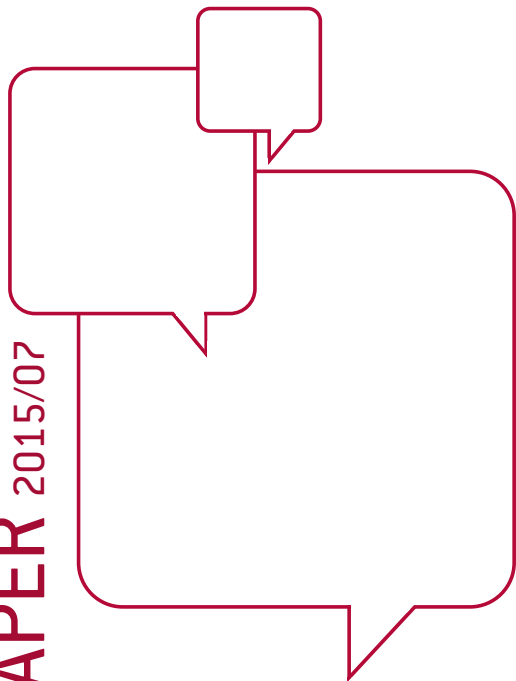




THE VULNERABILITY OF EUROPE'S SMALL AND MEDIUM-SIZED BANKS

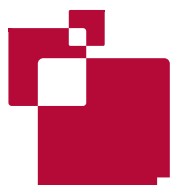
ASHOKA MODY AND GUNTRAM B. WOLFF

Highlights

- We study the vulnerability of 130 banks directly supervised by the European Central Bank's Single Supervisory Mechanism. Illustrative stress tests using banks' balance sheet data reveal that significant stress prevails in the euro area's smaller and medium-sized banks, many of them located in southern Europe. The banks we identify as stressed also have performed substantially worse on the stock market. The vulnerable banks are typically hobbled by non-performing loans to European businesses.
- Strengthening the banking system, therefore, is important to achieve sustainable recovery because it will revitalise credit to the healthier segments of the economy. But instead of emphasising bank recapitalisation, as in past years, we believe the task is to shrink the banking sector to a healthier core.

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Introduction

The Single Supervisory Mechanism (SSM) is the authority under which the European Central Bank (ECB) supervises euro-area banks that are deemed 'significant'. On 26 October 2014, just over a week before the SSM became operational, the ECB published the results of a comprehensive assessment of 130 banks under its oversight (ECB, 2014). Together, these banks had assets of €22.0 trillion, about 82 percent of the assets under the SSM. The assessment included an Asset Quality Review (AQR) and a stress test. The review found¹:

- An additional €136 billion of the banks' assets needed to be classified as non-performing.
- To meet the current regulatory norms, 25 banks needed an additional €25 billion in capital.
- And, under an adverse scenario, their capital would be depleted by some €263 billion; for the median bank, the core Tier-1 capital ratio would fall from 12.4 to 8.3 percent².

These findings brought a sense of relief. The financial markets concluded that the assessment was credible and that the banks would be able to raise the additional capital required. The relief contrasted with the dismay after the earlier stress tests conducted in July and December 2011 by the European Banking Authority (EBA) (Merler and Wolff 2013). Those tests failed to persuade markets that the problems had been recognised (Angeloni and Wolff, 2011).

Some, however, remain concerned that the risks to the euro-area banking system are still being underestimated. The concern centres on the appropriate measure of a bank's capital ratio. Soon after the publication of the ECB's assessment, Acharya and Steffen (2014) argued that the capital shortfall was probably above €500 billion rather than merely €25 billion. Their claim rests on assessing capital adequacy in terms of a market-based measure of banks' 'raw' leverage, the market valuation of the equity-to-asset ratio. They emphasise that the standard approach, as adopted by the ECB, which relies on weighting assets by regulatory risk weights, can be misleading. Because some assets are assigned low risk-weights (sovereign bonds, for example, have zero risk-weights), the capital held against them might be inadequate. The perception of an asset's risk can change quickly; banks are under no obligation to anticipate those risks and so even an adequate risk-weighted capitalisation can hide

¹ ECB (2014, section 1.2).

² Considered the highest quality capital, core Tier 1 capital comprises common equity and hybrid instruments such as preferred stock, including that provided by governments.

vulnerabilities [see, for example, Caprio, 2013]. Acharya and Steffen report that when the stress scenarios are applied to the leverage ratio, the capital shortfall is much larger. And that shortfall across banks is more tightly correlated with the financial market's valuation of banks, a conclusion also reached by Adrian and Shin [2010]. For these reasons, Admati and Hellwig [2011], among others, have advocated that banks be required to hold much more equity than presently.

Our focus is on highlighting the locus of vulnerability in the euro area's banking system. We find that while the largest banks, with their scale economies and internationally diversified assets, appear to be out of the woods, many of the small and medium-sized banks – and among them the unlisted banks – remain under considerable stress.

These small and medium-sized banks (SMBs) are important because they control a sizeable share of the euro area's bank assets (with a particularly high share in several of the smaller countries, see chart A1 in annex). SMBs in the euro area have also received substantial bail-outs – unlike in the US, where much more significant bank restructuring occurred. During recent periods of market pressure, SMBs have become closely interconnected in the market's perception, thereby posing a broader systemic risk.

The historical importance of SMBs was emphasised by Ben Bernanke in his 1983 paper on nonmonetary sources of transmission of the Great Depression. He pointed out that *“the US system, made up as it was primarily of small, independent banks, had always been particularly vulnerable”*³. Between 1929 and 1933, the number of banks in the United States fell by one-half. Bankrupt debtors hurt banks, which led to reduced credit availability and more stress on debtors. Bernanke concluded that these reinforcing vulnerabilities contributed significantly to the depth and duration of the Great Depression.

To be clear, we are not predicting widespread banking distress. We do, however, find that the mechanisms Bernanke outlined operate in the euro area on a scale that could, at the very least, delay and dampen the recovery. The weakest SMBs are burdened by non-performing corporate loans. This

³ Bernanke [1983, p. 253].

phenomenon is particularly serious in Italy⁴. As in the Great Depression, debtors and creditors continue to amplify each other's vulnerabilities, hurting economic growth and adding to deflationary pressures. The risk is that some countries could be tipped into prolonged deflation. In turn, these macroeconomic outcomes could add to the financial vulnerabilities.

Significant links also exist between banks and sovereigns. While the ferocity with which banks and sovereigns threatened to drag each other down has reduced for now, the essential vulnerabilities remain. Sovereign debt-to-GDP ratios are high and have, in almost all countries, increased since the so-called sovereign-bank loop first became manifest in 2009 (as described by Mody, 2009). Pisani-Ferry (2012) emphasised that bank asset size has become large relative to tax revenues, so that small problems in the banking system create a risk to government solvency. And as Gerlach, Schulz and Wolff (2010) showed, during financial crises, sovereign risk premia are higher when the banking system is larger, particularly following the implementation of government rescue packages. Mody and Sandri (2011) highlighted that these sovereign-bank links are more acute in countries with weak competitiveness and high debt-to-GDP ratios.

In the next section, we briefly outline our approach to the analysis of bank vulnerabilities. We then report on our 'stress tests' using balance-sheet data. To corroborate the findings from the balance-sheet data, we analyse movements in bank stock prices. Analysis of market data also helps us to reflect on systemic risks. A review of how banks have responded to the stress is followed by a discussion of the policy implications.

Our approach

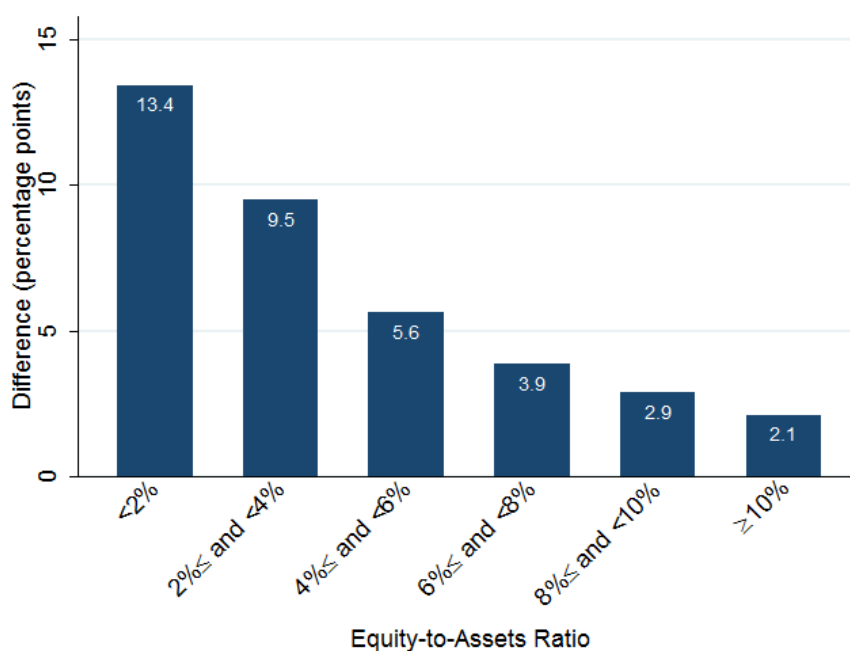
The ECB has published some of the data it used to assess Europe's banks. This valuable information is much more extensive than that made available by the EBA following the previous stress tests. Importantly, the data is harmonised and standardised to allow comparisons between banks and countries. The data covers 130 banks in 19 countries.

⁴ <http://www.bloomberg.com/news/articles/2014-10-26/ecb-test-shows-25-billion-euro-capital-gap-at-euro-banks>. The average NPEs of small and medium banks in Italy are 12.6 percent for SMEs and 14.0 percent for corporates. The euro area averages are 8.8 percent and 9.6 percent respectively.

In our analysis, we differentiated between banks that fall into three size categories: small (assets below €100bn), medium (assets between €100bn and €500 billion), and large (assets more than €500 billion). Of the €22 trillion in assets, the ‘small’ group has 84 banks with €3.1 trillion, the ‘medium’ group has 33 banks with €6.3 trillion, and the ‘large’ group has only 13 banks with aggregate assets of €12.5 trillion. Thus, ‘small’ banks have about 14 percent and ‘medium’ banks have 29 percent of total bank assets in the euro area. In a robustness check, we increased the threshold for large banks to €1 trillion, which reduces the number of large banks to six and the amount of assets to €8 trillion. The ‘medium’ group correspondingly increases and holds then just over half of all assets. Our main results remain unaltered.

We focus on banks’ leverage – the equity-to-assets ratios. This focus, as noted above, follows a widespread view that such ‘raw’ leverage rather than risk-weighted capital ratios provide a more reliable gauge of banks’ health and vulnerability (see for example Haldane, 2011). Figure 1 confirms the large differences between a bank’s leverage and risk-weighted capital ratios. This divergence is not random: banks with low equity/assets ratios (ie banks that have high leverage) tend to show large risk-weighted capital ratios. Thus, while they might meet the regulatory requirement, they could be vulnerable to changes in economic conditions and sentiment.

Figure 1: Difference between risk-weighted equity ratio and equity ratio



Source: Bruegel based on SNL Financial and ECB data.

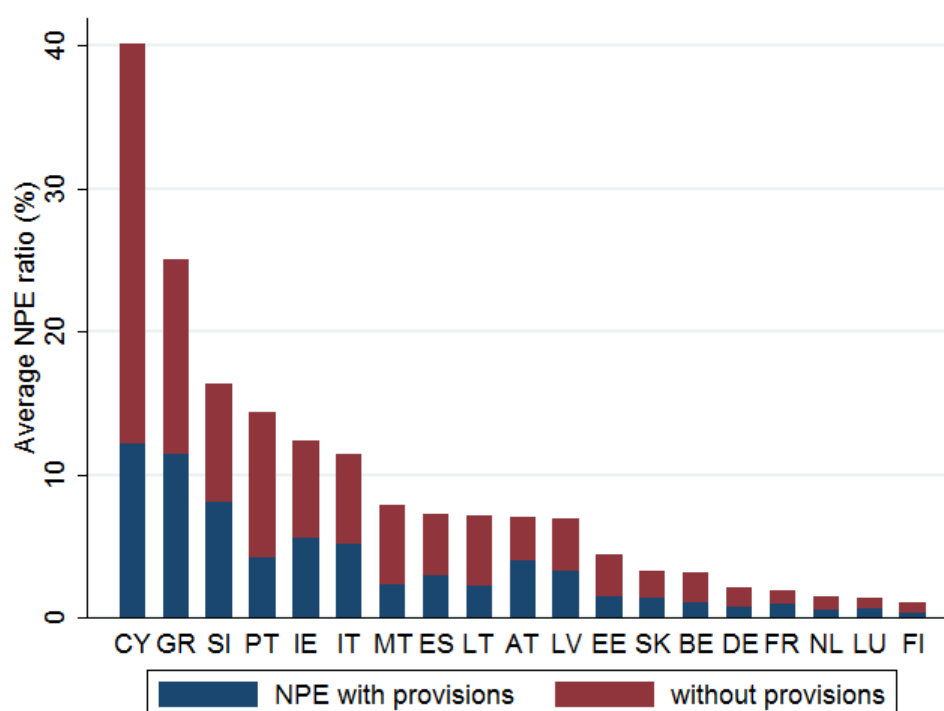
To measure the vulnerability of individual banks, we conducted a simple 'stress test' which asks the following question: if 65 percent of a bank's non-performing loans have to be written off, then after accounting for the provisions it has made, what would the bank's equity/assets ratio be? If the ratio falls below 3 percent, then we consider the bank to be 'under stress'. This, we acknowledge, is very crude. It is not based on any macroeconomic scenario nor on potential correlations of assets. As such, it is intended only to assess where the current trouble spots are without claiming to detect all problems that more sophisticated tests might be able to uncover. An equivalent scenario might assess when the projected losses are lower than the 65 percent we choose, but the equity requirement is higher, which some view as necessary. We are comforted by the fact, as reported below, that the stock prices of the banks show considerable correspondence with our stress analysis.

The stress tests

In December 2013, euro-area banks had non-performing exposures (NPEs) of €879 billion. This represents 4.0 percent of the total assets of the directly supervised banks. The banks have provisions that, overall, cover 42 percent of these NPEs. But, as Figures 2 and 3 show, the distribution of NPEs and coverage varies considerably for different countries and banks.

While Cyprus and Greece are clear outliers, problems are also serious in other countries (Figure 2). For example, Italian non-performing loans are about 11.4 percent of assets with about half (45.0 percent) provided for.

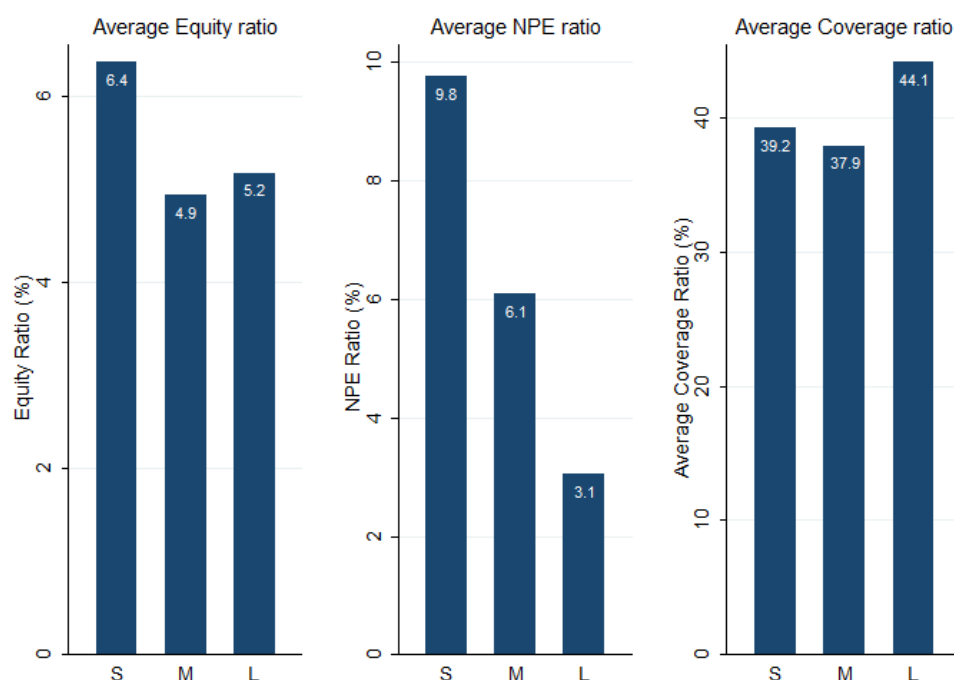
Figure 2: Non performing exposure and provisions



Source: Bruegel based on SNL Financial and ECB data. Note: NPEs are measured in percent of the total non-risk weighted assets.

There is also considerable variation across different sizes of banks (Figure 3). Large banks have relatively low NPE ratios and high rates of coverage for the NPEs and hence their relatively low equity-asset ratios are not a concern. In contrast, the small banks have a relatively high average equity-assets ratio (6.4 percent), but they also have a very high non-performing exposure ratio (9.8 percent) and a low coverage ratio (39.2 percent). The mid-sized banks fall in between for the NPE ratio but have the lowest coverage and the lowest equity ratios.

Figure 3: Non-performing exposures and provisions by size of banks



Source: Bruegel based on SNL Financial and ECB data. Note: (1) NPEs are measured as percentage of total non-risk-weighted assets. (2) The coverage ratio is measured as percentage of NPEs.

The ‘stress test’, in effect, converts these three measures into one composite metric. If the NPEs are written down, how much equity is depleted once the coverage reserves are exhausted? In the following charts, we show the distribution of equity after this stress is applied. The charts report the distribution of the number of banks and the total banks’ assets.

As may be expected from Figure 3, despite their relatively low equity ratios, only one of the large banks is placed under stress under the test we propose. Their NPEs are low and coverage is high. On the other hand, several small and medium banks fall below the 3 percent equity/assets threshold. These banks do not necessarily have low equity ratios at present. In fact, as Figure 3 indicates, the equity ratio, on average, is quite high. Rather, they have high NPEs and low provisions for them. Hence, even their relatively high equity ratios could prove insufficient in the event of a shock.

Figure 4a: Distribution of banks before and after stress test, number of banks

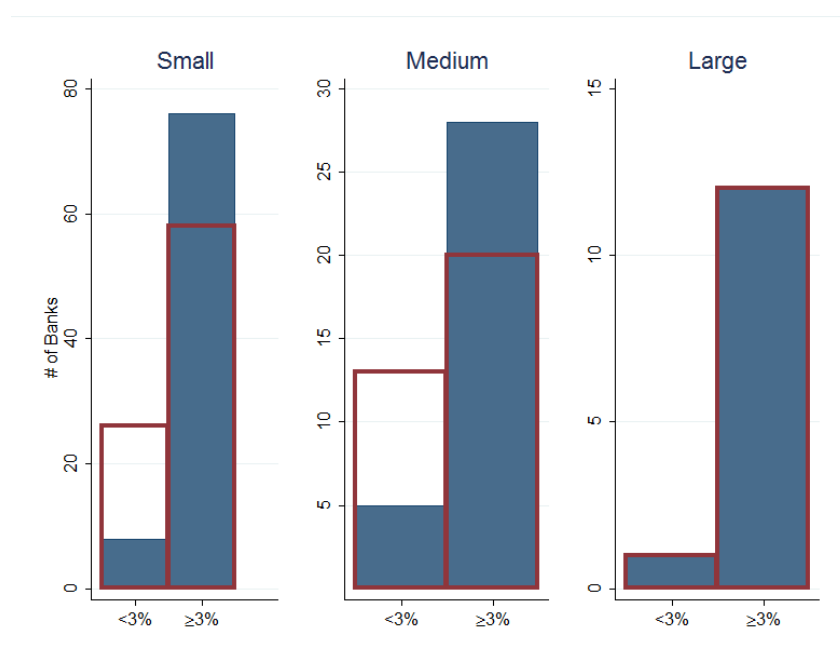
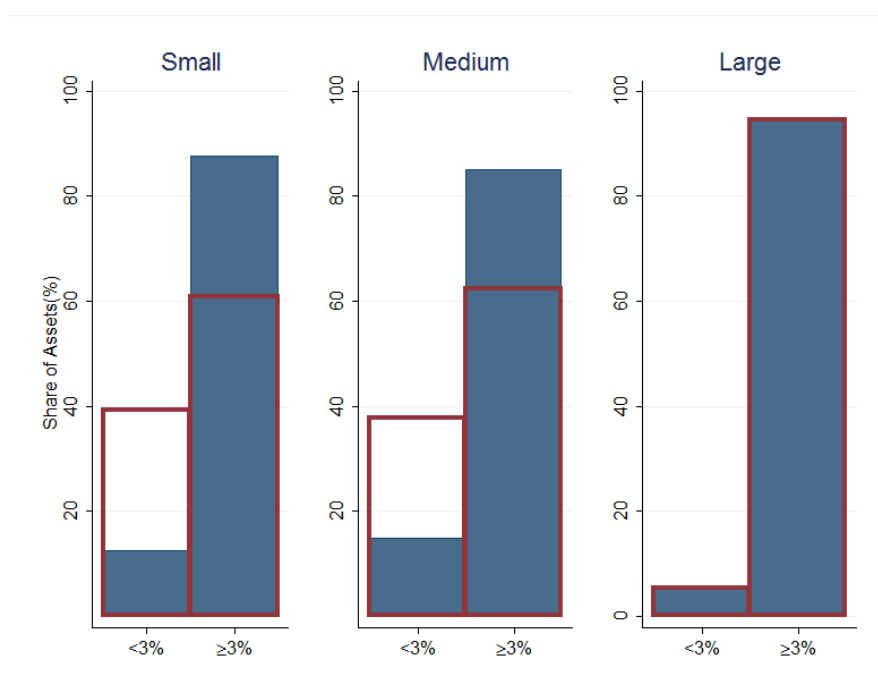


Figure 4b: Distribution of banks before and after stress test, share of assets, %



Source: Bruegel based on SNL Financial and ECB data. Note: The red histogram shows the distribution after the stress test while the blue before the stress test.

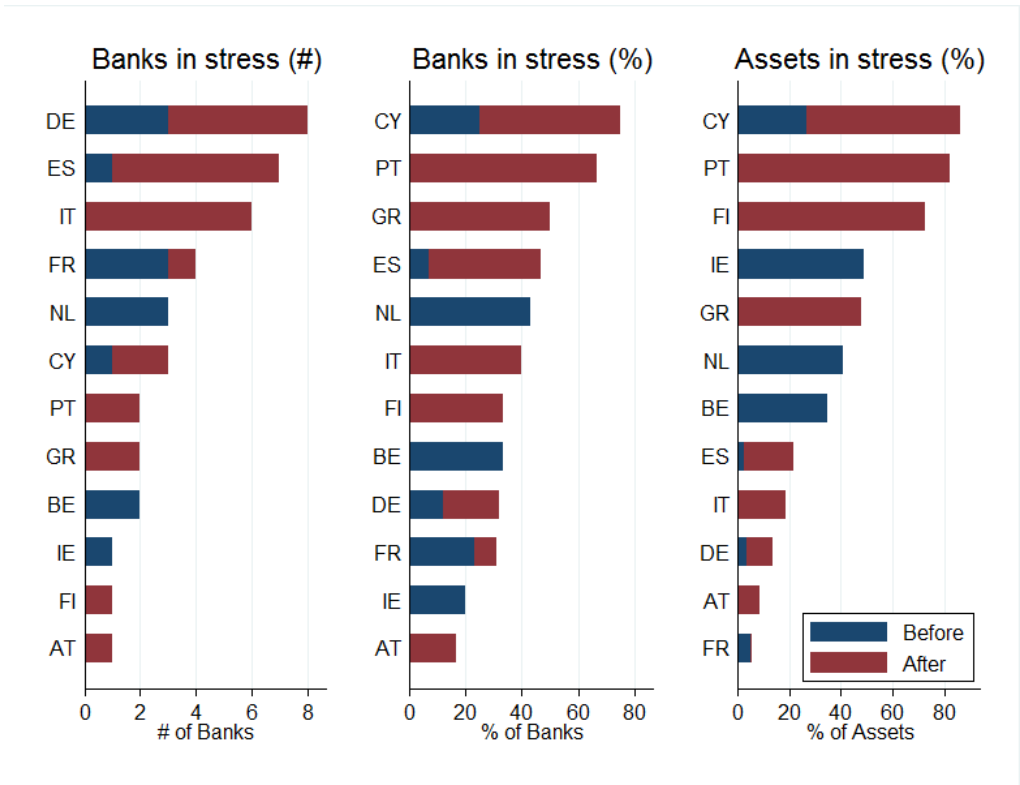
Thus, fewer than one in ten of the small banks currently have an equity ratio below 3 percent. But after the stress, just over a third of small banks would fall below the 3 percent equity ratio (Figure 4a). More importantly, the banks that would be stressed are the larger of the small banks. So, the share of distressed assets would go up from 12.4 percent to 39.2 percent (Figure 4b).

Similarly, the share of medium-sized banks with an equity ratio under 3 percent would go up from 15.2 percent to about 40.0 percent; and the share of stressed assets in this group of banks will go up from about 14.9 to 37.7 percent.

Applying these ratios to the assets of SMBs, about €1.2 trillion (about 39 percent) of small bank assets and €2.4 trillion (about 38 percent) of medium bank assets could come under stress. Together, the questionable assets amount to 38.2 percent of small and medium banks' assets and 16.4 percent of the entire banking systems' assets.

Figure 5 illustrates the country distribution of the stress. Alongside Cyprus and Greece, which are high on the list, Portugal, Finland, and Ireland would have about half or more of their assets under stress. Italy and Spain show lower shares of assets under stress mainly because they have large banks that are safe under these metrics. However, their share of *small* and *medium* banks' assets under stress would also be sizeable, 47 and 52 percent respectively for Italy and Spain.

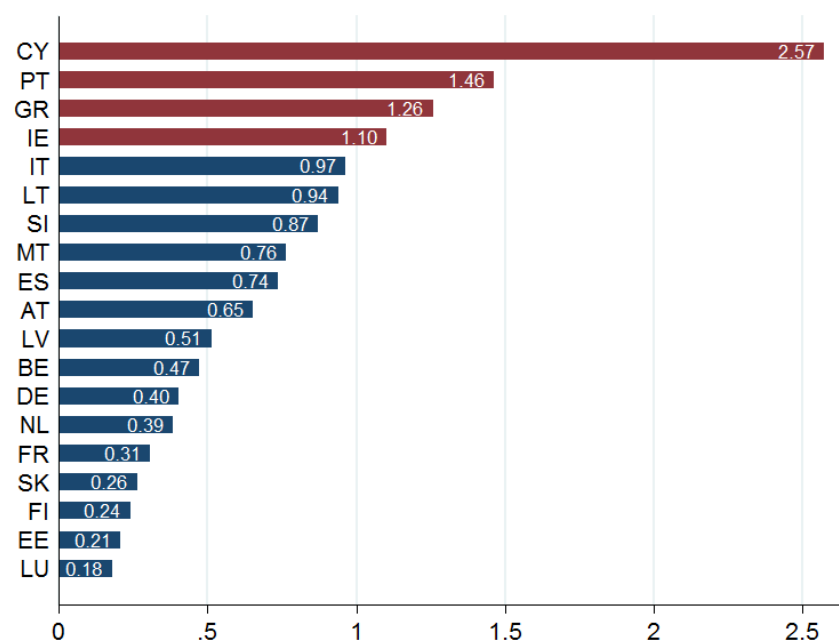
Figure 5: Banks with equity ratio below 3%, after and before the stress applied



Source: Bruegel based on SNL Financial and ECB data.

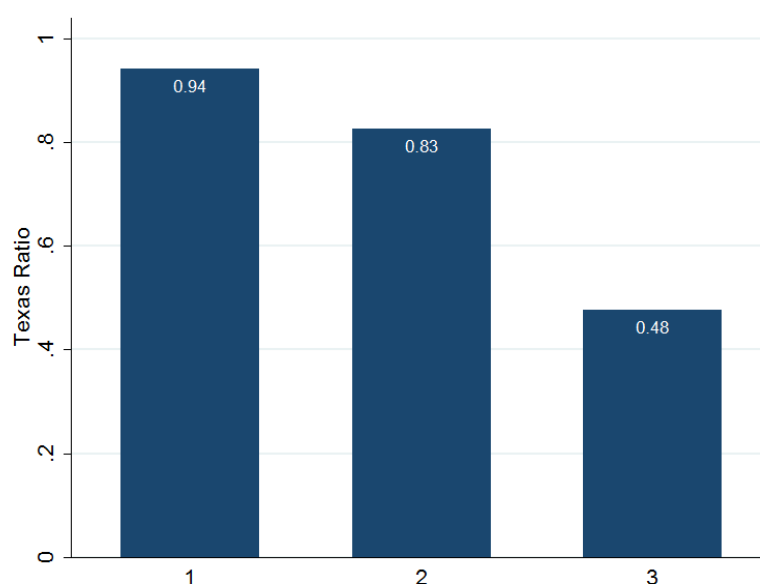
A somewhat comparable metric often used is the so-called Texas ratio (Siems, 2012). It is computed as the ratio of non-performing loans over the sum of equity and provisions. A ratio above 1 is often found to be an indicator of looming bankruptcies. Figure 6 shows the average Texas ratio by country as well as by size (see Annex for more details).

Figure 6a: Average Texas ratio by country



Source: Bruegel based on SNL Financial and ECB data. Note: We use raw equity not Tier 1 capital as often employed in the literature. The numbers are weighted averages across banks by balance sheet size.

Figure 6b: Average Texas Ratio by bank size group



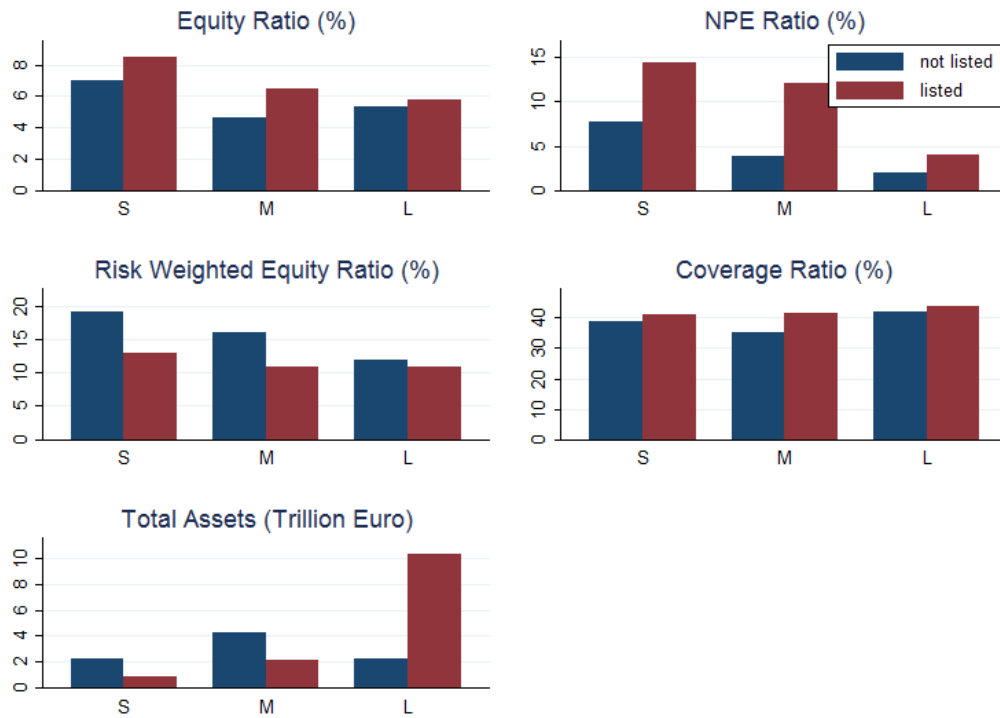
Source: Bruegel based on data from SNL Financial and ECB.

The geographical distribution of vulnerabilities is comparable to our stress tests. The most vulnerable banks appear to be located in Cyprus, Portugal, Greece and Ireland, but also in Italy. In terms of the size decomposition, we find that the vulnerabilities are again primarily in the small and medium-sized banks.

Stock price movements of 'stressed' and 'non-stressed' banks

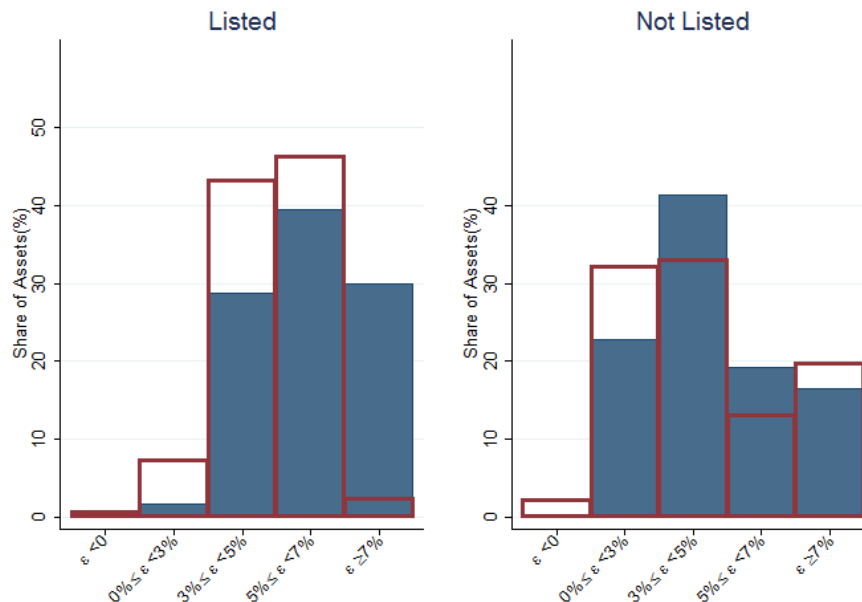
To corroborate our findings, we examine the stock market performance of the banks in the different groups. The first thing to note, however, is that several banks are unlisted (Figure 7). Among SMBs, unlisted banks have about 68 percent of total assets. The unlisted banks (in both the small and medium categories) have lower NPE ratios than the listed banks; but they also have lower equity ratios and, for medium-sized banks, they also have lower coverage ratios. For this reason, Figure 8 shows that much of the increase in stress will be in unlisted banks. As Gropp and Kashyap (2010) warn, unlisted banks play a major role in European banking dynamics. Being beyond the scrutiny of the market, it is unclear what the quality of their equity is.

Figure 7: Banking indicators for listed and unlisted banks



Source: Bruegel based on SNL Financial and ECB data.

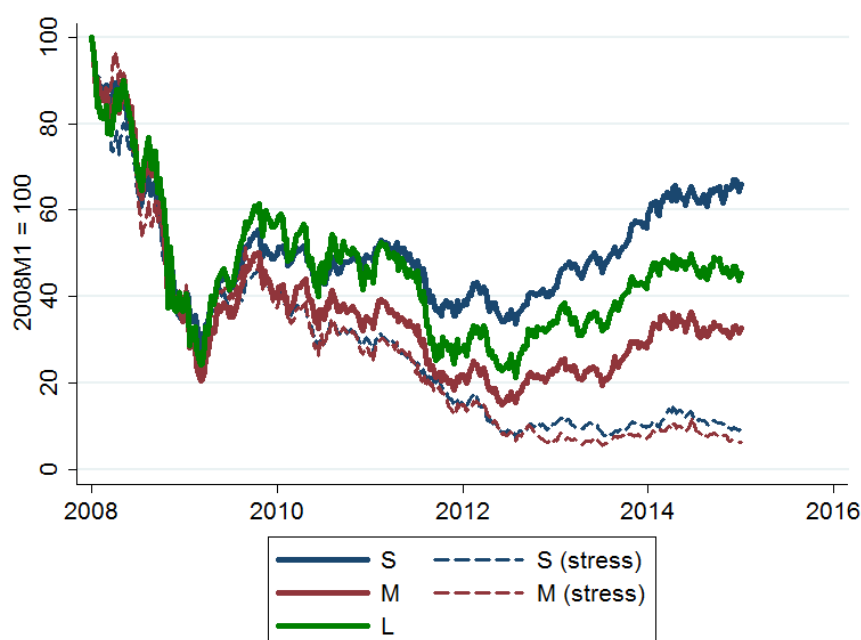
Figure 8: Stress test asset distribution: listed vs. unlisted banks



Source: Bruegel using data from ECB and SNL Financial. Note: The red bars show the distribution after the stress is applied.

Next, for 45 listed banks, we ask how their stock prices have fared. Notice in Figure 9, all types of banks have substantially lower stock prices than in the first quarter of 2008. This is so even for the unstressed banks. However, the stock prices of the unstressed banks, especially the small and the large banks, bottomed-out around mid-2012. In contrast, the banks identified as ‘stressed’ by our simple stress test have not only experienced much larger falls in stock prices (down to about one-tenth of the prices at the start of the crisis), but the stock prices of these banks have continued to fall even while the healthier banks regained some ground.

Figure 9: Evolution of banks' stock market prices



Source: Bruegel using data from Thomson Reuters Datastream. Note: Number of listed banks: 45 (23 Small, 12 Medium, 10 Large).

Altogether, the evidence suggests that the most serious vulnerabilities lie in the medium-sized banks (Table 1). On the liability side of their balance sheets, they have experienced a decline in deposits while large banks have reduced their debt and derivatives, while small banks have reduced their debt. On the asset side, the stressed medium-sized banks decreased their net loans much more significantly than the banks in the other groups, suggesting they have had to adapt their business substantially to deal with the pressures they face.

Table 1: Bank balance sheet behaviour

Unstressed and stressed

SMALL	unstressed			stressed	
	2008	2013		2008	2013
Assets (billion)	36.4	35.0		38.9	43.0
Net Loans (billion)	20.8	19.7		26.9	26.9
<i>(% of assets)</i>	<i>57.3%</i>	<i>56.2%</i>		<i>69.1%</i>	<i>62.5%</i>
Equity	1.6	3.0		2.2	2.1
<i>(% of liabilities)</i>	<i>4%</i>	<i>9%</i>		<i>6%</i>	<i>5%</i>
Deposits	15.9	18.0		18.5	22.6
<i>(% of liabilities)</i>	<i>44%</i>	<i>52%</i>		<i>48%</i>	<i>53%</i>
Debt	7.5	6.9		8.8	6.9
<i>(% of liabilities)</i>	<i>20%</i>	<i>20%</i>		<i>23%</i>	<i>16%</i>
Derivatives	0.8	0.9		0.8	1.0
<i>(% of liabilities)</i>	<i>2%</i>	<i>2%</i>		<i>2%</i>	<i>2%</i>
Securities	0.0	0.0		-	0.0
<i>(% of liabilities)</i>	<i>0.04%</i>	<i>0.11%</i>		<i>0.00%</i>	<i>0.00%</i>
MEDIUM	unstressed			stressed	
	2008	2013		2008	2013
Assets (billion)	237.0	201.0		253.0	186.0
Net Loans (billion)	128.3	108.1		112.5	86.6
<i>(% of assets)</i>	<i>54%</i>	<i>54%</i>		<i>44%</i>	<i>47%</i>
Equity	10.2	12.6		8.0	6.8
<i>(% of liabilities)</i>	<i>4%</i>	<i>6%</i>		<i>3%</i>	<i>4%</i>
Deposits	94.0	88.9		69.7	56.2
<i>(% of liabilities)</i>	<i>40%</i>	<i>44%</i>		<i>28%</i>	<i>30%</i>
Debt	59.8	45.6		60.7	48.5
<i>(% of liabilities)</i>	<i>25%</i>	<i>23%</i>		<i>24%</i>	<i>26%</i>
Derivatives	13.2	9.4		53.3	31.3
<i>(% of liabilities)</i>	<i>6%</i>	<i>5%</i>		<i>21%</i>	<i>17%</i>
Securities	0.3	0.3		3.3	1.9
<i>(% of liabilities)</i>	<i>0%</i>	<i>0%</i>		<i>1%</i>	<i>1%</i>

LARGE	unstressed				
	2008	2013			
Assets (billion)	1160.0	1050.0			
Net Loans (billion)	543.2	508.6			
<i>(% of assets)</i>	<i>47%</i>	<i>48%</i>			
Equity	48.2	58.1			
<i>(% of liabilities)</i>	<i>4%</i>	<i>6%</i>			
Deposits	393.1	449.6			
<i>(% of liabilities)</i>	<i>34%</i>	<i>43%</i>			
Debt	263.7	208.2			
<i>(% of liabilities)</i>	<i>23%</i>	<i>20%</i>			
Derivatives	207.1	114.1			
<i>(% of liabilities)</i>	<i>18%</i>	<i>11%</i>			
Securities	10.8	11.8			
<i>(% of liabilities)</i>	<i>1%</i>	<i>1%</i>			

Source: Bruegel. Note: Full balance sheet data from 2008 to 2013 was available only for 82 banks: 47 small (15 of which stressed) 30 medium (9 stressed) and 5 large.

Listed and unlisted Banks

SMALL	listed			unlisted	
	2008	2013		2008	2013
Assets (billion)	39.4	37.6		35.7	37.4
Net Loans (billion)	25.8	22.4		20.8	21.5
<i>(% of assets)</i>	<i>65%</i>	<i>60%</i>		<i>58%</i>	<i>58%</i>
Equity	2.5	0.1		1.3	0.0
<i>(% of liabilities)</i>	<i>6%</i>	<i>9%</i>		<i>4%</i>	<i>7%</i>
Deposits	19.1	0.0		15.2	0.0
<i>(% of liabilities)</i>	<i>49%</i>	<i>57%</i>		<i>42%</i>	<i>50%</i>
Debt	7.6	0.1		8.1	0.1
<i>(% of liabilities)</i>	<i>19%</i>	<i>12%</i>		<i>23%</i>	<i>21%</i>
Derivatives	0.8	0.0		0.8	0.0
<i>(% of liabilities)</i>	<i>2%</i>	<i>2%</i>		<i>2%</i>	<i>3%</i>
Securities	0.0	0.0		0.0	0.0
<i>(% of liabilities)</i>	<i>0%</i>	<i>0%</i>		<i>0%</i>	<i>0%</i>

MEDIUM	listed			unlisted	
	2008	2013		2008	2013
Assets (billion)	212.0	177.0		265.0	206.0
Net Loans (billion)	144.1	110.9		100.7	90.1
<i>(% of assets)</i>	68%	63%		38%	44%
Equity	12.6	11.4		6.4	9.2
<i>(% of liabilities)</i>	6%	6%		2%	4%
Deposits	95.6	86.5		73.1	66.6
<i>(% of liabilities)</i>	45%	49%		28%	32%
Debt	55.0	33.5		63.3	55.9
<i>(% of liabilities)</i>	26%	19%		24%	27%
Derivatives	8.7	7.0		45.7	26.8
<i>(% of liabilities)</i>	4%	4%		17%	13%
Securities	0.2	0.1		2.5	1.6
<i>(% of liabilities)</i>	0%	0%		1%	1%
LARGE	listed			unlisted	
	2008	2013		2008	2013
Assets (billion)	1230.0	1110.0		808.0	763.0
Net Loans (billion)	546.1	499.0		466.7	391.0
<i>(% of assets)</i>	44%	45%		58%	51%
Equity	53.3	62.5		26.8	37.5
<i>(% of liabilities)</i>	4%	6%		3%	5%
Deposits	383.2	448.2		373.1	331.3
<i>(% of liabilities)</i>	31%	40%		46%	43%
Debt	290.1	219.9		152.7	207.1
<i>(% of liabilities)</i>	24%	20%		19%	27%
Derivatives	253.0	139.3		45.6	46.3
<i>(% of liabilities)</i>	21%	13%		6%	6%
Securities	13.0	14.9		3.8	2.8
<i>(% of liabilities)</i>	1%	1%		0%	0%

Source: Bruegel. Note: 37 listed banks and 45 unlisted banks have balance sheet information available for the full sample period.

Finally, if the banks identified as stressed do face adversity, what are the risks of a systemic crisis? We do a pair-wise correlation of changes in stock prices over two periods, the first from January 2008 to June 2011 and the second from July 2011 to March 2015. These divide the period since the onset of the crisis into two halves, with the first period experiencing much greater stress than the second.

The correlation (Table 2) suggests that large banks were highly correlated throughout – which makes sense: they are part of a global network and move with the global trends. The medium-sized banks' stock prices were also highly correlated in the first period, when the crisis was in its more severe phase. Understandably, the small banks and the medium banks were less correlated in the calmer period after June 2011. These banks have more of a local and bank-specific idiosyncratic stock price component. Interestingly, in the second period, the 'stressed' banks are somewhat less correlated than the unstressed banks, indicating that they are more subject to idiosyncratic risks. The numbers, however, warn that if sentiment turns adverse, the correlations can rise quickly.

Table 2: Correlations in stock prices (monthly % change)			
		2008M1-2011M6	2011M7-2015M3
S	unstressed	35%	28%
	stressed	45%	21%
M	unstressed	54%	46%
	stressed	62%	28%
L	unstressed	67%	67%

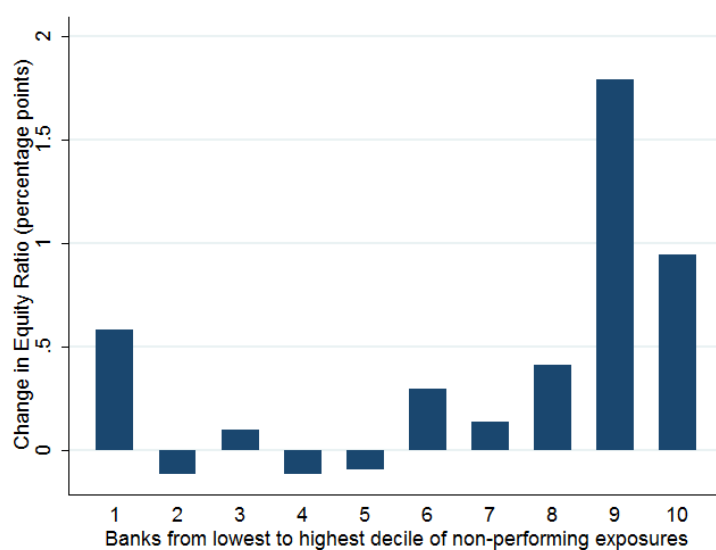
Source: Bruegel based on SNL Financial and ECB data.

Altogether, SMBs – especially the medium-sized banks – are the most vulnerable part of the euro-area banking system. They hold about half of the euro area's assets, and could once again prove to be a source of significant instability with systemic implications. This is not to suggest that large banks cannot pose risks. But crisis management has allowed them to emerge from the deep shock the euro area experienced in a healthier way.

On a positive note, some distressed banks have raised equity. Since year-end 2013, banks with the highest NPEs have been able to raise capital (Figure 10a). Most of the equity was raised in the form of 'common equity'. These numbers do not include deferred tax assets but rather reflect actual equity

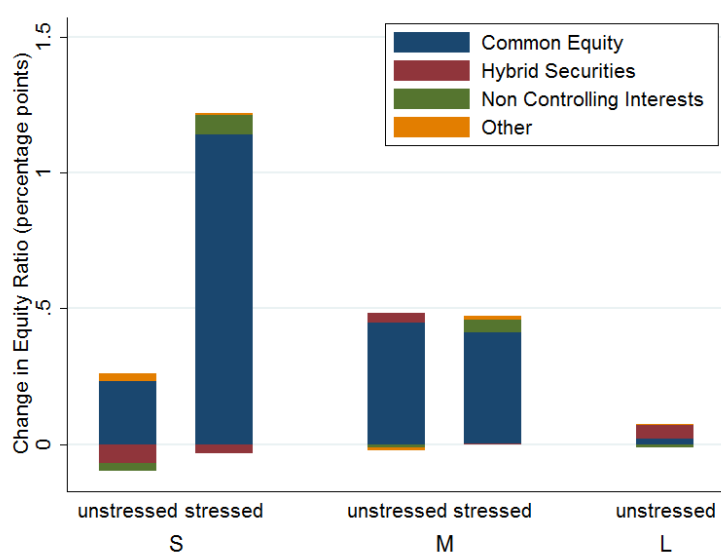
raised. In Greece, deferred tax assets are a major issue in the assessment of banks' vulnerability (Merler 2015). Figure 10b shows that much of the new equity raised was by small banks that remain stressed: hence, there is a long way to go.

Figure 10a: Increase in equity ratio by extent of non-performing exposure, from 2013Q4 to 2014Q2



Source: Bruegel based on SNL Financial and ECB data.

Figure 10b: Type of equity raised



Source: Bruegel based on SNL Financial and ECB data. Note: Decomposition only available for 96 of the 130 banks.

Conclusions and policy

In the European policy context, these findings are important for three reasons. First, the SMBs serve domestic markets and their continued stress impedes the flow of credit and limits the potential for economic recovery. The weakness of these banks is one reason why bank lending in Europe remains weak. Second, to the extent that these banks are unable to lend because of lack of demand, they might be subject to a deflationary (or low inflation environment) risk: lenders might struggle to repay their loans. In combination, banks and the corporate sector could (continue) to drag each other down. As Figure 11 shows, a large fraction of the NPEs are in 'corporate' and SME lending, ie in the business sector.

The implication is that a cycle of corporate distress and bank distress could yet unfold. Facing increasing risks, these banks might be tempted to take unwise risks. Thus, their problems could increase before they are brought under control.

Third, the geographical distribution of the banking stress is worrying. Countries that have experienced increased unemployment also have many stressed small and medium-sized banks. While their large banks are healthier and can to some extent compensate for that weakness, the slow resolution of bank problems in the small and medium-sized sector can delay the recovery further.

Almost the entire policy discussion has centred on the recapitalisation of banks. Such a focus on bank capital is important. Even more important however is the question of how and when to restructure and resolve existing banks. The experience in Japan has shown that unresolved banking problems can remain a drag on economic recovery for decades.

In the Great Depression, a large numbers of US banks were closed (Bernanke, 1983). Between 2008 and 2010, hundreds of US banks were closed (489 according to the FDIC⁵). By contrast, only a handful of banks have been closed in the euro area (51 banks according to the Open Economics failed-banks tracker⁶). Instead, the euro-area authorities have allowed for forbearance (through ample liquidity provision) and bank recapitalisation and public guarantees. Such financial support has been

⁵ <https://www.fdic.gov/bank/individual/failed/banklist.html>

⁶ <http://openeconomics.net/failed-bank-tracker/>; data current as of January 2015.

considerably higher in the euro area than in the United States. While banks in the US closed, the euro area propped up its banks with public money.

The ECB's comprehensive assessment and stress tests have focused on capital shortfalls but the SSM has so far not 'pulled the plug' and forced banks into bank recovery and resolution (Véron, 2015). We have highlighted that despite passing the official stress test, high levels of non-performing loans leave banks exposed to stress. We believe it is a pressing requirement to aggressively restructure, consolidate and close the weakest banks. Our analysis suggests that 38 percent of the assets of SMBs (16 percent of the assets of the entire banking system) very likely deserve to be subjected to this restructuring and consolidation process. The aim of this process would be to remove NPEs from balance sheets as much as possible. In some cases, it would involve closing the banks. In other cases, bad assets might have to be separated and then be transferred to a bad bank (see for example Gandrud and Hallerberg, 2013) or traded in markets for distressed assets. In still other cases, asset separation might have to be followed by consolidation and mergers with stronger banks.

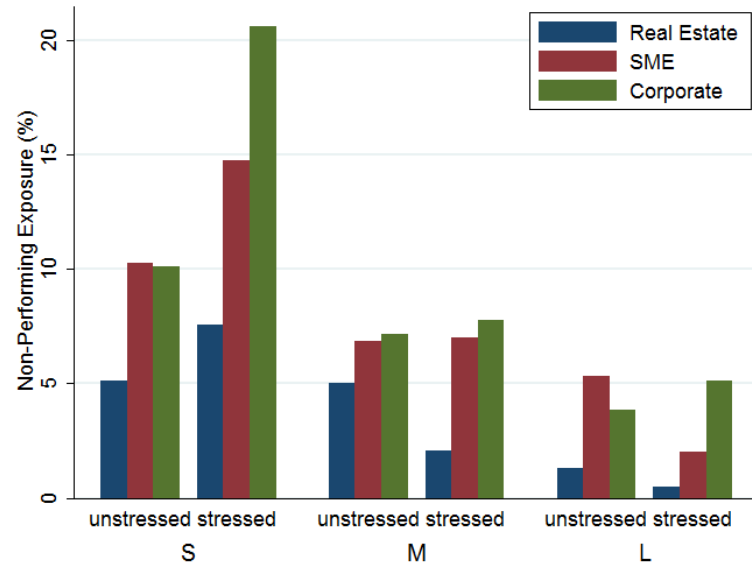
While far from perfect, the EU has created mechanisms to facilitate bank restructuring and resolution (Véron and Wolff, 2013). The uniform framework of the Bank Recovery and Resolution Directive (BRRD, 2014/59/EU) is necessary for consistent implementation in different countries and for a shift towards greater bail-in. Some countries where we highlight still substantial problems lag behind in the adoption of the BRRD⁷. These mechanisms should be put to use and the necessary restructuring and consolidation of Europe's banking system should not be delayed.

Our results also suggest that there are specific problems with the governance and business models of at least some of the small and medium-sized banks. While non-performing exposures obviously have increased very substantially because of the severe recession in many parts of the euro area, some banks have dealt better with the problem than others. Exploring further the political economy of bank governance, their business models and the impact thereof on non-performing exposures will remain for future research (Monnet *et al*⁸ provide some insights into the matter).

Figure 11: Non-performing exposure across sector by bank size

⁷ See for example: <http://www.wsj.com/articles/italy-france-9-others-must-adopt-new-rules-for-failed-banks-1432817274>

⁸ <http://www.bruegel.org/publications/publication-detail/publication/838-europe-between-financial-repression-and-regulatory-capture/>



Source: Bruegel based on SNL Financial and ECB data.

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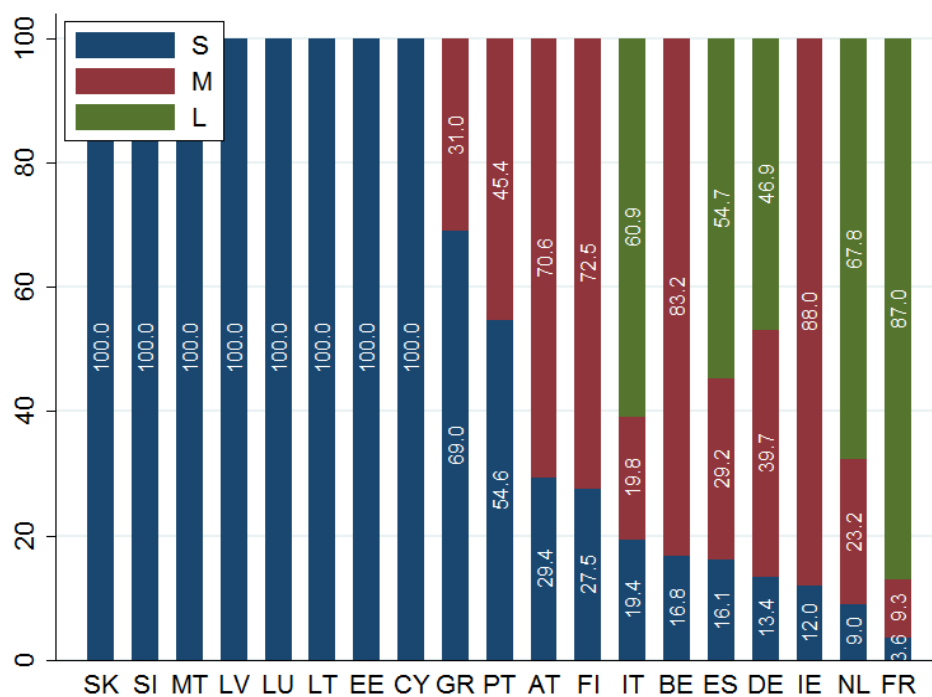
ANNEX

A1: Numbers of banks per EU member state

	Small	Medium	Large	Total
AT	4	2	0	6
BE	3	3	0	6
CY	4	0	0	4
DE	13	10	2	25
EE	3	0	0	3
ES		4	2	15
FI	2	1	0	3
FR	5	3	5	13
GR	3	1	0	4
IE	2	3	0	5
IT	10	3	2	15
LT	3	0	0	3
LU	6	0	0	6
LV	3	0	0	3
MT	3	0	0	3
NL	3	2	2	7
PT	2	1	0	3
SI	3	0	0	3
SK	3	0	0	3
Total	84	33	13	130

Small: Assets under €100 billion, Medium: Assets between €100 and €500 billion, Large: Assets greater than €500 billion.

A2: National banking system assets by size group



Name	Country	SNL ID	ECB reporting number	Size Group	Assets (€ billions)	Balance Sheet Availability	Stock Price Availability	Stress Dummy
Raiffeisenlandesbank Niederösterreich-Wien AG	AT	4155881	3	S	29.09	1	0	0
Bank für Arbeit und Wirtschaft und Österreichische Postsparkasse AG	AT	4155878	1	S	36.47	1	0	0
Raiffeisenlandesbank Oberösterreich AG	AT	4213238	4	S	37.23	1	0	0
Österreichische Volksbanken-AG	AT	4155879	6	S	40.60	1	1	1
Raiffeisen Zentralbank Österreich AG	AT	4112994	5	M	147.09	1	0	0
Erste Group Bank AG	AT	4089743	2	M	197.64	1	1	0
Argenta Bank- en Verzekeringsgroep	BE	4242091	7	S	36.52	1	0	0
AXA Bank Europe SA	BE	4242094	8	S	36.89	1	0	1
The Bank of New York Mellon SA	BE	4274504	10	S	52.90	0	0	0
Belfius Banque SA	BE	4235104	9	M	161.07	1	0	0
Dexia NV	BE	4024522	11	M	222.94	1	1	1
KBC Group NV	BE	4145062	12	M	241.31	1	1	0
Hellenic Bank Public Company Ltd	CY	4155888	15	S	6.35	1	1	1
RCB Bank Ltd	CY	4263452	16	S	8.16	0	0	0
Co-operative Central Bank Ltd	CY	4387826	14	S	16.29	0	0	1
Bank of Cyprus Public Company Ltd	CY	4055628	13	S	29.66	1	1	1
Wüstenrot Bank AG Pfandbriefbank	DE	4143295	40	S	13.44	1	0	1
Wüstenrot Bausparkasse AG	DE	4257337	39	S	22.55	0	0	1
KfW IPEX-Bank GmbH	DE	4338216	29	S	23.44	1	0	0
IKB Deutsche Industriebank AG	DE	4145065	28	S	24.71	1	1	1
SEB AG	DE	4242256	37	S	31.75	1	0	0
Deutsche Apotheker- und Ärztebank eG	DE	4155903	18	S	34.69	1	0	0
Münchener Hypothekenbank eG	DE	4186820	26	S	34.90	1	0	1
Aareal Bank AG	DE	4145288	17	S	42.98	1	1	0
HASPA Finanzholding	DE	4258418	24	S	44.47	0	0	0
Landeskreditbank Baden-Württemberg-Förderbank	DE	4242220	33	S	70.68	1	0	0
Landwirtschaftliche Rentenbank	DE	4186034	34	S	81.93	1	0	0

Name	Country	SNL ID	ECB reporting number	Size Group	Assets (billions EUR)	Balance Sheet Availability	Stock Price Availability	Stress Dummy
WGZ Bank AG Westdeutsche Genossenschafts-Zentralbank	DE	4136796	41	S	90.93	1	0	0
Volkswagen Financial Services AG	DE	4344661	38	S	98.02	0	0	0
Landesbank Berlin Holding AG	DE	4087940	30	M	101.16	1	0	1
HSH Nordbank AG	DE	4106903	25	M	109.28	1	0	1
DekaBank Deutsche Girozentrale	DE	4200927	22	M	116.07	1	0	1
Hypo Real Estate Holding AG	DE	4145051	27	M	122.45	1	0	0
NRW.Bank	DE	4242234	36	M	145.35	0	0	0
Landesbank Hessen-Thüringen Girozentrale	DE	4120106	32	M	177.00	1	0	0
Norddeutsche Landesbank-Girozentrale	DE	4145342	35	M	197.66	1	0	1
Bayerische Landesbank	DE	4048275	19	M	255.84	1	0	0
Landesbank Baden-Württemberg	DE	4073469	31	M	273.52	1	0	0
DZ Bank AG Deutsche Zentral-Genossenschaftsbank	DE	4142663	23	M	315.88	1	0	0
Commerzbank AG	DE	113985	20	L	561.38	1	1	0
Deutsche Bank AG	DE	113830	21	L	1,580.76	1	1	0
AS DNB Pank	EE	4419343	42	S	0.57	0	0	0
AS SEB Pank	EE	4252846	44	S	4.44	0	0	0
Swedbank AS	EE	4204955	43	S	8.59	0	1	0
Cajas Rurales Unidas, Sociedad Cooperativa de Crédito	ES	4242145	50	S	42.10	1	0	1
Liberbank, S.A.	ES	4291241	55	S	44.51	0	0	1
Banco Mare Nostrum, S.A.	ES	4178494	48	S	47.57	0	0	1
NCG Banco, S.A.	ES	4303835	56	S	52.59	0	0	1
Bankinter, S.A.	ES	4144839	47	S	54.43	1	1	0
Caja de Ahorros y M.P. de Zaragoza, Aragón y Rioja	ES	4228833	52	S	58.71	0	0	0
Kutxabank, S.A.	ES	4309260	53	S	60.09	0	0	0
Catalunya Banc, S.A.	ES	4295205	51	S	63.26	0	0	0
Unicaja Banco, S.A.	ES	4308526	59	S	77.14	0	0	1
Banco Popular Español, S.A.	ES	4144838	57	M	147.08	1	1	1
Banco de Sabadell, S.A.	ES	4151699	49	M	161.54	1	1	0

Name	Country	SNL ID	ECB reporting number	Size Group	Assets (billions EUR)	Balance Sheet Availability	Stock Price Availability	Stress Dummy
Banco Financiero y de Ahorros, S.A.	ES	4280116	45	M	266.49	0	0	1
Caja de Ahorros y Pensiones de Barcelona	ES	4219193	54	M	335.13	0	1	0
Banco Bilbao Vizcaya Argentaria, S.A.	ES	113904	46	L	587.09	1	1	0
Banco Santander, S.A.	ES	113983	58	L	1,117.16	1	1	0
Danske Bank Oyj	FI	4242252	60	S	26.68	1	0	0
OP-Pohjola Group	FI	4242235	62	S	88.99	1	0	0
Nordea Bank Finland Abp	FI	4242232	61	M	304.76	1	0	1
Banque PSA Finance	FR	4242113	72	S	25.15	0	0	0
RCI Banque	FR	4242247	73	S	29.23	0	0	0
C.R.H. - Caisse de Refinancement de l'Habitat	FR	4398179	69	S	53.13	0	0	1
BPI France (Banque Publique d'Investissement)	FR	4242236	66	S	53.92	0	0	1
Société de Financement Local	FR	4375875	74	S	83.53	0	0	1
HSBC France	FR	4040727	70	M	188.56	1	0	1
La Banque Postale	FR	4242218	71	M	199.23	1	0	0
Banque Centrale de Compensation (LCH Clearnet)	FR	/	63	M	238.76	0	0	0
Groupe Crédit Mutuel	FR	4242166	68	L	539.01	1	0	0
Groupe BPCE	FR	4239955	65	L	1,065.43	0	0	0
Société Générale	FR	113818	75	L	1,141.58	1	1	0
Groupe Crédit Agricole	FR	4242161	67	L	1,456.34	1	1	0
BNP Paribas	FR	3001689	64	L	1,640.31	1	1	0
Alpha Bank, S.A.	GR	4080963	76	S	73.60	1	1	0
Eurobank Ergasias, S.A.	GR	4145113	77	S	76.69	1	1	1
Piraeus Bank, S.A.	GR	4145110	79	S	92.01	1	1	1
National Bank of Greece, S.A.	GR	4048999	78	M	109.11	1	1	0
Ulster Bank Ireland Limited	IE	4259734	84	S	35.37	0	0	0
Permanent tsb plc.	IE	4332442	83	S	37.20	1	1	0
Allied Irish Banks plc	IE	4002079	80	M	117.73	1	1	0
The Governor and Company of the Bank of Ireland	IE	4041921	82	M	120.22	1	1	0

Name	Country	SNL ID	ECB reporting number	Size Group	Assets (billions EUR)	Balance Sheet Availability	Stock Price Availability	Stress Dummy
Merrill Lynch International Bank Limited	IE	4420156	81	M	294.68	1	0	1
Banca Piccolo Credito Valtellinese, Società Cooperativa	IT	4150574	92	S	27.20	1	0	1
Credito Emiliano S.p.A.	IT	4182970	91	S	28.35	1	1	0
Banca Popolare di Sondrio, Società Cooperativa per Azioni	IT	4145079	88	S	32.77	1	1	0
Banca Carige S.P.A. - Cassa di Risparmio di Genova e Imperia	IT	4150523	90	S	37.02	1	1	1
Veneto Banca S.C.P.A.	IT	4242278	99	S	37.11	1	0	0
Banca Popolare di Vicenza - Società Cooperativa per Azioni	IT	4145316	89	S	45.23	1	0	0
Iccrea Holding S.p.A	IT	4242199	93	S	46.22	1	0	1
Banca Popolare Di Milano	IT	4145073	87	S	49.35	1	1	1
Banca Popolare Dell'Emilia Romagna	IT	4219855	86	S	61.76	1	1	1
Mediobanca - Banca di Credito Finanziario S.p.A.	IT	4090384	95	S	75.95	1	1	0
Unione Di Banche Italiane Società Cooperativa Per Azioni	IT	4238420	97	M	124.29	1	1	0
Banco Popolare	IT	4183874	85	M	126.46	1	1	0
Banca Monte dei Paschi di Siena S.p.A.	IT	4182766	96	M	199.11	1	1	1
Intesa Sanpaolo S.p.A.	IT	4100801	94	L	536.62	1	1	0
UniCredit S.p.A.	IT	4055762	98	L	849.99	1	1	0
AB DNB bankas	LT	4578385	100	S	3.47	0	0	0
Swedbank AB	LT	4242265	102	S	5.67	1	0	0
AB SEB bankas	LT	4150581	101	S	6.83	0	0	0
UBS (Luxembourg) S.A.	LU	4096718	108	S	10.10	0	0	0
Clearstream Banking S.A.	LU	4100371	104	S	11.25	0	0	0
RBC Investor Services Bank S.A.	LU	4383200	106	S	12.74	0	0	0
State Street Bank Luxembourg S.A.	LU	4283101	107	S	31.36	0	1	0
Precision Capital S.A.	LU	4308660	105	S	32.48	1	0	0
Banque et Caisse d'Epargne de l'Etat, Luxembourg	LU	4224076	103	S	40.66	1	0	0
ABLV Bank, AS	LV	4393513	109	S	3.31	0	0	0
AS SEB banka	LV	4242092	110	S	4.28	1	0	0
Swedbank AS	LV	4242093	111	S	5.05	0	1	0

Name	Country	SNL ID	ECB reporting number	Size Group	Assets (billions EUR)	Balance Sheet Availability	Stock Price Availability	Stress Dummy
Deutsche Bank (Malta) Ltd	MT	4303250	114	S	2.83	0	0	0
HSBC Bank Malta plc	MT	4238353	113	S	5.13	1	0	0
Bank of Valletta plc	MT	4186075	112	S	7.43	1	1	0
The Royal Bank of Scotland N.V.	NL	4254287	120	S	45.74	0	0	0
Nederlandse Waterschapsbank N.V.	NL	4186955	118	S	73.01	0	0	1
SNS Bank N.V.	NL	4242257	121	S	74.54	1	0	0
Bank Nederlandse Gemeenten N.V.	NL	4400227	116	M	131.18	0	0	1
ABN Amro Bank N.V.	NL	4000991	115	M	369.75	0	0	0
Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A.	NL	4078587	119	L	674.14	0	0	1
ING Bank N.V.	NL	4092030	117	L	786.50	1	1	0
Banco BPI, SA	PT	4182795	123	S	40.03	1	1	0
Banco Comercial Português, SA	PT	4150602	122	S	82.01	1	0	1
Caixa Geral de Depósitos, SA	PT	4072651	124	M	101.51	1	0	1
SID - Slovenska izvozna in razvojna banka, d.d., Ljubljana	SI	4397825	127	S	3.88	0	0	0
Nova Kreditna Banka Maribor d.d.	SI	4238383	125	S	4.81	1	1	0
Nova Ljubljanska banka d. d., Ljubljana	SI	4049000	126	S	12.54	1	0	0
Tatra banka, a.s.	SK	4238416	129	S	9.47	1	0	0
Všeobecná úverová banka, a.s.	SK	4144832	130	S	11.56	1	1	0
Slovenská sporiteľňa, a.s.	SK	4186093	128	S	11.67	1	0	0

Data sources

1. The SSM publishes the result of its comprehensive assessment here:
<https://www.bankingsupervision.europa.eu/banking/comprehensive/html/index.en.html>.
One must download the information for each bank separately. This is also available as a single dataset via the SNL template 'ECB Comprehensive Review'.
2. Detailed Balance Sheet data is available from SNL Financial (amongst other providers). We use the following items:

Total Equity	132385
Equity Hybrid Securities	224974
Common Equity	132384
Noncontrolling Interests	138215
Total Assets	132264
Total Net Loans	132214
Total Deposits	132288
Total Debt	247398
Derivative Liabilities	247735
Securities Liabilities	247494
Other Financial Liabilities	247743

3. Stock price information is taken at the weekly frequency from Thomson Reuters Datastream. This data is commonly available from many providers.