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by Andrea Cardillo and Andrea Zaghini

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RECENT TRENDS IN LONG-TERM BANK FUNDING

by Andrea Cardillo* and Andrea Zaghini**

Abstract

We assess the long-term funding conditions for banks in the US, the euro area and the UK and, separately, for the group of global systemically important financial institutions (G-SIFIs), over the period 1997-2011. After the outbreak of the subprime crisis there was a considerable reshuffling of the relative weight of banks' funding sources, also due to non-conventional monetary policy interventions, government support measures and a significant increase in wholesale funding costs. By looking at 6,400 bank bonds we find that both implicit and explicit guarantees by the sovereign have a substantial role in shaping the wholesale cost of bond issuance with significant differences between AAA-rated and lower-rated countries. However, when a bank CDS exists the role of the government is significantly reduced with the market giving more weight to the soundness and creditworthiness of the issuing institution.

JEL Classification: G21; G01; G18.

Key words: long-term funding, bank balance sheet, financial crisis, G-SIFIs.

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1. Introduction and summary¹

The aim of the paper is to investigate the development in banks' long-term funding over the last 15 years (1997-2011), in the euro area, the US and the UK. In addition, we also look separately at the aggregate of the 29 global systemically important financial institutions (G-SIFIs), as they were defined by the Financial Stability Board (2011). We analyse the long-term funding activity from both a volume (gross issuance) and a price (cost at launch) perspective. Particular emphasis is devoted to the recent financial crisis which, on the one hand, has negatively affected bank funding conditions, especially in some peripheral countries of the euro area, due to a general overhauling of risk profiles, including at the sovereign level; on the other hand, it has induced substitution effects between different financial instruments of the same maturity, often due to national and supranational measures aimed at supporting the financial system.

In the first part of the analysis we focus on the evolution of all items on the liability side of bank balance sheets, in order to identify changes in banks' funding patterns over time. We start with the study of the size of the balance sheet and the change in the use of the funding options; we then focus on long-term financial instruments and their use in both uneventful and crisis periods.

In the second part of the paper we look at the cost of long-term funding by country and instrument and we propose an econometric investigation of the determinants of the cost at issuance paid by banks on long-term bonds. By looking at the asset swap spread at launch paid on 6,400 bonds we analyse the role played by bank characteristics, issuance features and market sentiment. We also look at the creditworthiness of the sovereign in order to assess the implications of explicit and implicit public guarantees on the cost of bank debt.

The main findings of the paper can be summarized as follows:

- the size of banks in terms of total assets has increased significantly over the last 15 years, especially for the banks in the UK and the euro area. A large part of the

¹ The authors would like to thank P. Alessandri, G. Grande, A. Levy, S. Masciantonio and G. C. Piazza for helpful discussions and useful suggestions and D. Pianeselli for his excellent research assistance. The views expressed in the paper do not necessarily reflect those of the Bank of Italy.

increase is due to the G-SIFIs, whose weight with respect to the combined total assets of the banking systems in the US, the euro area and the UK grew from 23 per cent in 1997 to more than 50 per cent in 2011.

- In the euro area, the relative weight of funding via long-term debt was fairly stable in the first half of the sample period at around 16 per cent. It then rose quickly to a peak of 22.5 per cent in 2006; afterwards it declined, going back to 16.4 per cent in 2011. A similar pattern can be detected for the UK in the most recent period. Instead, the long-term share rose considerably in the US over the whole period – even in the crisis years – coming to a halt only in 2011.
- Small euro-area banks (first quartile of the total assets distribution) rely much more on long-term funding than counterparts from the US and the UK, whereas the difference is much more muted for the largest banks (fourth quartile). This is most likely due to the heavy recourse of minor banks to retail-security selling in several euro-area countries.
- Since the outbreak of the subprime crisis in the summer of 2007 there has been a considerable redistribution in the composition of banks' long-term funding. The recourse to the various sources of funding differed in the three areas under analysis: the euro-area banking system relied considerably on the long-term liquidity support provided by the ECB (47 per cent of gross banks' long-term funding in 2011), banks from the US increased customer deposits and banks from the UK intensified their (“own name”) securitization activity.
- The cost of wholesale funding has increased dramatically since 2007, especially for unsecured issuance, and has shown significant heterogeneity across euro-area countries.
- Empirical results suggest that non AAA-rated governments add a burden to the cost of debt issuance by the domestic banking system. This implicit negative support intensified in the current sovereign debt crisis: we estimate that the absence of the backing of an AAA-rated government amounted, all other things being equal, to an average increase of 150bps in the cost paid by banks when issuing unsecured bonds in 2011.
- Finally, in the market for government-guaranteed bank debt, bond prices mainly reflect the characteristics of the guarantor whereas bank-specific and issue-specific

features play only a minor role. However, when looking only at banks for which a CDS exists, the role of the government in influencing bond prices is mitigated, with the market giving more weight to the soundness and creditworthiness of the issuing institutions.

2. The role of long-term funding

2.1 Balance sheet evolution

Our analysis is focused on the aggregate banking systems in the main financial areas of the United States, the euro area and the United Kingdom and, given their importance from the global financial stability perspective, on the group of the 29 global systemically important financial institutions (G-SIFIs) as identified by the Financial Stability Board in 2011. The G-SIFIs are financial institutions whose distress or disorderly bankruptcy, because of their size, complexity and systemic network, would cause significant disruption to the wider financial system and economic activity. Since such institutions are often seen as “too-big-to-fail” if in distress, national authorities might find themselves having no choice but to forestall their failure via public solvency support with deleterious consequences for private incentives and public finances. Thus their supervision has cross-border relevance since they can cause financial turmoil worldwide (FSB 2011). Among the G-SIFIs there are pure investment banks (such as Goldman Sachs and UBS) and more traditional deposit-based banks (such as HSBC and Unicredit).²

Our sample starts in 1997 and ends in 2011. The time span of the sample is determined, on the one hand, by data availability, and on the other, by the possibility of exploring at least two full economic cycles and two different periods of financial turmoil: the “dot-com” bubble and the recent “subprime/sovereign bond” crisis. We exploit several data sources to analyse the recent evolution in banks’ funding choice. We take information about bank balance sheets from Bankscope by Bureau van Dijk, information about the issuance of

² Table A1 in Appendix I reports the complete list of G-SIFIs together with the value of total assets in 2011 and the first year in which the balance sheet is available in our dataset (Bankscope).

securities from DCM Analytics by Dealogic and information about government-guaranteed bond issuance from Bloomberg.

For information on balance sheet our choice of Bankscope is due to the historical depth of their data collection and to the detailed breakdown of the liability items. As for banks' selection criterion, within Bankscope we picked only institutions whose balance sheet is classified with consolidation code C1 (for these entities we have the consolidated balance sheet only) or C2 (for these banks there are both the consolidated and the unconsolidated balance sheets), thus excluding all unconsolidated balance sheets to avoid data duplication. From Bankscope we select several bank liabilities components, to break down the balance sheet into: "customer deposits", "deposits from banks", "derivatives", "long term-funding" and "equity & reserves".³

| | EURO AREA | | | USA | | | UK | | | G-SIFIs | | |
|------|---------------|-------------------------|----------------------|---------------|-------------------------|----------------------|---------------|-------------------------|----------------------|---------------|-------------------------|----------------------|
| | Balance sheet | Cumulative total assets | Average total assets | Balance sheet | Cumulative total assets | Average total assets | Balance sheet | Cumulative total assets | Average total assets | Balance sheet | Cumulative total assets | Average total assets |
| 1997 | 548 | 15,235,179 | 27,801 | 340 | 6,662,844 | 19,597 | 153 | 3,010,515 | 19,677 | 18 | 5,792,327 | 321,796 |
| 1998 | 532 | 14,977,353 | 18,520 | 426 | 9,234,617 | 16,644 | 153 | 3,492,158 | 28,656 | 23 | 7,931,302 | 344,839 |
| 1999 | 576 | 18,041,241 | 31,322 | 728 | 15,805,952 | 21,711 | 152 | 4,056,846 | 26,690 | 25 | 10,544,915 | 421,797 |
| 2000 | 596 | 19,997,726 | 33,553 | 765 | 20,739,004 | 27,110 | 144 | 5,521,823 | 38,346 | 25 | 13,446,295 | 537,852 |
| 2001 | 600 | 22,240,393 | 37,067 | 782 | 24,613,181 | 31,475 | 137 | 5,934,086 | 43,314 | 27 | 17,084,417 | 632,756 |
| 2002 | 623 | 22,217,810 | 35,663 | 861 | 22,132,430 | 25,705 | 143 | 6,153,142 | 43,029 | 28 | 16,672,450 | 595,445 |
| 2003 | 631 | 23,563,007 | 37,342 | 893 | 21,358,908 | 23,918 | 145 | 6,208,028 | 42,814 | 28 | 16,300,256 | 582,152 |
| 2004 | 792 | 33,084,670 | 41,774 | 870 | 22,951,073 | 26,381 | 172 | 10,690,029 | 62,151 | 28 | 19,114,468 | 682,660 |
| 2005 | 732 | 36,776,672 | 50,241 | 869 | 28,181,784 | 32,430 | 176 | 9,845,659 | 55,941 | 29 | 24,484,399 | 844,290 |
| 2006 | 710 | 41,868,099 | 58,969 | 766 | 26,947,491 | 35,179 | 166 | 12,315,407 | 74,189 | 29 | 26,675,129 | 919,832 |
| 2007 | 664 | 40,697,200 | 61,291 | 697 | 26,488,622 | 38,004 | 164 | 12,456,928 | 75,957 | 29 | 29,608,639 | 1,020,988 |
| 2008 | 692 | 45,808,739 | 66,198 | 649 | 22,037,889 | 33,957 | 158 | 12,949,130 | 81,957 | 29 | 32,823,630 | 1,131,849 |
| 2009 | 680 | 41,562,209 | 61,121 | 673 | 21,518,999 | 31,975 | 159 | 12,202,209 | 76,743 | 29 | 30,631,904 | 1,056,273 |
| 2010 | 619 | 41,118,307 | 66,427 | 596 | 20,999,402 | 35,234 | 148 | 12,535,084 | 84,697 | 29 | 33,596,134 | 1,158,487 |
| 2011 | 439 | 37,739,299 | 85,967 | 524 | 19,742,390 | 37,676 | 118 | 11,830,186 | 100,256 | 29 | 35,587,644 | 1,227,160 |

Source: Bankscope

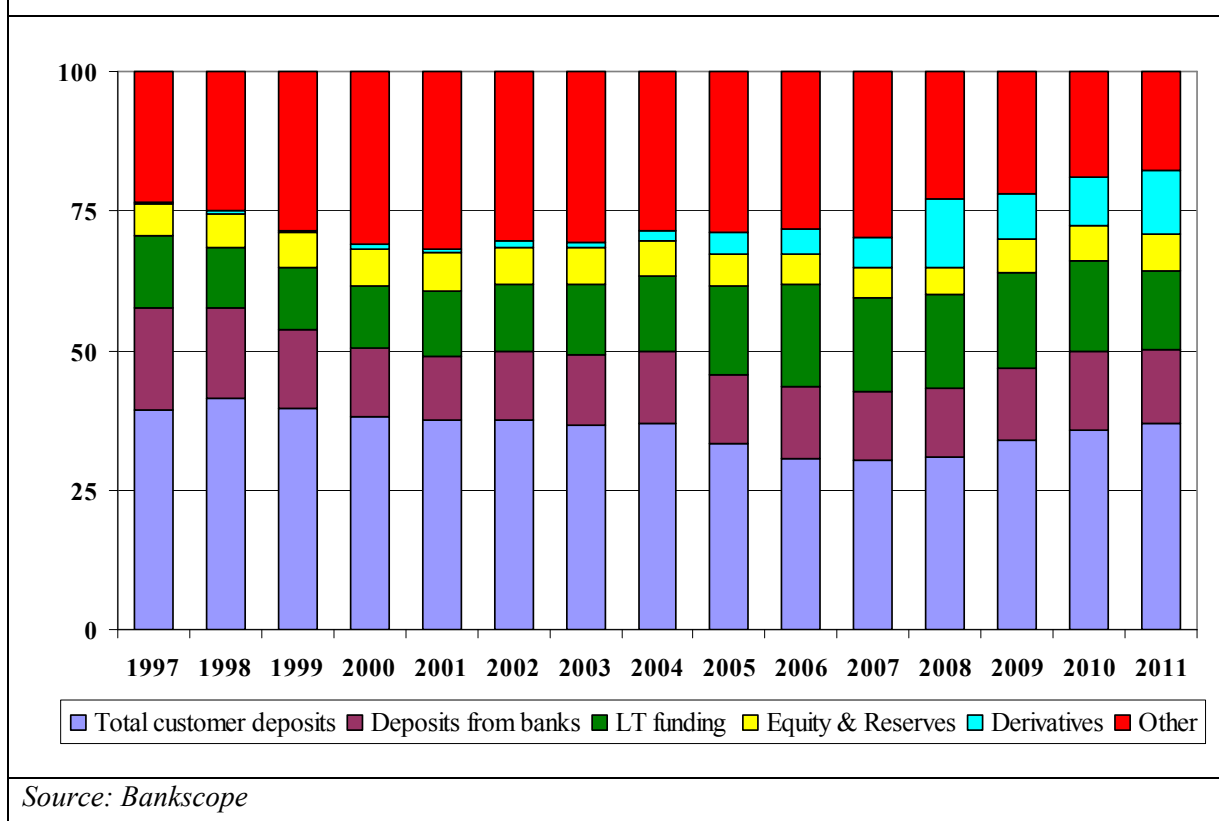
Table 1 reports the overall development over time of the sample. First of all, we note a significant increase in the total (cumulated) balance sheet size in each of the three economies under analysis (second column). The number of banks registered in Bankscope also rose substantially (first column), but not as steadily, thus suggesting that a true increase in the average size of the balance sheet has indeed occurred over our sample period (third column).

In addition, there are sizable differences between the three areas. In particular, while for the US the sample is basically stable and the increase in the size of the balance relatively

³ See Table A2 in Appendix I for details about the balance sheet items provided by Bankscope.

smooth, for the euro area and, in particular, the UK the increase in the magnitude of the balance sheets starting from 2004 is impressive. While the favourable business cycle phase, the low level of interest rates and the change of banking supervision regulations from Basel I to Basel II may have contributed, the bulk of the increase is most likely due to three factors: 1) a significant increase in Mergers and acquisitions (M&A) activity; 2) the rise in prices on the financial markets; 3) the introduction of the International Financial Reporting Standards (IFRSs).

Figure 1. Balance sheet liabilities (percentages)



A sizeable increase in the average balance sheet can also be detected for the G-SIFIs even though the striking circumstance to emerge from Table 1 is the balance sheet size *per se*. Notwithstanding the impossibility of a perfect comparison with the banking systems of the US, the euro area and the UK, given the presence of G-SIFIs outside the three areas, the weight of their aggregated total assets, which was already 23 per cent in 1997, reached 45 per cent in 2010 and breached the 50 per cent threshold in 2011 (51.3%).

Focusing on the whole sample, Figure 1 shows the evolution of the percentage composition of the balance sheet items. From the data we notice that:

- customer deposits decreased from around 41 per cent in 1998 to 31 per cent in 2008, to bounce back in the two following years, reaching 36 per cent in 2010 and 37 per cent in 2011;
- after constantly decreasing from 18 per cent in 1997 to 11 per cent in 2001, the item “deposits from banks” was relatively stable at around 13 per cent in the second half of the sample;
- there was a significant increase in derivative instruments from 2004;⁴ in particular, the large recourse to this group of financial instruments during the subprime crisis is in part due to the use of CDSs in connection with the rise of the counterparty risk (the increase continuing even in 2010 and 2011 due to the sovereign debt crisis in the euro area);
- long-term funding increased almost constantly from 1998 to 2006 and was still sizable at around 17 per cent after the outbreak of the subprime crisis (2007-2009), just 1 percentage point down from the 2006 value (due, in particular, to retained collateralized securities and the issuance of government-guaranteed bonds); afterwards it decreased to 16 per cent in 2010 and 14 per cent in 2011 most likely due to the negative spillover of the sovereign debt crisis;
- while the item “Equity & reserves” was almost constant over the whole period, the weight of “Other liabilities” significantly declined.

Keeping the broad picture in mind it is also worth signalling some cross-country and size differences.⁵ In particular, in the euro area the share of long-term funding was relatively stable in the first half of the sample period, but after a peak in 2006 at 22.5 per cent it started declining, reaching 16.4 per cent in 2011.⁶ In the UK the banks’ recourse to long-term funding recorded a four-fold increase to 20 per cent from 1997 to 2006, after which it began to decline (to 12 per cent in 2011). Instead, in the US the long-term share rose steadily over

⁴ Data on derivatives must be interpreted with caution: before 2004, when the IFRS accounting standards were implemented, banks from the euro area and the UK were not obliged to report their (gross) position in derivatives; in addition, reporting standards in the US require domestic banks to report net instead of gross positions for each derivative contract.

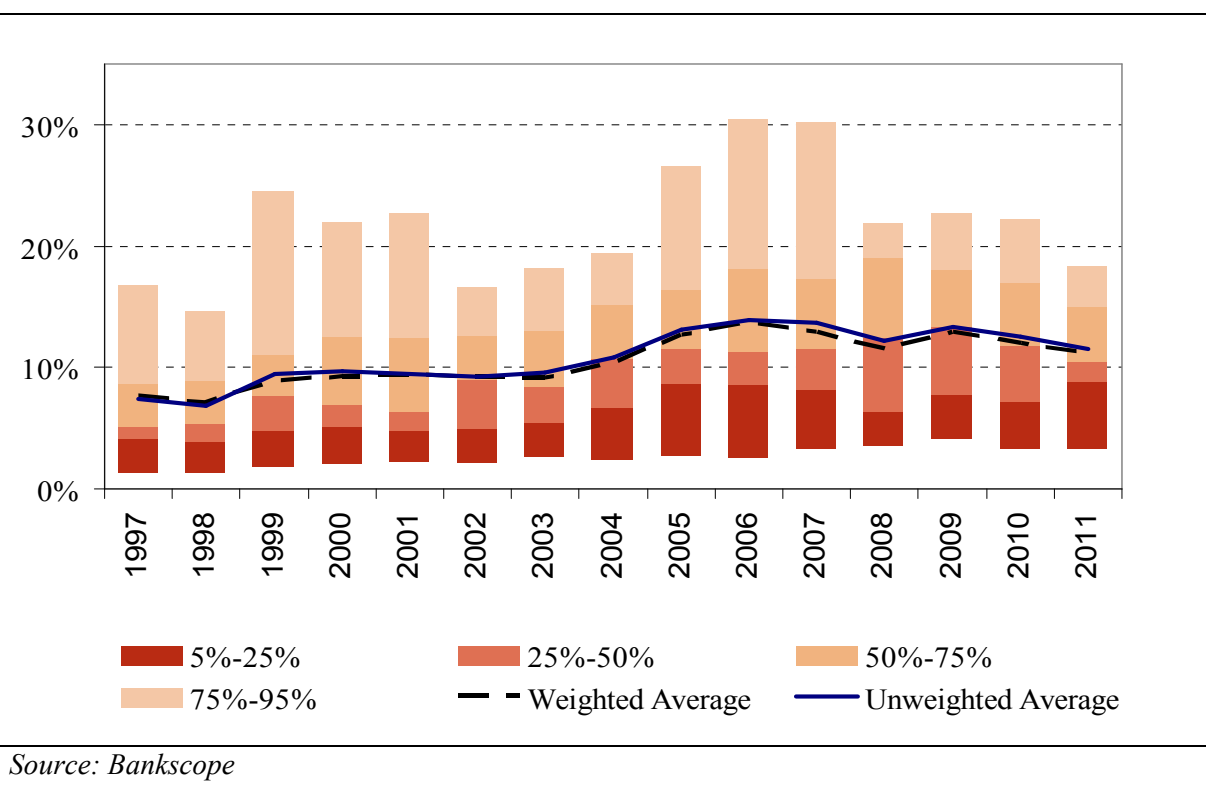
⁵ See Figures A1-A5 in Appendix I.

⁶ By relying on their own dataset, ECB (2012) provides similar results for the euro-area’s long-term funding dynamics, even though the annual averages are estimated at a somewhat lower level.

the whole time period from 6 per cent in 1997 to 15 per cent in 2010, however provisional data show a drop to 12 per cent in 2011.⁷

Small banks (first quartile of total assets) finance themselves largely with customer deposits, do not use the inter-bank market much, make almost no recourse to derivative instruments, marginally tap the long-term bond market and have a relatively larger share of equity (Figure A4). On the contrary the funding of larger banks (fourth quartile) exhibits a much broader spectrum of financial instruments, with recourse to customer deposits being around half that of small banks (35 per cent versus 63 per cent on average; Figure A5). In addition, by looking at the long-term funding share by country (Figure A6), it emerges that small euro-area banks rely much more on long-term securities than their US and UK counterparts, while this is not so for the largest banks (Figure A7). This is most likely due to the significant recourse to retail security selling in several euro-area countries.

Figure 2. G-SIFIs long-term funding (percentages)



⁷ The large share of “other liabilities” in the balance sheet of the US banking system is mainly due to debt expiring within 1 year, commercial paper and other short-term debt.

As regards the G-SIFIs, the aggregate balance sheet (Figure A8) reveals an earlier and greater recourse to derivatives than the whole sample (and even than the fourth quartile) reflecting the fact that they are financial institutions of a more sophisticated nature.⁸

In contrast, the share of long-term funding exhibits a relatively similar pattern to that of the whole sample even though at a lower level (Figure 2). Yet, the increase in the dispersion in the years immediately preceding the financial crisis – with the long-term share of some institutions being above 30 per cent – implies greatly different funding models. It is also worth signalling that, after the drop registered in the early phases of the subprime crisis, the recourse to long-term securities quickly rebounded in 2009 suggesting it was easier for them to tap the market. However, even G-SIFIs were significantly affected by the heightening of the sovereign debt crisis in several euro-area countries: the relative share of the long-term funding went back to levels registered well before the outbreak of the financial crisis and the overall dispersion considerably declined.

2.2 Long-term funding instruments

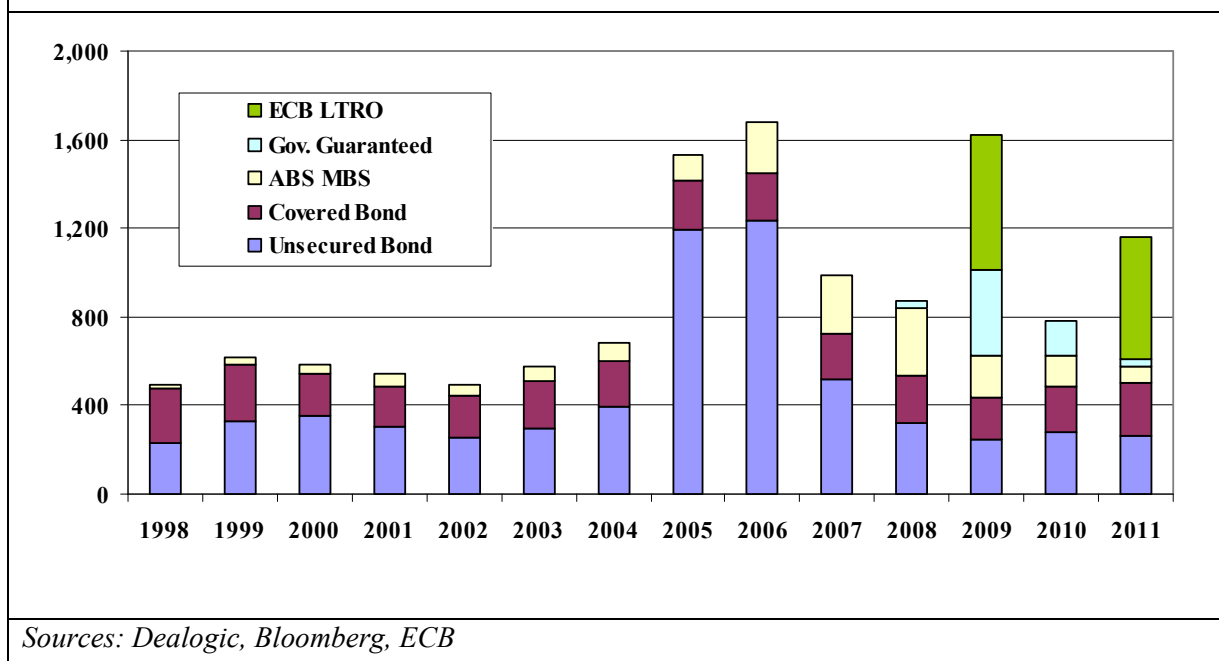
Given the growing importance of banks' long-term funding in the three economies under investigation and the evolution of long-term financial instruments during the unfolding of the crisis, we now analyse the bank choices regarding long-term funding by looking at the different debt securities. In fact, given the sudden change in risk assessment, the increase in interest rate spreads and the drying-up of several sources of funding following the Lehman Brothers demise (and the consequences of the sovereign debt crisis just a few years later) there was a significant recast of the share of financial instruments employed by banks in their funding decisions, especially at longer horizons. In addition, rescue plans by government, monetary authorities and supranational organizations, together with changes in market regulations, may also have steered bank decisions and amplified the substitution effect between different securities with the same maturity.

In order to analyse the choice of financial instruments issued by banks with a long-term horizon, we look at gross market issuance as reported by DCM Analytics by Dealogic

⁸ The breaking down of the balance sheet liability items for the G-SIFIs as in Figure 1 is made each year by aggregating the banks' complete reports only.

and Bloomberg. The DCM Analytics database reports with a very good coverage the (public) issuance of “plain vanilla” bonds, covered bonds, MBSs (mortgage-backed securities) and ABSs (asset-backed securities); instead, for retail issues, the coverage is not quite complete (some issues are made in some countries only, e.g. Italy). As for government guaranteed issuance of bank bonds with a duration of 12 or more months, we relied on Bloomberg which has a better coverage of this specific market instrument.⁹

Figure 3. Euro area long-term funding (billions of euros)



Looking at the main long-term instruments, in Figure 3 we can see that in the euro area the use of covered bonds was already extensive in the late 1990s (in 1998 they accounted for exactly 50 per cent of total long-term issuance, see also Figure A9). The relative share however declined significantly till 2006, but increased again during the crisis years. Developments in 2009 and 2010 were strongly affected by the ECB Covered Bond Purchase Programme (CBPP), implemented from the second half of 2009, under which the Eurosystem purchased eligible covered bonds up to a nominal value of 60 billion euros. In fact, since mid-2008 the covered bond market began to dry up; the programme was aimed at

⁹ Note that for the euro area we considered as long-term funding also 5 special LTROs offered by the ECB: 4 with 12-month maturity (3 in 2009 and 1 in 2011), and 1 in 2011 with 3-year maturity.

improving funding conditions for financial institutions as well as maintaining secondary market liquidity for this specific financial market segment. The measure was also meant to improve the risk profile of institutions holding covered bonds and thus sustaining credit growth.¹⁰

In addition to the ECB programme in support of covered bonds, two other elements were indeed significant in sustaining the wholesale funding of European banks: the ad hoc long-term refinancing operations (LTRO) offered by the ECB with maturity up to three years and the introduction of government guarantees on senior bond issuance. As for the former, the ECB called for three 12-month auctions in 2009 for a total amount of over €600 billion and one 12-month and one 3-year auction in 2011 totalling €550 billion.¹¹

As for the government guarantees, the exacerbation of the financial crisis which followed the collapse of Lehman Brothers in October 2008 led the governments of many advanced economies to use unprecedented amounts of state aid to support the financial sector. Among the most valuable tools there were, in fact, explicit government guarantees against default on bank fixed income debt. The adoption of debt guarantee programmes was internationally coordinated and synchronized. Government guaranteed issuance quickly became a key source of bank funding, and a new segment of the fixed income market, of non-negligible size, was formed.¹² For European banks the issuance of guaranteed bonds accounted for 40 per cent of long-term funding in 2009 and around 20 per cent in 2010.¹³

All in all, in the euro area the issuance of instruments perceived to be less risky by investors – such as covered bonds and guaranteed bonds (in addition to the direct tapping of long-term liquidity from the ECB) - more than offset in the crisis years the sharp decline in

¹⁰ In November 2011, the Eurosystem launched a second Covered Bond Purchase Programme (CBPP2), with a view to easing funding conditions for credit institutions and enterprises and encouraging credit institutions to maintain and expand lending to their clients. Under the CBPP2, eligible covered bonds for a total nominal amount of €40 billion are to be purchased up until October 2012. Purchases are conducted in both the primary and the secondary markets.

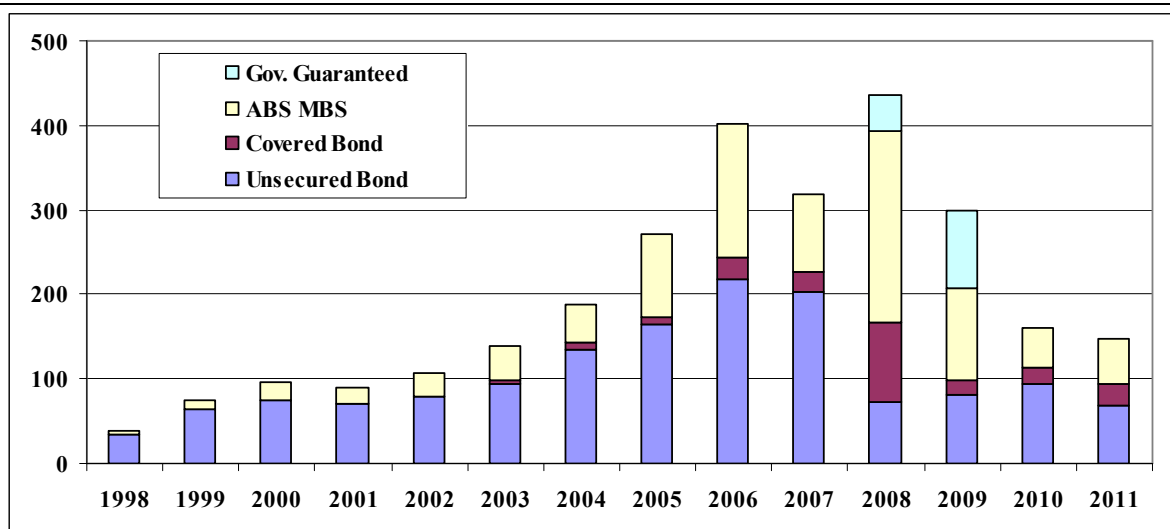
¹¹ An additional 3-year LTRO was implemented in February 2012 for an amount of €530 billion.

¹² See Panetta et al. (2009) and ECB (2010) for a description of the whole set of measures taken in support of the financial system and Levy and Zaghini (2011) and Grande et al. (2011) for an analysis of the government guarantees on bank bonds.

¹³ Another wave of government guaranteed bond issuance was recorded in 2011. However, most of the issuance was retained by the “own name” banks and offered as collateral for ECB financing operations.

asset-backed securities and in standard unsecured bonds in particular, which traditionally are the bedrock of bank funding.

Figure 4. UK long-term funding (billions of euros equivalent)

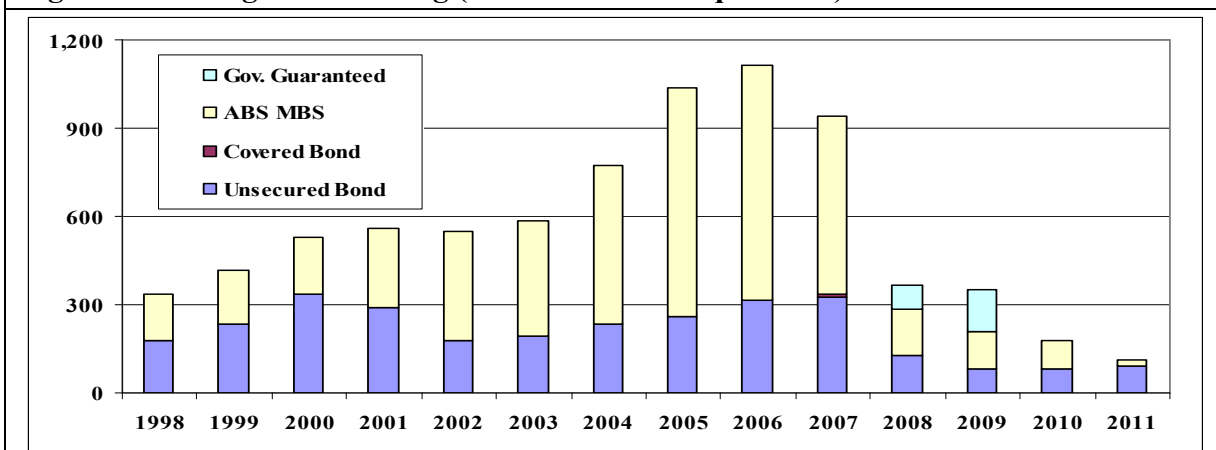


Sources: Dealogic, Bloomberg

In the UK, the early crisis years (2008 and 2009) are characterized by a different phenomenon, which was also the case in the euro area but to a lesser extent: retained securitization. In particular, as early as 2008 the Bank of England widened the list of collateral eligible for short-term funding including residential mortgage-backed securities and “own name” ABSs, namely the securitization of loans which banks have originated themselves. In addition, the Bank of England introduced two other measures: the Special Liquidity Scheme (SLS), enabling banks to swap MBSs and other securities for UK Treasury bills, and the Discount Window Facility (DWF), which allows participants to borrow gilts - for a fee - against a wider range of potentially less liquid collateral. Thus many banks found it worthwhile to devise some “own name” securitizations, retain them and use them as collateral for refinancing operations at the Bank of England.

This behaviour is clearly visible in Figure 4: after a slowdown in 2007, the issuance of ABSs and MBSs increased significantly in 2008 and was still sizable in 2009. In relative terms ABSs and MBSs accounted for 52 per cent of the total issuance in 2008, compared with an average of 30 per cent in the previous 5 years and with a still high share of 37 per cent in 2011 (see also Figure A10).

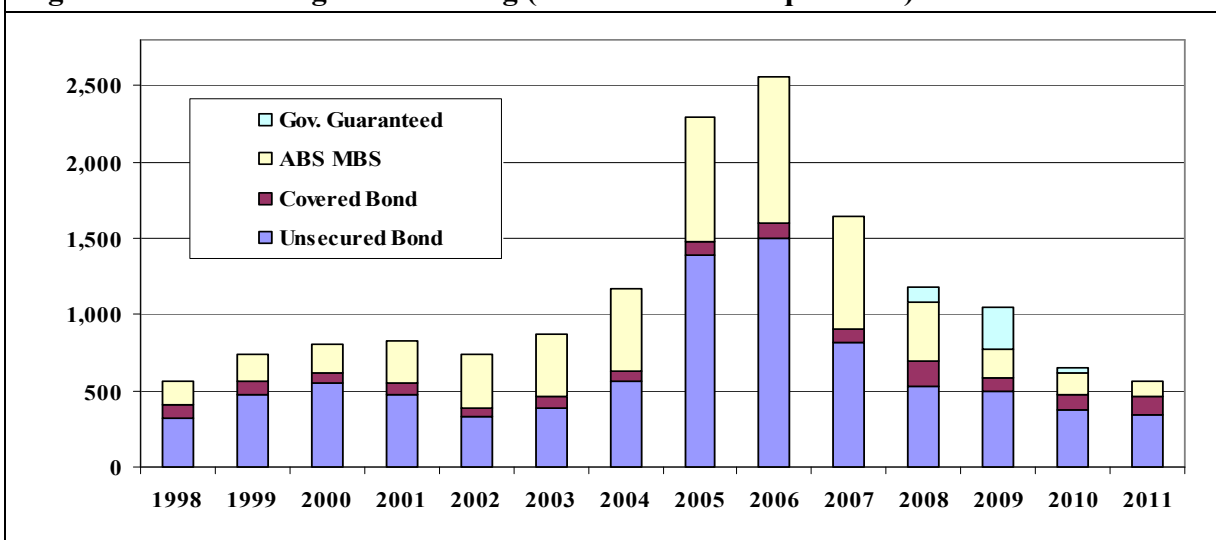
Figure 5. US long-term funding (billions of euros equivalent)



Sources: Dealogic, Bloomberg

In contrast, in the US the market of securitized assets has collapsed since the second half of 2007 following the subprime mortgage crisis (Figure 5). If we do not consider securitization activity stemming from the three main Federal agencies, the unprecedented market turbulence led to a drop in the issuance from an average of around €700 billion in the four years before the crisis to an average of €100 billion in the four following years. In addition, over the same period, the bond market contracted a lot due to significant deleveraging in banks' balance sheets. In 2008 and 2009 the government guaranteed bond issuance scheme supported the funding needs of banks, but this measure ended in 2010. In addition, the covered bond markets dried up after two years of tentative take-off in 2006 and 2007.

Figure 6. G-SIFIs long-term funding (billions of euros equivalent)



Sources: Dealogic, Bloomberg

Finally, Figure 6 shows that the size of G-SIFIs issuance is not far from that of the whole sample suggesting that much of the market is made by those few big institutions, especially for some market segments.

3. The cost of bond funding

3.1 The cost at issuance

In the previous section we overviewed the gross issuance of banks by instrument as a proxy of long-term funding needs; however, funding choices are also influenced by expiring debt and, in particular, the cost of issuance. Relying on a set of around 7,600 bonds, we now focus on the issuance cost for banks and we analyse changes over the crisis period. We start from the uneventful year of 2006 to compare the cost at launch of the different kinds of bonds that banks issued in the six-year period ending in 2011. Our dataset contains all long-term securities for which the cost at issuance is available. In particular, we refer to the spread of the bond yield at launch with respect to the asset swap contract (ASW) provided by Datastream.¹⁴

The number of securities issued over the sample period ranges from 662 in the UK to 5,687 in the euro area for a total of 7,618 (Table 2), with Germany and the US being the most important issuer (2,380 and 1,268 issues, respectively). For each of the six years of the time span we have a relatively large number of issues, with with less than one thousand observations in 2008 alone.

The cost at launch, as expected, shows an increasing trend for all countries. In 2006 the US average ASW spread was 11 basis points (bps), in the UK it was 5 bps and for the euro area the average was negative by around 10 bps, suggesting a healthy banking sector in the three major financial areas. One year later, the ASW spread increased significantly for the whole sample to 21 bps from -4 bps in the previous year, and in 2008, notwithstanding the start of the government guarantee programmes on banks' new debt issuance, the cost

¹⁴ By merging information from three databases (Dealogic, Datastream and Bloomberg) we were able to produce a consistent dataset of around 7,600 items. Detailed information about the selection procedure is provided in Appendix II.

skyrocketed to just under 80 bps, a level which was maintained in the two following years. In 2011, when the sovereign debt crisis triggered a new round of financial turbulence, the cost of bond issuance reached a new maximum of 116 bps. Within the euro area there is substantial heterogeneity with only three countries never breaching the 100 bps threshold over the sample period (France, Germany and the Netherlands) and the GIIPS countries (Greece, Ireland, Italy, Portugal and Spain) showing significantly higher issuing costs.

Table 2. ASW spread by country and type1

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Tot | Senior | Subordinated | Guaranteed |
|--------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|------------------|-----------------|-----------------|
| Austria | -19.08 (41) | -9.06 (32) | 7.39 (3) | 56.15 (19) | 40.13 (8) | 105.41 (15) | 16.26 (118) | 8.12 (93) | 48.60 (8) | 45.62 (17) |
| Belgium | -3.66 (44) | 16.35 (40) | 28.45 (46) | 52.62 (32) | 56.92 (45) | 77.62 (43) | 37.54 (250) | 36.40 (247) | 180.26 (2) | 33.80 (1) |
| Cyprus | 3.30 (2) | -31.80 (2) | | 250.36 (1) | | | 38.67 (5) | 34.94 (4) | 53.60 (1) | |
| Finland | 0.72 (7) | 43.10 (5) | 49.70 (3) | 110.30 (5) | 35.83 (7) | 85.84 (6) | 51.12 (33) | 47.05 (31) | 114.20 (2) | |
| France | -10.12 (128) | 3.17 (134) | 61.96 (98) | 69.85 (154) | 43.44 (228) | 83.92 (232) | 46.54 (974) | 42.94 (883) | 216.42 (35) | -2.90 (56) |
| Germany | 11.40 (234) | 4.42 (182) | 40.15 (108) | 51.65 (653) | 42.96 (634) | 52.03 (569) | 41.33 (2380) | 39.28 (2337) | 209.64 (29) | 35.02 (14) |
| Greece | -21.41 (19) | 42.22 (17) | 184.64 (8) | 234.75 (15) | 94.75 (3) | 425.21 (4) | 110.52 (66) | 111.03 (63) | 32.92 (2) | 233.70 (1) |
| Ireland | -32.54 (29) | -9.88 (26) | 68.56 (7) | 282.00 (15) | 283.36 (29) | | 110.63 (106) | 13.95 (58) | 385.87 (14) | 162.23 (34) |
| Italy | -32.34 (93) | 16.50 (60) | 89.71 (24) | 101.93 (39) | 110.09 (67) | 178.86 (129) | 83.88 (412) | 77.06 (364) | 135.62 (48) | |
| Netherlands | -16.15 (56) | 13.36 (55) | 39.10 (32) | 92.44 (125) | 54.52 (157) | 81.32 (137) | 57.54 (562) | 50.83 (510) | 244.04 (22) | 34.76 (30) |
| Portugal | -43.24 (18) | -16.25 (9) | 61.22 (10) | 125.15 (17) | 133.64 (7) | 925.07 (7) | 135.68 (68) | 107.81 (58) | 434.56 (6) | 91.45 (4) |
| Spain | -16.93 (150) | 0.16 (111) | 89.08 (52) | 85.94 (111) | 142.34 (117) | 237.87 (172) | 97.08 (713) | 97.96 (576) | 113.01 (45) | 83.77 (92) |
| GIIPS | -24.84 (309) | 5.93 (223) | 92.62 (101) | 118.75 (197) | 150.08 (223) | 231.29 (312) | 96.72 (1365) | 88.05 (1119) | 171.05 (115) | 105.51 (131) |
| Euro Area | -9.91 (821) | 5.84 (673) | 57.53 (391) | 69.97 (1186) | 63.21 (1302) | 104.88 (1314) | 56.51 (5687) | 50.83 (5224) | 186.24 (214) | 64.27 (249) |
| UK | 4.76 (136) | 25.58 (83) | 107.10 (65) | 83.01 (139) | 122.09 (122) | 108.39 (117) | 73.79 (662) | 76.18 (488) | 119.18 (89) | 12.54 (85) |
| US | 10.78 (219) | 46.87 (365) | 119.50 (159) | 108.48 (169) | 190.17 (150) | 189.16 (206) | 98.03 (1268) | 112.63 (1036) | 82.34 (87) | 3.07 (145) |
| Total sample | -4.36 (1176) | 20.65 (1122) | 78.79 (615) | 75.54 (1494) | 79.87 (1574) | 115.74 (1637) | 64.92 (7618) | 62.15 (6748) | 147.38 (391) | 36.56 (479) |

(1) ASW spread in basis points, number of issues in parentheses

The cost of issuance is however influenced by the type of bond placed in the market (last three columns of Table 2). Note, for instance, that Italy did not issue any government

guaranteed bonds¹⁵ which were by far the cheapest kind of issuance during the crisis, while France devised an ad hoc institution (SFEF - *Société de Financement de l'Economie Française*) to manage all French guaranteed issues; many Spanish saving banks (the usually small Cajas) enjoyed a public guarantee as well. Also US and UK banks were very active in the guaranteed issuance. Instead, the much more costly subordinated debt was mainly issued in the pre-crisis years.¹⁶

Table 3. Bond issuance by bank rating (averages)¹

| Bank Rating | ASW | Face value | Duration | Total |
|--------------------|------------|-------------------|-----------------|--------------|
| AAA | 37.03 | 515 | 2298 | 2965 |
| AA+ | 28.12 | 666 | 1950 | 317 |
| AA | 51.03 | 605 | 2330 | 720 |
| AA- | 65.25 | 496 | 2305 | 1106 |
| A+ | 89.03 | 298 | 2390 | 1100 |
| A | 115.0 | 360 | 2169 | 546 |
| A- | 88.12 | 166 | 1675 | 468 |
| BBB+ | 163.1 | 267 | 2261 | 119 |
| BBB | 208.2 | 512 | 4079 | 56 |
| BBB- | 187.4 | 352 | 1720 | 35 |
| BB+ | 156.0 | 57 | 4087 | 4 |
| BB | 395.3 | 235 | 2718 | 11 |
| BB- | 412.4 | 467 | 1572 | 7 |
| B+ | 324.0 | 77 | 1620 | 5 |
| B | 403.0 | 155 | 1107 | 3 |
| CCC+ | 312.2 | 109 | 2062 | 3 |
| CCC | 233.7 | 2207 | 1096 | 1 |
| NR | 101.8 | 304 | 2270 | 152 |
| Total | 64.92 | 453 | 2262 | 7618 |

(1) ASW spread in basis points, face value in millions, duration in days

Another important source of price differentiation is of course the issuer rating. Table 3 displays the average cost at launch together with the rating of the bank, the average duration of the issue and the average face value of the bond. The banks which were able to tap the

¹⁵ Actually, Italian banks did not issue any government guaranteed bonds during the first wave of government support measures (2009-2010). However, in December 2011, during the second wave of publicly guaranteed schemes, there were a few retained guaranteed issuances with maturity up to six months.

¹⁶ The exact distribution by type of banks' debt issuance of our sample and the associated cost at launch is shown in Table A3.

bond market more deeply were the top-rated ones: just under 3,000 bonds were placed by AAA-rated institutions, around 40 per cent of the total issuance. In addition, those banks were also able to issue at a longer duration (an average of 6.4 years) and at a relatively large face value (an average of €500 million). Similar behaviour can also be observed for banks showing the three AA rating classes: altogether they issued over 2,000 bonds, with an average ASW spread of 55 bps and size and duration equivalent to AAA-rated institutions.

The ability to tap the market is still good for A-rated banks, while the cost at issuance increases significantly from the BBB classes (usually “speculative grade”)¹⁷ for which the ASW spread reaches penalizing values and the number of bonds issued decreases considerably. Low-rated banks were able to issue during the crisis only under the government guarantee scheme. As noted by Levy and Zaghini (2011), the market of government guaranteed bank bonds priced the issuances mainly based on the creditworthiness of the guarantor, thus inducing an unusual tiering of ASW spreads linked to the residence country of the issuer.

3.2 An empirical investigation

In order to empirically assess the cost of bonds at issuance we propose a cross-country regression of the ASW spread paid at launch by banks over the 6 years from 2006 to 2011. From the complete set of 7,618 bonds for which the ASW spread is available, our initial analysis is restricted to the 6,392 issues for which we have the complete list of exogenous variables. They are issued by 651 banks in 14 countries.

In theory, the value of the premium paid on bonds could reflect several factors. First, the characteristics of the issuer, such as size and rating, it could also reflect the characteristics of the bonds, such as issue volume and maturity, it could also indicate the market characteristics and the soundness of the sovereign. Our empirical investigation tries to disentangle the contribution of each group of variables. Note that even though the aim is the same as in Levy and Zaghini (2011) and Grande et al. (2011), our empirical approach differs in two important aspects: first, we rely on the whole sample instead of looking at

¹⁷ Rating agencies are slightly different in the ranking of high-yield (or speculative grade) classes. For instance, while BBB- is already labelled high-yield for Standard & Poor’s, the equivalent Moody’s class Baa3 is still in the investment grade group.

specific sub-samples; secondly, whenever possible we use quantitative variables instead of a decomposition into a complete set of dummy variables.

By looking at the bank characteristics we found, as expected, that the rating of the institution has a negative influence on the ASW spread: the better the rating, the lower the issuance cost (Table 4, first column). However, the size of the bank (as measured by total assets or employees) turned out not to be statistically significant at the usual confidence levels.¹⁸ As for the issue features, the duration of the bond is positively related to the cost, while the bond rating negatively affects the ASW spread at launch. Another bond characteristic which was statistically significant is the denomination in euros of the issue, which pays a spread around 40 bps less than other currencies. The volume of the issue was never significantly different from zero. Finally, given the nationality of the issuer we introduced a dummy variable to assess the impact of the sovereign rating, the idea being that – even not considering any official public guarantee schemes – sovereign of strong creditworthiness provides an implicit guarantee for the banking system of the country (Schich and Levy, 2010). The variable turned out to be highly significant: bonds issued by banks from non-AAA states paid 80 bps more than banks with AAA-rated sovereigns.

We then add two further dummy variables in order to consider: first, the exceptional characteristics of the government guaranteed issues; secondly, the turbulence that spilled over to the corporate bond market from the sovereign one starting from mid-2010. As for the former, the support of the public scheme can be measured in an average reduction in the cost of issuance of around 33 bps, while the increase in the ASW spread at launch due to the sovereign debt crisis is assessed as 40 bps (Table 4, second column). However, these two coefficients do not consider the effect (negative or positive) of the creditworthiness of the sovereign in those particular time periods. We thus look at the interaction between the last two dummy variables and the sovereign rating variable. Column 3 of Table 4 shows that indeed there are significant differences between AAA countries and the others.

¹⁸ In the first set of regressions we did not consider the banks' CDS since only 225 out of 651 institutions could show one. The estimates displayed in Table 4 are those from the regressions including only the variables which turned out to be statistically significant.

Table 4. OLS regressions¹

| Dependent variable: ASW Spread at launch | | | |
|---|--------------------|--------------------|--------------------|
| Constant | 260.427 *** | 247.609 *** | 254.41 *** |
| | 19.254 | 18.955 | 16.838 |
| Duration | 0.013 *** | 0.011 *** | 0.011 *** |
| | 0.001 | 0.001 | 0.001 |
| Bond Rating | -4.496 *** | -5.949 *** | -5.658 *** |
| | 0.680 | 0.599 | 0.567 |
| Bank Rating | -8.267 *** | -6.226 *** | -6.591 *** |
| | 0.854 | 0.990 | 0.899 |
| Weak Sovereign Rating | 79.925 *** | 75.235 *** | 28.291 *** |
| | 6.193 | 5.604 | 5.572 |
| Issuance in euros | -39.554 *** | -45.417 *** | -44.225 *** |
| | 3.180 | 3.356 | 3.279 |
| Government Guarantee | | -33.127 *** | -43.343 *** |
| | | 9.098 | 6.999 |
| Sovereign Debt Crisis | | 39.678 *** | 14.265 *** |
| | | 4.545 | 3.741 |
| SovRat*GovGuarant | | | 77.751 ** |
| | | | 35.649 |
| SovRat*DebtCrisis | | | 123.05 *** |
| | | | 11.316 |
| R-squared | 0.199 | 0.227 | 0.263 |

(1) Included observations: 6392; Newey-West standard errors & covariances; Symbols ** and *** denotes statistical significance at 1% and 5%, respectively.

If we sum up the coefficients of the relevant dummies it turns out that, all other things being equal, not having a backing of an AAA sovereign amounted to an increase of the ASW spread at launch of more than 100 bps for the guaranteed issuances. This result confirms the finding in Levy and Zaghini (2011) and in Grande et al. (2011) that in the market for guaranteed bank debt the security pricing strongly reflects the characteristics of the guarantor whereas bank-specific and issue-specific factors play only a minor role. According to this literature, government guarantees were successful in achieving their main purpose, namely enabling banks to tap bond markets and roll over their maturing debt, by favouring not only guaranteed but also non-guaranteed issuance. However, the guaranteed debt market did not behave like the “traditional” corporate bond market because of the distortions introduced by public guarantees. On the one hand, the different creditworthiness of

guarantors ended up in a significant tiering of the issuance spreads paid by banks from different countries. Banks with the same rating but different nationalities were subject to markedly different costs. In some cases, banks with better ratings paid much larger spreads than lower-rated counterparts. Such risk pricing is inconsistent – at least on theoretical grounds – with a “level playing field” and implies the inefficient allocation of resources, in that weak banks in countries with (perceived) sound public finances can attract more funds than sounder and more deserving banks in (perceived) weak countries. On the other hand, this support measure favoured the banking system as a whole by signalling that an “implicit guarantee” was being provided by governments to a large set of banks, especially the larger ones, the guarantee being stronger the better the sovereign rating.

From the regression coefficients we can also compute the value of a sound state in the period of turbulence in the sovereign debt market. In fact, during the last sovereign crisis the backing of a lower than AAA-rated sovereign turned out to amount, all other things being equal, to an increase of 150bps in the ASW spread paid at launch by banks. There are several possible channels of interaction between bank funding conditions and sovereign creditworthiness, going in both directions. A distressed banking system at home can negatively affect the strength of the sovereign through two main channels: i) it drains public resources (through support measures and outright bank bailouts) and ii) it jeopardizes economic growth and amplifies shocks to the economy. Reinhart and Rogoff (2010) provide evidence of a significant increase in countries’ public debt-to-GDP ratios after banking crises, due to both the direct costs of rescuing financial institutions, and the higher deficits owing to the subsequent slower economic growth.¹⁹

On the contrary, an increase in perceived sovereign risk adversely affect the funding conditions of banks through several channels, owing to the pervasive role of public debt in the financial system. First, losses on holdings of government bonds weaken banks’ balance sheets, increasing their risk and making funding more difficult and more costly to obtain. Secondly, lower sovereign creditworthiness reduces the value of the collateral that banks can use to raise wholesale funding and central bank liquidity. Third, sovereign downgrades

¹⁹ See also Mody (2009), Gerlach et al. (2010) and Ejsing and Lemke (2011), for studies of the transmission channels from banks to sovereigns.

usually spill over to the banking system with subsequent downgrades of several domestic banks, increasing their wholesale funding costs, and potentially impairing their market access. Fourth, a weakening of the sovereign reduces the funding benefits that banks derive from implicit and explicit government guarantees.²⁰ In addition, sovereign tensions in one economy may spill over to foreign countries' banking systems, either through banks' direct exposures to the distressed sovereign, or indirectly, as a result of cross-border inter-bank exposures or possible contagion across sovereign debt markets.

In order to have a more detailed picture of banks' cost at issuance, we now restrict the sample to the banks for which a CDS is priced by the financial market - usually larger institutions which are more active on the financial market. The number of available bonds falls to 1,860 issues by 225 banks. Even though the sample reduction is sizable, we introduce an important quantitative variable into our empirical investigation, describing the market perception of the soundness and creditworthiness of each institution.

The first column of Table 5 shows that the CDS is highly significant and with the expected sign: a deterioration of the perceived soundness of the bank (an increase in the CDS) leads to an increase of the cost of funding.²¹ By looking at the financial crisis we see that also for these institutions the cost of debt issuance was cheaper when accompanied by the public guarantee and more costly during the sovereign debt crisis (second column). However, when disentangling the role of the sovereign guarantor during the crisis (third column) two circumstances stand out. First, the fact that a lower rated government is backing the debt issuance does not bring an additional effect on the cost of guaranteed bank bonds.²² Second, the sovereign debt crisis seems to affect only the banks operating in the lower-rated countries and thus those more exposed to the crisis.

²⁰ For a thorough analysis of the different channels through which sovereign risk affects bank funding see CGFS (2011).

²¹ Even though the explicatory power of the variable is limited, it can be estimated that having a CDS higher than 100 bp leads to an increase in the ASW spread of around 40 bp.

²² Note that the dummy signalling a non AAA sovereign is still significantly positive hinting that the implicit guarantee offered by a strong government is still priced in the bond cost.

Table 5. OLS regressions¹

| Dependent variable: ASW Spread at launch | | | |
|---|--------------------|--------------------|--------------------|
| Constant | 267.179 *** | 307.416 *** | 330.749 *** |
| | 30.385 | 31.660 | 34.206 |
| Duration | 0.016 *** | 0.013 *** | 0.014 *** |
| | 0.002 | 0.002 | 0.002 |
| Bond Rating | -4.798 *** | -9.764 *** | -10.434 *** |
| | 1.406 | 1.602 | 1.584 |
| Bank Rating | -9.623 *** | -6.976 *** | -7.612 *** |
| | 1.303 | 1.211 | 1.266 |
| Weak Sovereign Rating | 76.940 *** | 75.223 *** | 44.213 *** |
| | 7.071 | 6.536 | 7.871 |
| Issuance in euros | -21.778 *** | -32.310 *** | -32.334 *** |
| | 5.354 | 5.642 | 5.698 |
| Bank CDS | 0.050 *** | 0.036 *** | 0.048 *** |
| | 0.013 | 0.014 | 0.014 |
| Government Guarantee | | -56.680 *** | -56.009 *** |
| | | 10.445 | 10.774 |
| Debt crisis | | 29.265 *** | -2.234 |
| | | 7.129 | 7.151 |
| SovRat*GovGuarant | | | -2.666 |
| | | | 22.825 |
| SovRat*DebtCrisis | | | 91.013 *** |
| | | | 14.927 |
| R-squared | 0.228 | 0.258 | 0.284 |

(1) Included observations: 1860; Newey-West standard errors & covariances; Symbols ** and *** denotes statistical significance at 1% and 5%, respectively.

These findings suggest that the market is attaching more importance to the characteristics of the bank (part of the risk being caught by the CDS). In fact, if we compute the difference between the guaranteed issuance by banks in lower rated country and AAA-rated country the spread is, ceteris paribus, only 44 bp (the “usual” implicit guarantee). On the other hand, the weakness of the sovereign significantly spills over to the home banking system during the sovereign debt crisis, the difference between higher and lower rated countries amounting to 135 bp.

4. Conclusion

The paper provides a broad overview of trends in long-term funding for banks in the euro area, the US and the UK, as well as for those banks classified by the Financial Stability Board as global systemically important financial institutions (G-SIFIs). We first describe the evolution over the last 15 years of the size of balance sheets and the dynamics of the different types of bank liabilities. Several factors contribute to the explanation of the significant and steady increase in the size of banks' balance sheets: moderation in the business cycle, a relatively accommodative monetary policy which led to a protracted period of low interest rates, and a significant increase in M&A activity, among others. However, the long period of financial turmoil, which started in the summer of 2007 following the US subprime mortgage crisis and continued with the sovereign debt crisis in several euro-area peripheral economies, has induced a deterioration in banks' funding conditions leading in some cases to the drying-up of funding sources, the impairment of market segments and significant substitution effects.

Developments in bank funding sources differ in the three areas under analysis. In the US the issuance of securitized assets has collapsed since the start of the subprime crisis in the summer of 2007, while government-guaranteed bank bonds boomed in 2009 and the covered bond market dried up after two years of tentative take-off. In the euro area the banking system has benefited not only from government guarantees but also from a large supply of medium- and long-term liquidity from the ECB, which in part replaced standard unsecured bond issuance. Finally, in the UK retained securitization characterized 2008 and 2009.

Starting from mid-2010, concerns about the sustainability of public finances in several euro-area countries led to a deterioration of their perceived sovereign creditworthiness. In parallel with the home country's worsening of funding conditions and the related sovereign downgrades by rating agencies, many banks suffered the same fate with increasing CDS spreads and downgrades by several notches. Wholesale funding became more difficult and costly: the asset swap spread at the launch of long-term instruments increased significantly in almost all countries especially for banks in the economies most hit by the crisis.

In order to disentangle the factors affecting the cost at issuance we carried out an empirical investigation based on around 6,400 bonds issued between January 2006 and

December 2011. We found that the backing of an AAA-rated sovereign borrower provides important implicit support to the home banking system, while weaker governments add a burden to the funding cost of banks. This effect was exacerbated in the most recent period of the sovereign debt crisis: we estimate that the absence of an AAA-rated government amounted, other things being equal, to an increase of 150bps in the ASW spread paid at launch by banks. In addition, in line with the recent literature on government guaranteed bank bonds, we observed that the security pricing of explicitly guaranteed debt reflects, to a large extent, the characteristics of the sovereign, while bank-specific features and issue-specific characteristics play only a minor role. However, by restricting the sample to banks having a CDS – usually larger institutions which are more active in the financial market – we found that bond pricing reflects more closely the soundness and creditworthiness of each institution, with the role of government somewhat reduced.

Our findings suggest that the linkages between sovereigns and home banking systems affect significantly banks' cost of funding. While the direction of those linkages can also go in the opposite direction (from banks to the sovereigns), we showed that in crisis periods the effects of a deterioration in (perceived) sovereign creditworthiness spill over to home banks. This in turn might trigger a vicious circle of increasing sovereign risk, a deterioration in banks' funding access and a weakening economic outlook. While rescue plans by governments and supranational authorities together with unconventional monetary policy measures have successfully supported bank funding during the crucial phases of the crisis, further interventions aimed at consolidating public finances, supporting economic growth and strengthening banks' capital buffers are still needed to regain investor trust, break the downward spiral and avoid cross-country contagion effects (IMF, 2012).

Appendix I

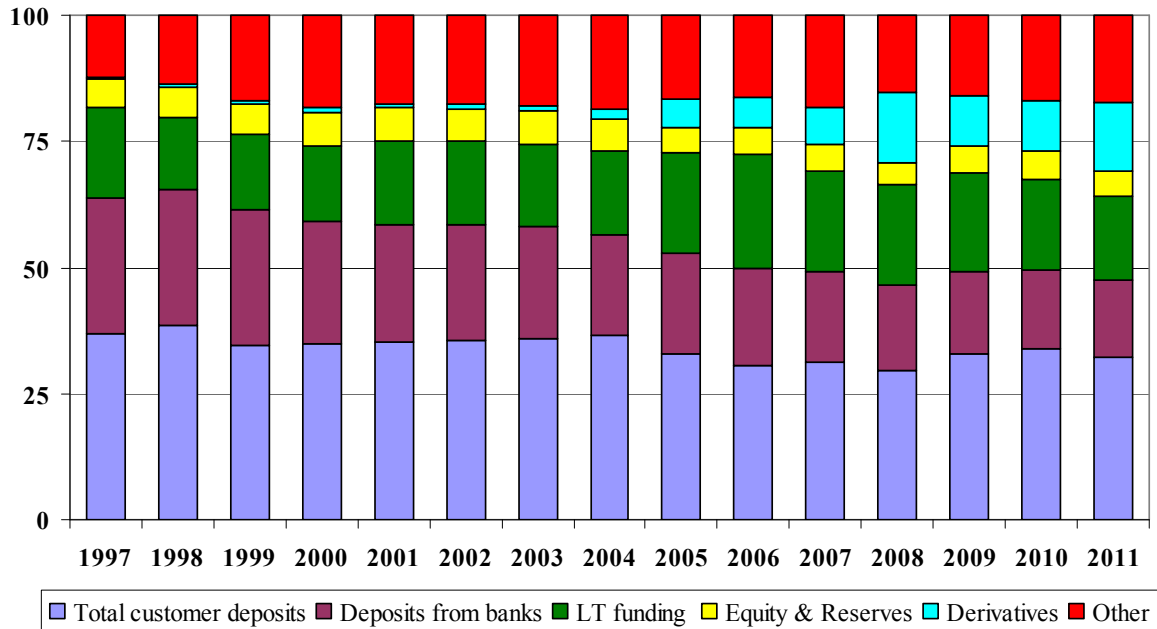
| Table A1. List of 2011 G-SIFIs | | | |
|--|----------------|------------------------------|--------------------------------|
| Bank Name | Country | Total Assets 2011 | First balance sheet |
| Bank of America Corporation | UNITED STATES | 1,645,540 | 1998 |
| Bank of China Limited | CHINA | 1,451,135 | 1997 |
| Bank of New York Mellon Corporation | UNITED STATES | 251,398 | 1997 |
| BPCE Group | FRANCE | 795,728 | 2005 |
| Barclays Bank Plc | UNITED KINGDOM | 1,868,202 | 1997 |
| BNP Paribas | FRANCE | 1,965,283 | 1997 |
| Citigroup Inc | UNITED STATES | 1,448,320 | 1999 |
| Commerzbank AG | GERMANY | 661,763 | 1997 |
| Credit Suisse Group AG | SWITZERLAND | 861,834 | 2002 |
| Deutsche Bank AG | GERMANY | 2,164,103 | 1997 |
| Dexia | BELGIUM | 412,759 | 1997 |
| Goldman Sachs Group, Inc | UNITED STATES | 713,561 | 1997 |
| Crédit Agricole Group | FRANCE | 1,879,536 | 2001 |
| HSBC Holdings Plc | UNITED KINGDOM | 1,975,207 | 1997 |
| ING Groep NV | NETHERLANDS | 1,279,228 | 1997 |
| JP Morgan Chase & Co. | UNITED STATES | 1,751,231 | 1997 |
| Mitsubishi UFJ FC | JAPAN | 1,678,412 | 1997 |
| Mizuho Financial Group | JAPAN | 1,330,564 | 2001 |
| Lloyds Banking Group Plc | UNITED KINGDOM | 1,181,058 | 1998 |
| Morgan Stanley | UNITED STATES | 579,596 | 1998 |
| Nordea Bank AB | SWEDEN | 716,204 | 1999 |
| Royal Bank of Scotland Group Plc | UNITED KINGDOM | 1,800,645 | 1997 |
| Banco Santander SA | SPAIN | 1,251,526 | 1997 |
| Société Générale | FRANCE | 1,181,372 | 1997 |
| State Street Corporation | UNITED STATES | 167,586 | 1997 |
| Sumitomo Mitsui Financial Group | JAPAN | 1,125,164 | 1998 |
| UBS AG | SWITZERLAND | 1,165,767 | 1997 |
| UniCredit SpA | ITALY | 926,769 | 1997 |
| Wells Fargo & Company | UNITED STATES | 1,015,488 | 1998 |

Source: FSB, Bankscope

Table A2. Bankscope balance sheet liability items

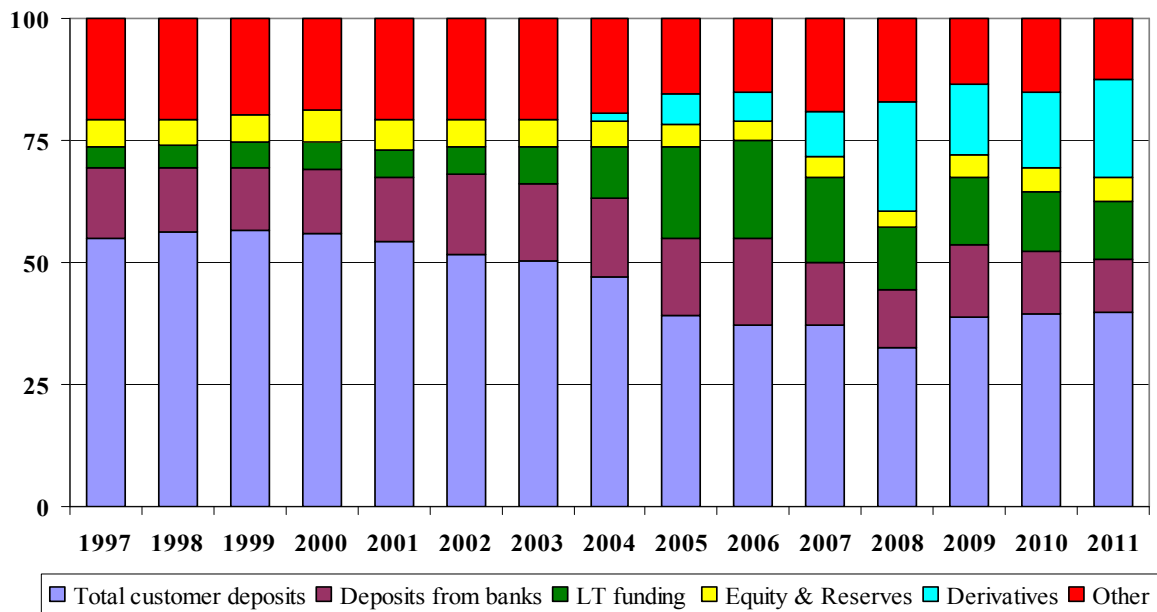
| |
|---|
| Bankscope's structure of liabilities |
| Deposits & short-term funding |
| <i>Total customer deposits</i> |
| <i>Deposits from banks</i> |
| <i>Other deposits and short-term borrowings</i> |
| Other interest bearing liabilities |
| <i>Derivatives</i> |
| <i>Trading liabilities</i> |
| <i>Long-term funding</i> |
| Other (non-interest bearing) |
| Loan loss reserves |
| Other reserves |
| Equity |
| Total liabilities & equity |

Figure A1. Euro area: balance sheet composition (percentages)



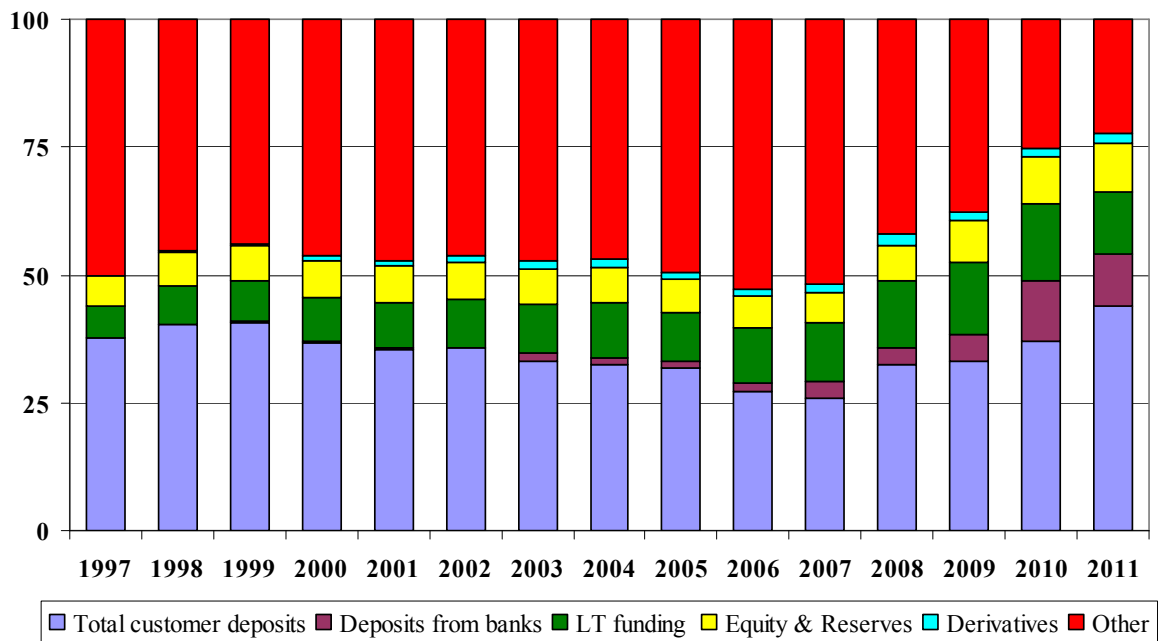
Source: Bankscope

Figure A2. UK: balance sheet composition (percentages)



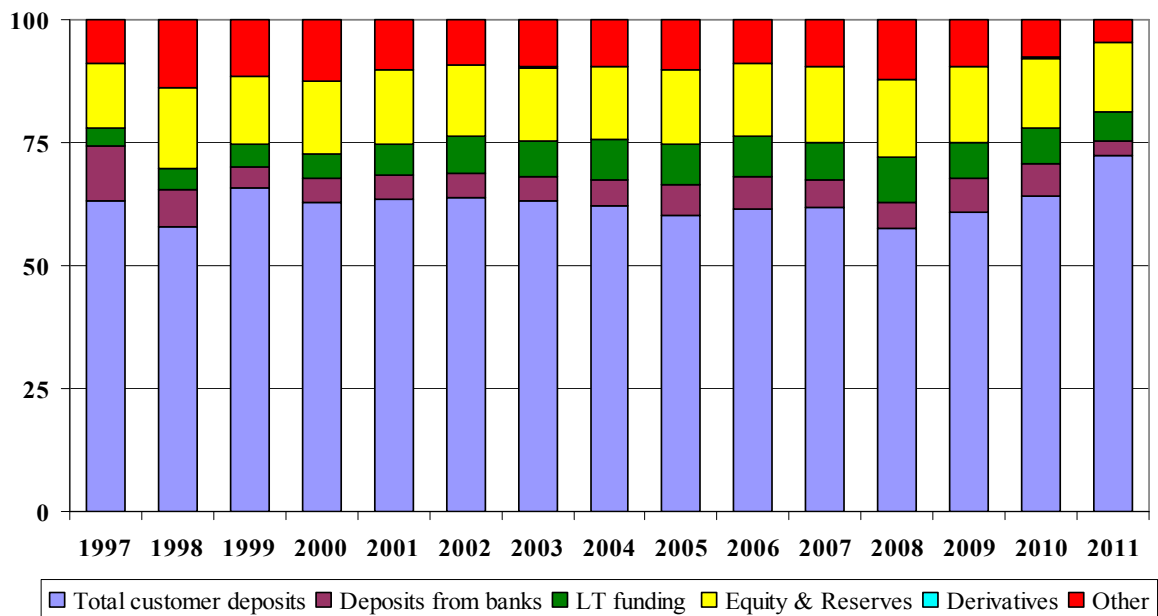
Source: Bankscope

Figure A3. US: balance sheet composition (percentages)



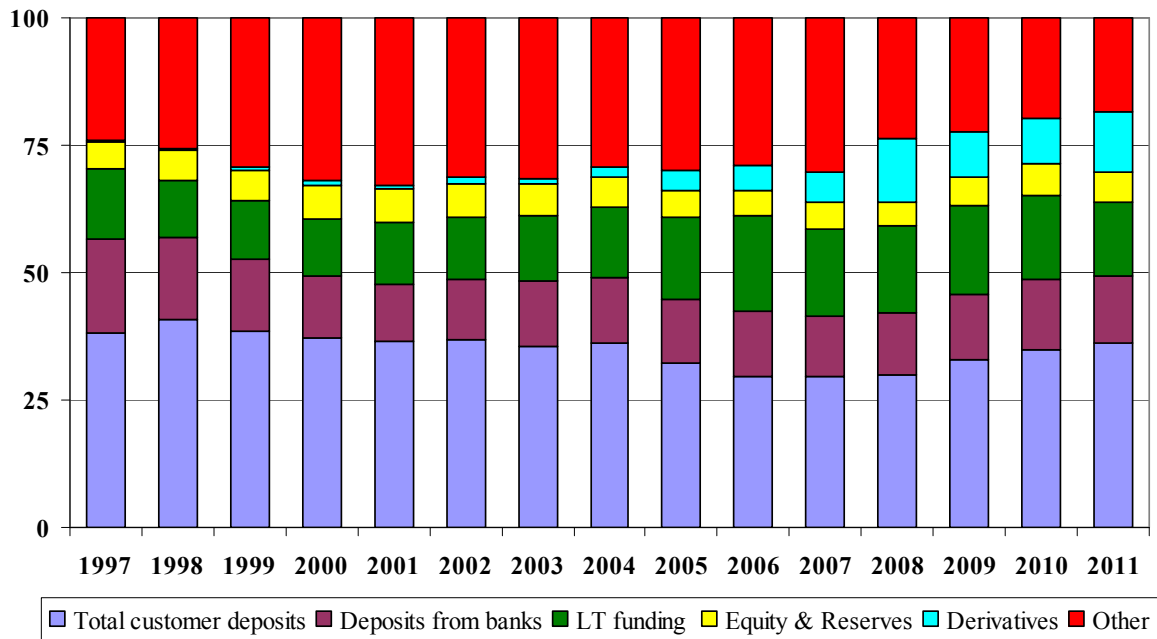
Source: Bankscope

Figure A4. First quartile: balance sheet composition (percentages)



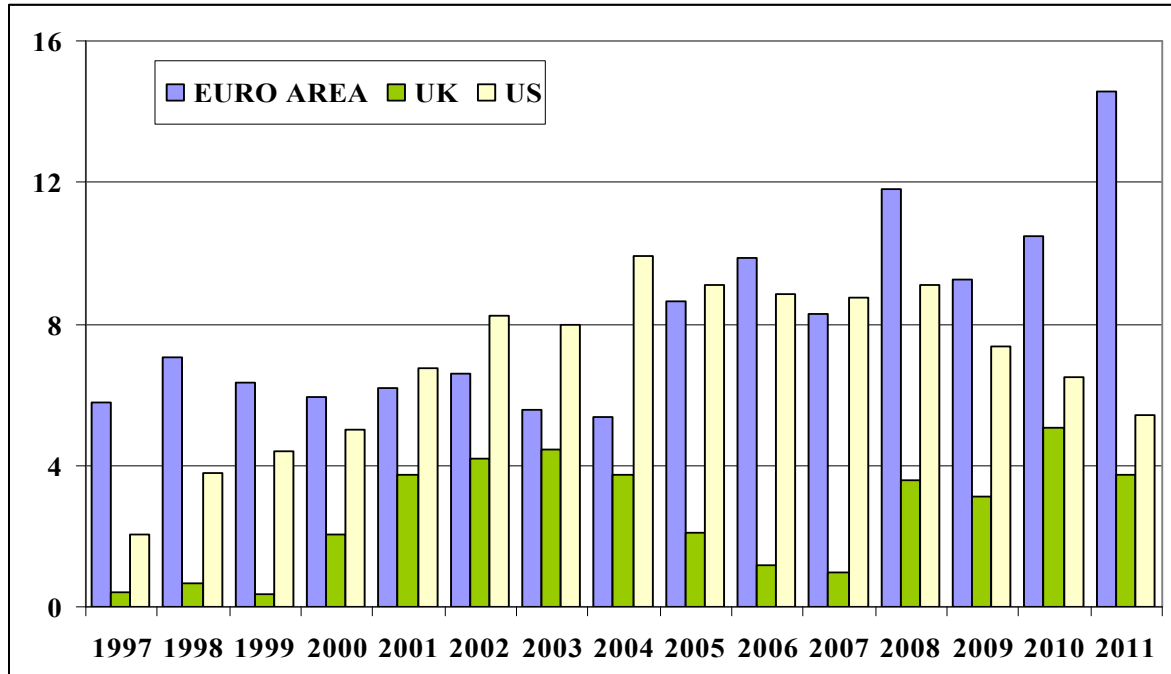
Source: Bankscope

Figure A5. Fourth quartile: balance sheet composition (percentages)



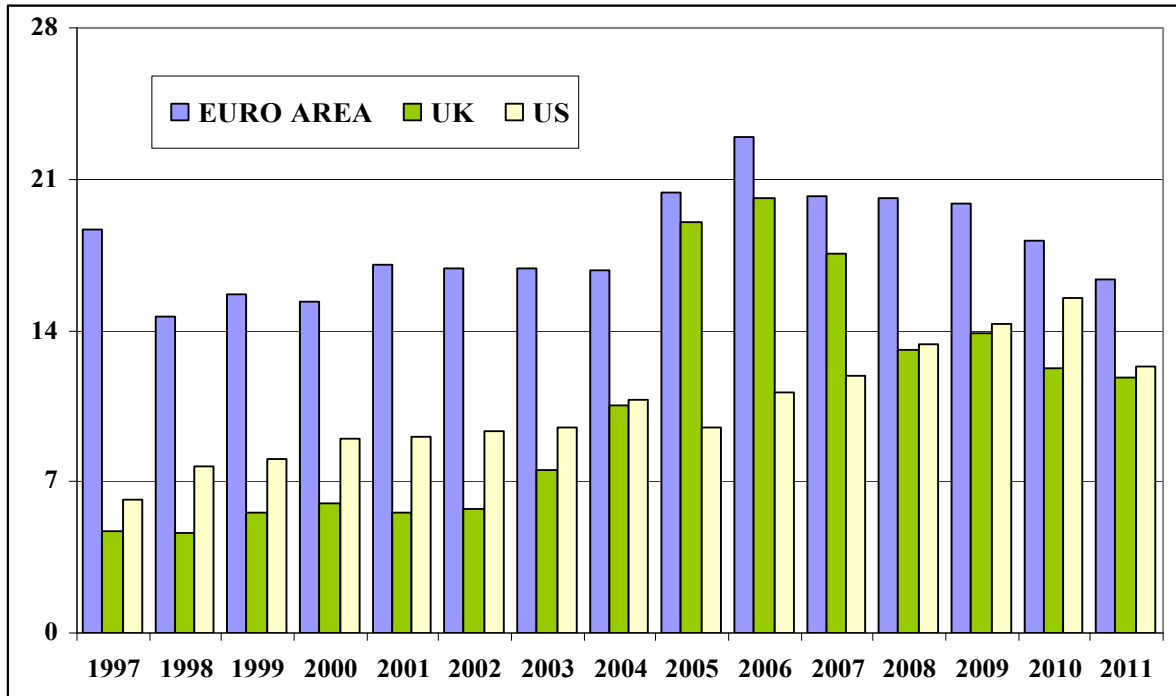
Source: Bankscope

Figure A6. First quartile: long-term funding share by area (percentage points)



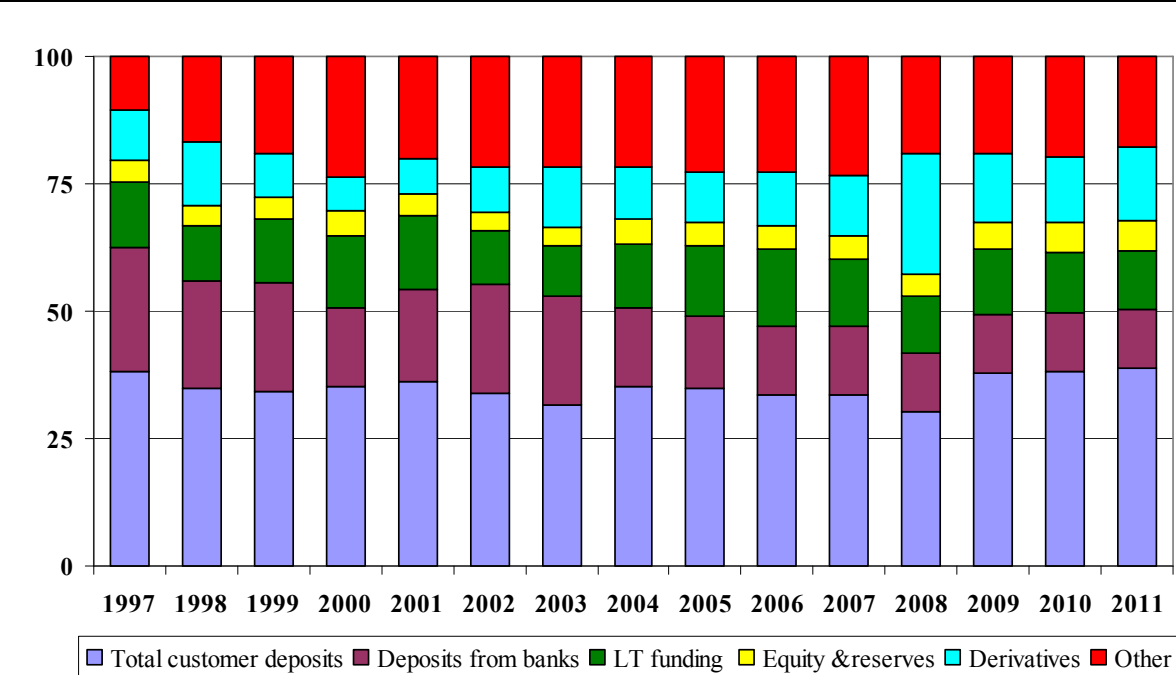
Source: Bankscope

Figure A7. Fourth quartile: long-term funding share by area (percentage points)



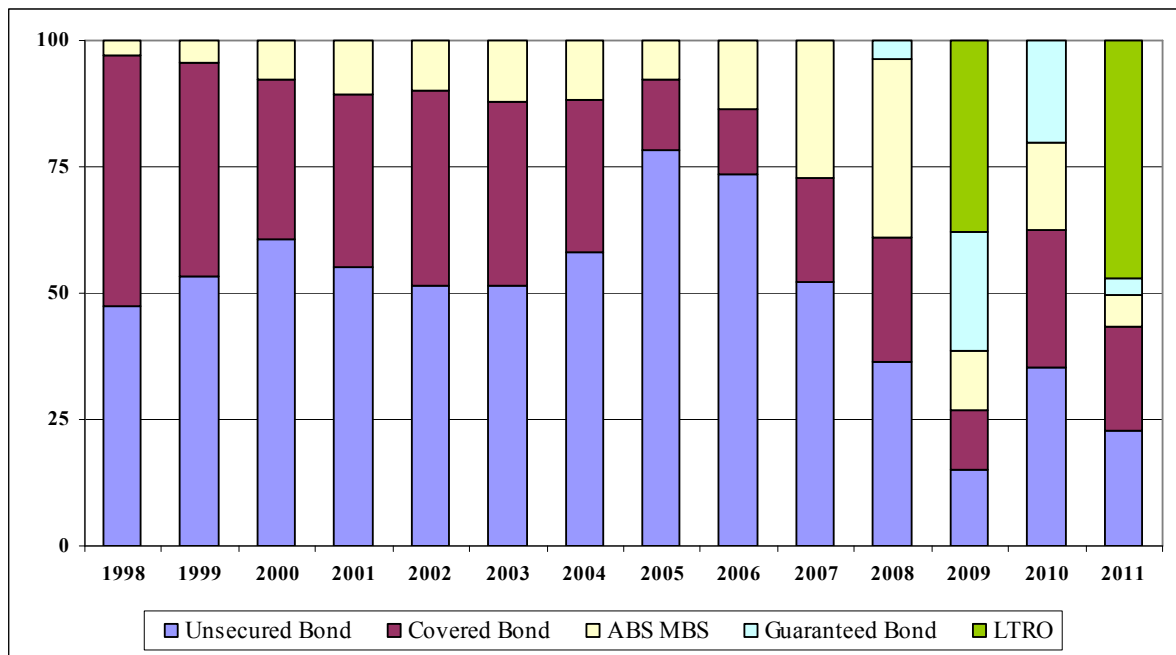
Source: Bankscope

Figure A8. G-SIFIs: balance sheet composition (percentages)



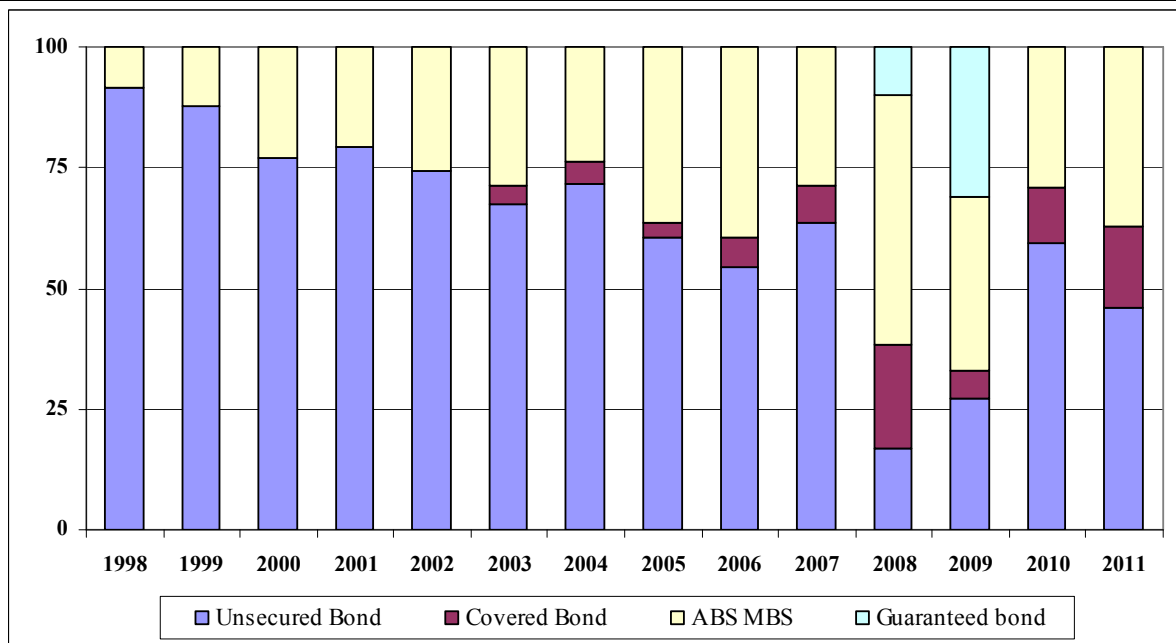
Source: Bankscope

Figure A9. Euro area: long-term financing composition (percentages)



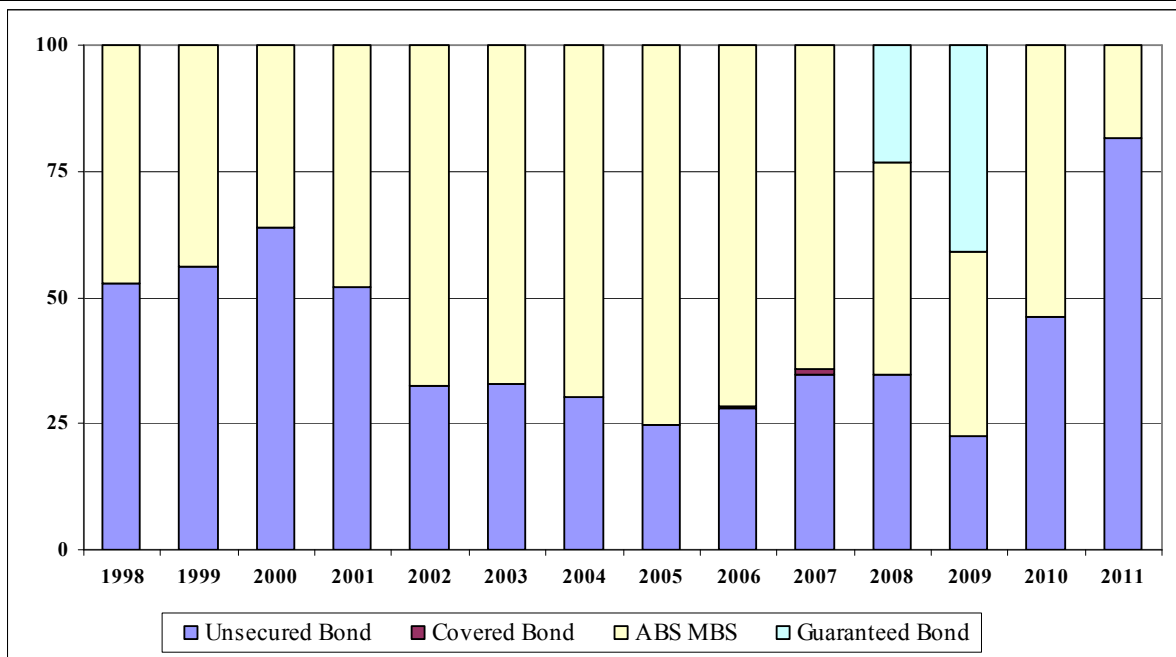
Source: Dealogic, Bloomberg, ECB

Figure A10. UK: long-term financing composition (percentages)



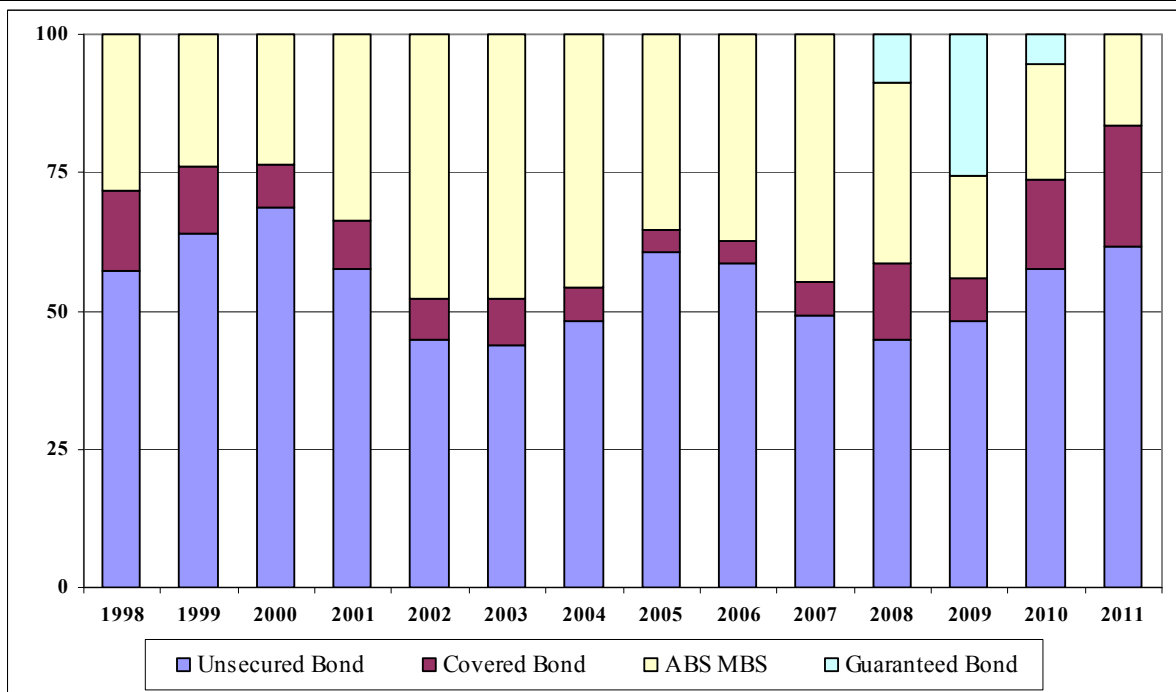
Source: Dealogic, Bloomberg

Figure A11. US: long-term financing composition (percentages)



Source: Dealogic, Bloomberg

Figure A12. G-SIFIs: long-term financing composition (percentages)



Source: Dealogic, Bloomberg

Table A3. Debt issuance by type of instruments (ASW spread in basis points)

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | TOT |
|---------------------------------|--------|--------|-------|--------|--------|-------|--------|
| Asset-Backed Security | 12 | 13 | 2 | | | | 27 |
| | 56.37 | 29.03 | 41.54 | | | | 42.11 |
| Mortgage-Backed Security | 86 | 17 | 3 | 3 | 11 | | 120 |
| | -28.78 | -29.48 | 52.29 | -42.70 | -132.8 | | -36.73 |
| Corporate Bond-High Yield | 4 | 6 | 1 | | 1 | 5 | 17 |
| | 413.8 | 367.9 | 538.3 | | 873.7 | 658.1 | 503.8 |
| Corporate Bond-Investment Grade | 562 | 580 | 238 | 327 | 615 | 575 | 2897 |
| | 1.79 | 23.93 | 124.7 | 178.2 | 101.6 | 115.8 | 80.05 |
| Covered Bond | 309 | 245 | 194 | 723 | 506 | 449 | 2426 |
| | -6.19 | 4.47 | 26.01 | 50.73 | 41.82 | 94.46 | 43.07 |
| Guaranteed | | | 85 | 321 | 60 | 8 | 474 |
| | | | 45.67 | 17.52 | 87.37 | 253.1 | 35.39 |
| Medium-Term Note | 201 | 250 | 89 | 120 | 380 | 600 | 1640 |
| | -20.73 | 22.18 | 91.94 | 103.4 | 98.20 | 125.3 | 81.99 |
| Other | 2 | 11 | 3 | | 1 | | 17 |
| | 43.70 | 50.90 | 298.3 | | 83.00 | | 95.60 |
| Total | 1176 | 1122 | 615 | 1494 | 1574 | 1637 | 7618 |
| | -4.36 | 20.65 | 78.79 | 75.54 | 79.87 | 115.7 | 64.92 |

Source: Datastream, Dealogic, Bloomberg

Appendix II

As for the data sources of long-term financing, we focused our attention on all types of securities issued by private banks from January 2006 to December 2011. In particular: “plain vanilla” bonds, medium-term notes, secured bonds (mortgage-backed securities and asset-backed securities), covered bonds and guaranteed bonds. For all kinds of securities, except guaranteed bonds for which Bloomberg proved to be a better dataset, we took the available information from the dataset “DCM analytics” by Dealogic: date of issuance, ISIN code, issuer, issuer parent, parent nationality, ratings of the issue (at launch, average of the single agencies), amount issued, type of issue, type of coupon.²³

| Table A4. Data source and time span | | | |
|--|---------------|-----------------------------|----------------------------------|
| Data | Period | Source | Number of items processed |
| Balance sheet (consolidated only) | 1998- 2010 | Bankscope | 5,210 |
| Long-term funding: | | | |
| <i>Unsecured bond</i> | 1998-2011 | Dealogic: DCM Analytics | 91,809 |
| <i>ABS-MBS</i> | 1998-2011 | Dealogic: DCM Analytics | 37,748 |
| <i>Covered bond</i> | 1998-2011 | Dealogic: DCM Analytics | 16,498 |
| <i>Guaranteed bond</i> | 2008-2011 | Bloomberg | 1,082 |
| Market data: | | | |
| <i>Asset swap spread</i> | 2006-2011 | Thomson reuters: datastream | 8,389 |
| <i>CDS banks</i> | 2006-2011 | Bloomberg | 1,988 |
| <i>CDS sovereign</i> | 2006-2011 | Bloomberg | 12 |
| Structural information on the issuer: | | | |
| <i>Number of employees</i> | 2006-2011 | Bloomberg | 23,639 |
| <i>Total assets</i> | 2006-2011 | Bloomberg | 25,317 |
| Ratings: | | | |
| <i>Sovereign rating</i> | 2006-2011 | Bloomberg | 12 |
| <i>Banks rating</i> | 2006-2011 | Dealogic: DCM Analytics | 27,642 |
| <i>Bond rating</i> | 2006-2011 | Dealogic: DCM Analytics | 44,379 |

²³ Table A4 shows the data sources for each variable together with the initial number of observations processed.

Then, by relaying on the unique ISIN code for each issuance, we looked at the associated Asset Swap Spread (ASW) on the day of issuance as provided by Datastream, which is an accurate measure of the cost of the bond. When the ASW spread was not available for the deal date we looked at the average of the following 10 days. From the ISIN code we also obtained the price of the Credit Default Swap (CDS) of the issuer from a different dataset (Bloomberg). In particular, we took the average value of the CDS in the fifteen days before the deal date. Still concerning security, we obtained the rating of the issue from Dealogic for all but guaranteed bonds, for which the information was taken from Bloomberg. The issue rating is the average of the ratings assigned by the three main rating agencies (Standard & Poor's, Moody's and Fitch).

Finally, as regards the rating of the issuer, the source is Bloomberg as it is for the government rating.

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