

R O M E

Research On Money in the Economy

No. 15-02 – April 2015

Banking Union as a Shock Absorber

Ansgar Belke and Daniel Gros

ROME Discussion Paper Series

"Research on Money in the Economy" (ROME) is a private non-profit-oriented research network of and for economists, who generally are interested in monetary economics and especially are interested in the interdependences between the financial sector and the real economy. Further information is available on www.rome-net.org.

ISSN 1865-7052

Research On Money in the Economy

Discussion Paper Series
ISSN 1865-7052

No 2015-02, April 2015

Banking Union as a Shock Absorber

Ansgar Belke and Daniel Gros

Prof. Dr. Ansgar Belke
University of Duisburg-Essen
Department of Economics
Universitaetsstr. 12
D-45117 Essen
e-mail: ansgar.belke@uni-due.de
and
Institute for the Study of Labor (IZA) Bonn
Schaumburg-Lippe-Str. 5 – 9
D-53113 Bonn

Daniel Gros
Centre for European Policy Studies (CEPS)
1 Place du Congrès
B-1000 Brussels
e-mail: danielg@ceps.eu

Member of the Monetary Expert Panel
in the European Parliament

The discussion paper represents the authors' personal opinions and do not necessarily reflect the views of IZA Bonn.

NOTE: Working papers in the "Research On Money in the Economy" Discussion Paper Series are preliminary materials circulated to stimulate discussion and critical comment. The analysis and conclusions set forth are those of the author(s) and do not indicate concurrence by other members of the research network ROME. Any reproduction, publication and reprint in the form of a different publication, whether printed or produced electronically, in whole or in part, is permitted only with the explicit written authorisation of the author(s). References in publications to ROME Discussion Papers (other than an acknowledgment that the writer has had access to unpublished material) should be cleared with the author(s) to protect the tentative character of these papers. As a general rule, ROME Discussion Papers are not translated and are usually only available in the original language used by the contributor(s).

ROME Discussion Papers are published in PDF format at www.rome-net.org/publications/.

Please direct any enquiries to the current ROME coordinator
Prof. Dr. Albrecht F. Michler,
Heinrich-Heine-University of Duesseldorf, Department of Economics, Universitaetsstr. 1,
Build. 24.31.01.01 (Oeconomicum), D-40225 Duesseldorf, Germany
Tel.: ++49(0)-211-81-15372
Fax: ++49(0)-211-81-15261
E-mail: helpdesk@rome-net.org
michler@uni-duesseldorf.de

Abstract

This study investigates the shock-absorbing properties of a banking union by providing a detailed comparison between the way regional financial shocks have been absorbed at the federal level in the US, but have led to severe regional (national) financial dislocation and tensions in Europe and particularly in the euro area. The institutions of the banking union, which is now emerging in the euro area, should increase its capacity to deal with future regional boom and bust cycles. Cross-border capital flows in the form of equity appear to be much more stable than those taking the form of credit, especially inter-bank credit. It therefore follows that cross-border banks would be useful to deal with regional shocks. But large banks pose the ‘too big to fail’ problem and they would also propagate regional shocks, especially if they originate in large countries, to the entire area. The extent to which the (incomplete) banking union now put in place for the euro area provides some shock absorption is also discussed.

JEL-Classification: E42, E50, F3, G21

Keywords: banking union, currency union, default, shock absorber, two-tier reinsurance system.

Acknowledgments

We gratefully acknowledge comments received by participants at the International Finance and Banking (FIBA) Conference, March 26-27, 2015, Bucharest, Romania, where this paper was presented as a keynote lecture.

Corresponding author

Daniel Gros, PhD, Director Centre for European Policy Studies (CEPS), Brussels,
Email: danielg@ceps.eu

1) Introduction and motivation

The euro area started as a pure 'monetary union'. It is now in the process of also becoming a 'banking union' (BU). The leaders of the EU have argued that even this step is not enough. In September 2012, close to the peak of the euro crisis, a joint report by the four Presidents of the European Union (the Presidents of the European Commission, the European Council, the Euro Group and the European Central Bank), entitled "Genuine Economic and Monetary Union", argued that much more was needed (Belke, 2013, and Begg, 2014). The four Presidents argued in essence that the establishment of a banking union should also be seen as a first step towards further integration. According to their report a fiscal union would be the next logical step. Moreover, a fiscal union was held to imply the need for a political union.

There is surprisingly little analytical support, however, for the claim that a banking union needs to lead to a fiscal union (Belke, 2013, 2013a). The key argument most often heard is simply the observation that the euro area has only a very limited central budget (at least compared with other monetary unions), and that therefore there are almost no fiscal transfers to smooth asymmetric shocks. By contrast, the US, which is of a similar size as the euro area, does have a substantial federal fiscal budget. The US experience is thus usually taken as a model of what is needed for a sustainable monetary union.

This study contributes to this debate by illustrating how the 'banking union' of the US provides a very tangible insurance against local financial shocks, without a major involvement of the 'fiscal union', which undoubtedly also exists in the US.

The transatlantic financial crisis which started in 2007-08 and led to the Great Recession, provides a key episode in assessing the importance of mechanisms to absorb regional shocks. The financial shocks became quickly regional in the euro area after 2009-10 when the financial systems of some countries almost collapsed and their sovereigns lost market access (e.g. Ireland, Portugal and Greece). It is often overlooked that the origins of the crisis in the US were also rather concentrated at the regional level. The housing boom was very concentrated in the US (as it also was in Europe). The increase in housing prices varied enormously from state to state and only a few states accounted for most of the sub-prime lending, overbuilding and thus the subsequent economic distress and losses from delinquent mortgages.

However, the US experienced 'only' a system-wide crisis in 2007, 2008 and 2009, but there was no specific crisis involving only those states where the real estate excesses had been most marked (Nevada, Florida and California). The main thrust of this study is that the US was better equipped to deal with regional shocks because it is a fully-fledged banking union (BU).

The euro area officially has a banking union, but most observers would agree that it is incomplete if one starts with the three 'canonical' elements of a banking union (IMF, 2013a,b):

- i. Common supervision. This has been achieved since the ECB, under the heading of the SSM (Single Supervisory Mechanism), has become the ultimate supervisor for banks in the euro area and the direct supervisor of most larger banks accounting for a majority of banking assets.

- ii. A common mechanism to resolve banks. This has also been achieved with creation of the Single Resolution Mechanism (SRM), which will be able to rely on a common fund (the Single Resolution Fund) after a transition period. The SRM will cover all banks in the euro area (and in those other EU countries wishing to join the SSM).
- iii. Common deposit insurance. No agreement has been reached on this point. It remains to be seen how important this lacuna will become.

By contrast, the US has had all three elements in place at least since 1933.¹ The US thus qualifies as a banking union. The central theme of this study is that the consequences of this difference could be seen during the financial crisis. A simple comparison of the fate of two different members of a large monetary union after they were hit by a financial crisis offers a powerful illustration of the importance of an integrated banking system. Ireland and Nevada, in fact, provide an almost ideal test case. These two entities share several important characteristics. For example, they both have similar populations as well as GDP and they both experienced an exceptionally strong housing boom. But when the boom turned to bust, the US states did not experience any local financial crisis (nor did any state government have to be bailed out).

This study finds that the key difference between Nevada and Ireland is that banking problems are taken care of in the US at the federal level (effectively a banking union), whereas in the euro area, responsibility for banking losses remains national.

The study is organised as follows. The next section presents some case studies of the stabilisation properties of a banking union. Section 3 then analyses the role of 'foreign-owned banks' as a sort of 'private banking union'. Section 4 analyses the institutions that paid for the shock absorption provided by the official US federal banking-related institutions: the Federal Deposit Insurance Corporation (FDIC) and Government-Sponsored Enterprises (GSEs). Section 5 speculates on the extent to which European banking union as currently planned could provide comparably strong protection against regional shocks. Section 6 provides some considerations on the degree of financial integration in the euro area and discusses how the insurance premia within the SRM should be determined. Section 7 contains some general considerations with respect to a fiscal union and financial shock absorbers. Section 8 concludes.

2) The macro-economic stabilisation properties of a banking union: some case studies

In this section we analyse the implications of a banking union for macroeconomic stability by making comparisons between countries/states which have experienced

¹ In that year a common mechanism and fund for both deposit insurance and resolution was created in the form of the FDIC (Federal Deposit Insurance Corporation). The creation of the FDIC came after most of the 50 different state based deposit insurance schemes went bankrupt as a country wide banking crisis led to the failure of hundreds of banks.

similar local boom/bust cycle in real estate, but are part of different federal systems in terms of financial markets.²

The comparison pairs will be Ireland-Nevada, Florida-Spain and Latvia-Nevada. The first of these two pairs is part of a large currency area. The Latvia-Nevada comparison is interesting because Latvia was in the euro area during its boom/bust cycle, but its banking system was dominated by banks from Nordic countries. In this sense Latvia was part of a 'Nordic Banking Union'.

The pairing Ireland-Nevada is the one that comes closest to a natural experiment as these two entities are of a very similar size and had a very similar boom and bust in terms of real estate. The key difference is of course that the banks operating in Nevada are so much part of the fully integrated wider US banking system that one cannot really speak of a 'banking system of Nevada'. The analysis will show that this was decisive for the limited impact of the bust for the local economy and local public finances in Nevada (and other US states with similar local real estate booms).

Florida can be compared to Spain. Both these entities represent larger, more diversified economies than either those of Nevada or Ireland. Somewhat surprisingly, real estate investments seem to have played a larger role in Spain, although it is somewhat larger than Florida.

Another useful comparison is that between Nevada and Latvia or the other Baltic countries. None of the latter was part of the euro area when the crisis struck in 2008/9. However, they all weathered the crisis more quickly than Ireland, or other peripheral euro area countries, because they benefited from the fact that their banks were to a large extent owned by larger Nordic banks which were able to absorb the losses that arose when the housing boom collapsed and the Baltic economies experienced a very sharp recession. It is interesting that the only Baltic country that needed a bail-out was Latvia, which was also the only country that still had a significant local bank.

Before going into these pair-wise comparisons it is useful to consider to what extent the boom/bust cycle is different between the US and the euro area at the aggregate level.

2.a) Regional concentration of real estate cycles within a monetary union

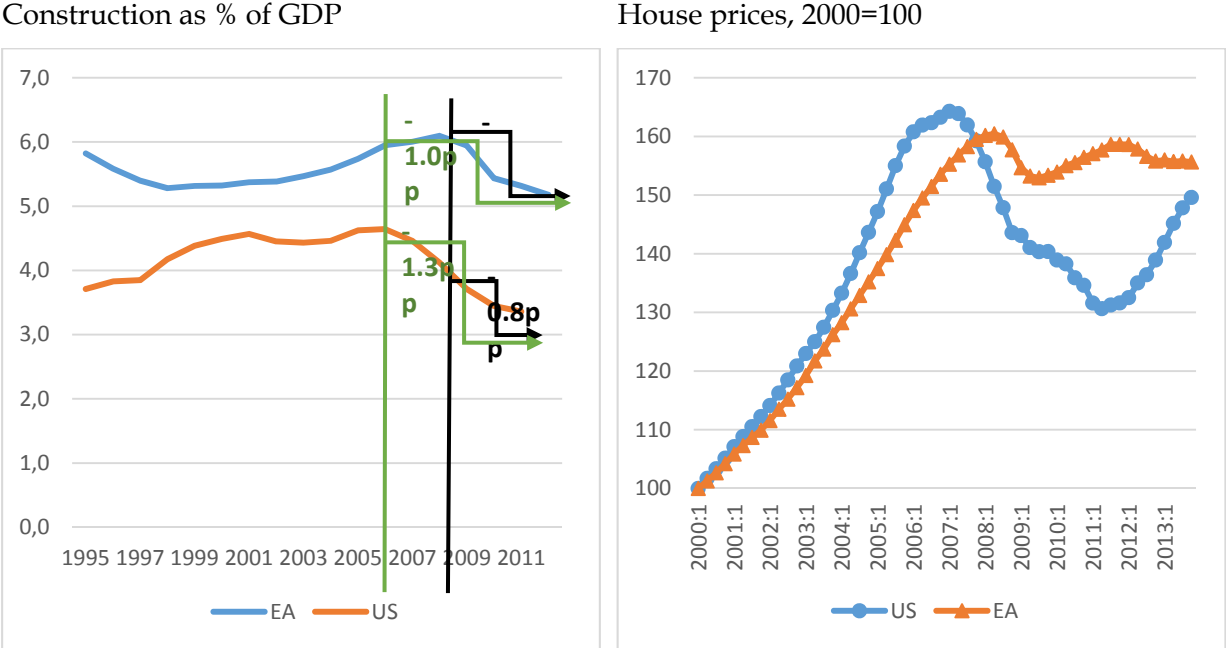
The aggregate data on house prices and construction activity (as % of GDP) reveals a considerable similarity; the boom was actually somewhat more pronounced in the US than in the euro area, at least if one looks at aggregate numbers (Figure 1). House prices increased by more in the US, then fell by more, but also recovered earlier, thus ending up at about the same level relative to the euro area, if one looks at the period since the start of monetary union (Figure 1, right-hand side).

An even more important indicator of the potential cost of a real estate cycle is the amount of construction activity undertaken (Figure 1, left-hand side). A large stock

² The starting point for this section is Gros (2012b).

of unsellable houses often constitutes the main reason for losses on mortgages. Here again, one finds that the cycle was somewhat more pronounced in the US than in the euro area since construction spending fell by about 1.3 percentage points of GDP in the US, but only about 1.1 percentage points of GDP (on aggregate) in the euro area.

Figure 1 – Development of real estate sector over time – US versus Euro area



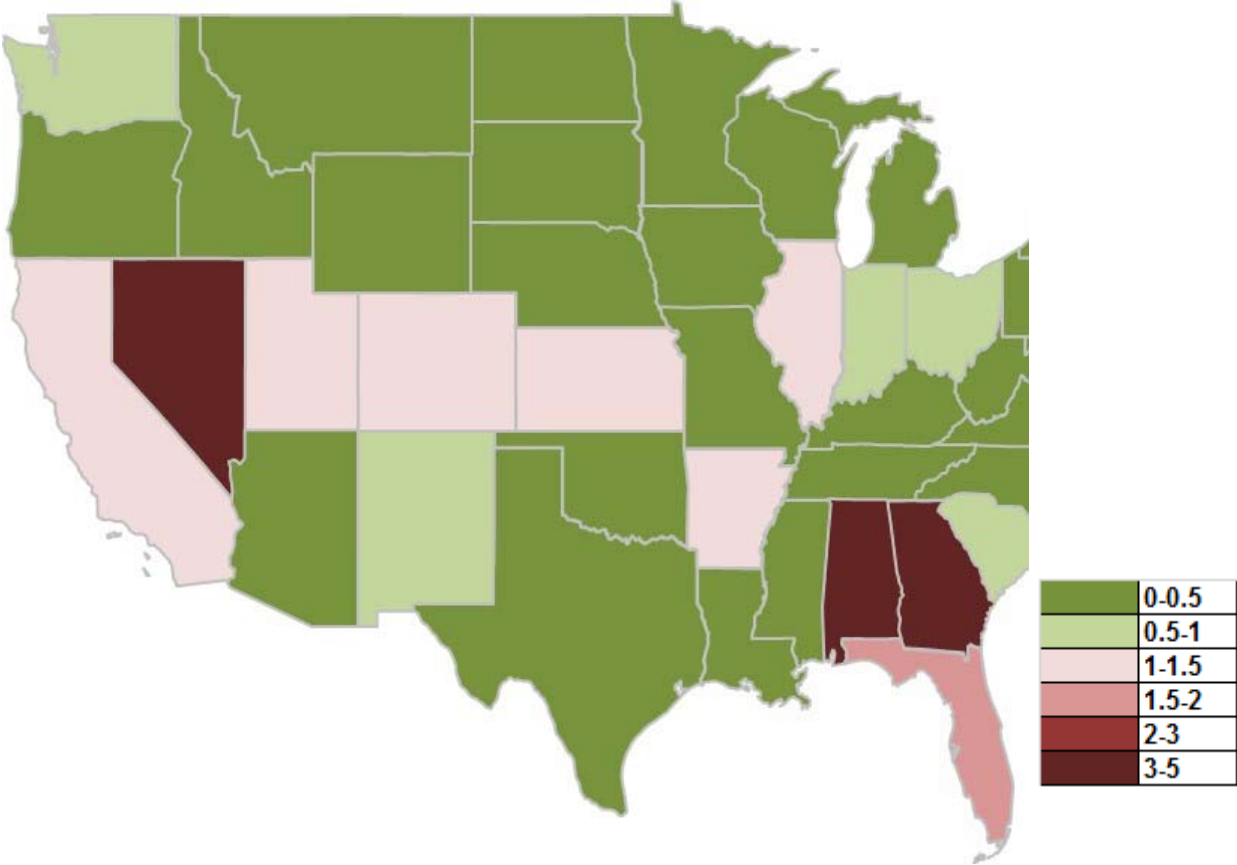
Source: Eurostat

How could one then explain that the US recovered earlier from the bust of the housing bubble and that there were very serious difficulties at the national level in Europe, even in countries like Ireland or Spain, where public finance had been under control?

It is tempting to argue that this lack of regional problems in the US was due to a more uniform manifestation of the boom in the US than in the euro area. Within the euro area the average number hides fundamental differences between the peripheral countries Spain and Ireland, where both house prices and construction activities boomed until 2007, and core countries like Germany where both house prices and construction activity were relatively weak (again until 2007/8).

However, the boom/bust was also very concentrated in the US. Figure 2 below shows the distribution of the losses sustained by the Federal Deposit Insurance Corporation (FDIC) during the last crisis in each state. It is apparent that the banking problems were highly concentrated in a few states (dark red indicates losses above 3% of GDP, light pink 1.5-2 % of GDP and green below one half of one % of GDP).

Figure 2 - Distribution of the losses from the 2007/08 subprime crisis sustained by the Federal Deposit Insurance Corporation (FDIC)



Source: Various FDIC documents.

This combination of a similar boom/bust pattern in the aggregate variables and a similar degree of concentration at the regional level already suggests that the structure of the financial system and its back-up mechanism must have played a key role in containing regional problems in the US.

2.b) Ireland versus Nevada

Ireland and Nevada share several important characteristics, as reflected in Table 1 below. They have similar populations (2.7 to 4.5 million) and similar levels of GDP (\$120-200 billion). Both federal states experienced a strong recession and a very similar increase in unemployment. However, the fall in GDP was much larger in Ireland than in Nevada. As will be argued below, this was due to the fact that the losses arising from the real estate bust in Nevada were to a large extent absorbed by the US federal financial system.

Table 1 - *Ireland and Nevada compared*

| | Nevada | Ireland |
|---|--------|---------|
| Population (in million, 2011) | 2.7 | 4.5 |
| GDP (in \$ billion, 2011) | 120 | 200 |
| Change in GDP (2007-2010) | -5.3% | -17.6% |
| Average net migration rate since 'bust' (2008) as percent of total population | 0.32% | 0.09% |
| Unemployment rate (2011) | 13.5% | 14.4% |

Sources: Eurostat and BEA, US Census Bureau.

The most important similarity is, however, that they both experienced an exceptionally strong housing boom – and bust. The similarity of the boom-bust cycle is shown in a set of figures below:

Panel 3a (nominal) GDP increased by a very similar proportion during the boom and then fell.

Panel 3b shows the evolution of house prices, which increased up to 2007/08 and then turned downwards. This was the first fall in house prices during peace time for the US.

Panel 3c shows construction activity as a % of GDP (for Ireland) and a % of GSP (Nevada). It is again apparent that the two series follow the same pattern, but construction activity seems to have been much more important to the economy of Ireland than that of Nevada. However, this difference might be due to a difference in definition of the aggregate 'construction' in the national accounts.

Panel 3d shows the consequences for the real economy in terms of the unemployment rate, which also follows a similar pattern.

Figure 3 - The boom/bust cycle in Nevada and Ireland compared

Figure 3a - Nominal GDP: Ireland vs. Nevada

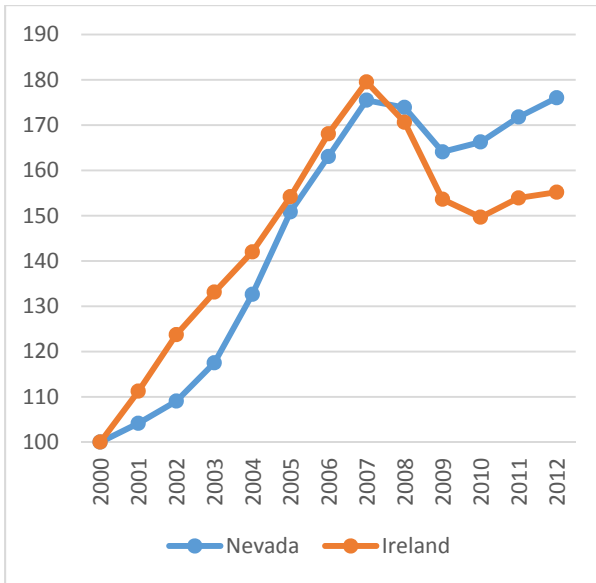


Figure 3b - House prices: Ireland vs. Nevada

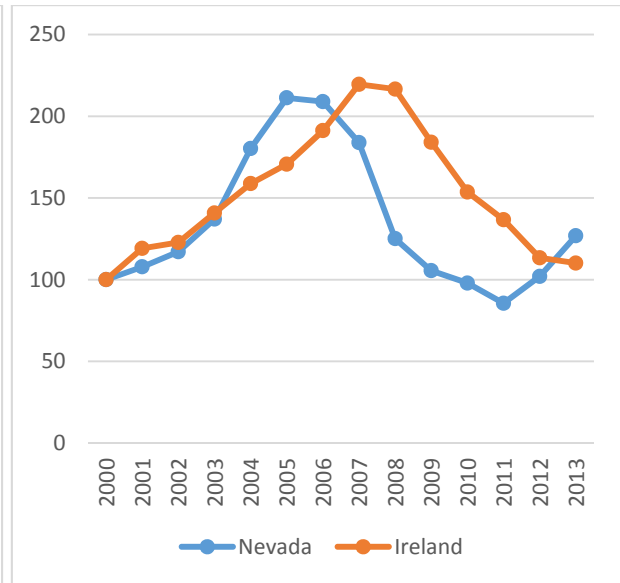


Figure 3c - Construction activity (% GDP or GSP): Ireland vs. Nevada

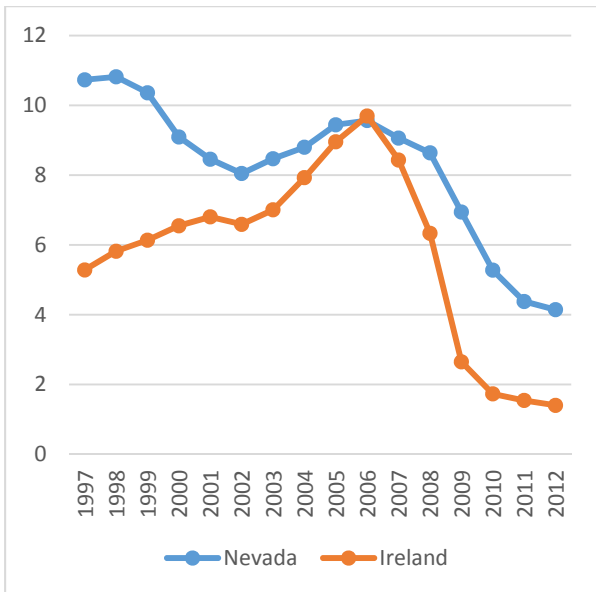
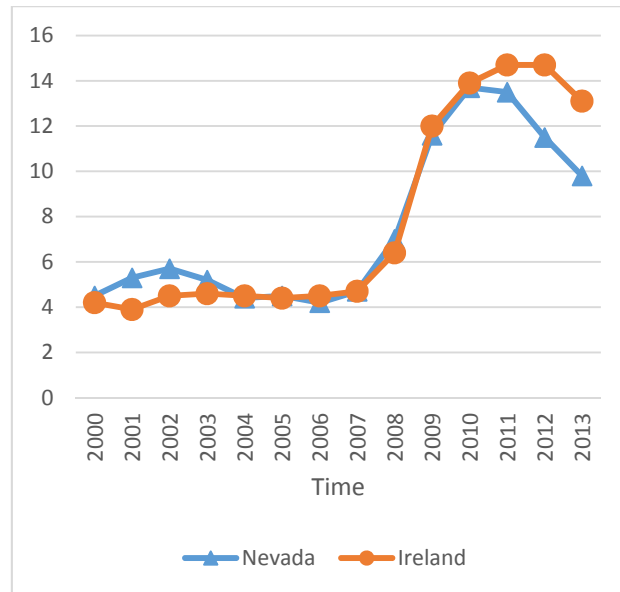


Figure 3d - Unemployment: Ireland vs. Nevada



Sources: Eurostat and US Bureau of Labour Statistics (BLS).

However, there is one fundamental difference between the two: when the boom turned to bust, Nevada did not experience any local financial crisis and the state government did not have to be bailed out. By contrast, the government of Ireland was for some time unable to issue any new debt on the market and had to be supported by a very large loan financed jointly by the IMF and the European rescue fund (the ESM and its precursor the EFSF).

The key difference between Nevada and Ireland is that banking problems in the US are taken care of at the federal level (the US is a banking union), whereas in the euro

area, responsibility for banking losses was national, and will remain partially national until the SRF is fully operational.

Local banks in Nevada experienced huge losses (just like in Ireland) and many of them became insolvent, but this did not lead to any disruption of the local banking system as these banks were seized by the Federal Deposit Insurance Corporation (FDIC), which covered the losses and transferred the operations to other, stronger banks. In 2008-09, the FDIC thus closed 11 banks headquartered in the state, with assets of over \$40 billion, or about 30% of state GDP. The losses for the FDIC in these rescue/restructuring operations amounted to about \$4 billion.³

Other losses were borne at the federal level when residents of Nevada defaulted in large numbers on their home mortgages. The two federal institutions that re-finance mortgages have lost between them about \$8 billion in the state since 2008.⁴

The federal institutions of the US banking union thus provided Nevada with a 'shock' absorber of about 8-9% of GDP, not in the form of loans, but in the form of an (*ex-post*) transfer because losses of this magnitude were borne at the federal level. (Against this transfer one would of course have to set the insurance premia paid by banks in Nevada prior to the bust. But they are likely to have been of a smaller order of magnitude.)

Of course, a lot of the banking business in Nevada was (and still is) conducted by 'foreign' banks, i.e. by out-of-state banks, which just took the losses from their Nevada operations on their books and could set them against profits made elsewhere.⁵ This is another way in which an integrated banking market can provide insurance against local financial shocks. One might call this a 'private' banking union (or a truly integrated banking market). It is impossible to estimate the size of this

³ The initial loss estimates of the FDIC were later revised downwards to 2.4 billion. As some of the assets which the FDIC had to evaluate at crisis prices later recovered partially in value. However, the initial estimate constitutes the more important figure because it shows the amount of risk the FDIC was prepared to assume at the height of the crisis. During a financial crisis the perception of risk by the market and the ability to bear risk is more important than the exact amount of the losses that materialise once the crisis is over.

The loss estimates of Fannie and Freddy were not revised as they represent just the sum of mortgages that did not perform.

At first sight it appears that the loss rate for the FDIC was about 10 %, not much higher than the 8% of bail-in-able debt instruments that EU banks are supposed to hold under the regulations. This would seem to suggest that the likelihood that the SRM could face large losses should be minor. However, Washington Mutual, which had its headquarters in the state, represents a large part of the balance sheet of the intervened banks. However, given that there was no loss for the FDIC in this operation (WAMU was sold for 1 dollar) the loss rate on the other banks was much higher, about 30 %.

⁴ Fannie Mae and Freddy Mac have taken the unusual step of indicating their credit losses for those states hardest hit by the crisis (including Nevada, Florida, California, for example).

⁵ The experience of Washington Mutual (WaMu) constitutes a somewhat special case. The biggest bank to have failed in US history, a mortgage specialist, WaMu had its headquarters in Nevada (although the name suggests otherwise) and some small operations there. However, its failure did not lead to any local losses as Washington Mutual was seized by the FDIC and its banking operations were sold for a very low sum to another large US bank (JP Morgan Chase) – but without any loss for the FDIC. Such an 'overnight' operation would have been impossible in Europe where no euro area-wide institution would have carried through a cross-border takeover of this size. Moreover, WaMu received about \$80 billion in low-cost financing from the US Federal Home Loan Bank. Irish banks received massive amounts of low-cost emergency liquidity assistance from the European Central Bank, but the Central Bank of Ireland had to guarantee these loans, which was not the case for the State of Nevada or for any bank in Nevada.

additional shock absorber, but the losses absorbed by out-of-state banks might very well have been at least as large again as the ones borne by the federal institutions. The total write-downs of the large US banks which operate across the entire US were about 440 billion, twice as much as the 220 billion of losses of the three official institutions (FDIC, Fannie and Freddie). If these losses were distributed in a similar way to the losses of the official institutions mentioned so far one can conclude that the shock absorption capacity of the large union-wide banks is likely to have been worth about 17% of GDP.

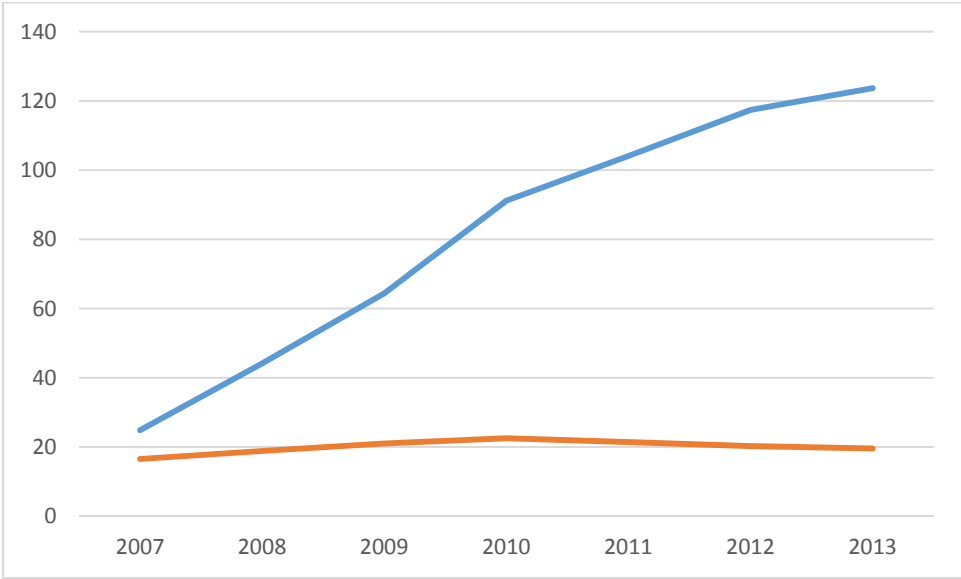
Nevada was also one of the states where 'non-conforming' or 'sub-prime' mortgages became particularly widespread. Non-conforming loans are not eligible for insurance and securitisation by the GSEs, but they were widely packaged into 'Private Real Estate Mortgage Securities (PRMBS), which then were sold to investors worldwide. Some of these sub-prime securities remained on the balance sheets of the large US banks mentioned above. But a large part was bought by other US and foreign investors. These investors thus absorbed another part of the losses generated locally. The scale of this additional risk-sharing is very difficult to estimate precisely. But given that sub-prime issuance was also particularly widespread in Nevada it is likely that this risk-sharing was also substantial.

All in all one can thus conclude that the overall loss absorption provided by the public institutions (FDIC and the two GSEs) and the private sector (large banks, sub-prime securitisation) must have been substantially larger than the 25% of GDP coming through the FDIC and the GSEs plus the banks ($8.5 + 17 = 25$).

In Europe there was no official risk-sharing in the sense that the Irish government had to take the responsibility for saving the banks in Ireland. The ESM did provide financing for the Irish government when it lost market access. But the ESM could provide only loans, which have to be repaid with interest. Moreover, as an implicit counterpart to this support the Irish government was asked not to bail in investors holding the bonds of Irish banks.

One consequence of this lack of risk-sharing was that public debt soared in Ireland. As shown in the Figure 4 below, just prior to the start of the crisis Ireland had a very low debt/GDP ratio of around 25% of GDP, which was actually very similar to that of Nevada. The debt ratio of Nevada did not increase much, even though the housing cycle was very similar, as illustrated above. Today the debt ratio of Ireland is above 120 % of GDP; six times that of Nevada.

Figure 4 – Irish government debt versus Nevada state and local debt (in percent of GDP)



Source: Own calculations, Blue = Ireland; Brown = Nevada.

In Europe, this ‘private’ banking union channel of risk mutualisation operates only in some cases. It is of paramount importance only for the smaller Baltic EU countries, whose banks are to a large extent in foreign hands. Estonia, Lithuania (and to a lesser extent Latvia) thus benefited from a similar protection against losses provided by the Scandinavian headquarters of their local banks. By contrast, most of the real estate lending in Ireland (and Spain) had mostly been extended by local banks so that most of the losses remained local (without any federal institution to provide insurance).⁶

The comparison between Nevada and Ireland thus clearly illustrates the shock-absorbing capacity of an integrated banking system and a banking union. For Nevada, the banking union resulted in a transfer worth over 25%, possibly up to 30% of its income. Nevada is admittedly an extreme example of the housing boom and bust. Nevertheless, this example illustrates the general point that a banking union can provide more shock-absorbing capacity than could ever be provided by any ‘fiscal capacity’ that is currently being contemplated for the euro area.

2.c) Florida: another example of the US banking union in action

Florida and Spain constitute another pair of countries that can be used to illustrate the difference in the impact of a local real estate boom/bust cycle when there is a fully fledged banking union. Both Florida and Spain are much larger and more

⁶ It appears, however, that the larger UK banks, like RBS, also had substantial operations in Ireland, where they had to write off of about 8 billion £. Unfortunately, it is not possible to establish what proportion of the write off resulted in actual losses and what part of any losses was incurred in the Republic of Ireland and what part in Northern Ireland.

diversified economies than Ireland (or Nevada) and their housing cycles were less extreme. Table 2 below provides some of the basic data, showing that Florida is about half the size of Spain, both in terms of population and GDP and that initially the impact on GDP was very similar. However, the local labour markets reacted in a very different way.

Table 2 – Comparison Spain-Florida

| Comparison Spain & Florida | Spain | Florida |
|---|--------|-------------------|
| Population (in million, 2011) | 46.1 | 19.1 |
| Nominal GDP (in € billion, 2011) | 1063 | 542 (770 bn. USD) |
| Change in nominal GDP (2007-2011) | 1.0% | -0.9% |
| Unemployment rate (2011) | 21.7% | 10.5% |
| Change in unemployment rate (2007-2011) | 13.4pp | 6.5pp |

Source: Own calculations.

Aslo Figure 5 below provides an indication of the similarity in the cycle. Nominal GDP increased a bit more in Spain, but the downturn was also longer so that over the entire cycle the increase in GDP was almost exactly the same. A similar pattern can be seen for house prices, which turned earlier in Florida, but then also started recently to recover; whereas as Spanish house prices still continue to fall. Investment in construction follows exactly the same pattern, but has always been higher in Spain. It is in unemployment that one sees a decisive divergence with the bust. Unemployment rose initially in a similar way, but has continued to increase in Spain and already declined substantially again in Florida.

Figure 5 - The boom/bust cycle in Florida and Spain compared

Figure 5a - Nominal GDP: Florida vs. Spain

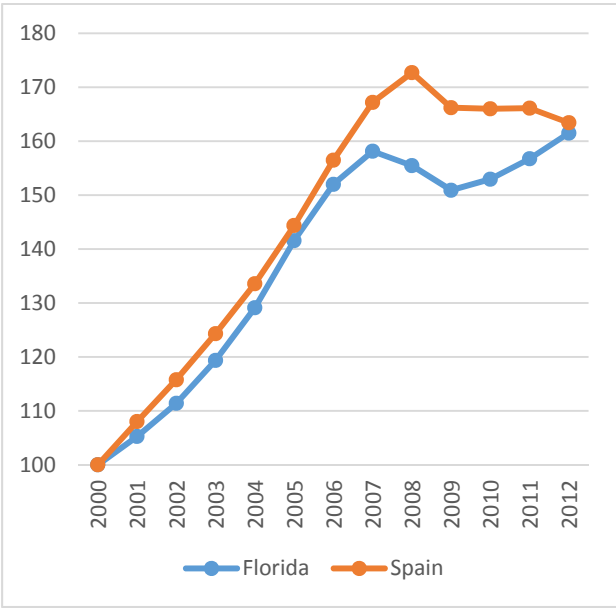


Figure 5b - House prices: Florida vs. Spain

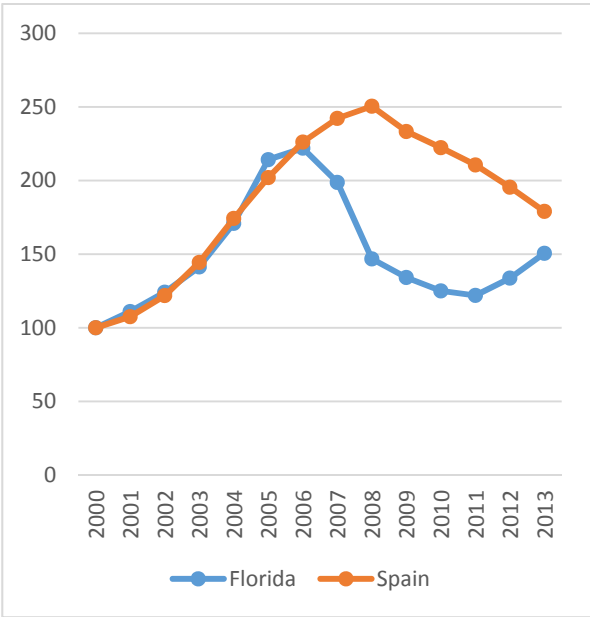


Figure 5c - Construction activity (% GDP or GSP): Florida vs. Spain

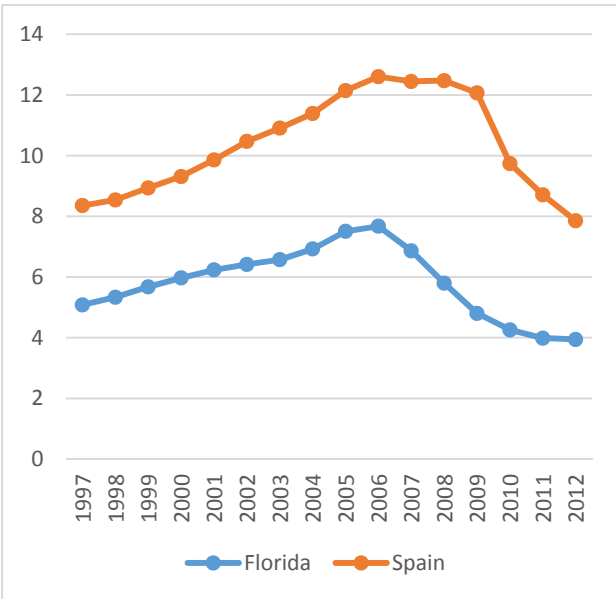
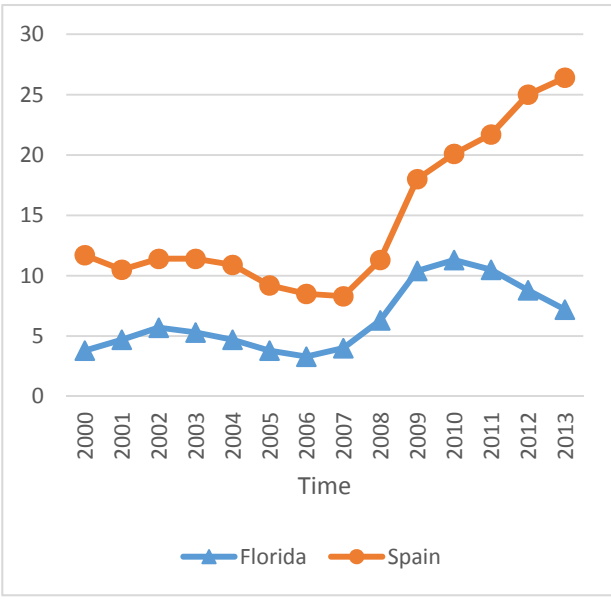


Figure 5d - Unemployment: Florida vs. Spain



Sources: Eurostat and US Bureau of Labour Statistics (BLS).

The key difference one has to explain is again that the state government of Florida was barely affected by the crisis whereas the government of Spain had to pay a substantial risk premium for issuing new debt. Moreover, when the full scale of the banking problems became apparent Spain received a loan of 60 billion euro (about 6% of its GDP) to help finance the recapitalisation of its problem banks (mainly the *cajas*, which had engaged in most of the real estate lending which caused most of the losses).

By contrast, in Florida one can see again the US banking union in action. During the period 2008-12 the FDIC closed over 70 banks headquartered in Florida, with total losses for the FDIC of roughly \$14 billion, or 2 % of Florida GSP.

Moreover, mortgages originating from Florida and covered by Fannie Mae & Freddie Mac experienced high default rates, leading to losses of the two GSEs of \$19 billion since 2008. Federal loss-sharing on mortgages originating in Florida, but insured by federal 'government sponsored entities' thus amounted to another 2.3% of Florida GDP. Total direct loss absorption through the official banking union amounted to about 33 billion, or 4.3% of GDP.

As argued above, one has to consider the fact that in Florida (as in Nevada) the large US banks operating nationwide have a very large share. Under the maintained assumption that the losses at the large US banks operating nationwide were about twice as much as FDIC + GSEs, it follows that private sector losses borne out of state might be twice as large as those assumed by the FDIC and GSEs; or probably another 8-9% of GDP.

The total loss absorption (*ex post*) of the private and public pillar of the US banking union for Florida was thus probably more than 12% of GSP. By comparison, Spain did receive a loan from the ESM, worth about 6% of its GDP to help finance the recapitalisation of Spanish mortgage banks (*cajas*). But this was a loan and has to be repaid with interest.

As for Nevada, another form of loss absorption came through private sector securitisation. In the US the most risky part (sub-prime) of the mortgages (which accounted for about 20 % of all originations in Florida) were securitised and sold to capital market investors not only in the US, but also internationally (including many Europeans). Large US banks retained only part of the remaining risk. A further part of the local risk from sub-prime mortgages was thus borne by 'out of state' investors, protecting the economy of Florida, which could rebound earlier as its debt burden was much lighter.

2.d) Nevada versus Latvia

All of the Baltic states experienced strong growth rates in GDP and house prices and double-digit current account deficits until about 2007. This boom turned into a bust very quickly when global financial conditions turned around in 2007/08. The adjustment was then very sharp, with GDP falling also by double-digit percentages as investment in construction virtually coming to a standstill and credit being called back (Figure 6). None of the Baltic countries was in the euro area when this occurred. This meant that their local banks could not access the various facilities of the ECB and the national central banks had to be rather restrictive, given that they wanted to defend their exchange rate against the euro. Only one of the Baltic countries, Latvia, needed international financial assistance, mainly to deal with the aftermath of the problems at its only large domestic bank.

Figure 6 - The boom/bust cycle in Nevada and Latvia compared

Figure 6a - Nominal GDP: Nevada vs. Latvia

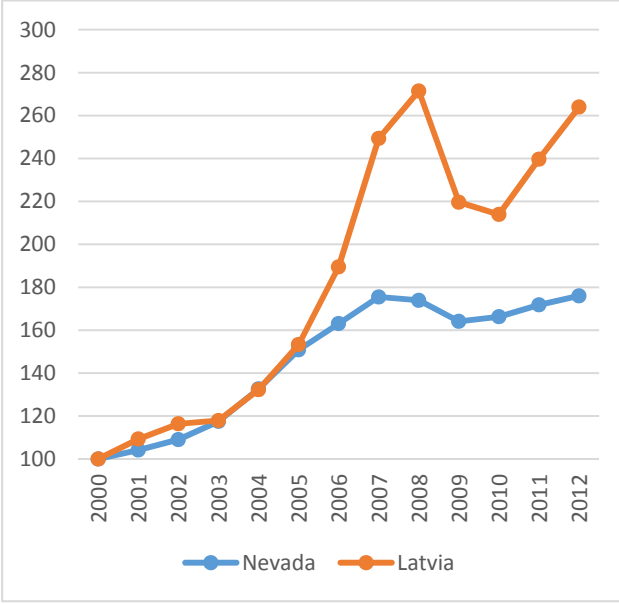


Figure 6b - House prices: Nevada vs. Latvia

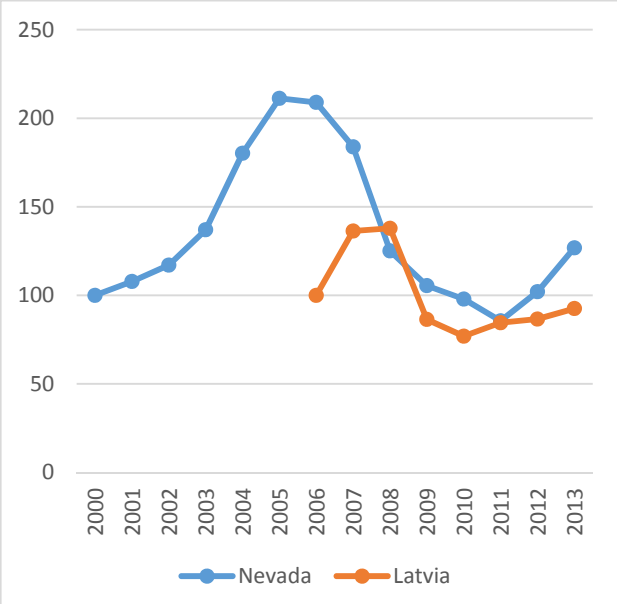


Figure 6c - Construction activity (% GDP or GSP): Nevada vs. Latvia

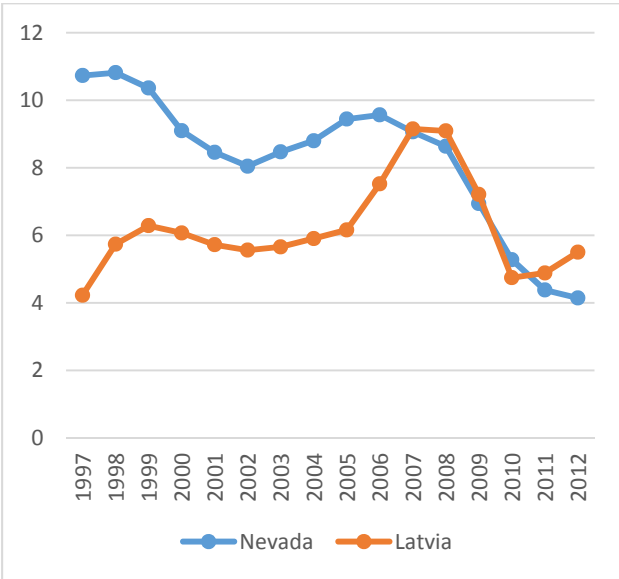
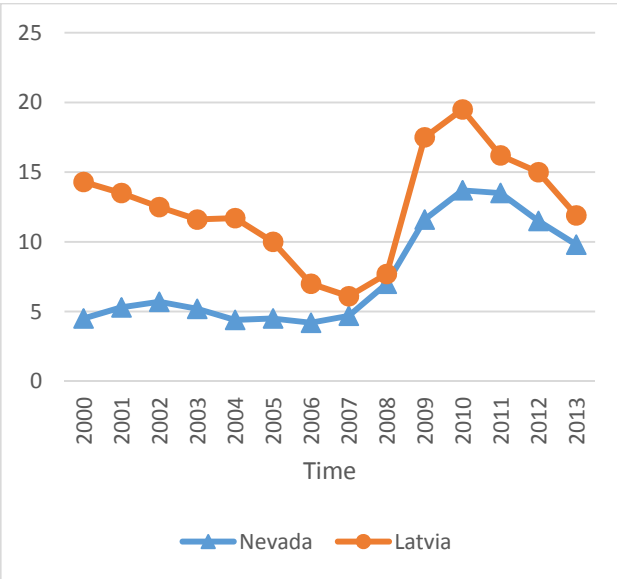


Figure 6d - Unemployment: Nevada vs. Latvia



Sources: Eurostat and US Bureau of Labour Statistics (BLS).

Although Latvia was not then (2007/08) in the euro area it still makes sense to compare it to Nevada because the adjustment patterns were similar due to the strong presence of foreign banks. House prices (available only since 2006) fell strongly when the crisis hit in 2008, but recovered already a few years later (as in Nevada) (Figure 6b). Unemployment first rose even more than in Nevada, but also started to improve after a few years, mimicking the pattern of Nevada (Figure 6d). In terms of construction activity the upturn had been shorter, and sharper in Latvia, but here also the recovery set in quickly (in contrast to Nevada where the longer period of

elevated construction activity probably led to a more significant housing overhang) (Figure 6c).

The one reason why this relatively early recovery was possible in Latvia (despite the fall in GDP of over 25%) was that the banking system of the country was owned to over 60% by foreign banks. These banks thus absorbed most of the losses that arose when the Latvian housing market turned in 2007/08.

It is naturally very difficult to pinpoint the origin of losses occurring within large internationally active banks. The available anecdotal evidence suggests that Swedish banks alone made loan losses in the Baltics of about 12-20 billion USD between 2009 and 2012, which would be several times larger than the capital invested in the local subsidiaries and would amount to between 15 and over 20% of the GDP of the three Baltic states together.⁷

Given that other Scandinavian banks also had a significant part of the market in the Baltic states (about one-third, on average) it is thus likely that the total loss absorption by foreign banks in the Baltic states was closer to 30% of their GDP.

The Baltic states thus benefited enormously from the fact that their banking systems consisted essentially of subsidiaries of foreign banks. As loan losses were in many cases larger than the capital invested in these subsidiaries the foreign (mostly Swedish) banks could have walked away from their daughter companies, which would have forced the Baltic governments to sustain them during the crisis. However, the Swedish (and other Nordic) banks chose to put additional capital into their Baltic subsidiaries because they were counting on the long-term growth potential the region.⁸

The broad conclusion that emerges is that one of the reasons why Latvia (as the other Baltic states) weathered the crisis more quickly than Ireland, or Spain, is that it benefited from the fact that its banks were to a large extent owned by larger Nordic banks, which were able to absorb the losses that arose when the housing boom collapsed and the Baltic economies experienced a very sharp recession. It is interesting to note that the only one of the Baltic countries that needed a bailout was Latvia, which was also the only country that had still a significant local bank.

⁷ See “Swedish banks can handle Baltic losses of 20 billion dollars”, web: <http://www.baltic-course.com/eng/finances/?doc=14707>; see also “Riksbank sees 2010 Baltic bank losses at USD 3.7 bln”, web: <http://www.baltic-course.com/eng/finances/?doc=23185>.

⁸ See Ingves (2010) and “SEB banka has not yet recovered what it lost during financial crisis”, web: <http://www.baltic-course.com/eng/finances/?doc=88286>.

3) Foreign owned banks: a substitute for BU? The experience in the EU

The case studies presented in the previous section suggest that in the United States the large banks that operate throughout the entire territory provided a very important channel through which local shocks could be better absorbed. The estimates provided above suggest that the shock-absorbing contribution from internationally active banks could have been twice as significant as the one provided by the official 'Banking Union' institutions (the FDIC and the GSEs). This is generally not the case in Europe. Somewhat surprisingly, however, transnationally operating banks have played a more important role outside the euro area than within.

For example, Spain did not have protection from a Banking Union as there was little activity of foreign owned banks in Spain. Moreover, most of the real estate-related lending that later caused most of the losses was done by the local *cajas* that financed their loan books not with local savings, but by attracting large inflows of foreign capital, mostly in the form of covered bonds or inter-bank loans; neither of which is loss absorbing.

In the case of Ireland some loss absorption occurred because the large UK banks had a substantial exposure to Ireland and thus also absorbed some losses that occurred there. However, the magnitudes are difficult to ascertain.

However, there has been little cross-border integration of the banking sector within the euro area; much more has occurred within the EU with large banks from the old member states taking over most of the banking systems in the new member states (West-East). This trend was particularly strong in the small Baltic states where foreign banks had a market share of 80 - 90% and absorbed most losses that occurred when the credit and real estate boom in the region ended abruptly in 2008/09, as documented above (Buch, Körner and Weigert, 2013, p. 9). It is interesting to note that the only exception to the dominance of foreign banks occurred in Latvia, where one significant local bank remained, but its problems almost pushed the government into insolvency.

The experience of the Baltic States shows that integration via equity markets (ownership) can mimic the shock absorbing properties of a Banking Union: Foreign owned banks can absorb losses. However, this mechanism works only if the (until now national) supervisor allows them to maintain exposure. This willingness of the Swedish (and other Nordic) supervisors to allow their banks to maintain their exposure in the Baltic States and to recapitalize their subsidiaries there was one crucial element which stabilised the financial sector in the region.

Another condition for loss absorption by 'foreign banks' to be stabilising is that the foreign-owned banks must be strong enough to carry substantial losses. This condition was fulfilled since the Swedish and other banks that had large exposures in the Baltic states were able to absorb substantial losses, given that the business in their home base remained solid and given that their home economies were running large current account surpluses, which effectively insulated them from the flight of cross-border capital which started in 2010/11 when the broader financial crisis became the euro crisis.

The European experience has also shown that a strong presence of foreign banks can lead to a propagation of financial shocks abroad to the domestic economy. This happened during the first leg of the financial crisis when the large banks from the 'older' Member States came under funding stress and started to pull back capital and credit lines from their subsidiaries in Central and Eastern Europe. These banks came from countries like Italy, Austria or Belgium, whose fiscal and balance of payments position was less strong than those of the Scandinavian countries (like Sweden) whose banks dominated the Baltic banking market. This pull back by the foreign parents contributed to the economic downturn throughout Central and Eastern Europe, and threatened to initiate a self-reinforcing spiral of a withdrawal of financial support from the foreign parents, a deeper recession and therefore more local losses, prompting the foreign parents to accelerate their withdrawal. Moreover, each individual parent bank initially acted in isolation, hoping that the economic impact of its withdrawal would be limited since other banks could at least in principle take its place in financing the local economy.

It took an international initiative, coordinated by the international financial institutions, to bring the handful of key parent banks from Western Europe together. Under this so-called Vienna Initiative the banks promised not to reduce their exposure to Central and Eastern European countries and the IMF agreed to provide the countries with substantial balance of payments support. This combination was sufficient to arrest the vicious circle described above since it helped to stabilise the economies in the region, which in turn limited the losses for the parent banks, thus providing also a justification for the banks to continue to provide financing in the region.

This episode illustrates the general economic principle that 'there is no free lunch'. Large cross-border or cross regional banks can mitigate the local impact of local financial shocks, but they also propagate shocks to the overall financial system to all regions in which they play an important role.

To come back to the US example one could thus argue that the presence of the large US banks throughout the US provided a shock absorbing mechanism for Nevada or Florida, but also a shock propagating mechanism for the States in the North where there had been no real estate boom. The financial crisis, which started when the sub-prime boom burst, led to a tightening of credit availability all throughout the US, although the boom had been rather concentrated in a few states as documented above.

4) Who pays for the shock absorbers?

One key issue for any shock-absorber mechanism is whether the mechanism is self-financing or needs public funding. This issue has played a key role in the political debate, both in the US and in the EU. The political slogan has been that 'the industry' should pay for its own mistake, and that 'tax payer's money' should not be used to bail out banks. These principles were at the basis of the construction of the Single Resolution Mechanism and its Single Resolution Fund, which will be financed by contributions from industry. The size of the SRF could be kept relatively small because another piece of EU legislation, namely the BRRD (Bank resolution and recovery Directive), established tough rules on the 'bail in' of creditors before a bank can receive financial support from the SRF. Ex ante there is thus a clear intention to make the key pillar of the banking union in the euro zone self-financing, obviating the need for financial support from the budgets of Member States.

It is of course too early to say whether the European Banking Union will be 'self-financing'.

In the US there are two 'official' shock-absorber mechanisms (FDIC and securitisation by the GSEs), which have been operating for long enough to measure whether, *ex post*, the system did finance itself, i.e. whether the costs that had to be sustained were on average borne by the industry.

As these two systems are of a different nature they have to be discussed separately.

4.1) FDIC

Historically, the losses of the FDIC have come in two waves: the savings and loans crisis of the 1990s and the 'subprime' crisis of the last decade.

The losses the FDIC had to sustain after 2008 were larger than the fund it had accumulated during the previous boom years. At the start of the crisis the FDIC had slightly over 50 billion USD at its disposal, equivalent to about 1.2 % of insured deposits. However, already about one year into the crisis the available funding was about to run out.

This is why the FDIC had to be supported by a large line of credit from the Treasury. The FDIC fund thus went negative to about 21 billion USD already in 2009/10, but it was replenished quickly because the FDIC was able to force banks to pre-pay assessments up to 2012, bringing the fund quickly back into the black. However, it will take another decade or so before the FDIC will again reach its target level of 1.25% of insured deposits.⁹

The FDIC's funding will thus be reconstituted by contributions from industry. This part of the US banking union thus needed liquidity support from the federal

⁹ For more detailed information see "FDIC Statistics at a glance", web: <http://www.fdic.gov/bank/statistical/stats/2012mar/fdic.html>.

institutions during the biggest financial crisis in living memory. But in the end, the FDIC remained solvent.

By contrast a large part of the Savings & Loans (S&L) crisis of the 1990s was ultimately borne by the Federal Budget.

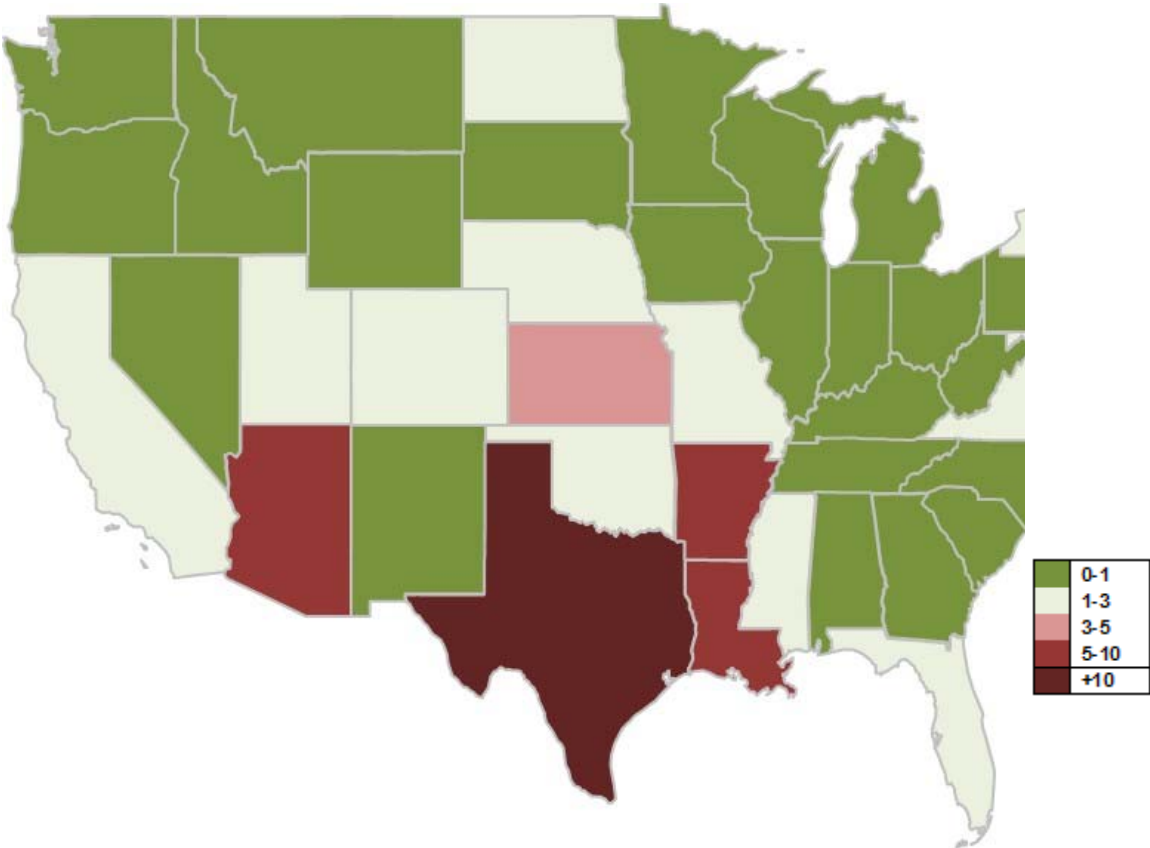
The savings and loans crisis of the 1990s was different (see http://en.wikipedia.org/wiki/Savings_and_loan_crisis for a description). Over 1 000 so-called thrifts were closed or otherwise intervened (of the initially 3,000 that had existed beforehand).¹⁰

In this case the government was needed not for liquidity, but to bail out the institutions which were in principle responsible for ensuring deposits at these institutions (the S&Ls had a separate deposit guarantee system). At the time the FDIC was not responsible for the 'thrifts' whose deposit guarantee system was organised separately on a sectoral basis. As the sector was much weakened after the crisis (and given that the losses were large relative to the size of the sector) it was not possible to recover the cost from the surviving institutions later. The total losses for the US tax payers amounted to about 130 billion or about 1 % of US GDP at the time.

The S&L crisis was also different in that it involved large-scale fraud and was not related to a system-wide weakness in other segments of the financial market. However, the S&L crisis was regionally very concentrated, with a few states, in particular Texas, accounting for most losses as can be seen in Figure 7 below in which states with zero losses are in green, and those with losses above 3 % are coloured red. However, in this case again there were no spill-over effects for the budgets of Texas or the other states in which the S&L crisis was concentrated because the losses were first absorbed by the S&L safety net, which was organised on a nationwide basis. When that proved insufficient the federal government assumed the remaining losses in order to make depositors whole. The losses assumed at the federal level amounted to over 10% of the GSP of Texas at the time.

¹⁰ A thrift is a financial institution focusing on taking deposits and originating home mortgages. Thrift banks often have access to low-cost funding from Federal Home Loan Banks, which allows for higher savings account yields to customers and increased liquidity for mortgage loans. It is also known as "savings and loan associations".

Figure 7 - Distribution of the losses from the S&L crisis sustained by FDIC and precursors



Source: Various FDIC documents.

As an aside one should note the important role of commercial real estate loans played during the S&L crisis. Commercial real estate is potentially riskier because the borrower is a limited liability company so that the recovery value rests only on the value of the land and its constructions. In the case of single family mortgages, by contrast, the debtor remains in principle liable for the entire amount of the loan, even if the value of the house is lower (deficiency payments). In the US this is the case in at least some States. A historical report by the FDIC on the banking crisis of the late 1980s concluded that “... in 1980, banks that subsequently failed had 43 percent of their total real estate loan portfolio in commercial real estate loans; by 1993 this had increased to about 69 percent. In contrast, non-failed banks were more conservatively invested: in 1980, 32 percent of their total real estate loan portfolio was invested in commercial real estate loans, and by 1993 the percentage was still approximately the same”.¹¹

4.2) Securitisation via US federal housing-market institutions

The two GSEs-package conforming mortgages (i.e. mortgages conforming to certain stringent criteria which ensure a very high probability of repayments) and sell them to investors as so-called ‘mortgage backed securities’ (MBS). However, the securities

¹¹ See http://www.fdic.gov/bank/historical/history/137_165.pdf.

issued by the GSEs are de facto ultimately guaranteed by the US federal government because the GSEs securitise only mortgages which have been insured by them or another federal housing institution. In principle there should thus not be any losses for investors on any mortgage that enters into the MBS issued by the two GSEs. When a GSE-packaged mortgage goes into default the loss is made good by the insurance arm of the GSEs. This implies that the shareholders of the GSEs ultimately had to bear any losses when many households could not or did not want to service their mortgages. When the losses mounted the federal government had to put additional capital into the GSEs; it thus appeared that the losses would have to be borne by the tax payer.

During the boom years a large proportion of mortgages were non-conforming, most of them called euphemistically 'sub-prime' because they were lacking proper documentation, had 'teaser' rates (instead of the US standard of 30 years fixed) and were for a higher proportion of the value of the house than accepted by the US housing agencies (typically at most 80%). These 'non-conforming' mortgages were not eligible for securitisation by the two GSEs and were sold as so-called 'private label' MBS. The large losses, which materialised on these securities once house prices fell and unemployment rose, were borne by the ultimate investors (including the Landesbanken). These private-label MBS were different from covered bonds in that the principal of the various tranches was not guaranteed. This system of risk distribution thus did not involve any public expenditure.

An empirical investigation showed that the correlation between sub-prime origination and losses for the federal institutions is rather low. Indeed, the sign of the correlation is *a priori* uncertain: rising house prices make sub-prime loans appear to be a safe bet, thus leading to higher sub-prime origination overall. But given house prices (and building activity) a higher proportion of sub-prime origination should mean lower losses for FDIC and the GSEs as more of the risk is borne by the private sector.

The GSEs had never experienced any overall losses before the 'sub-prime' crisis. This was because during normal times the loss rates on the 'conforming' mortgages that the GSE insure and securitise is rather low and the insurance premiums GSE were charging were, on average, enough to cover these small loss rates. Of course, the loss rates declined even further during the housing boom with its soaring house prices of the early 2000s. With rising house prices the value of the collateral increased. Even if the home owner could not service the mortgage the GSEs (which had kept LTV ratios below 80%) were unlikely to make a loss when the underlying mortgage went into delinquency and the house (the GSE typically insure mortgages on single family homes) had to be sold. However, this changed when house prices started to fall in the wake of the financial crisis and unemployment soared. Widespread unemployment put many families in difficulty and the lower house prices meant that foreclosure more often resulted in a loss.

During the early years of the crisis the GSEs thus made large losses, as documented above. These losses were larger than the capital they had. The government thus had to step in and refinance them. However, the losses incurred during 2008-2012 are now in the process of being made up as the insurance premium has increased and

delinquency rates are falling. This part of the US banking union is thus likely to become self-financing. To put it in another way: the insurance against regional shocks provided de facto by the GSEs has in the end been financed entirely by investors (and mortgage holders). One key reason that the losses of the GSEs can now be made up is that only a very small proportion (6%) of the newer loans has a mark to market loan-to-value ratio above 100%, whereas that proportion was 40% during the boom years 2005-2008, as shown in the last-but-one column of the table below. It is thus not surprising that the delinquency ratio rose to almost 10% on the mortgages from the boom years, but is now only 0.35% for newer mortgages.

Table 3 - Selected Credit Characteristics of Single-Family Conventional Loans Held, by Acquisition Period¹²

| As of March 31, 2013 | | | | |
|---|--|--|--|---------------------------|
| | % of | | | |
| | Single-Family Conventional Guaranty Book of Business | Current Estimated Mark-to-Market LTV Ratio | Current Mark-to-Market LTV Ratio >100% | Serious Delinquency Ratio |
| New Single-Family Book of Business..... | 69% | 70% | 6% | 0.35% |
| Legacy Book of Business: | | | | |
| 2005-2008..... | 20 | 96 | 40 | 9.77 |
| 2004 and prior..... | 11 | 56 | 6 | 3.57 |
| Total Single-Family Book of Business..... | 100% | 74% | 13% | 3.02% |

Source: <http://www.fanniemae.com/resources/file/ir/pdf/quarterly-annual-results/2013/q12013.pdf>, page 5.

4.3) Securitisation via US federal housing-market institutions

During the credit boom many households were able to obtain mortgages even if the payment record and the credit score of the mortgage holder was below the minimum required by the GSEs or with loan to value ratio above the 80 % permitted by Fannie Mae and Freddie Mac. These mortgages, which were not ‘conforming’ to the standards of the GSE, were euphemistically called ‘sub-prime’ and packed in securities (RMBS = Residential Mortgage Based Securities) and sold in different tranches, many of which were rated AAA because during the boom years housing prices were increasing and the loss rates on these loans were low. The AAA rated tranches were sold to investors world-wide as they were considered a safe investment given the expectation that house prices would continue to increase.

¹² See web: www.fanniemae.com/resources/file/ir/pdf/quarterly-annual-results/2013/q12013.pdf, Page 5.

This form of securitization provided another important element of regional shock absorption because during the bust the default and delinquency rates on these mortgages rose even more than the conforming mortgages which had been insured by the GSE. The losses that arose in particular in those states where sub-prime lending had been most prevalent, e.g. Nevada and Florida, were thus not borne by the local banks in these states, but by the ultimate investors in the RMBS, many of which were banks from countries with excess savings, like Germany.

This is of course an ex post view. One could also argue that the possibility to securitize sub-prime mortgages led to serious moral hazard problems as the originating banks and brokers had an incentive to originate as much business as possible without taking into account the ability of the borrower to service the mortgage since the risk of default would be borne by the holders of the RMBS.

4.4) Who pays in the end? The incidence of taxes in a competitive industry

No tax payer's money was thus spent to support the official shock absorbing institutions of the US after the sub-prime crisis. In this sense the US provides a model how to reach the often stated aim of having 'industry' pay for the cost of a financial crisis.

However, the losses of the FDIC and the GSEs had to be borne by somebody. This somebody were the shareholders and the clients of the financial sector. The GSE's had little equity, most of the losses from the excess lending during the boom years had thus to be compensated by higher risk premia paid by families who took their mortgage during the bust. Similarly, the losses of the FDIC have to be compensated by new levies on bank deposits. General theorems of public finance imply that the cost of these additional levies will be 'translated' to customers in the form of lower returns on deposits or higher interest rates if banking is a competitive business.

This is the basic conundrum facing the position that 'the industry' should pay for its own mistake because tax payer's money should not be used to shore up failing banks. Ex ante, capital flow into the industry up the point at which it can expect to earn a normal, risk adjusted, return. This implies that the cost of contributing to future bank rescues will be factored in by investors into the banking sector as an element in their decisions leading them to demand higher risk premia. This means that the customers of the industry will ultimately bear the expected cost of future rescues in the form of lower deposit rates, higher lending rates or higher generally higher fees for banking services. The capital cushions accumulated by the higher risk premia during tranquil times will then be needed when a crisis arise. Ex post the capital in the industry can then be used to pay for the cost of any rescues that are needed. Ex post it might thus appear that 'the industry paid for its own mistake'. Ex ante this is impossible to ensure in a competitive environment.

5) What to expect from the European Banking Union?

The key aim of Banking Union was to break the ‘diabolic feedback loop’ between banks and sovereign.¹³ With the legislative framework now in place one could ask how regional instability would be dealt with under the Banking Union.

To illustrate the importance of the Banking Union one just needs to perform the thought-experiment of how the boom/bust cycle in Ireland would have played out with the SRF fully in operation (i.e. after the end of the transition period).¹⁴

The most visible difference would of course arise during the bust downturn since the local banks would naturally run into difficulties as the local real estate boom turns to bust. If the Irish real estate bust had occurred under the Banking Union the consequences for the Irish government would have been quite different from what happened in 2008/9/10 when the Irish government first felt obliged to give a blanket guarantee for all liabilities of its banks and then was prevented from bailing in the few instruments which were not covered by the guarantee.

With the banking union in place the funding for keeping Irish banks alive would have come from the SRF. The Irish government would have sustained losses only if the SRF had decided not to save the local banks and the losses had been so large that the national deposit insurance scheme would have had to intervene to ensure that no holder of an insured retail deposit made a loss.

In the case of another Ireland-type real estate boom and bust the ECB would signal the banks in difficulties to the SRF, which would then decide whether to allow some banks to fail, put them into resolution or whether to save them because they are judged systemic. The funds needed to save any banks (or enable an orderly resolution) would come from the SRF, not from the national government, as today.

The ‘diabolic’ feedback loop between weak banks and weak sovereigns that was so destructive at the height of the euro crisis should thus be broken from the start (Belke, 2014, Begg, 2014).

Moreover, the Banking Union might also have limited the size of the booms and the size of the exposure of the national banking system to its real estate sector. National supervisors had a natural tendency to protect the independence of ‘their’ banks, thus limiting de facto in many cases cross-border mergers and acquisition and the formation of multinational banks. Cross-border equity investment in the banking sector should now become more frequent, which constitutes a further stabilising factor as the experience of the Baltic countries has shown.

In future a national real estate boom/bust cycle is thus likely to play out very differently. A future Ireland-type bust is less likely to entail severe distress for the

¹³ In this context, Allard et al. (2013) emphasize as a systemic problem that the inability to cope with shocks is a problem not just for the affected country, but also to other ones due to the rapid spillover of fiscal stress.

¹⁴ Formally it will take ten years for the SRF to reach its target of 55 billion euro and the full merger of the national ‘compartments’ within the SRF will be achieved after 8 years. This might appear a rather long transition, but the mutualisation will proceed relatively quickly at the beginning since 60 % of national compartments within the SRF will be merged already after 2 years. The gradual increase in the degree of mutualisation agreed corresponds to the proposal made by Gros and Schoenmaker (2012).

sovereign. This does not mean that the Nevada scenario of no stress at all for the local sovereign will materialise, given that the other elements of the US banking union (securitization via the GSEs, federal deposit insurance and large banks which operate throughout the area) are missing in Europe. But the extreme stress on sovereigns observed in the cases of Ireland Spain should become much less likely.

Moreover, it is likely that the European institutions, not only SSM, but also the ESRB would have recognised the existence of a regional house price boom, and would have been much more likely than a local supervisor to warn banks about excessive real estate valuations; thus limiting the extent of the over-lending and construction.

The potential losses for the SRF would anyway probably be lower than those incurred by the Irish government because of the bail-in rules under the BRRD, which mandates that public funds can be provided only if not only shareholders, but also some creditors have accepted a loss (have been 'bailed in') of 8 % of the bank's assets. This did not happen in the case of Ireland because at that time the entire euro area banking system was in difficulties, and because it was thought that letting any Irish banks fail would have sparked another panic, comparable to the one that followed the failure of Lehman brothers in the autumn of 2008.

For banks which are intervened by SRF it would of course become relevant whether the debt instruments that are bailed in are held predominantly by residents, local households or other local financial intermediaries. If other local financial institutions are heavily invested in the 'bailable' instruments of local banks there would still remain an important channel for local contagion. This was up to now the case as until 2008 a large part of cross-border investment within the euro area was in the most secure or short-term spectrum like short-term interbank deposits and covered bonds. By contrast hybrid forms of capital, which would be the first to be bailed in were until now sold locally in Europe. The reason is that often these instruments are tailor-made to be tax efficient under the local legal system. Another reason is that the information needed to evaluate hybrid capital is also available mostly in the home country.

In the specific case of Ireland a large part of the real estate lending had been financed by inter-bank deposits from other countries; and these deposits were mostly of a longer maturity than 7 days, and could thus have been bailed in under the new rules contained in the BRRD. If the BRRD had been in force the Irish crisis might have taken a different course. But it remains to be seen whether interbank deposits (with a maturity longer than 7 days) will again become as important as they were until 2007/08.

Another potential channel of contagion from banks to the sovereign arises from article 109 of the BRRD which stipulates that the (national) deposit guarantee scheme (DGS) has to contribute to the funding of resolution to the extent of the losses the DGS would have faced if the bank in question had been left go bankrupt. This makes sense from the point of view of protecting the funds of the SRF, but it opens a Pandora's box of practical issues. First of all, it is always very difficult to estimate the losses the opening of a bankruptcy procedure would produce. This could also be observed in the cases of the two major bankruptcies which happened during the 2008

crisis, namely Lehman brothers and the Icelandic banks. Immediately after the opening of insolvency proceedings the price of the unsecured bonds of these institutions fell drastically, sometimes to as little as less than 10 % of the face value. However, the prices of these bonds rose strong later as the insolvency procedures advanced and it became clearer that the assets were worth more than had been thought originally (partially this was due to the general recovery of asset values which set in in 2009). Moreover, for any international bank or banking group it will be even more difficult to determine in which subsidiary of the group the losses are to be located. There are thus likely to be strong conflicts of interest among the different national DGSs which insure the deposits of the subsidiaries in different countries.

These valuation problems are particularly acute given that the decision on the bail in and the involvement of the SRM will typically have to be taken over the course of a weekend. Fortunately paragraph 5 of article 109 BRRD limits the contribution of the DGS to one half of the target level of funds the DGS in question has. The target level of the funds for a DGS is typically less than 1 % of GDP. The maximum contribution the SRF can demand from any one DGS is thus less than one half of 1 % of GDP.

The local contagion might of course be even stronger if the SRM lets some banks fail (i.e. if the SRF does not intervene). In this case the local deposit guarantee system (DGS) fund would have to bear at least part of the burden (provided the losses are larger than the bail-inable capital of 8% of assets). Moreover, when the losses are very large relative to the balance sheet of the bank(s) involved there is no limit to the size of the losses the DGS might have to cover. In the case of large international banking groups different national DGSs might experience quite different loss rates. This constitutes another aspect of the conflicts of interest between the SRF and the (national) DGS as well as among the latter mentioned above because a high contribution by the SRF to keep the bank in question afloat would mean a lower risk of losses for the DGS. Representatives of the SRF might thus argue that the local DGS should contribute to any rescue operation, although the latter has no legal obligation to do so as long as the bank is not formally insolvent.

All in all one can conclude the (incomplete) banking union created for the euro area is likely to diminish the strength of the feedback loop from weak banks to their national sovereign. However, large banks with very large losses could still create problems for their national government.

6) Open issues for Banking Union

This section deals with some of the open issues that remain if the Banking Union is to become a bulwark against regional financial shocks. The purpose is not to be exhaustive, but to briefly discuss some of the major issues that remain. Two near term issues are the lack of a fiscal backstop for the Single Resolution Fund and its financing via risk related contributions. A third issue concerns the lack of an agreement on a common deposit insurance scheme. Official decisions have recently been taken in both areas, but they appear to lack in ambition.¹⁵

The main financial element of the Banking Union will be the Single Resolution Fund (SRF). This fund will be created together with the SRM via a separate 'Intergovernmental Agreement (IGA)' and not via the normal procedure based on the EU Treaty. However, this legal particularity should not impair the proper functioning of the SRM as a 'federal' institution.

Officially the purpose of the SRF is not to absorb losses, but only to provide temporary financing for banks that need to be restructured (Belke, 2014). Reality might be quite different, given that any policy on bank resolution suffers from acute time inconsistency: during tranquil times it is in the interest of the public authorities to announce that they do not intend to bail out the creditors of any bank, hoping that this will make the creditors of banks aware of the risk they are running. However, when a bank gets into difficulties the temptation is always extremely strong to bail out either the bank itself, or its creditors. The reason is that the insolvency of a bank can lead to extremely serious contagion effects and endanger systemic stability, as the experience with the default of Lehman brothers showed. However, this problem is not specific for the SRM, it affects all resolution funds when it has to deal with a potentially systemic crisis.¹⁶

However, there remain two issues which are specific to the financing of the SRM.

6.1) Can the SRF survive without a fiscal backstop?

The size of SRF has often been criticised as being insufficient. But this is largely mistaken. A fund of €55 billion would be enough to resolve all but the very largest banks in Europe (based on the rule of thumb that the cost of resolution should usually does not exceed a small multiple of own funds); and would also be sufficient to deal with even a systemic crisis in small- to medium-sized countries (Spain needed €60 billion from the ESM).

Moreover, the EU (draft) Regulation establishing SRM specifies also that the SRF can, if needed, raise ex post levies. For any given year the limit for the ex post levies is 3 times the 'normal' annual contributions, or $3 \times 12.5 = 37.5$ % of the total (target) fund,

¹⁵ The agreement on the contributions to the SRF can be found here: http://ec.europa.eu/internal_market/finances/banking-union/single-resolution-mechanism/index_en.htm. The agreement on DGS can be found here: http://ec.europa.eu/internal_market/bank/guarantee/index_en.htm.

¹⁶ See for example Acharya and Yorulmazer (2007) who stress the problem of "Too Many to Fail". Chari, Kehoe (2009) analyse the link with optimal regulation. Other contributions in this vein are Gimber (2012) and Grochulsky (2011).

or about 20 billion euros. Over time these ex post levies could provide the SRF with important additional funding.

The SRM is of course relatively small compared to the overall assets of SSM banking system (which amount to over €25,000 billion) and also small relative to the overall capital of the sector (about €1,000 billion). But one cannot expect a resolution fund to deal with the chronic undercapitalisation of the European banking sector (see also Beck, Gros and Schoenmaker, 2013). The resources of the SRF will be significant relative to the capitalisation of most individual banks (the 30 German banks directly under the SSM have on average a capitalisation of only €10 billion). Moreover, the resources of the SRF will loom large relatively to the budget of any single member state, bare the largest ones.

Any restructuring fund can only be a first-aid kit dealing with a small number of occasional accidents. A systemic crisis always requires a fiscal back-up. The euro area at present does not have such an explicit back-up in that it is not clear who would lend to the SRF should its funds not be sufficient to deal with a crisis which is systemic at the level of the euro area. (As argued above, the SRF should be able to deal with a systemic crisis in any small to medium sized member country.)

One can argue, however, that implicitly a back-up exists as experience has shown that during a crisis; when there was a need for public funds, they were found. The process was of course slow and cumbersome and the slow creation of the ESM made the crisis even worse. But there is already now agreement that a (small) part of the resources of the ESM would be available for a direct recapitalisation of banks if a member country is not able to raise the funds on its own.¹⁷ Moreover, should the resources committed already now for bank recapitalisation by the ESM not be sufficient it would take only a further political decision to provide a backstop to the SRF in case of a truly systemic crisis. This choice will be politically natural once the lending capacity of 700 billion euros of the ESM has been restored, which should be the case once the current programmes have ended and the funds have been reimbursed. It is clear that it would be preferable to have an explicit, Treaty based, back-up for the SRF. However, a legal guarantee does not seem to be indispensable since it seems that even in the US the backing of the Treasury for the FDIC is based on a political decision taken a long time ago, rather than being mandated by law.¹⁸

¹⁷ For the official decision see http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ecofin/137569.pdf.

¹⁸ On the issue of the "Full Faith and Credit" backing for the FDIC one finds the following (http://en.wikipedia.org/wiki/Federal_Deposit_Insurance_Corporation): In light of apparent systemic risks facing the banking system, the adequacy of FDIC's financial backing has come into question. Beyond the funds in the Deposit Insurance Fund above and the FDIC's power to charge insurance premia, FDIC insurance is additionally assured by the Federal government. According to the FDIC.gov website (as of March 2013), "FDIC deposit insurance is backed by the full faith and credit of the United States government. This means that the resources of the United States government stand behind FDIC-insured depositors." The statutory basis for this claim is less than clear. Congress, in 1987, passed a non-binding "Sense of Congress" to that effect, but there appear to be no laws strictly binding the government to make good on any insurance liabilities unmet by the FDIC.

6.2) How to discourage risk taking via the contributions to the SRF

There is general agreement that the banking sector should pay for its own safety net. Resolution and deposit guarantee funds should thus be financed by contributions from the banks itself. This principle is at the basis of the approach taken in the EU Directive on (national) Deposit Guarantee Schemes that has recently been passed. And it is also enshrined in the basic rules of the Single Resolution Fund (SRF) which will be at the disposal of the Single Resolution Mechanism (SRM) which has also been recently approved (see article 69 of the SRM Regulation).

Moreover, there is also general agreement that the contributions individual banks pay to the resolution (or deposit guarantee) fund should be based on the riskiness of the bank itself. This is essential to provide individual banks with the proper incentives.

However, in reality a practical problem arises: resolution or deposit guarantee funds (whether national DGS or the SRF) have also a target level, usually as a percentage of deposits or some other liability. Once this target level has been reached, contributions are no longer needed (see article 69 of the SRM Regulation). But this implies that the incentive effect of linking contributions to risk factors at the individual bank level no longer operates once the target level has been reached at the level of the overall fund.

The problem can be solved in two ways (see Box 1). One way would be to keep assessing contributions even after the fund has reached its target level, but provide banks with a refund based on their passed contributions. The ongoing contributions would then be based on current risk levels (in terms of riskiness and magnitude of insured deposits), thus providing the right incentives.

Box 1 - Contributions to a bank resolution fund: conceptual underpinnings

The usual approach is to set the annual flow, i.e. the contribution of each bank for each year as simply a function of its liabilities base (of that year) and certain risk factors (measured for that year or some recent past average):

$$contribution_{i,t} = \alpha_{i,t}(riskfactors)L_{i,t}$$

Where the alpha denotes the contribution rate of bank i, which will be a function of its riskiness. The liabilities base on which contribution rates, alpha, are defined is not material for the problem at hand. The alpha can be calibrated in such a way that the target level of the fund is reached in a number of years (ten in Europe).

The main limitation of this approach is that contributions stop when the target level has been reached, i.e. when the sum of all past contributions (neglecting interest the fund earns on its investments) is larger than the target level.

$$\sum_{t,i} c_{i,t} \geq overall\ target\ level = x \left[\sum_i L_i \right] / 100$$

In the case of Europe the target level would be equal to a percentage x of the liabilities base which has to be calculated as a function of the ratio between covered deposits and the liability base for contributions (x = covered deposits/liabilities).

After ten years, contributions would thus stop and the risk factors would cease to have an incentive effect.

A simple way to ensure that the incentive effect of risk based contributions is preserved beyond the transition period is to stipulate that the annual contributions have to be paid each year, irrespective of the size of the fund. But there would be an additional rule: each bank receives also a transfer back which is proportional to its share in the total pot accumulated so far.

Under this computationally simple way to preserve the incentive effects of risk based contributions keys the annual net transfer a bank has to make to the resolution fund would be given by:

$$net\ payment = nc_{i,T} = c_{i,T} - \frac{\sum_{t=0}^T c_{i,t}}{Target\ level}$$

Where $\sum_{t=0}^T c_{i,t}$ denotes the sum of all past payments made by bank i.

Under this system the incentive effects of the risk based factors would persists even after the target level has been reached.

The net amount a bank would have to transfer to the system (i.e. the difference between its annual contribution and its pro rata reimbursement) could thus become negative (and indeed on average half of the banks would face net negative 'contributions').

Alternative approach:

At time t the overall target stock of capital a bank i should have contributed to the resolution fund is defined as:

$$C_{i,t}^* = \alpha_{i,t}(riskfactors)L_{i,t}$$

Where the alpha denotes again the contribution rate of bank i, which should be a function of its risk factors (capital base, etc.).

The annual contribution to the resolution fund a bank i would have to transfer to the resolution fund could be one tenth of the difference between the target capital level and the sum of the actual transfer this bank has made in the past. (Neglecting interest the fund earned, which would have to be offset against its running costs.)

Formally the annual contribution, denoted by a lower case, c, in year T, would be given by:

$$c_{i,T} = \left[C_{i,T}^* - \sum_{t=0}^T c_{i,t} \right] / 10$$

Under this system the incentive effects of the risk based factors would remain intact even after the resolution fund has reached its target level of 1 % of covered deposits. Banks whose risk has fallen relative to the past would receive a reimbursement and banks whose riskiness has increased would continue to have to pay. The same applies to increases/falls in the liabilities which form the base for the contribution:

banks whose liabilities increase (more than the system average) continue to pay whereas those whose liability base falls receive reimbursements.

Another approach would be to define a target level for the stake each bank has in the resolution fund. This stake is given by the sum of its past contributions to the fund. As shown in the technical box this would be subtly different from the usual approach of defining an annual contribution based on present risk levels.

A simple way to ensure that the incentive effect of risk based contributions is preserved beyond the transition period is to stipulate that the annual contributions have to be paid each year, irrespective of the size of the fund. But there would be an additional rule that each bank receives also a transfer back which is proportional to its share in the total pot accumulated so far. Under this approach the incentive effects of the risk based factors would persist even after the target level has been reached.

The net amount a bank would have to transfer to the system (i.e. the difference between its annual contribution and its pro rata reimbursement) could thus become negative for those banks whose risk profile improves. (In a now growth situation on average half of the banks would face net negative 'contributions').

One needs thus to make a clear distinction between the annual flows of payments to the fund (usually called contributions) and the stock of cumulated contribution to the fund which denote for each bank the stake or capital which the bank has contributed to the fund in the past. Unfortunately this principle has not been recognised in the agreement of October 21st, 2014, on the "ex-ante contributions to the Single Resolution Fund" (http://ec.europa.eu/internal_market/finances/banking-union/single-resolution-mechanism/index_en.htm). The contributions to the SRM will thus not contribute to pricing risk taking by individual banks once the target level of the funds has been reached.

6.3) Separating resolution and deposit insurance: Principles of a two-tier European deposit (re-)insurance system

As mentioned above it is widely agreed that a full BU comprises three elements, namely common supervision, common funding for restructuring and common deposit insurance. Many academic observers (see, for example, the contributions to Beck, 2012) stress the need to introduce all three elements together. However, deposit insurance has de facto been dropped from the official agenda.¹⁹

This does not imply that nothing has been done regarding deposit insurance at the EU level. The European Commission tabled a proposal for a directive on Deposit

¹⁹ The blueprint of the European Commission for a 'genuine EMU' contains only a passing reference to the need for "solid deposit guarantee schemes in all Member States". Some have argued that it is not needed and for others it is just politically too contentious (e.g. Pisani-Ferry and Wolf, 2012).

Guarantee Schemes (DGS) already in 2010.²⁰ The directive has in the meantime been adopted (http://ec.europa.eu/internal_market/bank/guarantee/index_en.htm).

However, the scope of this ‘DGS’ directive is quite limited as it aims only at harmonizing coverage, the arrangements for pay-out (e.g. the time limit for paying out depositors) and the financing of national DGSs. The Commission has so far only proposed “mutual borrowing between DGSs, i.e. a borrowing facility in certain circumstances”. Somewhat surprisingly, an accompanying Joint Research Centre report (JRC, 2011) on deposit insurance at the EU level does not consider the reinsurance model at all.²¹

The case for maintaining deposit insurance at the national level used to be the national level remains best qualified to evaluate idiosyncratic risks of the banks under its watch. National DGSs should also have the right incentive to monitor individual banks as they would have to pay for any losses. In reality, however, most national DGS (and national supervisors in general) operate within so many political constraints that they have little influence except for very small banks. At any rate, with supervision now concentrated in the SSM (effectively the ECB) the case of retaining deposit insurance has been fundamentally weakened.

The fact that the ECB will be the direct supervisor of only the largest 120 banks, might strengthen the case of leaving all the other smaller banks under national deposit insurance, but the SRM will cover all banks.

Moreover, a little noticed part of the SRM agreement stipulates that the SRM can require (national) DGSs to make a contribution to the resolution of bank up to the amount of the losses the DGS would have made if the SRM had not intervened (i.e. the bank would have gone into insolvency). This makes sense from a theoretical point of view: if the SRM puts its funds into a bank and thus helps a DGS to avoid a loss this advantage for the DGS should be compensated. However, while this approach seems theoretically logical it is likely to be totally impractical because the amount the DGS(s) would have to contribute to the resolution of a bank under the SRM would have to be determined in a few hours during a frantic a weekend. Moreover, the determination of how much a DGS would have lost in case the SRM had not intervened (and the bank thus would have gone into insolvency) can never be determined objectively.

This is not just a general consideration, but a real life problem. When the Icelandic banks went insolvent, institutions had collected deposits in several countries. Although these banks had operated through branches, the national authorities felt compelled to compensate savers in their country as if the branches had been covered by the national DGS (because the Icelandic deposit insurance system also became effectively insolvent). At the time (2008) it appeared that this would impose a large

²⁰ http://ec.europa.eu/internal_market/bank/docs/guarantee/20100712_proposal_en.pdf.

²¹ Under the heading “Pan-EU DGS”, this report “explored the option to establish a pan-EU DGS, either:
a. in the form of a single entity replacing the existing schemes, or
b. in the form of a complementary fund to existing DGS (‘28th regime’), or
c. structured as a network of schemes providing each other with mutual assistance (‘European system of DGS’).”

cost to national tax payers in Germany, the UK and the Netherlands. However, the end result was quite different from the initial fears. The German DGS was able to recover most of the cost it incurred compensating German savers because it was able to seize some assets in Germany and waited patiently until these assets recovered in value. The UK and Dutch government brought a court case against the Icelandic government as they were not able to recover any assets in their countries. However, over time the estate of the Icelandic banks was able to recover much more than initially assumed, given that depositors had a preference over many other creditors. More than one half of the losses have thus already been covered. The FDIC has made a similar experience over the last years. In some cases it had to revise its losses considerably downwards over time.

In real life insolvency cases the estimates of the recovery value of assets can thus vary greatly over time. However, if the SRM intervenes the cost of insolvency cannot be observed and can only be estimated as a counterfactual. There will thus an unavoidable conflict of interest between the SRM and (national) DGS.

These difficulties would of course multiply for internationally active banks (with different subsidiaries in different countries, which remains the dominant model). The SRM would thus have to determine in a weekend how much each national DGS would have to contribute in a insolvency of the group. This seems next to impossible given that one would have to determine what assets would be a disposable for different national authorities. A process, which would likely take years and many lengthy court cases.

The cases of the Icelandic banks and that of the cajas in Spain shows that the real problem in deposit insurance is not the problems posed by individual banks, but by system risk. Experience confirm again and again that national authorities are not well placed to evaluate systemic risk, i.e. risks to their entire banking system. As discussed extensively above, the main source of such shocks which often threaten the entire national banking system are local real estate booms and busts

Local credit bubbles. The national real estate bubbles were not recognised as such in Spain or Ireland, although foreign observers and EU institutions had repeatedly warned about unsustainable developments. Moreover, national authorities are also not well placed in practice to deal with banks that are well connected at the national political level, either because of size ('national champions') or because of the nature of their business (banks financing local real estate development). This fosters the accumulation of large risks and delays in loss recognition once the bubble bursts. A local real estate bubble which had been financed by local institutions with local deposits might also constitute a case in which the SRM might thus be the most likely case under which a large number of local banks would incur large losses with high payouts required from the national DGS.

There is thus a need to re-insure national deposit insurance systems against large, systemic events.²²

The need for reinsurance thus arises even without considering the specific problems posed by large cross-border bank groups. In reality, most large cross-border banks operate via subsidiaries. These subsidiaries contribute to the DGS of their host countries the same way as purely national banks, and the national DGS would have to pay out should one of these large cross-border banks fail. This provides some automatic burden-sharing.

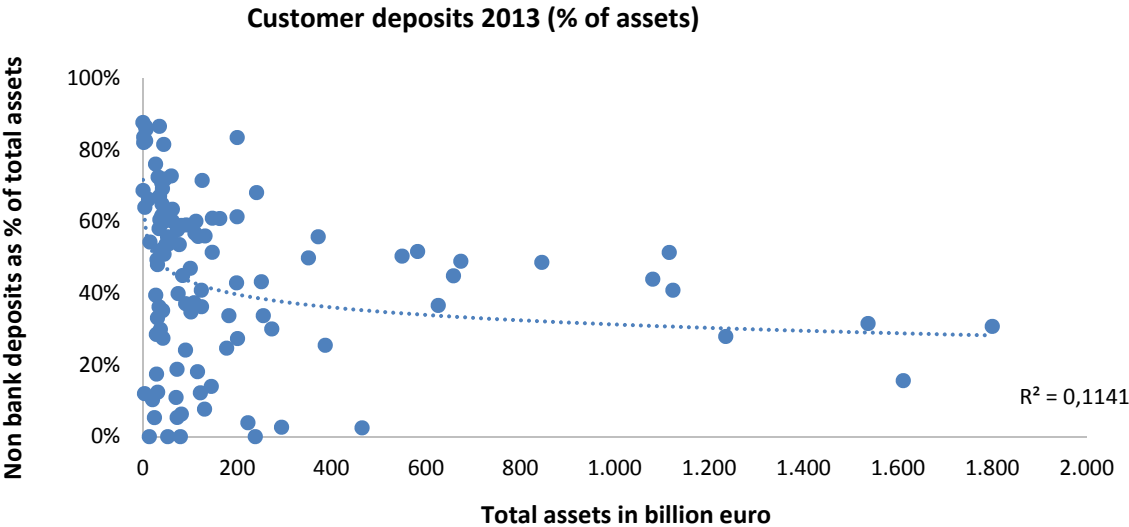
However, the burden-sharing is limited to the case of cross-border banks operating with subsidiaries. Losses at large-cross-border banking groups (mostly classified as SIFIs, or significantly important financial institutions) pose other problems, as the distribution of assets across subsidiaries will determine where the losses arise. The experience with Fortis has clearly shown this phenomenon. SIFIs are usually saved by government intervention because of the threat they pose to systemic stability.

Deposit insurers are thus not directly involved and anyway do not constitute the largest creditors because these large institutions are mostly universal banks for which deposit-taking is only one part of the overall business model with customer deposits amounting usually to less than one-half of the balance sheet. Figure 8 below shows the share of customer deposits by bank size (measured as total assets) of the about 100+ euro area banks subjected at least one of the CEBS and EBA exercises between 2010 and 2014 or ECB Comprehensive Assessment in 2014, which covered for all the member countries the largest banks accounting for at least one-half of assets at the national level.²³

²² Pisani-Ferry et al. (2012) arrive at the same conclusion.

²³ The 2010 stress test exercise was conducted on a sample of 91 European banks. In total, national supervisory authorities from 20 EU member states participated in the exercise. In each of the 27 member states, the sample was built by including banks, in descending order of size, so as to cover at least 50% of the respective national banking sector, as expressed in terms of total assets. As the stress test was conducted at the highest level of consolidation for the bank in question, the exercise also covers subsidiaries and branches of these EU banks operating in other member states and in countries outside Europe. As a result, for the remaining seven member states where more than 50% of the local market was already covered through the subsidiaries of EU banks participating in the exercise, no further bank was added to the sample. The 91 banks represent 65% of the total assets of the EU banking sector as a whole. For about 10 of these banks no data on customer deposits was available.

Figure 8 - The relative importance of deposits as a function of bank size



Source: CEPS database (see Ayadi and De Groen, 2014).

Existing mutual guarantee schemes provide another rationale for reinsurance. These schemes, notably among the German savings banks, exist usually among groups of small savings institutions, all of which have a very similar business model. Groups of banks with a mutual guarantee system constitute essentially one large bank from the point of view of a deposit insurance system. There is no reason to dissolve systems that have worked well so far. But these groups clearly are not immune to systemic risk. A first reinsurance layer for groups of savings or cooperative banks which have a mutual guarantee agreement could be provided at the national level. But this is not sufficient since these groups account for a large share of deposits in some countries and could thus overtax the loss absorption capacity of the national authorities.

There has been some debate about the need for a European approach to deposit insurance (for a survey see Belke, 2014). For example, Pisani-Ferry and Wolff (2012) argued that a common deposit insurance fund is not needed. The reason given was that deposit funds insure against the failure of a single, small financial institution, but not against the failure of the euro area financial system. This is undoubtedly true. But their argument strengthens actually the case made here for the need for some back-up for national DGSs that experience a shock that is systemic at the national level, but not at the euro-area level. The experience with Spain and Ireland has shown that this type of shock can certainly arise. Depositor confidence everywhere should be strengthened if it is known that there exists a credible back-up for national deposit insurance funds.²⁴

²⁴ If a common deposit insurance of this form remains absent due to worries about moral hazard, the euro area will most likely remain less integrated financially. This is because the scope for private financial flows to accommodate asymmetric shocks would be restricted. Credit institutions would stay retrenched within national boundaries, limiting the supply of credit in weaker economies, inhibiting their capacity to restore growth and employment. See Begg (2014) and Howarth and Quaglia (2013).

Box 2 – *The FDIC as an example for Europe?*

The Federal Deposit Insurance Corporation (FDIC) in the US is an independent institution with a considerable staff which can monitor and assess the risk posed by the thousands individual banks operating in the US.

A key aspect of the FDIC is that it is completely unconcerned by the local political difficulties that might arise when it swoops in and resolves an ailing bank over a weekend. During this crisis the FDIC has been able to resolve hundreds of (admittedly mostly small) banks, whereas in Europe very few banks have been resolved or allowed to fail. However, some of the banks dealt with by the FDIC had balance sheets which were larger those of the banks in Cyprus and even most cajas in Spain. What would qualifies as small for the FDIC (and probably for the SRM as well) could thus be relevant in the context of smaller member states.

The FDIC follows a strict ‘waterfall’ of claims with junior debt first to be wiped out and even senior bond-holders often suffering large haircuts. The FDIC model would thus be preferable for the EU as well, but unfortunately it does not seem to have any chance of being adopted at present.

It is interesting to note that one of the key arguments for the creation of the FDIC was the fact that deposit guarantee had been a responsibility of the states. But during the crisis of the early 1930s, most of the deposit schemes at the state level had become insolvent (Golembe, 1960) as contagion led to a cascade of local banking panics which overwhelmed the capacity of the local DGSs of the time.

One of the key reasons why state deposit insurance systems failed was the fact that the small undiversified banks exposed to local real estate bubbles and agricultural difficulties were prone to systemic crisis (Thies and Gerlowski, 1989). This problem remains even today. The Spanish and Irish deposit insurance funds would be overwhelmed by the multiple failures within a small undiversified group of banks resulting from a local boom and bust. Federal re-insurance would diversify this risk of local shocks.

The need to provide insurance against systemic shocks remains today as important as ever. This need motivates the following concrete proposal.

6.4) Basic principles of reinsurance

Gros (2013) proposes to apply the principles of subsidiarity and re-insurance to deposit insurance. The basic idea is simple: Existing national deposit guarantee schemes (DGSs) would continue to operate much as before (with only minimal standards set by an EU directive), but they would be required to take out re-insurance against risks that would be too large to be covered by them. A European Reinsurance Fund (EReIF) would provide this reinsurance financed by premia paid by the national DGSs, just as any reinsurance company does in the private sector.

The European Fund would pay out only in case of large losses. This ‘deductible’ would provide the national authorities with the proper incentives, but the reinsurance cover would stabilize depositor confidence even in the case of large shocks.²⁵

A first point is that what is needed is reinsurance, not a mutual guarantee among all national DGS. This implies that the reinsurance scheme proposed here will not put the deposits of savers in virtuous countries at risk.

A new institution – the European Reinsurance Fund (EReIF) – would have to be created. This institution would collect premia from all national DGSs and would pay out in case losses at the national level exceed a certain threshold. Three other principles also need to be stressed: the compulsory nature, the need for independent management and premia based on systemic, or macroeconomic, risk and the transition.

6.4.a) Compulsory reinsurance with a deductible

The compulsory element is indispensable. Otherwise a serious adverse selection bias would arise. Differences in risk profiles are no reason to allow any national DGS to opt out.

(National) Deductible: As for any insurance, there should be a first loss tranche, or deductible, which is borne at the national level. This means that the losses that might arise if a small to medium sized bank fails somewhere these losses would have to be covered by the national DGS alone. This ‘deductible’ should be of such a size that the national DGS could pay out without endangering its own viability. It should be proportional to the size of the national fund accumulated, which in turn should be large enough to deal with the failure of any single domestic bank (but not necessarily the EU-wide deposits of the large cross-border banking groups). The Commission has proposed to set as a target for each national DGS a fund equivalent to 1.5% of (insured) deposits. The national DGSs should then dedicate a part of the risk premia they collect from their banks to reinsure themselves with the EReIF. As a rough guess about one-third to one-half of the premia collected at the national level might be needed for the reinsurance against systemic or large national shocks.

The contract between the EReIF and the national DGS would thus specify that the EReIF would pay out if, over a time period to be specified (say 2-3 years), the total claims on the national DGS exceed (e.g. two times) the fund accumulated nationally. Another way to specify the reinsurance event would be to fix the deductible (or national first loss piece) in terms of a percentage of GDP.

Reinsurance is thus completely different from lending among national DGSs, as proposed by the European Commission. A national DGS will need financial support only if the country experiences a systemic crisis. But these are exactly the conditions

²⁵ It will of course take time to build up the funding for such a reinsurance fund. This approach is thus not meant to deal with legacy problems from the current crisis.

under which the other DGS systems will not want to lend and it will be difficult to force the stronger DGSs to lend to others in crisis. Moreover, this mutual lending will constitute a vehicle for contagion, which should be avoided.²⁶

There will be limits to the amount the EReIF pays out. The limit is likely to be large enough to cover systemic events in small- to medium-sized Member States. The empirical literature indicates that the average cost of a banking crisis is around 5% of GDP. Even for a country like Spain, this would translate into €50 billion, and should thus be manageable by a fund of this order of magnitude.

A systemic shock to a large country could not be handled by the EReIF alone. In such a case, recourse to the ESM will be unavoidable because any systemic crisis of a large member country will lead to systemic consequences for the entire euro area economy. It will then be up to the fiscal authorities represented in the ESM to decide whether European taxpayers' money should be used to intervene.

How much protection could be provided by the reinsurance model proposed here? If one assumes that one-half of the premia are needed to cover against systematic risk, the protection provided by EReIF would be inverse to the size of the country. For example, for a small country which accounts only for 5% of all deposits, the common fund would be 20 times as large as the national fund. Even for a country accounting for 10% of all deposits (e.g. Spain), the EReIF would still be ten times larger than the national fund and thus be much more able to deal with a loss that might be too large to be dealt with at the national level.

6.4.b) Premiums and management

Risk premia should of course reflect differences in risk. Systemic events materialise rarely. It will thus be very difficult to calculate the appropriate premia. There will be long periods during which no systemic event occurs, and hopefully many countries will never experience a systemic crisis in a life time. But one could use the expertise of the large European reinsurance industry to assess the proper premium for this type of rare event. A real institution will be needed; a mere 'post box' system without expertise at the centre will not work because it would not be able to properly assess the risk of the national DGS. It is of course essential that the institution that sets the premia for the reinsurance is completely independent of political influence in its risk assessment. This seems to exclude the ESM in its present form because its staff has little autonomy under a Board that is dominated by the national finance ministers whose main mandate is to look after the interests of their national taxpayers, and not the stability of the whole system.

The EReIF would not need to have expert knowledge in bank management, but would need to look out for systemic, macroeconomic risk. In principle, this expertise is already available in the European Systemic Risk Board (ESRB). It would thus be important to find an institutional solution under which this expertise can be used by

²⁶ A 2011 study of the Joint Research Centre (JRC) of the EU did not consider the reinsurance approach. See Joint Research Centre (2011).

the EReIF. For example, the EReIF could be empowered to increase the premia it charges to the national DGSs concerned if the national authorities had ignored a warning and a recommendation from the ESRB to undertake certain actions to forestall a potential danger to price stability.²⁷

The EReIF should also be able to judge the overall quality of the national DGSs, which requires expertise in systems management, rather than analysts of bank balance sheets. The EReIF should thus have the right to inspect the practical working of national DGSs, checking for example whether premia are properly adjusted for risk (as required already by the EU Directive on DGS). Here it could benefit from the expertise of the Directorate General for Competition Policy (DG Comp) of the European Commission. In the private sector such a supervision of the reinsured is usually not feasible. This is why a fundamental principle of private reinsurance contracts is “The Duty of Utmost Good Faith” (Devery and Farrell, 2008)²⁸. Under this principle; the EReIF should be present at the table once a national DGS is nearing the borderline where a pay-out from the EReIF would be triggered. The EReIF would then need to give its consent to measures that would reduce loss-absorption capacity. Here again, a collaboration with DG Comp would make sense.

6.4.c) Transition

For a two tier system like the one proposed here the transition should be relatively straightforward to manage. Presumably there will be no need for immediate pay outs (assuming no systemic crisis arises again). This implies that the re-insurance function can be build up gradually as the funds in the EREI build up gradually.

The legacy problems from the current crisis should have been dealt with in the meantime by the Asset Quality Review which the ECB conducted in 2014 prior to becoming the direct supervisor of the 120 largest euro area banks.

A new, two tier deposit insurance system could thus start anytime, with the EReIF gradually building up its capital. The next systemic crisis will be different from the euro crisis and (hopefully) some time off. There should thus be enough time to build a new institution and accumulate enough funding before the next systemic crisis hits.

²⁷ A warning under the excessive imbalances procedure that is managed by the Commission and decided by the ECOFIN Council could of course be taken as another signal to the EReIF that the DGS of the country in question faces a greater risk of a systemic event.

²⁸ “One of the most fundamental principles in reinsurance – indeed, what sets the reinsurance field apart from most other industries – is the concept of utmost good faith (also known as “*uberrimae fides*”). The duty originated in the context of marine insurance law, when underwriters had no practical means of inspecting reinsured ships or cargo in distant ports.”

7) General consideration: fiscal union and financial shock absorber

A key finding of this study is that a common back up system for banks combined with the overall integration of national financial systems greatly increase the ability of financial markets to reduce the negative spillovers among members of a monetary union resulting from national or regional financial crisis. This finding is confirmed in more macroeconomic terms by the empirical literature which measures the channels of stabilization of regional income in existing monetary unions, like the US and Germany. For example, Asdrubali, Sorencen and Yosha (1996) find that in the United States, around 40% of shocks to per capita gross state product is smoothed by capital markets and around 25% by credit markets. This implies that about two thirds of shocks to state income are absorbed by financial markets. Similarly, Athanasoulis and van Wincoop (2001) find that around 70% of the shocks in the United States are smoothed through private and public risk-sharing mechanisms: financial markets play the biggest role, allowing around 60% of the total smoothing, while the federal fiscal policy covers the other 10%. More recently, Hepp and von Hagen (2013) find that for Germany, in the pre-unification period, most of the smoothing was provided by the federal tax-transfer and grant system (55%), while for the post-unification period, factor income flows have become the most important channel (contributing about 51% of total income smoothing).

The introduction of the euro and the common payments infrastructure has reduced barriers to financial integration and credit flows via the wholesale interbank market have boosted financial integration as measured by the size of cross-border flows and stocks. This was expected to facilitate risk-sharing among investors.

However, the euro crisis has shown that sometimes larger cross-border financial flows and stock can actually be at the origin of a crisis (Mink and de Haan, 2014). The main reason for this is that banks have been the primary financial intermediaries in the European Union and in the euro area. Most euro area member countries' financial systems are heavily 'bank-centred' and stock and bond markets provide a relatively modest share of the financing to the private sector in most countries. Total bank assets account for 283% of GDP in the EU, compared to about 65% of GDP in the U.S. (Fuceri and Zdzienicka, 2013).

There is no robust evidence in the literature that such financial system, dominated by banks (rather than market) and debt (instead of equity) has increased the capacity of the economy for risk-sharing.

Kalemli-Ozcan et al. (2010) and Demyank et al. (2007) find evidence that increased cross-banking integration has fostered ex-post the optimality of the currency union by improving cross-country risk sharing. By contrast, Furceri (2013) finds that "the decrease in private credit smoothing after the creation of the EMU reflects the fact that credit flows have become less counter-cyclical".

By contrast, as is the main focus of this paper, the US shows a model how a high degree of banking integration can absorb shocks. The main reason for this that in the

US banking integration has not taken the form of cross-border credit, but de facto cross-border equity as a few large banks are operating nation-wide.

8) Concluding remarks

The existing banking union in the US has been very successful in managing the local real estate booms and busts that the US has experienced as well. A careful comparison of the cases of Nevada and Florida (compared to Ireland and Spain, respectively) showed that these financial shock absorbers have a higher shock-absorbing capacity than could ever be provided by any 'fiscal capacity' for the euro area. The macro-economic literature confirms this in the sense that it finds that in the US, the shock absorption provided by financial markets is much larger than that provided by the fiscal system (see, for instance, Begg, 2014).

There are several channels through which regional financial shocks are absorbed in the US. The FDIC is the most visible one, but the system of securitization of mortgages, especially the so-called GSEs contributes as well. Moreover, the large banks, which operate nation-wide, dominate the banking sector. They are able to absorb local losses in their overall results. By contrast, in Europe international banks are still called and perceived as foreign banks. Integration via international groups has so far been limited in the euro area (but has been very important for the new Member States).

In the EU (euro area) cross-border investment is usually in the most secure or short-term spectrum: interbank deposits (implicit ECB guarantee, not to be bailed in under SRM) and covered bonds (which have a guarantee for the nominal amount by the issuing banks and thus transfer little risk). Hybrid forms of capital are mostly sold locally in Europe. This is partially the case because they are tailor-made to be tax efficient under local legal system. Another reason is that the information needed to evaluate hybrid capital is also available mostly in the home country.

The prevalent form of financial market integration within the euro area across borders is debt, which does not act as a shock absorber in the case of systemic shocks. By contrast there has been much more cross-border equity outside the euro area through large-scale foreign ownership of banks in Central and Eastern Europe.

If the really important and costly shocks are financial boom-bust cycles, followed by a financial crisis, the question arises: What arrangement provides the best protection against these shocks?

The US experience seems to provide a clear answer: the shock-absorbing power of explicit federal transfers is rather small, but the US banking union provides important support in the case of large shocks to the local financial system.

This has one simple implication: To insure its stability, the euro area needs a strong banking union, but not a fiscal union²⁹. The usual argument that the former needs to be followed by the latter should thus be turned on its head: an area with a well-functioning banking union does not need fiscal shock absorbers and thus does not need a fiscal union (see also Belke, 2013). From the latter observation, it follows that there is also no need for a political union.

Each member state can remain responsible for its own fiscal policy as long as the stability of the banking system is assured. In a banking union excessive spending by individual member states might lead to difficulties for the state concerned, but it should no longer destabilise the entire system. This implies that political responsibility for fiscal policy would remain at the national level.

Two elements of the US banking union that do not exist, at least not yet, in the euro area are widespread securitisation and the existence of large banks that operate throughout the entire area. These two characteristics of the US financial system allow it to absorb regional shocks.

But these two characteristics also have their own drawbacks. Large banks are often more prone to generate systemic risk, and it has been shown (ASC, 2014) that most of the growth in the banking sector over the last decade has come from the largest banks. The drawbacks of widespread securitization also became apparent during the 'sub-prime' crisis when it was shown that the originating banks were subject to serious conflicts of interests as they earned fees from originating mortgages irrespective of the quality of borrower and his/her ability to service the loans. A system that deals more easily with regional crises might thus have other drawbacks. The challenge for Europe will be to build a system that breaks the 'diabolical' feedback loop between weak banks and their sovereign but one that is not dominated by a handful of very large banks which are then not only too large to fail, but also too large to be saved.

²⁹ For an early discussion of fiscal and political union see Gros and Thygesen (1995). The view that a fiscal and political union is needed is expressed at the political level by the report of the 4 EU Presidents on Genuine Economic and Monetary Union. See van Rompuy et al. (2012).

References

- Acharya, Viral V., and Yorulmazer, T. (2007): Too Many to Fail - An Analysis of Time-Inconsistency in Bank Closure Policies, Working Paper no. 319, Bank of England, February.
- Advisory Scientific Committee (ASC) (2014): Is Europe Overbanked?, Reports of the Advisory Scientific Committee of the ESRB, No. 4/June 2014. Available at https://www.esrb.europa.eu/pub/pdf/asc/Reports_ASC_4_1406.pdf
- Aizenman, J. (2012): US Banking over Two Centuries: Lessons for the Eurozone Crisis, in: Beck (2012).
- Allard, C., Koeva Brooks, P., Bluedorn, J. C., Bornhorst, F., Christopherson, K., Ohnsorge, F. and Poghosyan, T. (2013): Towards a Fiscal Union for the Euro Area, IMF Staff Discussion Note 13/09, International Monetary Fund, Washington, D.C., November.
- Asdrubali, P., B. E. Sorensen and O. Yosha (1996): Channels of Interstate Risk Sharing: United States 1963-1990, The Quarterly Journal of Economics, MIT Press, vol. 111(4), pp. 1081-1110, November.
- Athanasoulis, S. and van Wincoop, E. (2001): Risk Sharing within the United States: What Do Financial Markets and Fiscal Federalism Accomplish?, Review of Economics and Statistics, Vol. 83(4): 688-698, November.
- Ayadi, R. and de Groen, W.P. (2014): Banking Business Models Monitor 2014: Europe, Joint Centre for European Policy Studies (CEPS) and International Observatory on Financial Service Cooperatives (IOFSC) publication, Montreal.
- Beck, T., Gros, D. and Schoenmaker, D. (2013): On the Design of a Single Resolution Mechanism, European Parliament, Monetary Dialogue Notes, <http://www.europarl.europa.eu/document/activities/cont/201304/20130422ATT64861/20130422ATT64861EN.pdf>.
- Beck, T. (2012): Banking Union for Europe - Risks and Challenges, VoxEU e-book, October (<http://www.voxeu.org/content/banking-union-europe-risks-and-challenges>).
- Beck, T. (2012, ed.): Banking Union for Europe - Risks and Challenges, VoxEU Book, Centre for Economic Policy Research (CEPR), London.
- Begg, I. (2014): Genuine Economic and Monetary Union, The New Palgrave Dictionary of Economics, Online Edition, Edited by Steven N. Durlauf and Lawrence E. Blume.
- Belke, A. (2013): Towards a Genuine Economic and Monetary Union – Comments on a Roadmap, in: Politics and Governance, Vol. 1(1), pp. 48–65.
- Belke, A. (2013a): Debt Mutualisation in the Ongoing Eurozone Crisis – A Tale of the ‘North’ and the ‘South’, The New Palgrave Dictionary of Economics, Online Edition, Eds. Steven N. Durlauf and Lawrence E. Blume, Palgrave Macmillan, Houndmills, Basingstoke, web: http://www.dictionaryofeconomics.com/article?id=pde2013_D000273.

- Belke, A. (2014): Oral Evidence, in: House of Lords, Genuine Economic and Monetary Union' and the Implications for the UK, European Union Committee 8th Report of Session 2013–14. The Stationery Office, London.
- Bignon, V., Breton, R., Rojas Breu, M. (2013): Currency Union with and without Banking Union, Banque de France Working Paper 450, Banque de France, Paris, October.
- Breuss, Fritz, Werner Roeger and Jan in'tVeld (2014): The Stabilising Properties of a European Banking Union in Case of Financial Shocks in the Euro Area.
- Buch, C.M., Körner, T., Weigert, B. (2013): Towards Deeper Financial Integration in Europe: What the Banking Union Can Contribute, Working Paper 02/2013, German Council of Economic Advisors, Wiesbaden, August.
- Chari, V. V., and Patrick Kehoe (2009) "Bailouts, Time Inconsistency and Optimal Regulation." Federal Reserve Bank of Minneapolis Research Department Staff Report (November).
- Demyank, Y., Ostergaard, C. and Sorensen, B. (2007): Risk Sharing and Portfolio Allocation in EMU, European Commission Working Paper, Brussels.
- Devery, J.R. and MacDonald Farrell, E. (2008): Key Principles and Concepts, in Mealey's Fundamentals of Reinsurance Litigation & Arbitration, 11 February, Washington, D.C.
- European Commission (2012): A Blueprint for a Deep and Genuine Economic and Monetary Union Launching a European Debate, Communication from the Commission, Brussels, 28.11.2012 COM(2012) 777 final.
- FDIC (1997): An Examination of the Banking Crises of the 1980s and Early 1990s, Web: http://www.fdic.gov/bank/historical/history/137_165.pdf.
- Furceri, D. and Zdzienicka, A. (2013): The Euro Area Crisis: Need for a Supranational Fiscal Risk Sharing Mechanism?, IMF Working Paper WP/13/198, International Monetary Fund, Washington/DC, September.
- Gimber, A.R. (2012): Bank Resolution, Bailouts and the Time Consistency Problem, mimeo, European University Institute, Florence.
- Golembe, C. (1960): The Deposit Insurance Legislation of 1933, Political Science Quarterly 76, pp. 181-195.
- Grochulsky, B. (2011): Financial Firm Resolution Policy as a Time-Consistency Problem, in FRBR Economic Quarterly, Vol. 97/2, pp. 133–152.
- Gros, D. (2012a): Principles of a Two-Tier European Deposit (Re-)Insurance System, Kredit und Kapital, Vol. 45, No. 4, pp. 489–499.
- Gros, D. (2012b), "Banking Union: Ireland vs. Nevada, an illustration of the importance of an integrated banking system", CEPS Commentary, Centre for European Policy Studies, Brussels, October (<http://www.ceps.eu/book/banking-union-ireland-vs-nevada-illustration-importance-integrated-banking-system>).

- Gros, D. (2013): The SRM and the Dream to Resolve Banks without Public Money, CEPS Commentary, Centre for European Policy Studies, Brussels, 19 December.
- Gros, D. and Schoenmaker, D. (2012): European Deposit Insurance: Financing the Transition, CEPS Commentary, 6 September (<http://www.ceps.eu/book/european-deposit-insurance-financing-transition>).
- Gros, D. and Schoenmaker, D. (2013): Cleaning up the Mess: Bank Resolution in a Systemic Crisis, CEPS Commentary, Centre for European Policy Studies, Brussels, 7 June.
- Gros, D. and N. Thygesen (1995), European Monetary Integration, Longman, London.
- Hepp, R. and von Hagen, J. (2013): Interstate Risk-sharing in Germany: 1970-2006, Oxford Economic Papers, 65(1):1-24, January.
- Howarth, D. and Quaglia, L. (2013): Banking Union as Holy Grail: Rebuilding the Single Market in Financial Services, Stabilizing Europe's Banks and 'Completing' Economic and Monetary Union, Journal of Common Market Studies, Vol. 51, pp. 103-123.
- IMF (2013a): A Banking Union for the Euro Area, IMF Staff Discussion Note 13/01, International Monetary Fund, Washington/DC, February.
- IMF (2013b): Toward a Fiscal Union for the Euro Area, IMF Staff Discussion Note 13/09, International Monetary Fund, Washington/DC, September.
- Ingves, S. (2010): The Crisis in the Baltic – the Riksbank's Measures, Assessments and Lessons Learned, Speech by Mr Stefan Ingves, Governor of the Sveriges Riskbank, to the Riksdag Committee on Finance, Stockholm, 2 February 2010, Web: <http://www.bis.org/review/r100203b.pdf>.
- Joint Research Centre (JRC) (2011), "JRC Report under Article 12 of Directive 94/19/EC as amended by Directive 2009/14/EC", Joint Research Centre, European Commission, Unit G09, Ispra (Italy) (http://ec.europa.eu/internal_market/bank/docs/guarantee/jrc-rep_en.pdf).
- Kalemli-Ozcan, S., Papaioannou, E. and Peydró, J.L. (2010): What Lies beneath the Euro's Effect on Financial Integration? Currency Risk, Legal Harmonization, or Trade?, Journal of International Economics, 81(1), pp. 75-88.
- Mink, M. and de Haan, J. (2014): Spillovers from Systemic Bank Defaults, CESifo Working Paper 4792, Munich, May.
- Pisani-Ferry, J. and Wolff, G.B. (2012): The Fiscal Implications of a Banking Union, Bruegel Policy Brief No. 2012/02, Bruegel, Brussels.
- Pisani-Ferry, J., A. Sapir, N. Véron and Wolff, G.B. (2012): What Kind of European Banking Union?, Bruegel Policy Contribution, Bruegel, Brussels, June.

- Schoenmaker, D. and Gros, D. (2012): A European Deposit Insurance and Resolution Fund, CEPS, Working Document No. 364, Centre for European Policy Studies Brussels, May, later published in *Kredit & Kapital*.
- Schröder, M. (2012): Risikoübernahme im Bankensektor: Unterscheiden sich Sparkassen und Genossenschaftsbanken von Geschäftsbanken?, Zentrum für Europäische Wirtschaftsforschung (ZEW) GmbH, Mannheim.
- Thies, C. and Gerlowski, D. (1989): Deposit Insurance: A History of Failure, *Cato Journal* 8, pp. 677-693.
- Van Rompuy, H., in close collaboration with J.M.Barroso, J.-C. Juncker, and M. Draghi, (2012): Towards a Genuine Economic and Monetary Union, Web: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/134069.pdf.

The following ROME Discussion Papers have been published since 2007:

- | | | | |
|---|------|--|--|
| 1 | 2007 | Quo vadis, Geldmenge? Zur Rolle der Geldmenge für eine moderne Geldpolitik | Egon Görgens Karlheinz Ruckriegel Franz Seitz |
| 2 | 2007 | Money and Inflation. Lessons from the US for ECB Monetary Policy | Ansgar Belke Thorsten Polleit |
| 3 | 2007 | Two-Pillar Monetary Policy and Bootstrap Expectations | Peter Spahn |
| 4 | 2007 | Money and Housing – Evidence for the Euro Area and the US | Claus Greiber Ralph Setzer |
| 5 | 2007 | Interest on Reserves and the Flexibility of Monetary Policy in the Euro Area | Ulrike Neyer |
| 1 | 2008 | Money: A Market Microstructure Approach | Malte Krueger |
| 2 | 2008 | Global Liquidity and House Prices: A VAR Analysis for OECD Countries | Ansgar Belke Walter Orth Ralph Setzer |
| 3 | 2008 | Measuring the Quality of Eligible Collateral | Philipp Lehmbecker Martin Missong |
| 4 | 2008 | The Quality of Eligible Collateral and Monetary Stability: An Empirical Analysis | Philipp Lehmbecker |
| 5 | 2008 | Interest Rate Pass-Through in Germany and the Euro Area | Julia von Borstel |
| 1 | 2009 | Interest Rate Rules and Monetary Targeting: What are the Links? | Christina Gerberding Franz Seitz Andreas Worms |
| 2 | 2009 | Current Account Imbalances and Structural Adjustment in the Euro Area: How to Rebalance Competitiveness | Ansgar Belke Gunther Schnabl Holger Zemanek |
| 3 | 2009 | A Simple Model of an Oil Based Global Savings Glut – The “China Factor” and the OPEC Cartel | Ansgar Belke Daniel Gros |
| 4 | 2009 | Die Auswirkungen der Geldmenge und des Kreditvolumens auf die Immobilienpreise – Ein ARDL-Ansatz für Deutschland | Ansgar Belke |

| | | | |
|----|------|--|--|
| 5 | 2009 | Does the ECB rely on a Taylor Rule? Comparing Ex-Post with Real Time Data | Ansgar Belke Jens Klose |
| 6 | 2009 | How Stable Are Monetary Models of the Dollar-Euro Exchange Rate? A Time-varying Coefficient Approach | Joscha Beckmann Ansgar Belke Michael Kühl |
| 7 | 2009 | The Importance of Global Shocks for National Policymakers – Rising Challenges for Central Banks | Ansgar Belke Andreas Rees |
| 8 | 2009 | Pricing of Payments | Malte Krüger |
| 1 | 2010 | (How) Do the ECB and the Fed React to Financial Market Uncertainty? The Taylor Rule in Times of Crisis | Ansgar Belke Jens Klose |
| 2 | 2010 | Monetary Policy, Global Liquidity and Commodity Price Dynamics | Ansgar Belke Ingo G. Bordon Torben W. Hendricks |
| 3 | 2010 | Is Euro Area Money Demand (Still) Stable? Cointegrated VAR versus Single Equation Techniques | Ansgar Belke Robert Czudaj |
| 4 | 2010 | European Monetary Policy and the ECB Rotation Model Voting Power of the Core versus the Periphery | Ansgar Belke Barbara von Schnurbein |
| 5 | 2010 | Short-term Oil Models before and during the Financial Market Crisis | Jörg Clostermann Nikolaus Keis Franz Seitz |
| 6 | 2010 | Financial Crisis, Global Liquidity and Monetary Exit Strategies | Ansgar Belke |
| 7 | 2010 | How much Fiscal Backing must the ECB have? The Euro Area is not the Philippines | Ansgar Belke |
| 8 | 2010 | Staatliche Schuldenkrisen – Das Beispiel Griechenland | Heinz-Dieter Smeets |
| 9 | 2010 | Heterogeneity in Money Holdings across Euro Area Countries: The Role of Housing | Ralph Setzer Paul van den Noord Guntram B. Wolff |
| 10 | 2010 | Driven by the Markets? ECB Sovereign Bond Purchases and the Securities Markets Programme | Ansgar Belke |

| | | | |
|----|------|---|---|
| 11 | 2010 | Asset Prices, Inflation and Monetary Control – Re-inventing Money as a Policy Tool | Peter Spahn |
| 12 | 2010 | The Euro Area Crisis Management Framework: Consequences and Institutional Follow-ups | Ansgar Belke |
| 13 | 2010 | Liquiditätspräferenz, endogenes Geld und Finanzmärkte | Peter Spahn |
| 14 | 2010 | Reinforcing EU Governance in Times of Crisis: The Commission Proposals and beyond | Ansgar Belke |
| 01 | 2011 | Current Account Imbalances in the Euro Area: Catching up or Competitiveness? | Ansgar Belke Christian Dreger |
| 02 | 2011 | Volatility Patterns of CDS, Bond and Stock Markets before and during the Financial Crisis: Evidence from Major Financial Institutions | Ansgar Belke Christian Gokus |
| 03 | 2011 | Cross-section Dependence and the Monetary Exchange Rate Model – A Panel Analysis | Joscha Beckmann Ansgar Belke Frauke Dobnik |
| 04 | 2011 | Ramifications of Debt Restructuring on the Euro Area – The Example of Large European Economies' Exposure to Greece | Ansgar Belke Christian Dreger |
| 05 | 2011 | Currency Movements Within and Outside a Currency Union: The Case of Germany and the Euro Area | Nikolaus Bartzsch Gerhard Rösl Franz Seitz |
| 01 | 2012 | Effects of Global Liquidity on Commodity and Food Prices | Ansgar Belke Ingo Bordon Ulrich Volz |
| 02 | 2012 | Exchange Rate Bands of Inaction and Play-Hysteresis in German Exports – Sectoral Evidence for Some OECD Destinations | Ansgar Belke Matthias Göcke Martin Günther |
| 03 | 2012 | Do Wealthier Households Save More? The Impact of the Demographic Factor | Ansgar Belke Christian Dreger Richard Ochmann |
| 04 | 2012 | Modifying Taylor Reaction Functions in Presence of the Zero-Lower-Bound – Evidence for the ECB and the Fed | Ansgar Belke Jens Klose |

| | | | |
|----|------|--|--|
| 05 | 2012 | Interest Rate Pass-Through in the EMU – New Evidence from Nonlinear Cointegration Techniques for Fully Harmonized Data | Joscha Beckmann Ansgar Belke Florian Verheyen |
| 06 | 2012 | Monetary Commitment and Structural Reforms: A Dynamic Panel Analysis for Transition Economies | Ansgar Belke Lukas Vogel |
| 07 | 2012 | The Credibility of Monetary Policy Announcements: Empirical Evidence for OECD Countries since the 1960s | Ansgar Belke Andreas Freytag Jonas Keil Friedrich Schneider |
| 01 | 2013 | The Role of Money in Modern Macro Models | Franz Seitz Markus A. Schmidt |
| 02 | 2013 | Sezession: Ein gefährliches Spiel | Malte Krüger |
| 03 | 2013 | A More Effective Euro Area Monetary Policy than OMTs – Gold Back Sovereign Debt | Ansgar Belke |
| 04 | 2013 | Towards a Genuine Economic and Monetary Union – Comments on a Roadmap | Ansgar Belke |
| 05 | 2013 | Impact of a Low Interest Rate Environment – Global Liquidity Spillovers and the Search-for-yield | Ansgar Belke |
| 06 | 2013 | Exchange Rate Pass-Through into German Import Prices – A Disaggregated Perspective | Joscha Beckmann Ansgar Belke Florian Verheyen |
| 07 | 2013 | Foreign Exchange Market Interventions and the \$-¥ Exchange Rate in the Long Run | Joscha Beckmann Ansgar Belke Michael Kühl |
| 08 | 2013 | Money, Stock Prices and Central Banks – Cross-Country Comparisons of Cointegrated VAR Models | Ansgar Belke Marcel Wiedmann |
| 09 | 2013 | 3-Year LTROs – A First Assessment of a Non-Standard Policy Measure | Ansgar Belke |
| 10 | 2013 | Finance Access of SMEs: What Role for the ECB? | Ansgar Belke |
| 11 | 2013 | Doomsday for the Euro Area – Causes, Variants and Consequences of Breakup | Ansgar Belke Florian Verheyen |
| 12 | 2013 | Portfolio Choice of Financial Investors and European Business Cycle Convergence – A Panel Analysis for EU Countries | Ansgar Belke Jennifer Schneider |

| | | | |
|-----|------|---|--|
| 13 | 2013 | Exports and Capacity Constraints – A Smooth Transition Regression Model for Six Euro Area Countries | Ansgar Belke Anne Oeking Ralph Setzer |
| 14 | 2013 | The Transmission of Oil and Food Prices to Consumer Prices – Evidence for the MENA countries | Ansgar Belke Christian Dreger |
| 15 | 2013 | Target-balances: The Greek Example | Malte Krüger |
| 16 | 2013 | Competitiveness, Adjustment and Macroeconomic Risk Management in the Eurozone | Peter Spahn |
| 17 | 2013 | Contextualizing Systemic Risk | Lukas Scheffknecht |
| 01 | 2014 | Exit Strategies and Their Impact on the Euro Area – A Model Based View | Ansgar Belke |
| 02 | 2014 | Monetary Dialogue 2009-2014: Looking backward, looking forward | Ansgar Belke |
| 03 | 2014 | Non-Standard Monetary Policy Measures – Magic Wand or Tiger by the Tail? | Ansgar Belke |
| 04 | 2014 | Böhm-Bawerk und die Anfänge der monetären Zinstheorie | Peter Spahn |
| 05 | 2014 | State-of-play in Implementing Macroeconomic Adjustment Programmes in the Euro Area | Daniel Gros Cinzia Alcidi Ansgar Belke Leonor Coutinho Alessandro Giovannini |
| 06 | 2014 | Der Transaktionskassenbestand von Euro-Münzen in Deutschland | Markus Altmann Nikolaus Bartzsch |
| 06e | 2014 | The Volume of Euro Coins held for Transaction Purposes in Germany | Markus Altmann Nikolaus Bartzsch |
| 07 | 2014 | Labor Market Reforms and Current Account Imbalances – Beggar-thy-neighbor Policies in a Currency Union? | Timo Baas Ansgar Belke |
| 08 | 2014 | Do the poor pay for card rewards of the rich? | Malte Krüger |
| 09 | 2014 | The Bank Lending Channel in a Simple Macro Model – How to Extend the Taylor Rule? | Peter Spahn |
| 10 | 2014 | The Relevance of International Spillovers and Asymmetric Effects in the Taylor Rule | Joscha Beckmann Ansgar Belke Christian Dreger |

- | | | | |
|----|------|--|-----------------------------------|
| 11 | 2014 | Sacrifice Ratios for Euro Area Countries: New Evidence on the Costs of Price Stability | Ansgar Belke Tobias Böing |
| 01 | 2015 | Zins- und Wohlfahrtseffekte extremer Niedrigzins- politik für die Sparer in Deutschland | Gerhard Rösl Karl-Heinz Tödter |
| 02 | 2015 | Banking Union as a Shock Absorber | Ansgar Belke Daniel Gros |