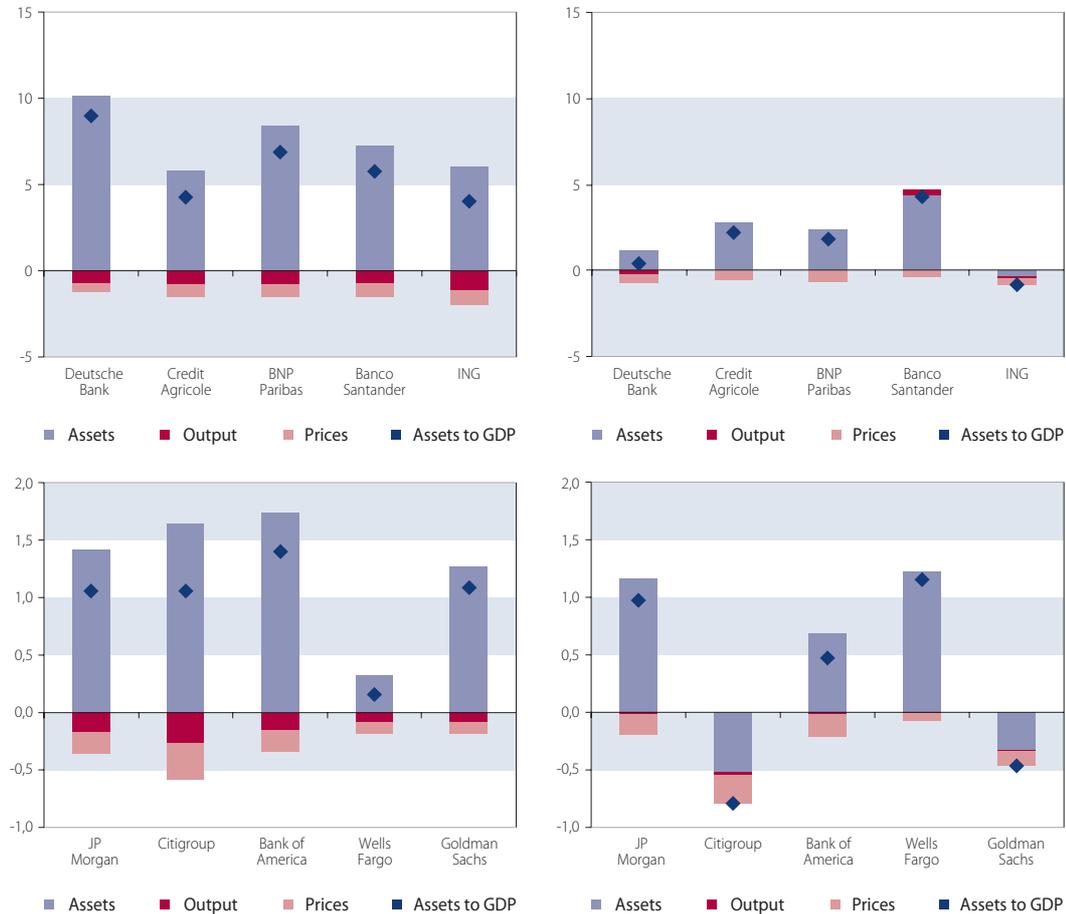
Similarly as in section 1, the aim is to capture the two different stages of development. The first is a period of economic boom between 2003 and 2007. The second period is the one from 2007 to 2011, starting with initial market turbulences and following with a period of financial and economic crisis. Again, euro area and U.S. top five banks according to total assets are scrutinized. In the previous section, it was shown that top five banks expanded their balance with unprecedented dynamics; in aggregate by more than 20 percentage points of GDP in the euro area and slightly less than 20 in the United States. Normalized ratio to GDP provides consistent and well comparative measure, however fails to show how the dynamics of underlying economic boom actually compares with the size of nominal balance sheet expansion. By decomposing the ratio of total assets to GDP it is possible to see a contribution of real GDP growth, price developments and assets expansion itself to this ratio. Figure 6 shows such decomposition of the top 5 banks (as they also appeared in the figure 2 and 4) in the euro area and the United States.

Despite strong economic upswings between 2003 and 2007; ranging from annual average of 2.5% in euro area to 3.5% in euro area peripheries (in average) and also in non-euro area EU countries, this growth was completely dwarfed by the expansion of assets. In fact, output growth together with inflation (being in denominator of the ratio) were together responsible only for 1/10<sup>th</sup> to 1/5<sup>th</sup> of financial deepening in the euro area and for 1/5<sup>th</sup> to 1/3<sup>rd</sup> in the U.S. top 5 banks.



**Figure 6 Decomposition of total assets to GDP**

Upper charts refer to the euro area and bottom charts to the U.S., left panels refer to annual change between 2003 and 2007 and right panels refer to annual change between 2007 and 2011. Contributions are in percentage points of GDP. GDP used is that of a weighted geographic area of banks' activity in case of the euro area and that of the U.S. for the United States.



Source: Own calculation based on Bloomberg, Eurostat and ECB.  
 Note: Blue striped bars refer to annual average growth in nominal assets in percentage points of GDP. Dark red bars refer to (negative) contribution of real GDP to growth in asset to GDP ratio. The same applies to red bars referring to inflation.<sup>14</sup>

14 Due to the fact that asset to bank host country GDP ratio is far larger in the euro area than in the U.S., also the contributions are higher by order of magnitude. A chart would read e.g. average annual negative contribution of real GDP to increase in asset to GDP ratio of BNP Paribas is 0.8 percentage points. In other words, average annual financial deepening of 6.9 percentage points contributed by BNP Paribas was being triggered by 8.4 percentage points average annual growth of total assets and held back by real GDP growth by 0.8 percentage points and similarly by inflation.

In the pre-crisis years, the largest euro area banks were adding 5-10 percentage points per year of their relative host country GDP – constituting an unprecedented financial deepening. Figure 6 also documents that any prior claiming that further expansion of assets after the onset of the financial crisis is due to contraction in GDP is false.

Figure 7 provides better comparison between the scale of expansion in the euro area and U.S. (if put into comparison with bottom charts of figure 6) by expressing the ratio of total assets to euro area GDP and reflecting decomposition as having a fully-fledged single market. This representation is however correct only if taking granted existence of now being created Single Supervisory Mechanism. If this is not the case, vulnerability coming from excessively leveraged and undercapitalised financial institutions is predominantly in competence of national authorities.

Comparing the euro area with the U.S. it is apparent that financial deepening contributed by top 5 financial institutions was substantial and

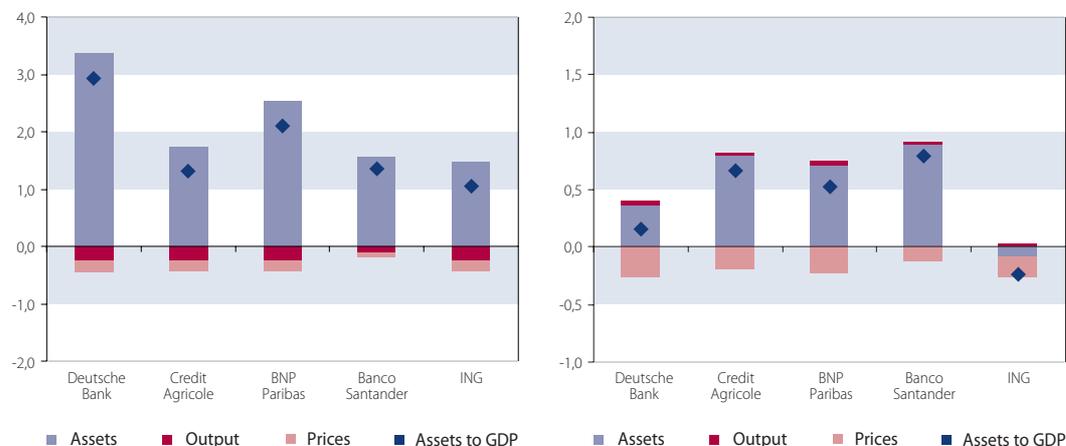
broadly similar in the pre-crisis period, however the crisis period delivers a different story. While some asset reduction (driven by deleveraging) may be seen between 2007 and 2011 in the U.S. financial sector (and this is the case also for several other large banks in top 20, not shown), this is very seldom the case in the euro area. It may also be concluded that neither output nor inflation contribute significantly to the balance sheets dynamics, but nominal asset growth itself.

### 3 CONCLUSIONS

Banks balance sheets have lived through a rapid expansion before the crisis, which had been to some extent validated by financial deepening on the background of technical innovations, liberalized market and environment of perceived stability. The most extreme cases could be observed among the largest European banks each adding to size of their balance sheets 5-10 percentage points of euro area GDP per year. However, also U.S. banks were not so far behind the curve. This

**Figure 7 Decomposition of total assets to GDP**

Annual contributions during the crisis, top 5 banks in the euro area on the left, top 5 banks in the U.S. on the right. Contributions are in percentage points of euro area GDP.



Source: Own calculation based on Bloomberg, Eurostat and ECB.

Note: Blue striped bars refer to annual average growth in nominal assets in percentage points of GDP. Dark red bars refer to (negative) contribution of real GDP to growth in asset to GDP ratio. The same applies to red bars referring to inflation.

Literature sources:

1. Arcand J.L., Berkes, E. and Panizza, U. (2012): Too Much Finance? *IMF Working Papers 12/161*, International Monetary Fund.
2. Easterly, W., Roumeen I., and Stiglitz J.E. (2001): Shaken and Stirred: Explaining Growth Volatility In B. Pleskovic and N. Stern, eds., *Annual World Bank Conference on Development Economics*.
3. Gertler, M., N. Kiyotaki, and A. Queralto (2011): Financial crises, bank risk exposure and government financial policy. New York University. mimeo
4. Khan M.S., Senhadji, A.S. and Smith B.D (2001): Inflation and financial depth, *IMF Working paper, WP/01/44*.
5. Klein M. and Olivei G. (1999): Capital Account Liberalization, Financial Depth, and Economic Growth, *NBER Working Paper 7384*.

development in Europe was unlike in the U.S. mainly driven by rapid extension of credit, however exceptions here apply since individual banks asset structure varies widely.

Since many authors link financial deepening to economic growth and/or inflation, we have looked into its composition. We have found that macroeconomic components in financial deepening constitute only minor part and it is far from uniform across the size brackets of banking groups. Larger banking groups were likely to experience higher multiples of asset growth relative to macroeconomic effect of their relevant economic environment. In case of top 5 banking groups, underlying expansion of balance sheets was 5 to 10

times stronger than absorption by macroeconomic environment, leading to quick uptake of financial deepening.

Given that balance sheet expansion occurred extensively in top sized banks, we were following their case further. Further build-up of assets has been observed even after the onset of financial crisis, although by much lesser extent, and in the environment of zero output growth and low inflation and in different liquidity conditions. Data also show significantly more differentiation in the size of balance sheets in the top U.S. banks during the crisis years. This is likely to be related to lower share of loans in their portfolios and therefore more flexible arrangements.

INFORMÁCIE

Ponuka podujatí Inštitútu bankového vzdelávania NBS, n. o., na február 2013



Názov vzdelávacieho podujatia	Dátum konania
Bank analysis training course	4. 2. 2013
Skúšky sprostredkovateľov – vyšší stupeň	13. 2. 2013
Skúšky sprostredkovateľov – stredný stupeň	20. 2. 2013