Journal of the Statistical and Social Inquiry Society of Ireland
Vol. XLIV

The Funding of the Irish Domestic Banking System During the Boom?

Philip R. Lane[1]
Trinity College Dublin
Centre for Economic Policy Research

(read before the Society, 15th January 2015)

***Abstract*:** This paper analyses the funding of the Irish domestic banking system during the boom period. We highlight: the shifting roles of deposit and bond funding; the prominence of foreign banks as funding counterparties; the role of interoffice funding; and the scale of US dollar and Sterling funding. From August 2007, the deterioration in funding conditions is clearly evident across a range of indicators.

Keywords: banking, credit, Ireland
JEL Classifications*:* G21, G24

1. INTRODUCTION

The aim of this paper is to examine the funding of the domestic Irish banking system during the boom period (especially 2003-2008). While there has been considerable attention paid to the asset side of the balance sheets of these banks (in particular, the rapid and overly- concentrated growth in property-related loans), it is also important to examine in detail the funding sources that underpinned the extraordinary credit boom. While it is well understood that foreign funding inflows (both deposits and other sources of liabilities) played an important role in facilitating lending growth, a more comprehensive analysis of funding patterns is warranted.

Understanding the funding dynamics is important for several reasons. First, it may provide valuable lessons in terms of developing improved surveillance procedures in tracking systemic risk in the banking system. Second, funding runs can be the trigger for the onset of a banking crisis and it is important to probe the relative roles of solvency concerns versus liquidity concerns in run dynamics. Third, the liability structure is important in determining loss allocation in the event of a banking crisis.

In terms of data analysis, the Irish boom-bust cycle is especially challenging in view of the dominance of externally-orientated foreign-owned banks in the aggregate banking statistics.[2] Since 2010, the Central Bank of Ireland has published more detailed banking statistics (stretching back to 2003) that report data for the "domestic market" group (Irish banks plus the domestically-orientated subsidiaries of foreign-owned banks) and the more narrow "Irish-headquartered" group of local banks (the six banks in this category in relation to the boom period were Bank of Ireland, AIB Bank, Anglo-Irish Bank, Irish Life & Permanent, Irish Nationwide and Educational Building Society).[3] Our primary focus is on the latter group. In addition to the aggregate banking statistics, we also derive bank-level data from the annual reports of these institutions and the Bankscope database. In relation to bond funding, we also examine the bond issuance data contained in the Thomson One database. In relation to cross-border funding, we supplement the data available from the Bank of International Settlements with data from the Central Bank of Ireland and the Bundesbank.

[1] I thank my discussants (Dermot Coates, Greg Connor) and meeting participants for comments. I thank Rahul Dewan, Caroline Mehigan, Rogelio Mercado, Tony O'Connor, Jonathan Rice, George Sorgs-Langhan, Iain Snoddy and Clemens Struck for excellent research assistance. I also gratefully acknowledge research support from the Irish Research Council. Email: plane@tcd.ie.
[2] See also Coates and Everett (2013).
[3] The latter group was previously described as the "covered banks" group since these six banks took advantage of the Irish State guarantee at the end of September 2008, while there were other banks that were headquartered in Ireland but had an external focus and external ownership (such as Depfa Bank).

This paper builds on a rapidly-growing related literature. In the Irish context, Coates and Everett (2013), Everett (2014), Everett et al (2014) and Coates et al (2015) analyse important dimensions of the funding dynamics of the Irish banking system.[4] The increase in the net foreign liabilities of the Irish banking system is also studied by Honohan (2006, 2009, 2010a), Connor and O'Kelly (2012), Connor et al (2012) and Lane (2014).

At an international level, Bruno and Shin (2015) analyse the interaction between global funding markets and credit dynamics in individual national economies, while Borio et al (2011), Calderon and Kubota (2012), Carvalho (2014), Errico et al (2014) and Lane and McQuade (2014) examine the interactions between international financial flows and domestic credit growth. The interest in this topic is elevated by the roles of credit growth and external liabilities as predictors of financial crises (Gourinchas and Obstfeld 2012, Catao and Milesi-Ferretti 2014). At a policy level, the conduct of macroprudential policies and the operation of the European Union's Macroeconomic Imbalances Procedure (MIP) may be informed by a deeper analysis of bank funding patterns.

The structure of the paper is as follows. Section 2 briefly outlines the nature of bank balance sheets. In Section 3, we examine bank-level data derived from annual reports. In Section 4, we focus on the money and banking statistics produced by the Central Bank of Ireland. In Section 5, we examine additional dimensions of cross-border bank funding by drawing on data newly assembled by the Central Bank of Ireland. In Section 6, we examine some characteristics of bond funding. Finally, Section 7 concludes with a discussion of the policy implications of the analysis.

2. THE STRUCTURE OF BANK BALANCE SHEETS

At the high level of aggregation that is typically disclosed in annual reports and in aggregate banking statistics, the balance sheet of a bank (or banking system) provides a decomposition by which assets are categorised into: (a) customer loans (*LOAN A*); (b) inter-bank deposit assets ($INTERBANK^A$); and (c) other liquid assets (LIQ^A_{OTH}).[5]4 On the other side, liabilities are categorised into: (a) customer deposits ($DEPOSITS^C$); (b) inter-bank deposit liabilities ($INTERBANK^L$); (c) senior bond liabilities ($BONDL^{SENIOR}$); (d) capital (*CAPITAL*). In the *CAPITAL* category, the main instruments are equity and subordinated bonds ($BONDL^{SUB}$).

In thinking about funding dynamics, an important concept is the funding gap between loans and customer deposits, which can be written as

$$\begin{aligned} GAP &= LOAN\ A - DEPOSITS^C \\ &= (INTERBANK^L - INTERBANK^A) + BONDL^{SENIOR} + \\ &\quad BONDL^{SUB} + EQUITY\ L - LIQA \end{aligned}$$

so banks can fund an above-unity loan-deposit ratio by being a net borrower in the interbank market, through issuance of senior and subordinated bonds, through equity issuance and by holding a low level of other liquid assets.

Of course, it would be desirable to work with a finer level of disaggregation. In addition to knowing more about the composition and maturity structure of loan assets, these categories do not provide sufficient information about the nature of funding liabilities. In particular, knowledge about the maturity structure and currency composition of customer deposits, interbank deposit asset and liabilities and senior and subordinated bonds (together with off balance sheet items such as derivative positions) are essential for a complete picture. Subject to this caveat, this paper analyses the aggregated information provided in the available reports and datasets.

3. BANK-LEVEL DATA

We begin by examining the data contained in the annual reports of the individual banks. Annual reports are compiled on the basis of group-wide information, so that this source combines the activities of the domestic and foreign operations of the banks. An analysis of bank-level data is potentially helpful in identifying the relative contributions of common and bank-specific factors in balance sheet dynamics.

[4] Everett et al (2014) provides a helpful guide to the funding of the Irish banking system over 2001-2012.
[5] In the context of the Irish banking system, the local banks were not large holders of bond portfolios during the boom period, so I do not dwell on the sub-composition of the other liquid assets category.

Figure 1 compares aggregate liabilities from the annual reports compared to the aggregate for the domestic units of the banks from the Central Bank's aggregate money and banking statistics. While there is a strong correspondence between the two series, the gap widens during the mid-2000s indicating an increase in the scale of the activities of the overseas affiliates of the banks.[6]

Figure 2 plots the relative size of each bank over 2000-2008. Throughout, AIB and Bank of Ireland dominate the banking system, even if the increase in the relative size of Anglo Irish Bank is visible in the mid-2000s. Despite the much smaller size of Anglo Irish Bank, the main banks perceived it to be important to relax credit standards to preserve market share (Honohan 2010b, Regling and Watson 2010, Nyberg 2011).[7]

Figures 3-8 show the dynamics of liabilities for each bank. While all banks saw a rapid expansion in the scale of balance sheets over 2002-2007, the composition of liabilities varied across the banks. For instance, while all banks saw an increase in the relative importance of senior bond funding during 2002-2007, there was a spectacular increase in the cases of Irish Life & Permanent and Irish Nationwide. However, the relative importance of senior bond funding declined during 2008 with a rise in the relative share of bank-sourced deposits acting as a substitute. Across the banks, non-capital liabilities dominated, broadly in line with the procyclical pattern identified by Adrian and Shin (2014). Moreover, within the capital category, there was marked growth in subordinated bonds relative to ordinary equity, which constituted a deterioration in terms of the quality of loss-absorbing capacity.

Figure 9 shows the dependence on net interbank funding (liabilities to banks minus claims on banks) for each bank, which provides a more useful guide to the reliance on interbank funding than the level of gross liabilities to other banks. The banks vary widely in terms of net reliance on interbank funding, with some banks holding net interbank assets for most of the period. However, a common pattern is a relative decline in this category until 2006 but increasing reliance during 2007-2008. Again, this is consistent with the decline in other funding options during 2007-2008.

4. AGGREGATE BANKING STATISTICS

Since 2010, the Central Bank of Ireland has published disaggregated versions of its money and banking statistics, with data available back to January 2003. In addition to the aggregate banking data (which is distorted for analytical purposes by the inclusion of externally-orientated IFSC-type banks), balance sheet data are also published for the "domestic market" group (the local banks and the domestically-active subsidiaries of foreign-owned banks) and the "Irish-headquartered" group (the main local banks). These data are important in understanding the dynamics of the local banking system. In particular, this dataset provides information that cannot be extracted from the annual reports of the individual banks, which focus on consolidated group-level data that combines the domestic and international activities of the banks.

In overall terms, Figure 10 shows the sharp growth in the total assets of the domestic banking system over 2003.1-2008.9. While the local banks were dominant throughout, Figure 11 does show a marked (if minor) increase in the market share of foreign-owned banks until July 2005 which was subsequently unwound. This pattern is consistent with the narratives in Honohan (2010b), Regling and Watson (2010) and Nyberg (2011) that a loss of market share to foreign-owned banks was one factor behind more aggressive lending behaviour by the local banks.

Figure 12 shows that the Irish banking system grew more quickly than the aggregate euro area system during 2003-2006 but its share then remained stable during 2007-2008. Figure 13 plots the composition of liabilities for the local banks: the increase in bond funding is quite marked over this period. Indeed, Figure 14 shows that the growth in bond funding was quite exceptional relative to the aggregate euro area.

Honohan (2006, 2009, 2010a) drew attention to the sharp increase in the net foreign liabilities of the Irish banking system that began around 2003. Figures 15-16 confirm this pattern: both local and foreign-owned banks saw a substantial increase in net foreign liabilities (relative to total assets), even if the relative importance of foreign funding was far greater for the latter group throughout the period. This is in line with the global literature on the role of foreign-owned banks, which typically have much greater access to foreign funding.

Figures 17-18 show a marked differences between the local banks and the foreign-owned banks in terms of the composition of net foreign liabilities. As shown in Figure 18, net deposit liabilities were the predominant type of

[6] See also Kearns (2007).
[7] The strategic choices made by individual banks during this period warrants further investigation. The testimony by bank executives to the Oireachtas Banking Inquiry provides some illumination (https://inquiries.oireachtas.ie/banking).

foreign funding for the foreign-owned banks during this period, with relatively minor roles for bond funding and other funding. Moreover, Figure 17 shows a striking divergence in the behaviour of the net foreign liability position in bank deposits and loans (foreign deposit liabilities minus foreign loan assets) versus the net foreign position in bonds (holdings of foreign bond assets minus foreign bond liabilities), with a reversal in relative funding patterns from August 2007 onwards (this being the month that marked the start of an international reversal in liquidity patterns). Figure 18 for the foreign-owned banks clearly shows the decline in long-term net foreign bond funding and the increasing dependence on net foreign deposit funding, which is more likely to be short-term in nature. This reversal is consistent with narrative accounts of the Irish banking crisis (Honohan 2010b, Regling and Watson 2010, Nyberg 2011) and highlights the importance of examining the composition of foreign funding, in addition to the aggregate net foreign position.

5. THE SOURCES OF CROSS-BORDER FUNDING

This section draws on newly-reconstructed data from the Central Bank of Ireland. While there is some information on cross-border funding in the money and banking statistics dataset that was analysed in the preceding section, it is desirable to know more about the sources of cross-border funding. In particular, it is important to understand the currency composition of external liabilities and the relative roles of bank and non-bank funders in relation to both deposit liabilities and bond liabilities. At an international level, these dimensions are reported through the International Banking Statistics dataset compiled by the Bank of International Settlements (BIS). However, the headline BIS dataset includes all resident banks (including the IFSC banks), while the BIS "locational by nationality" dataset is distorted for Ireland during this period by the inclusion of the German Pfandbrief banks that were foreign-owned and externally-orientated but registered as Irish-headquartered banks. Accordingly, it is necessary to construct an alternative "locational by nationality" dataset that just includes the local Irish banks. To this end, in what follows, I rely on data kindly provided by the Central Bank of Ireland.

Figure ?? shows that the external liabilities of the local banks comprised a minority of the aggregate external liabilities of resident banks. However, the local share was not constant but rather sharply increased during the mid-2000s. The time-varying share of local banks in external liabilities mean that it is not possible to infer by proxy the external position of the local banks from the aggregate BIS data, such that it is necessary to compile a dedicated dataset for this group.

Figure 20 plots the share of external liabilities owed to non-bank investors. Throughout the period, it is clear that foreign banks were the dominant source of funding for the domestic banks. Moreover, the relative importance of bank-sourced funding increased during the latter part of the period (2006-2008). Figure 21 plots the interbank share in external deposit liabilities over 2003.Q1-2008.Q4. It shows that foreign banks were the primary source of external deposit funding, with the inter-bank share climbing during 2003-2006. However, the relative decline in this type of deposit funding began in early 2007 and continued throughout 2007-2008. Within the inter-bank category, Figure 22 shows that much of this funding came from the foreign affiliates of the local banks, especially during 2007-2008. This is also in line with the evidence presented by Everett et al (2014), which shows that the net positions of the local banks vis-a-vis their foreign affiliates changed sign in mid-2007, with the domestic units of the banks relying on the foreign affiliates for substantial net funding during 2007-2008.

Figure 23 shows the share of external liabilities denominated in euro. The euro share peaked at 44.8 percent in 2004.Q3 and had fallen back to 36.9 percent by 2008.Q1. The high reliance on non-euro external liabilities is consistent with the strong linkages between the Irish banks and the UK and US .nancial systems. Figure 24 affirms this by showing the currency shares of the euro, the US dollar and Sterling in external liabilities. The expansion in the US dollar share from 2005 onwards is striking.

Figure 25 plots the share of euro-denominated deposits in interbank external deposit liabilities. While this share climbed during 2002-2006, non-euro deposits accounted for the majority of interbank deposits throughout the sample period. Figure 26 shows that the euro-denominated share was especially low for inter-office external deposit liabilities: most of the funding raised through inter-office channels was in foreign currencies. This is consistent with the geographical location of the foreign offices of the Irish banks, which were orientated towards the United Kingdom and the United States. Finally, Figure 27 shows the share of external bonds denominated in euro (in respect of bonds held by foreign banks), which only climbed above 50 percent towards the end of the sample period.

6. BOND FUNDING

In this section, we look more closely at the bond issuance pattern by Irish banks. First, we show that bond spreads during 2002-2006 were very low, so that Irish banks could raise significant funding. Moreover,

contemporaneous reports suggest that the demand for Irish bank bonds was geographically quite diverse, with investors from many countries participating in the primary market. However, risk spreads increased in 2007-2008 and the volume of bond issuance declined significantly.

Table 2 provides a description of the subordinated bond issues by Bank of Ireland, AIB, Anglo-Irish Bank and Irish Life & Permanent over 2002-2008. Table 2 shows that bonds were issued at low spreads across a range of categories and maturities during 2002-2006. For instance, Euroweek (June 18, 2004) reports on a €750 million ten-year lower tier two bond issue by Anglo-Irish Bank that was priced at Euribor plus 50 basis points. According to one bookrunner (ABN Amro): "We were oversubscribed and there were over 90 accounts in the book from 17 different countries. It reached over €900 million after only a two-day book building process, and the depth of demand and the diversification of the order book was unprecedented for the issuer, paving the way for future issuances for Anglo."

According to another bookrunner on the same bond issue (Barclays): "The FRN market in recent weeks, both on the senior and subordinated sides, has seen material involvement from less traditional FRN buyers, such as high quality northern European asset managers and insurance money. Given the uncertainty with rates and FRNs being viewed as defensive products, this transaction saw material participation from this group of investors. As a result, the order book was of an extremely high quality and diverse in terms of geographic split. Distribution was as follows: by investor type, fund managers and asset managers took 71% of the bonds, banks 22%, and the remainder were sold to pension and retail money. By geography, German investors were the largest takers with 24% of orders, followed by the UK with 17%, Iberia 15%, France 13%, Scandinavia 10%, Ireland 8% and Asia 4%."[8]

During the 2002-2006 period, contemporaneous reports pointed to low global bond yields and the strong profitability of the Irish banks as drivers of international interest in Irish bank bonds. CDIS spreads on these bonds were very low, suggesting that the markets did not have major concerns about default risk during that period. Consistent with the evidence in the earlier sections, Table 2 shows that bonds were issued in US dollars and Sterling as well as in euro, in line with the strong ties of Irish banks to the UK and US financial systems.

While the last subordinated bond issue by Anglo-Irish Bank was in May 2007 before the tightening of market conditions, both AIB and Bank of Ireland issued dated lower Tier Two subordinated bonds in mid-2008. By this late stage, spreads were considerably higher than in previous years, while the range of investors was also more limited. The AIB STG£ 700 million 15-year bond was priced at 250 basis points over mid-swaps at the end of May 2008, while the Bank of Ireland STG£ 450 million 12-year bond was priced at 370 basis points over mid-swaps at the end of July 2008. In relation to the AIB issue, Euroweek (30 May 2008) reported the comments of the bookrunners (HSBC, Lehman Brothers, Morgan Stanley): "We opened the books at 2pm, and closed them an hour and a half later at pound(s) 1bn. The majority (90%) of interest came from the UK and Ireland. The book was distributed between 42 accounts, 83% of which were fund managers and pension funds, and 12% were insurance firms." In relation to the Bank of Ireland issue, Euroweek (1 August 2008) reported the comments of the bookrunners (Merrill Lynch, Royal Bank of Scotland): "Roughly 95% of the trade went to the UK and Ireland, with Scandinavia the other notable player at 3%. More than 50% went to fund managers, around 25% went to banks, and just under 10% to insurance firms." Euroweek also reported some market views: "... this came at a wide level. They built a huge book, which is not surprising given that they priced it at 70bp back from CDS. They paid up to ensure a smooth execution."

Figures 28-29 show the evolution of CDS spreads on senior and subordinated bonds over 2007-2010.[9] The decline in funding conditions is clearly seen from the second half of 2007 onwards, consistent with the balance sheet data in earlier sections. The higher spreads on subordinated debt relative to senior debt is in line with the different risk exposures of the two types of bonds, although the substantial spreads on senior bonds during various intervals suggests that the markets took seriously the risk of default on senior bonds.

Finally, while data availability on the geographical distribution of bond holding is notoriously limited, a partial view on the dynamics of foreign holdings of Irish bank bonds can be obtained from Bundesbank data in relation to German-resident investors.[10] Figure 30 shows the Irish bank bond holdings of German banks (MFIs), non-bank financial institutions (OFIs) and the nonfinancial sector (households, non-pro.t institutions serving households and non-financial corporates).[11] Figure 30 shows that the MFI sector was the largest investor in Irish

[8] FRN is the acronym for floating-rate notes.
[9] Spreads prior to 2007 were much lower.
[10] This does not include any holdings of the foreign affiliates of German institutions.
[11] These data are an extract from the Bundesbank's Securities Holdings database.

bank bonds during the pre-crisis period but this position was shrinking even before September 2008 and fell by a further 50 percent by September 2010.[12] In contrast, the holdings of the other sectors actually climbed between 2008 and mid-2010 before falling back during the turmoil of late 2010.

7. CONCLUSIONS

The aim of this paper has been to provide an empirical profile of the funding of the Irish banking system during the credit boom period.

Our data analysis highlights a number of patterns. First, the boom period was relatively short: 2003 to mid-2007. From mid-2007, multiple indicators signalled that the funding conditions of the Irish banks were deteriorating. Second, foreign-resident banks were a primary counterparty for much of the foreign funding. Importantly, this category includes the foreign offices of the local banks, with inter-office funding growing in relative importance as market conditions tightened during 2007-2008. Third, much of the funding was in US dollars and Sterling, which is consistent with the strong links between Irish banks and these financial systems. Undoubtedly, the capacity of Irish banks to raise considerable non-euro funding can be linked to the hedging opportunities provided by the large euro-dollar and euro-Sterling derivatives markets. Fourth, senior and subordinated bond issues were an important source of funding from 2003-2007 but banks increasingly relied on interbank deposit funding during 2007-2008. While the broad nature of these funding patterns are captured in the narrative reports of Honohan (2010b), Regling and Watson (2010) and Nyberg (2011), this paper provides supporting quantitative evidence, while the importance of non-euro funding sources and the role of foreign offices of local banks has received relatively little prior attention.[13]

The scope of this paper is quite narrow in only looking at the liabilities of the domestic Irish banks. It would be desirable also to learn more about the allocation strategies of the foreign counterparties that provided so much funding to these banks. However, the current state of international financial statistics does not facilitate an analysis of this topic.

In terms of the policy debate, the analysis of bank funding patterns should be an integral element in macro-prudential surveillance. In the Irish case, the switch in the composition of net external financial liabilities from long-term net bonds to shorter-term net deposits from mid-2007 onwards was an important signal of the increasing market scepticism about the health of the Irish banking system. Throughout, the high ratio of debt-type liabilities to equity-type liabilities limited the loss absorption capacity in the system.

Finally, the publication of more granular data on the balance sheets of the banking system would make it easier for analysts to probe emerging risk factors. To this end, Ireland should fully participate in the various current international initiatives to expand the scope of banking statistics and link better domestic sectoral and external financial accounts (Ali et al 2012, Committee on the Global Financial System 2012, Lane 2015).

References

Adrian, Tobias and Hyun Song Shin (2014), "Procyclical Leverage and Value-At-Risk," *Review of Economic Studies* 27(2), 373-403.

Ali, Robleh D., Andrew Haldane and Paul Nahai-Williamson (2012), "Towards a Common Financial Language," *mimeo*, Bank of England.

Borio, Claudio, Robert McCauley and Patrick McGuire (2011), "Global Credit and Domestic Credit Booms," *BIS Quarterly Review* (September), 43-57.

Bruno, Valentina and Hyun Song Shin (2015), "Cross-Border Banking and Global Liquidity," *Review of Economic Studies* 82(2), 535-564.

Calderon, Cesar and Megumi Kubota (2012), "Gross Inflows Gone Wild: Gross Capital Inflows, Credit Booms and Crises," *World Bank Policy Research Working Paper No. 6270*.

Carvalho, Daniel (2014), "Financial Integration and the Great Leveraging," *Banco de Portugal Working Paper No. 2014-07*.

Catao, Luis and Gian Maria Milesi-Ferretti (2014), "External Liabilities and Crises," *Journal of International Economics* 94(1), 18-32.

[12] A limitation is that the data do not indicate the roles of net sales versus valuation losses in determining the decline in positions.
[13] See also Coates and Everett (2013) on the role of interoffice funding.

Coates, Dermot and Mary Everett (2013), "Profiling the Cross-Border Funding of the Irish Banking System," *Central Bank of Ireland Economic Letter No. 2013-4*.

Coates, Dermot, Mary Everett, Joe McNeill and Aoife Moloney (2015), "Interpreting Data for Ireland in International Banking Statistics," *Central Bank of Ireland Economic Letter No. 2015-1*.

Committee on the Global Financial System (2012), "Improving the BIS International Banking Statistics," *CGFS Paper No. 47* "The Shadow Banking System Through a Global Flow of Funds Analysis," *IMF Working Paper No. 14/10.*

Connor, Gregory and Brian O'Kelly (2012), "Sliding Doors Cost Measurement: The Net Economic Cost of Lax Regulation of the Banking Sector," *The World Economy* 35(10), 1256-1276.

Connor, Gregory, Thomas Flavin and Brian O'Kelly (2012), "The US and Irish Credit Crises: Their Distinctive Differencs and Common Features," *Journal of International Money and Finance* 31, 60-79.

Everett, Mary (2014), "Blowing the Bubble: The Global Funding of the Irish Credit Boom," *mimeo*, Central Bank of Ireland.

Everett, Mary, Jane Kelly and Fergal McCann (2014), "Banks. Internal Capital Markets, Official Liquidity, and International Shock Transmission: An Irish Illustration," *mimeo*, Central Bank of Ireland.

Forbes, Kristin and Francis E. Warnock (2012), "Capital Flow Waves: Surges, Stops, Flight and Retrenchment," *Journal of International Economics* 88(2), 235-251.

Galstyan, Vahagn and Philip R. Lane (2013), "Bilateral Portfolio Dynamics During the Global Crisis," *European Economic Review* 57(1), 63-74.

Gourinchas, Pierre-Olivier and Maurice Obstfeld (2012), "Stories of the Twentieth Century for the Twenty-First," *American Economic Journal: Macroeconomics* 4(1), 226-265.

Honohan, Patrick (2006), "To What Extent Has Finance Been a Driver of Ireland's Economic Success?," *ESRI Quarterly Economic Commentary* (December), 59-72.

Honohan, Patrick (2009), "Resolving Ireland's Banking Crisis," *Economic and Social Review* 40(2), 207-231.

Honohan, Patrick (2010a), "Euro Membership and Bank Stability - Friends or Foes? Lessons from Ireland," *Comparative Economic Studies* 52, 133-157.

Honohan, Patrick (2010b), *The Irish Banking Crisis: Regulatory and Financial Stability Policy 2003-2008*, Preliminary Report of the Commission of Investigation into the Banking Sector in Ireland.

Kearns, Allan (2007), "A Financial Stability Perspective on Irish Banks' Foreign Business," in *Financial Stability Report 2007*, Central Bank of Ireland, 103-113.

Lane, Philip R. (2013), "Capital Flows in the Euro Area," *European Economy Economic Paper No. 497*.

Lane, Philip R. (2015), "Cross-Border Financial Linkages: Identifying and Measuring Vulnerabilities," *CEPR Policy Insight No.77.*

Lane, Philip R. and Gian Maria Milesi-Ferretti (2011), "The Cross-Country Incidence of the Global Crisis," *IMF Economic Review* 59(1), 77-110.

Lane, Philip R. and Gian Maria Milesi-Ferretti (2012), "External Adjustment and the Global Crisis," *Journal of International Economics* 88(2), 252-265.

Lane, Philip R. and Gian Maria Milesi-Ferretti (2015), "Global Imbalances and External Adjustment After the Crisis," in *Global Liquidity, Spillovers to Emerging Markets and Policy Responses* (edited by Claudio Raddatz, Diego Saravia and Jaume Ventura), Central Bank of Chile, 105-139.

Lane, Philip R. and Peter McQuade (2014), "Domestic Credit Growth and International Capital Flows," *Scandinavian Journal of Economics* 116(1), 218-252.

Milesi-Ferretti, Gian Maria and Cedric Tille (2011), "The Great Retrenchment: International Capital Flows During the Global Financial Crisis," *Economic Policy* 26(66), 285-342.

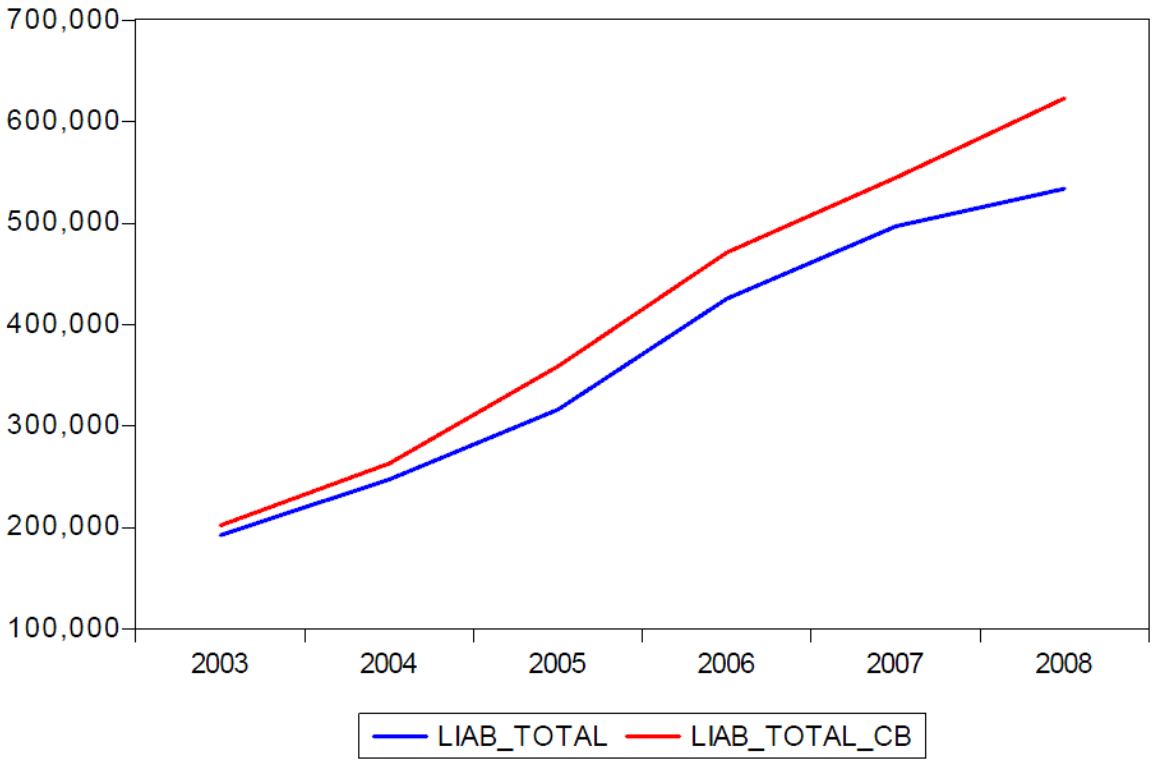
Nyberg, Peter (2011), *Misjudging Risk: Causes of the Systemic Banking Crisis in Ireland*, Report of the Commission of Investigation into the Banking Sector in Ireland.

Obstfeld, Maurice (2012), "Does the Current Account Still Matter?", *American Economic Review* 102(3), 1-23.

Regling, Klaus and Max Watson (2010), *A Preliminary Report on the Sources of Ireland's Banking Crisis*, Preliminary Report of the Commission of Investigation into the Banking Sector in Ireland.

Rey, Helene (2013), "Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence," *mimeo*, London Business School.

Figure 1: Aggregate Liabilities: Group Level versus Resident Offices.

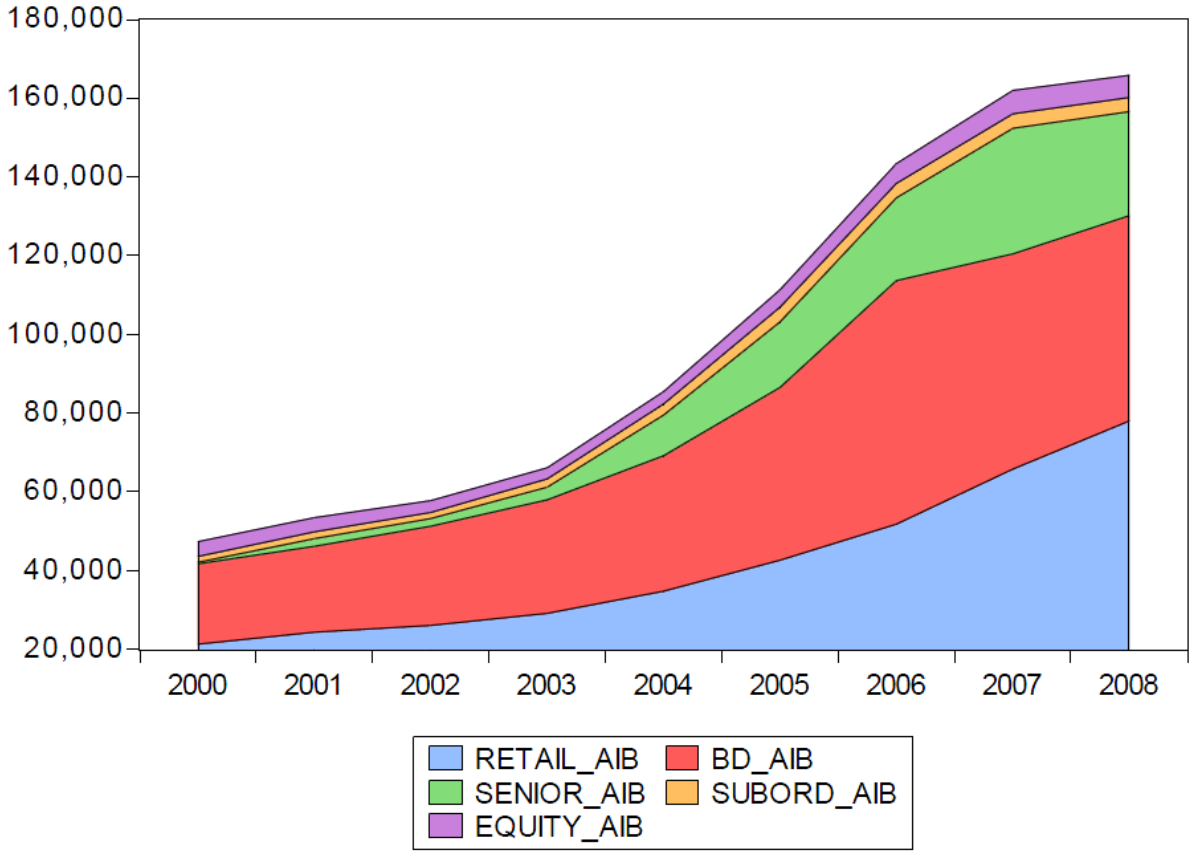


Note: Author's calculations based on annual reports of banks and Central Bank of Ireland data.

Figure 2: Shares in Aggregate Balance Sheet of Local Banks.

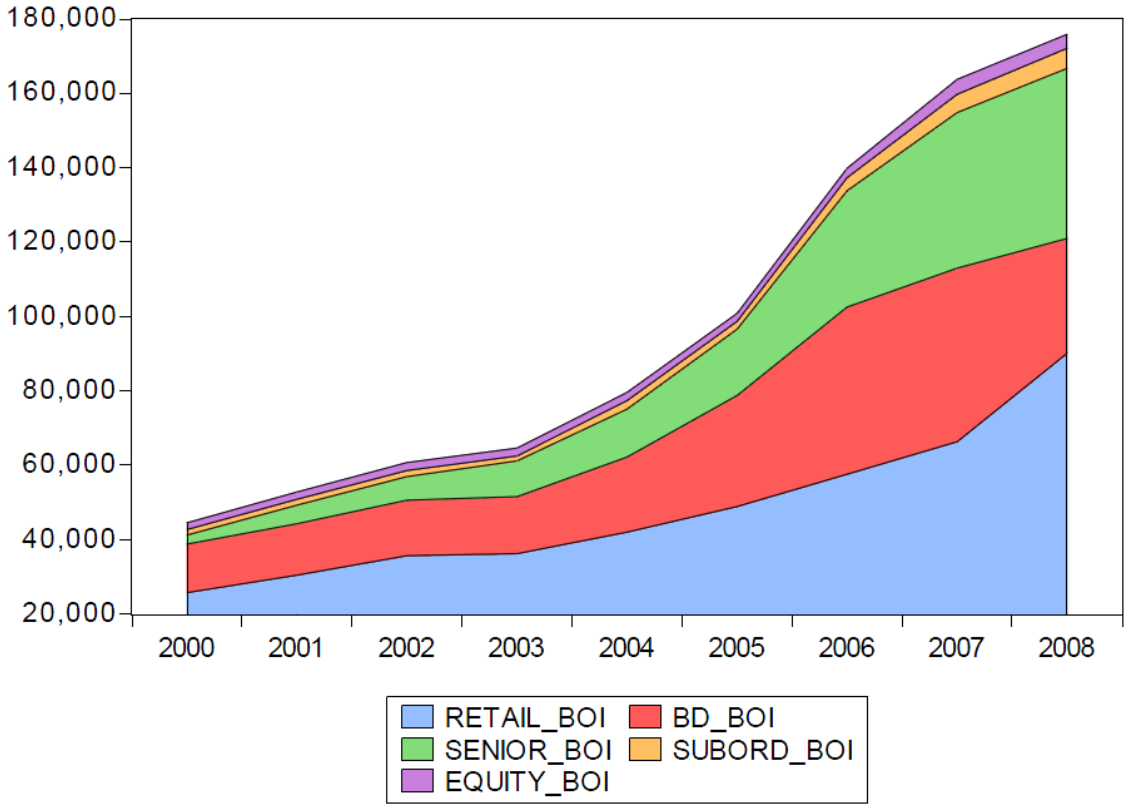
Note: Author's calculations based on data in annual reports.

Figure 3: Composition of Liabilities: AIB.



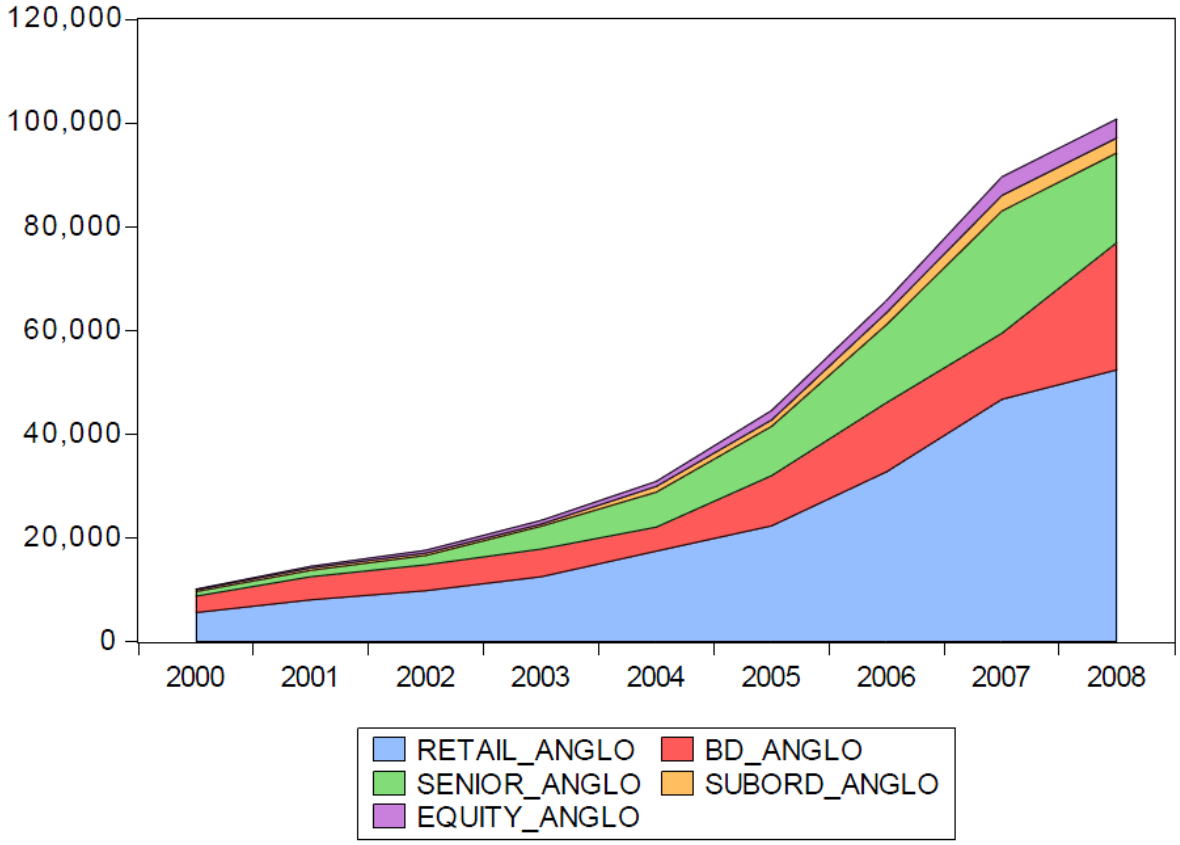
Note: Author's calculations based on data from annual reports.

Figure 4: Composition of Liabilities: Bank of Ireland.



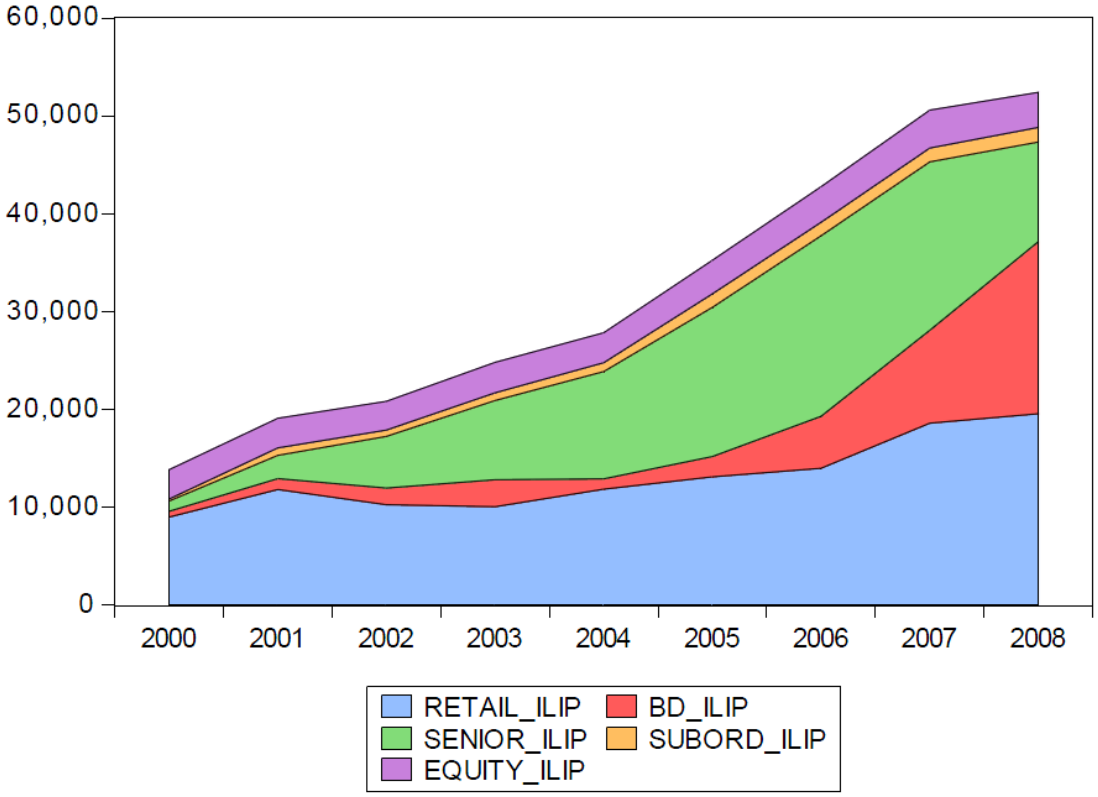
Note: Author's calculations based on data from annual reports.

Figure 5: Composition of Liabilities: Anglo Irish Bank.



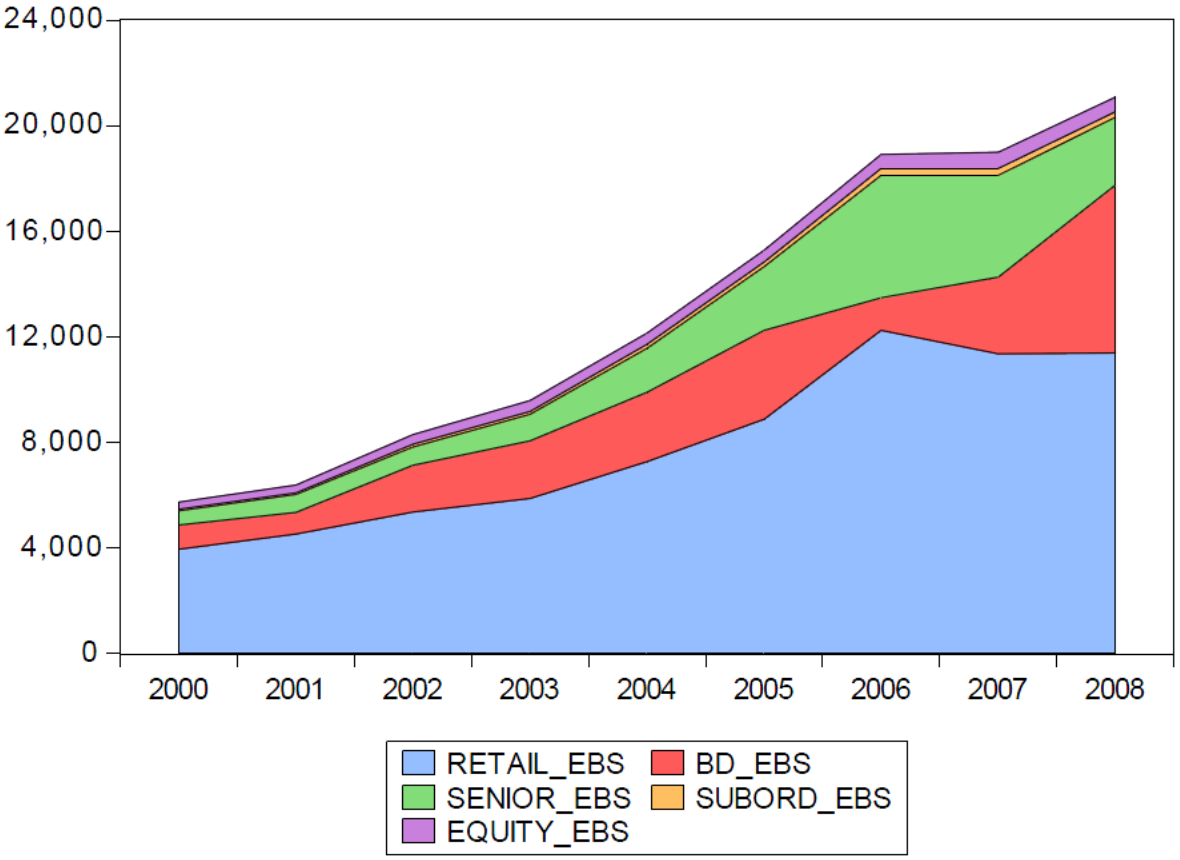
Note: Author's calculations based on data from annual reports.

Figure 6: Composition of Liabilities: Irish Life & Permanent.



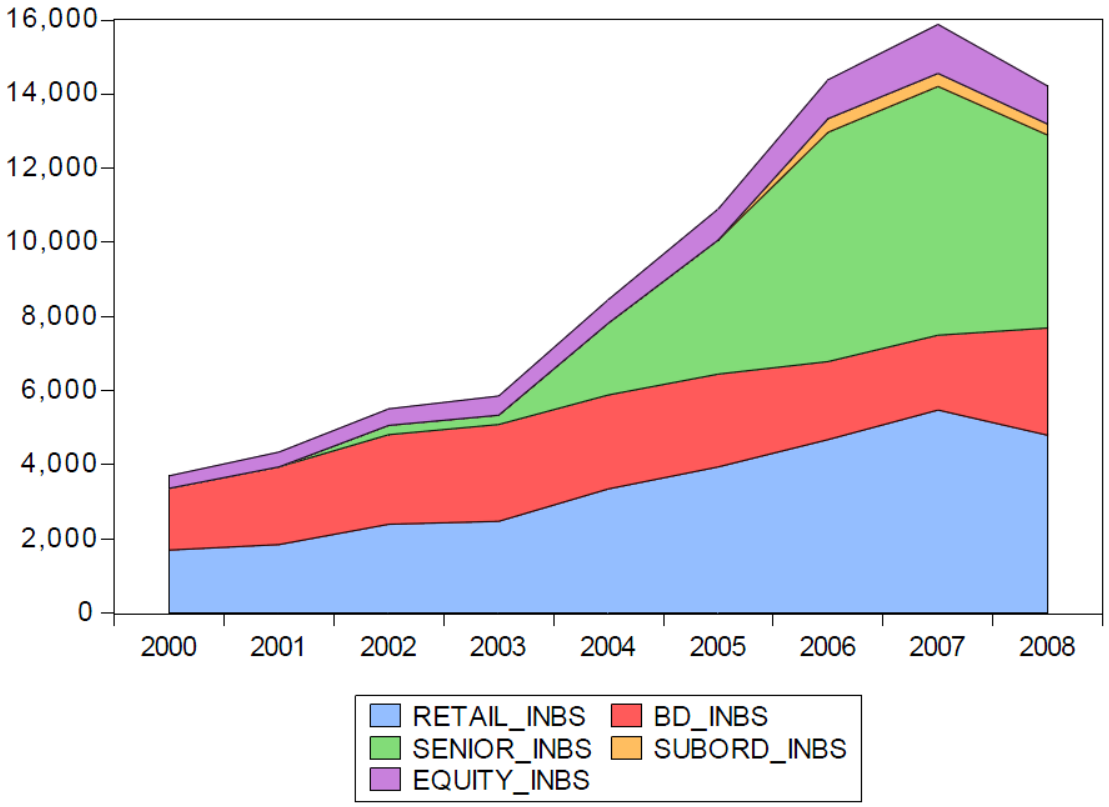
Note: Author's calculations based on data from annual reports.

Figure 7: Composition of Liabilities: Educational Building Society.



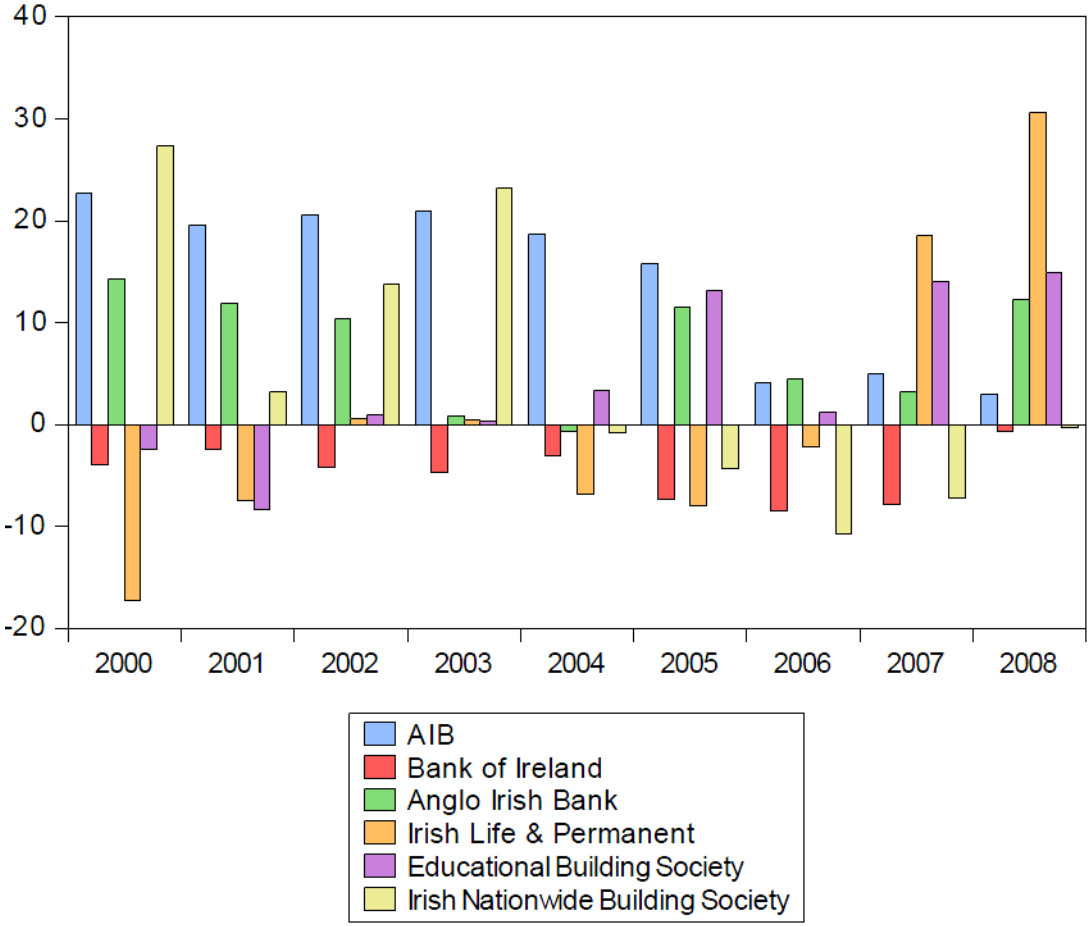
Note: Author's calculations based on data from annual reports

Figure 8: Composition of Liabilities: Irish Nationwide Building Society.



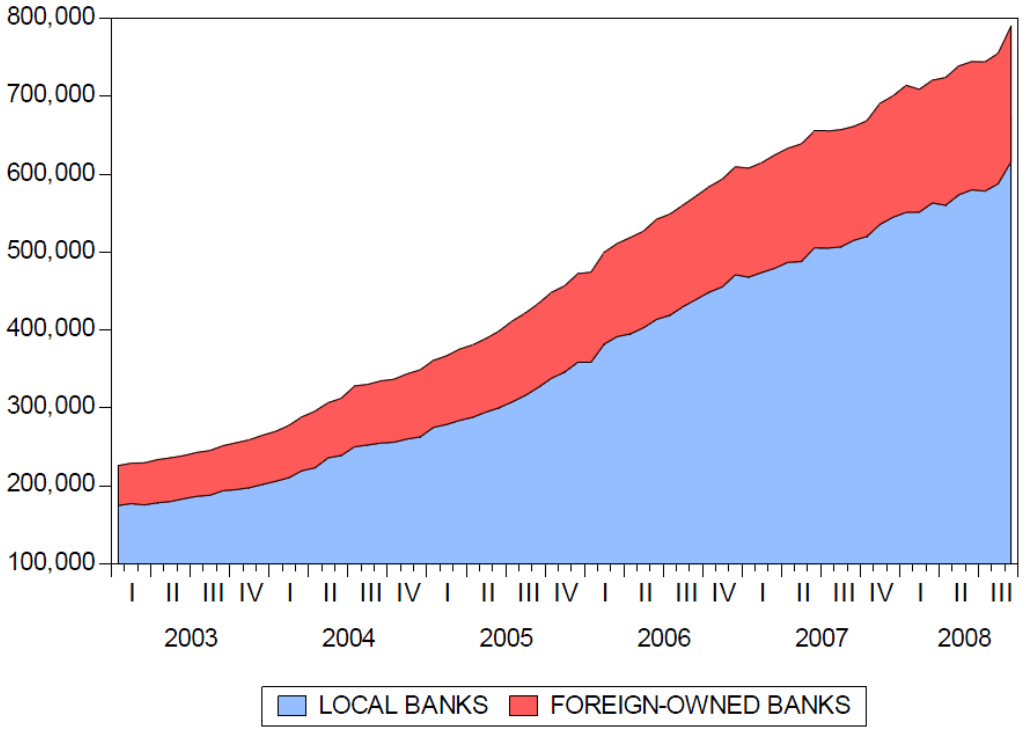
Note: Author's calculations based on data from annual reports.

Figure 9: Net Inter-Bank Funding.



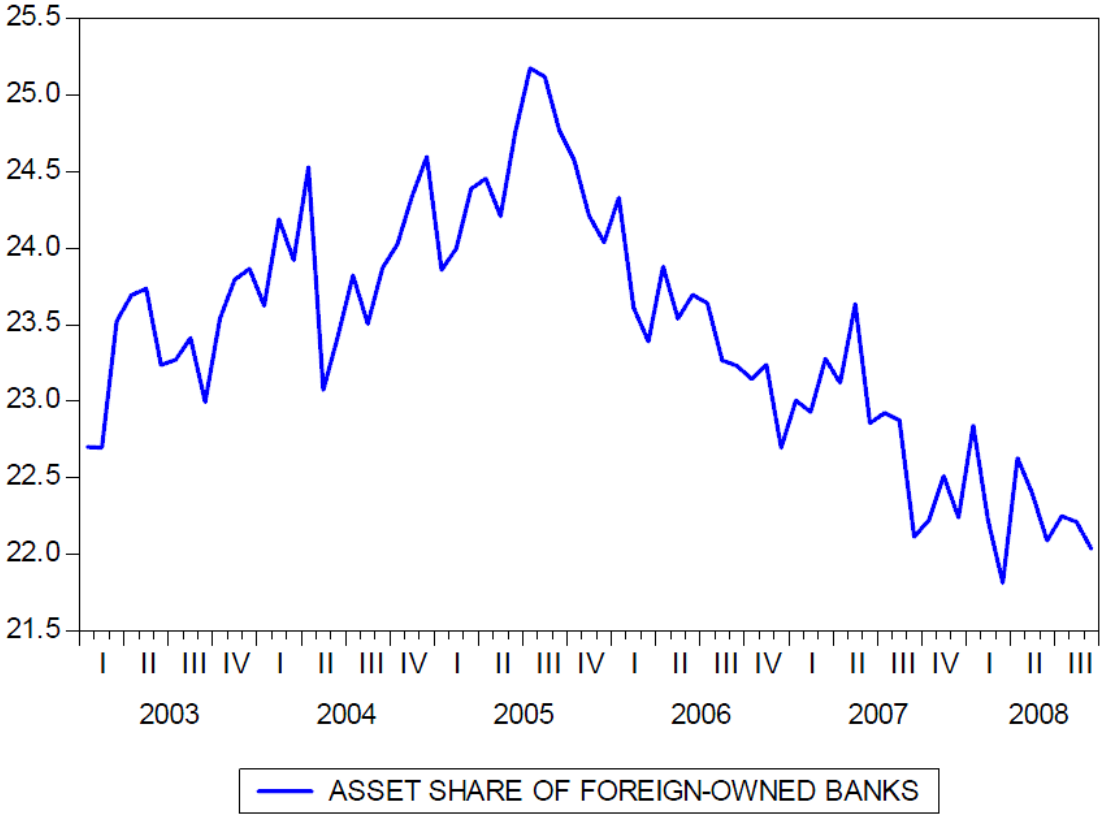
Note: Scaled by total liabilities. Author's calculations based on annual reports of the banks.

Figure 10: Total Assets of Domestic Banking System.



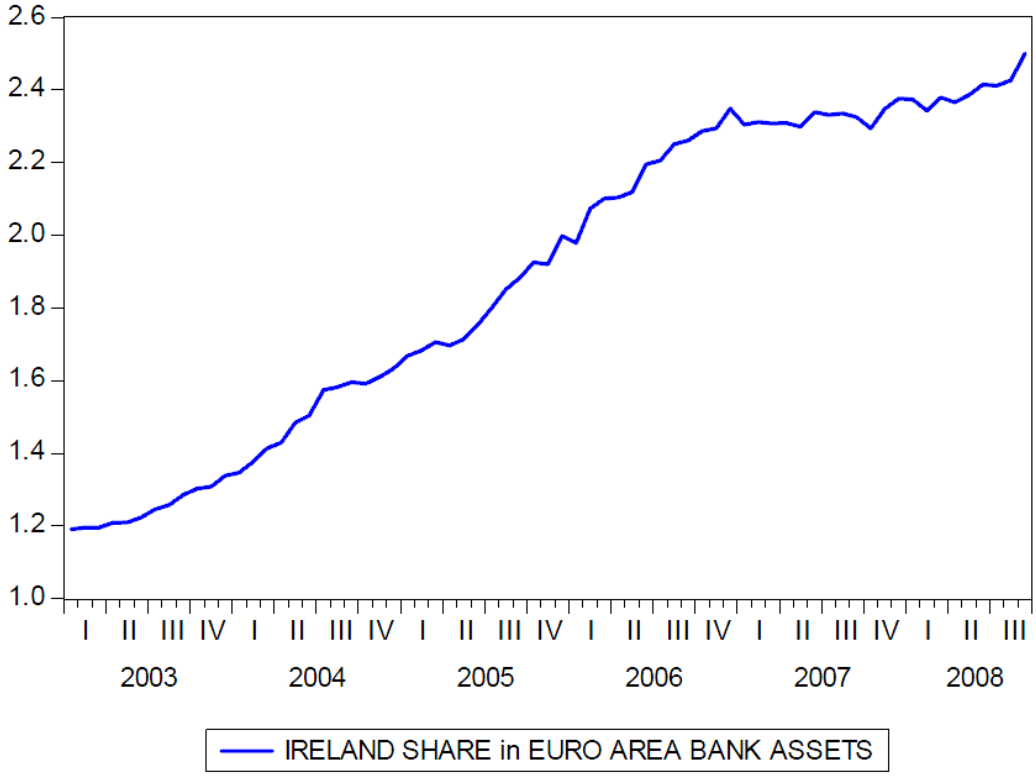
Note: € Millions. Author's calculations based on Central Bank of Ireland dataset.

Figure 11: Asset Share of Foreign-Owned Banks.



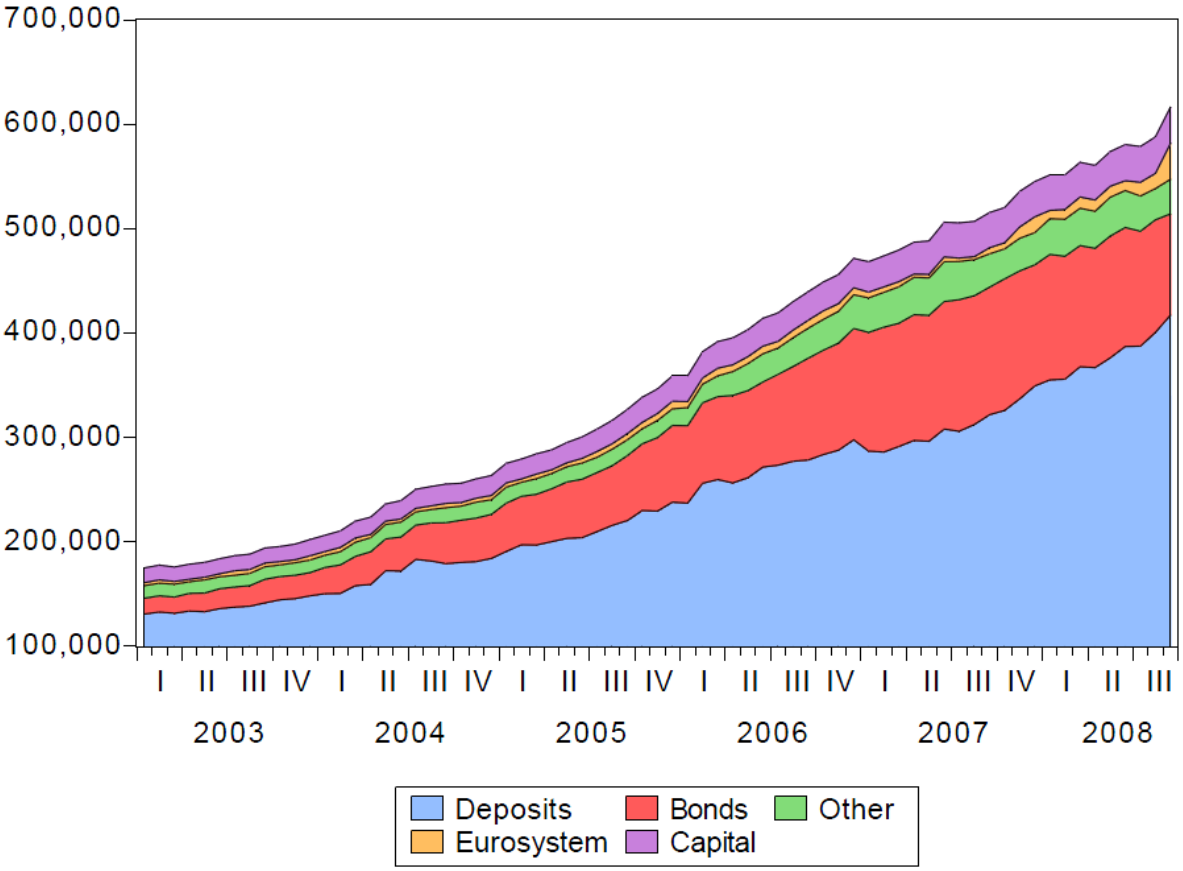
Note: Author's calculations based on Central Bank of Ireland dataset.

Figure 12: Bank Assets: Ratio to Euro Area Total.



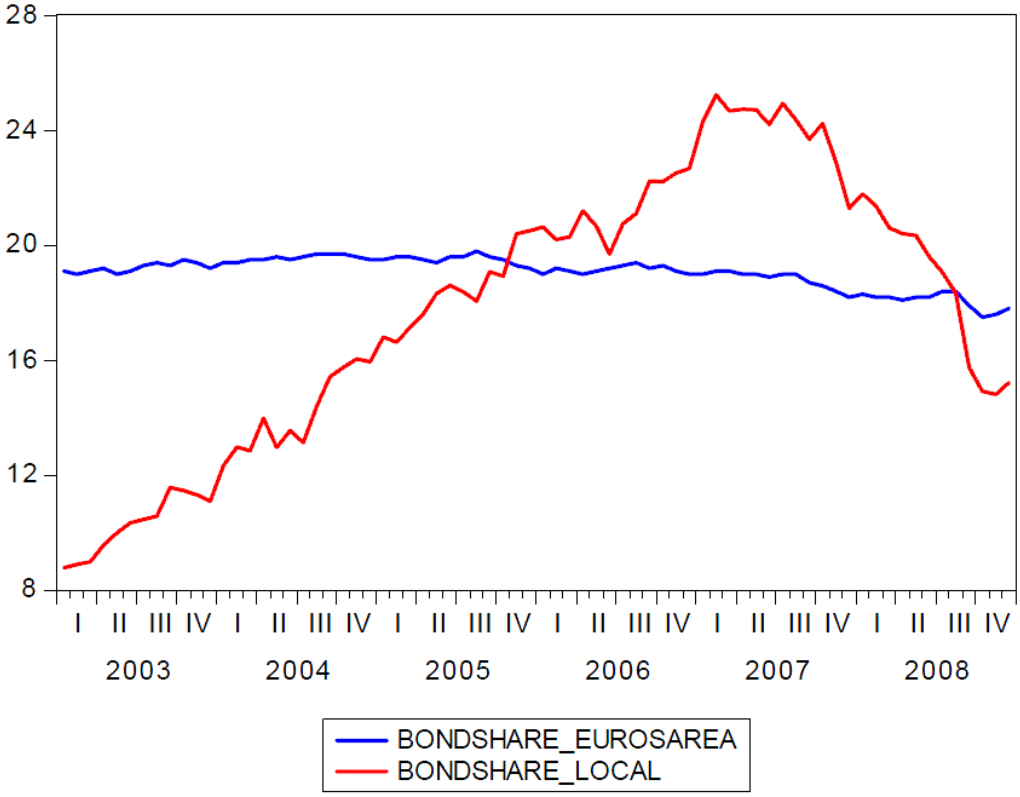
Note: Author's calculations based on Central Bank of Ireland and European Central Bank datasets.

Figure 13: Composition of Liabilities: Local Banks.



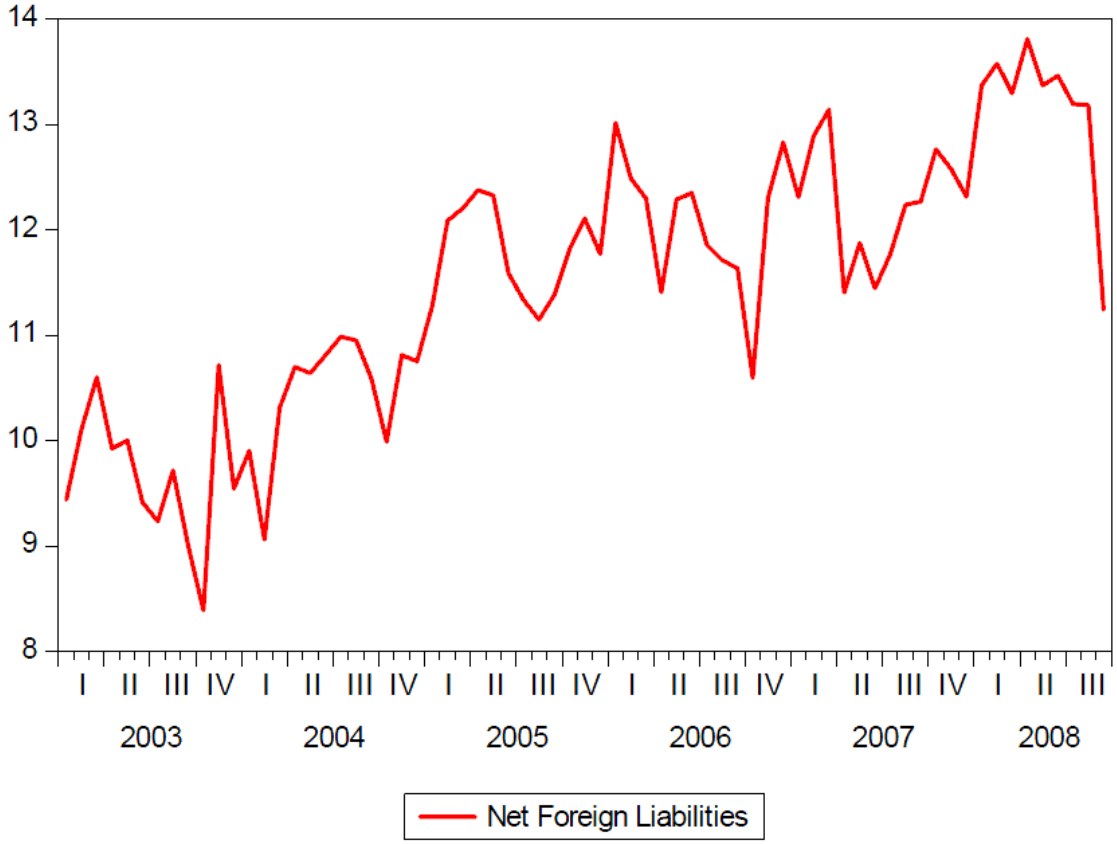
Note: Author's calculations based on Central Bank of Ireland dataset

Figure 14: Share of Bond Funding in Total Liabilities: Ireland and Euro Area.



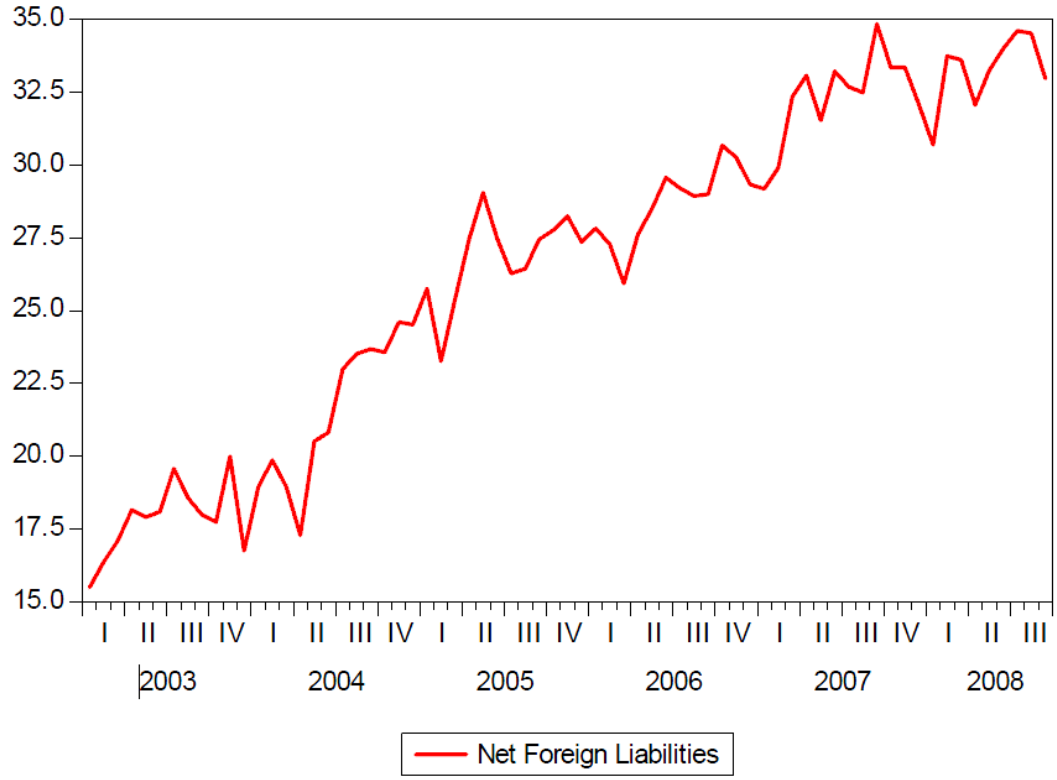
Note: Author's calculations based on data from European Central Bank and Central Bank of Ireland.

Figure 15: Net Foreign Liabilities: Local Banks.



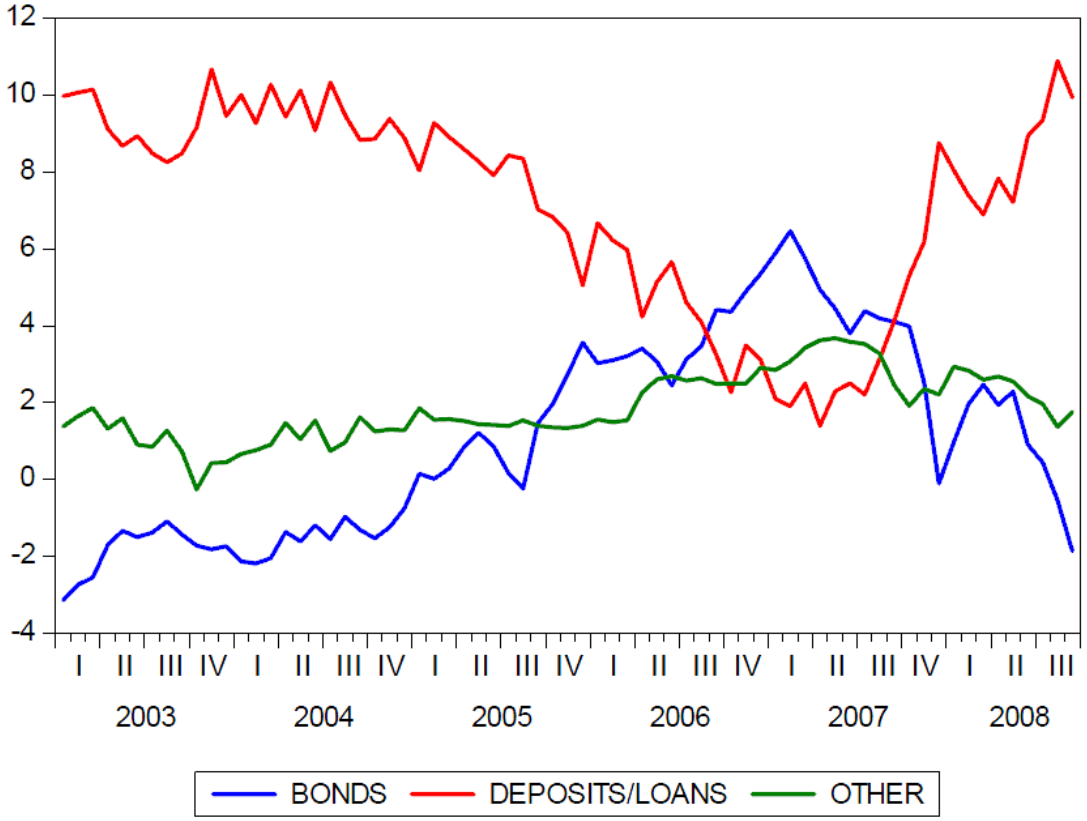
Note: Scaled by total assets. Author's calculations based on Central Bank of Ireland dataset.

Figure 16: Net Foreign Liabilities: Foreign-Owned Banks.



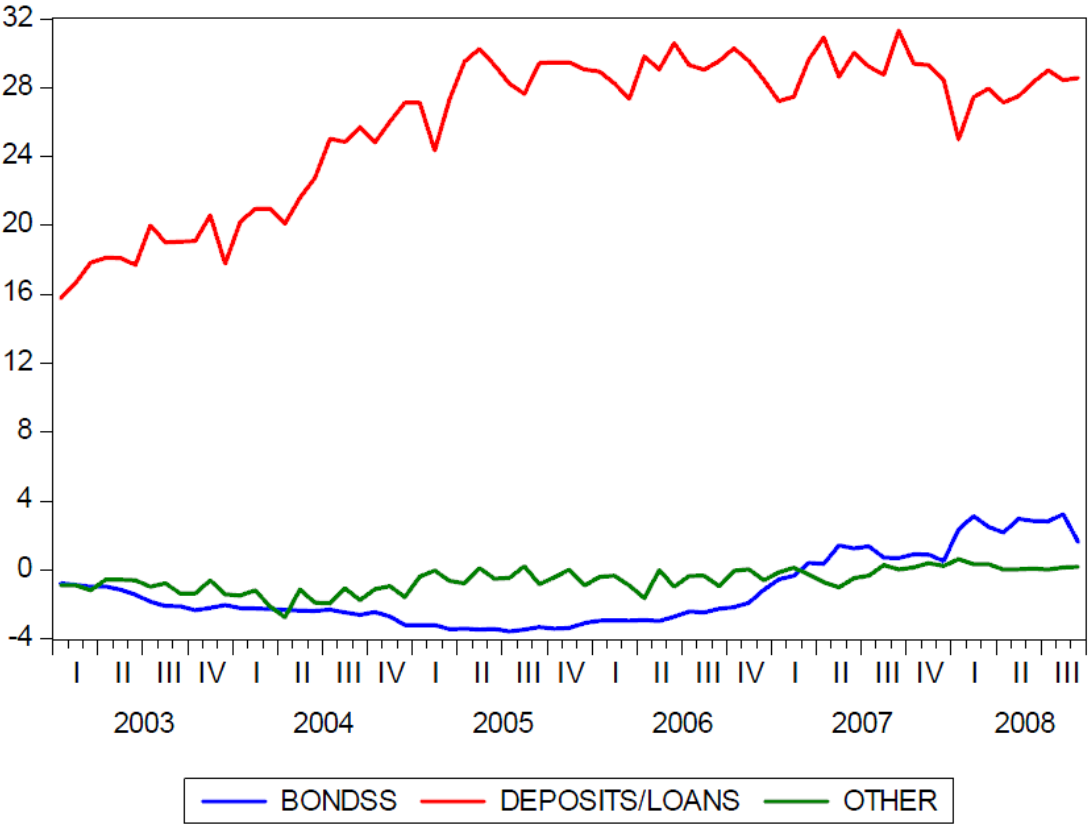
Note: Scaled by total assets. Author's calculations based on Central Bank of Ireland data

Figure 17: Composition of Net Foreign Liabilities: Local Banks.



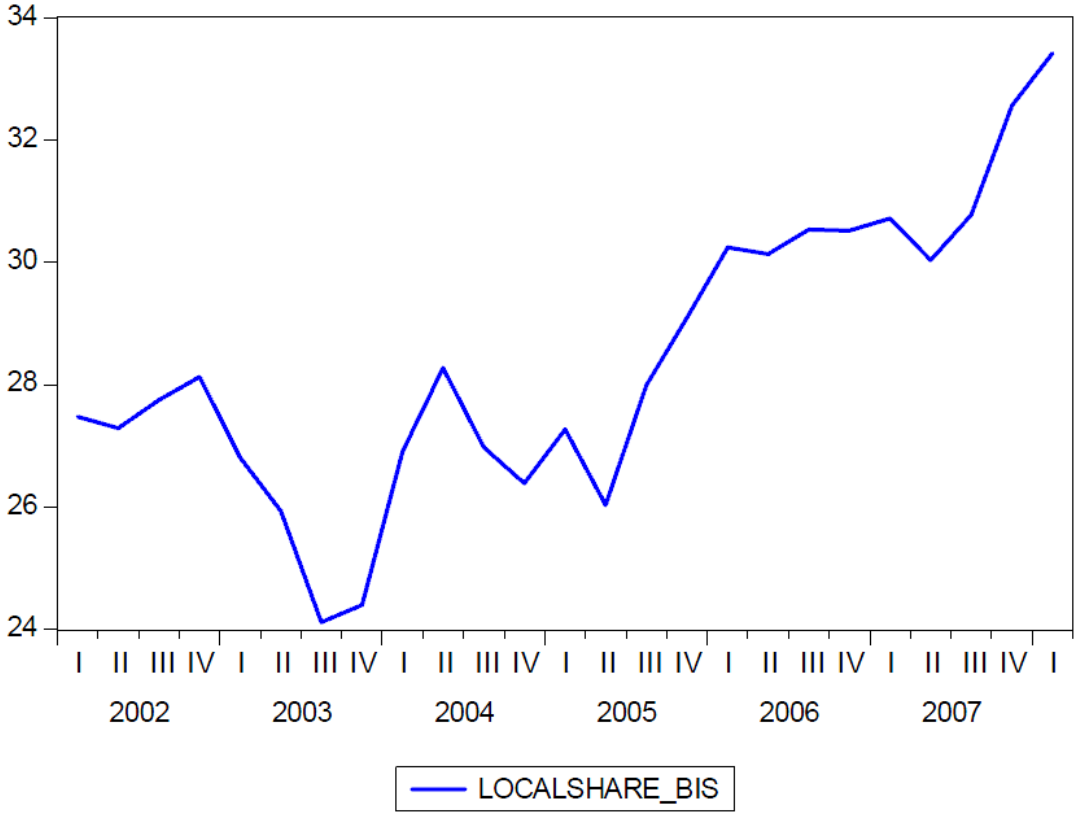
Note: Scaled by total assets. Author's calculations based on Central Bank of Ireland dataset

Figure 18: Composition of Net Foreign Liabilities: Foreign-Owned Banks.



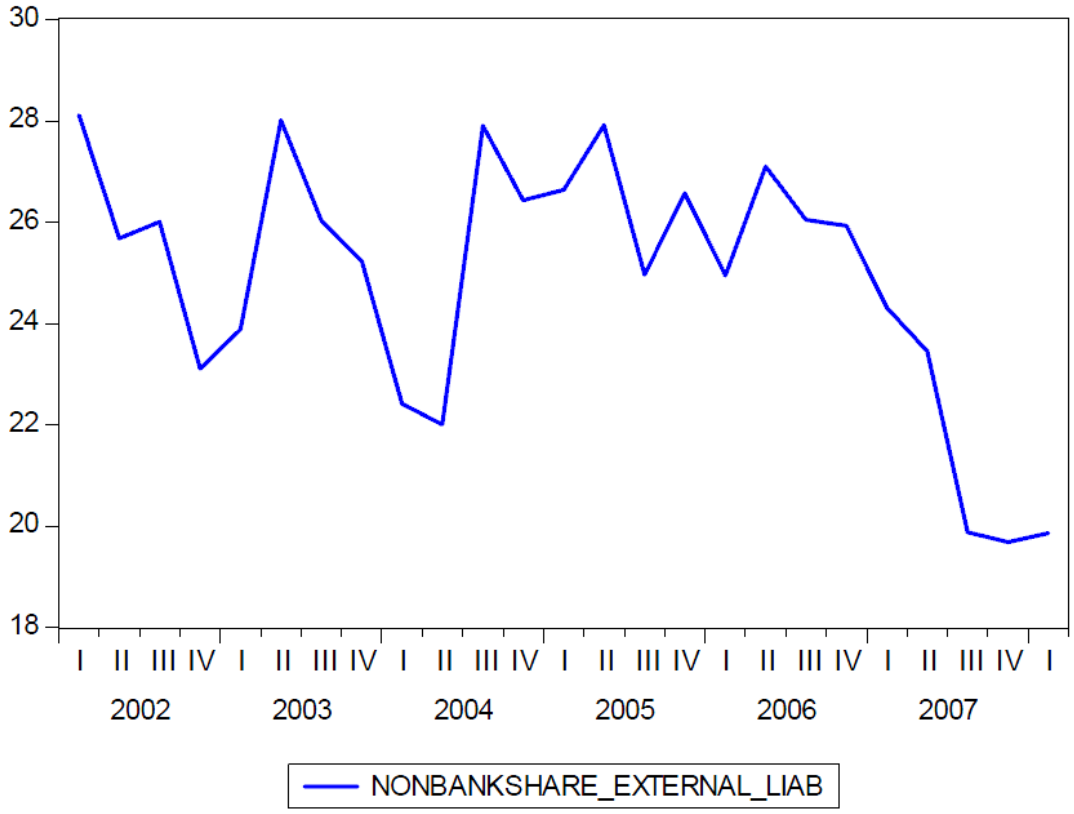
Note: Scaled by total assets. Author's calculations, based on Central Bank of Ireland data.

Figure 19: Share of Local Banks in Aggregate External Liabilities of Resident Banks.



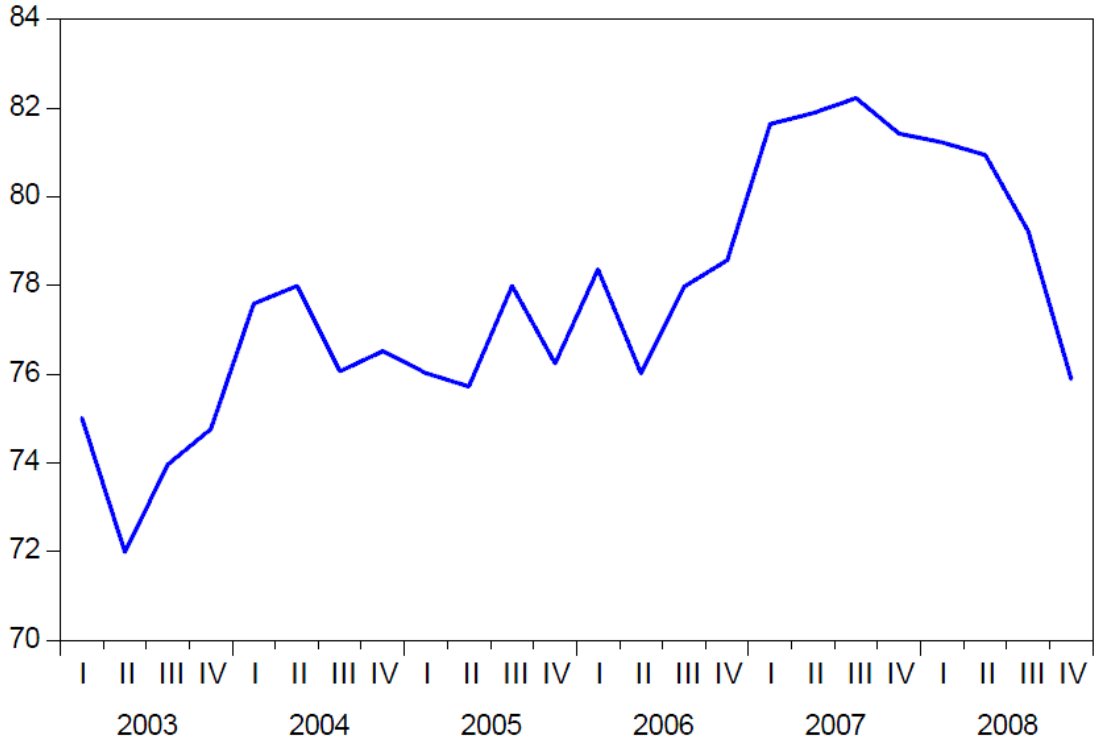
Note: Author's Calculations based on data from BIS and Central Bank of Ireland.

Figure 20: Share of External Liabilities Owed to NonBanks.



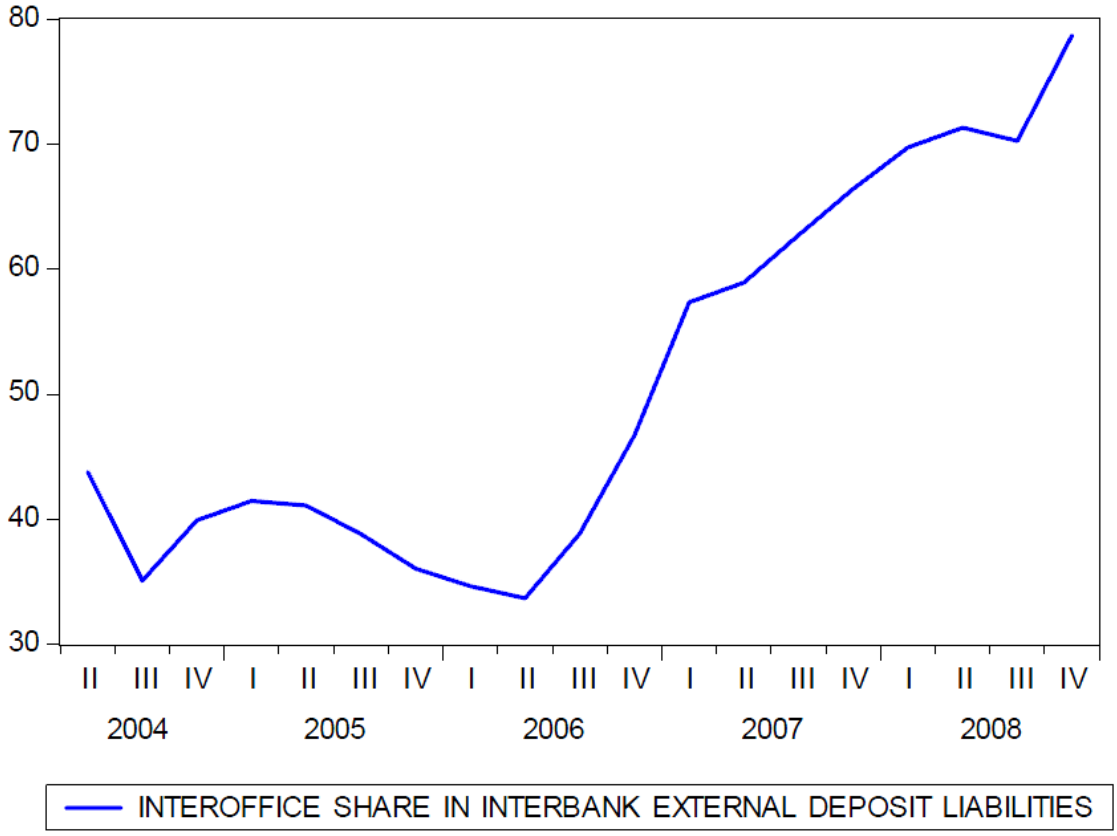
Note: Author's calculations based on Central Bank dataset.

Figure 21: InterBank Share in External Deposit Liabilities.



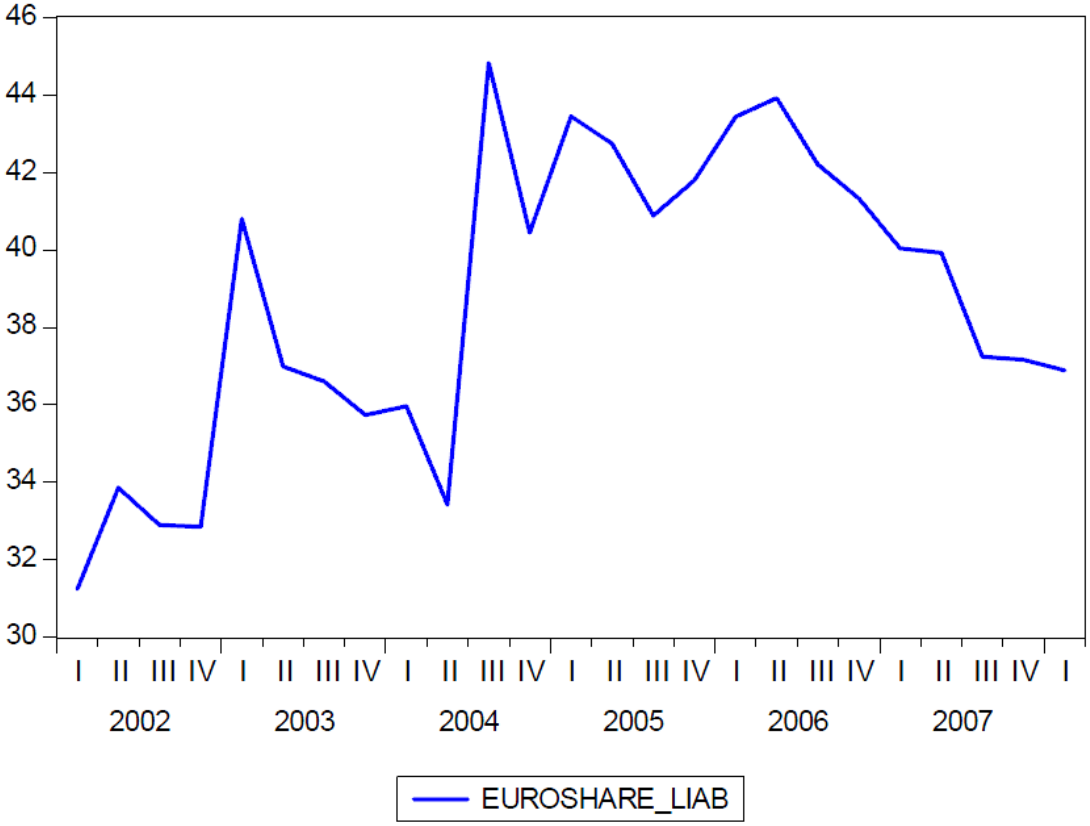
Note: Author's calculations based on Central Bank of Ireland data.

Figure 22: Inter-Office Share in Inter-Bank External Deposit Liabilities.



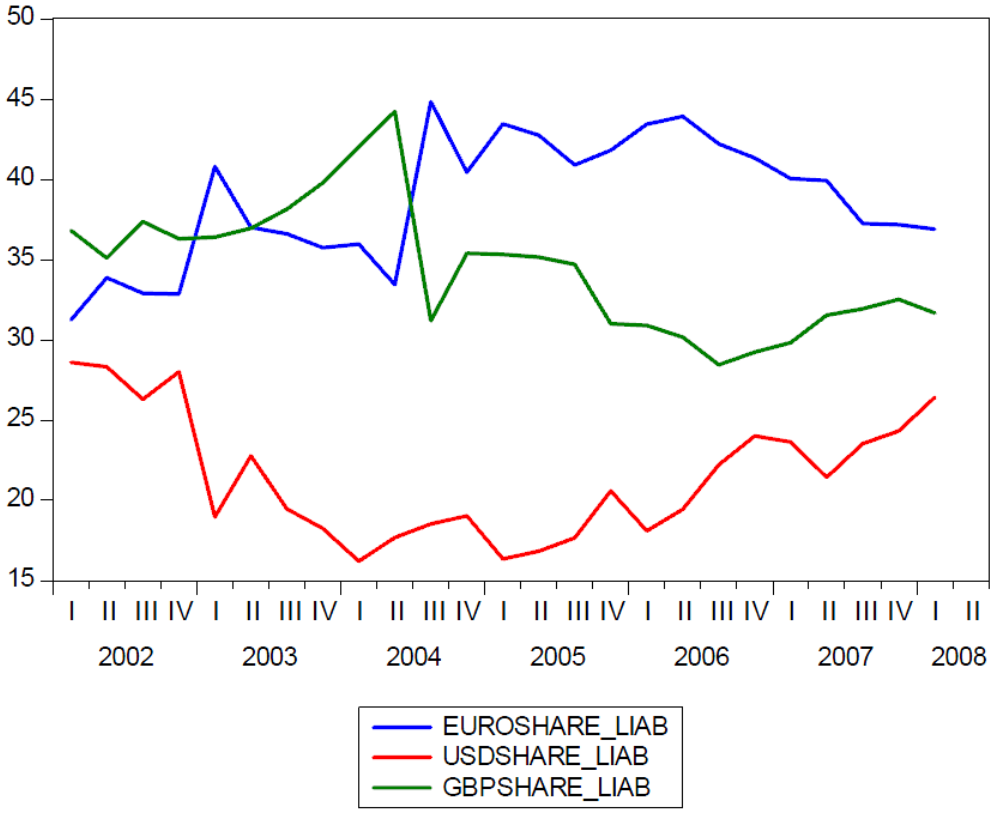
Note: Author's calculations based on Central Bank of Ireland data.

Figure 23: Share of External Liabilities Denominated in Euro.



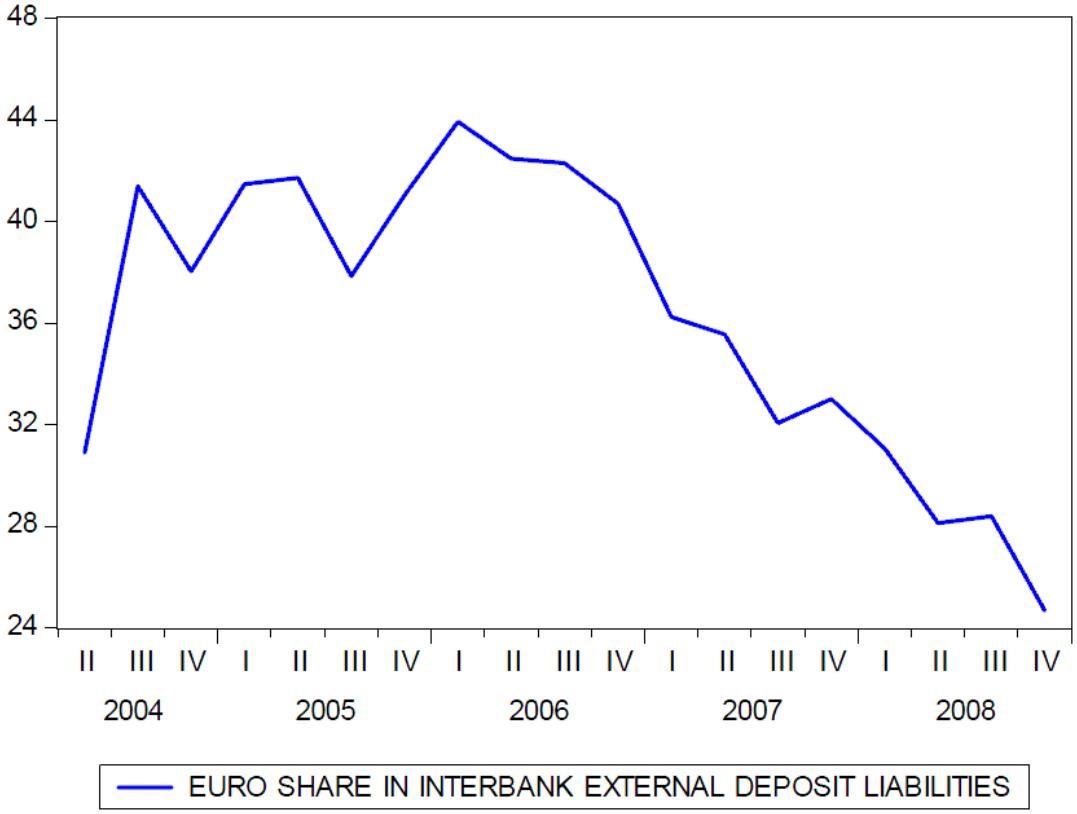
Note: Author's calculations based on Central Bank data.

Figure 24: Currency Shares in External Liabilities.



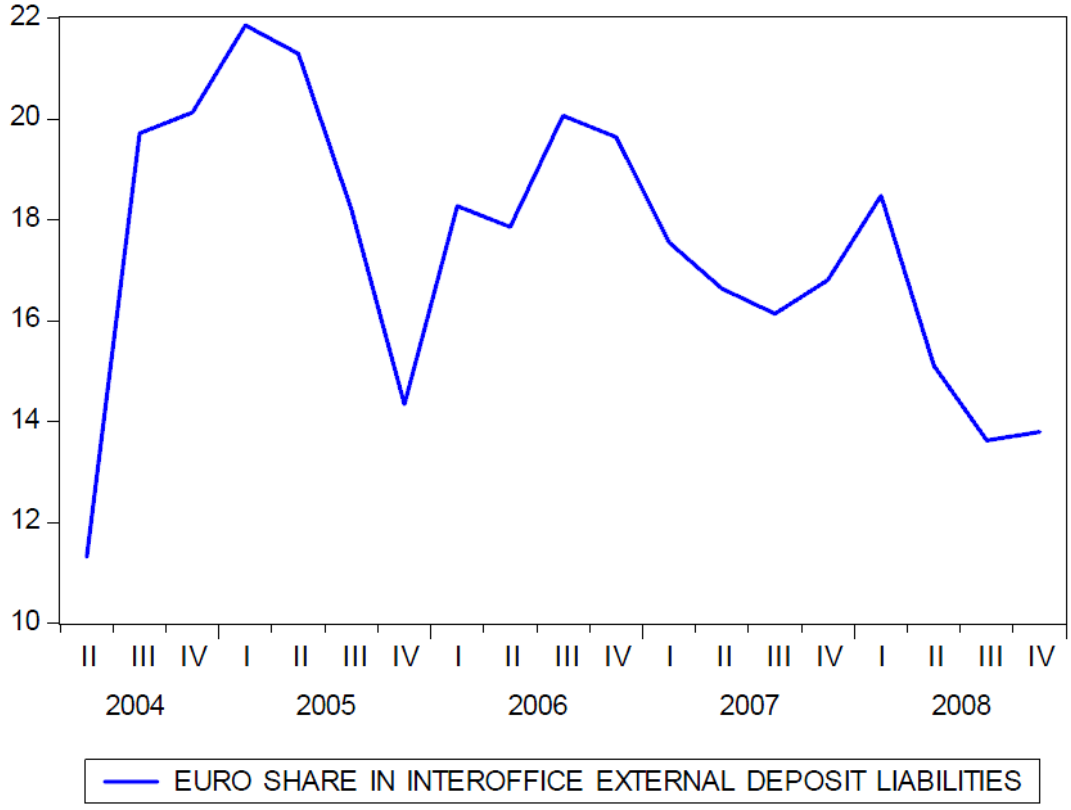
Note: Author's Calculations based on Central Bank data.

Figure 25: Euro Share in Inter-Bank External Deposit Liabilities.



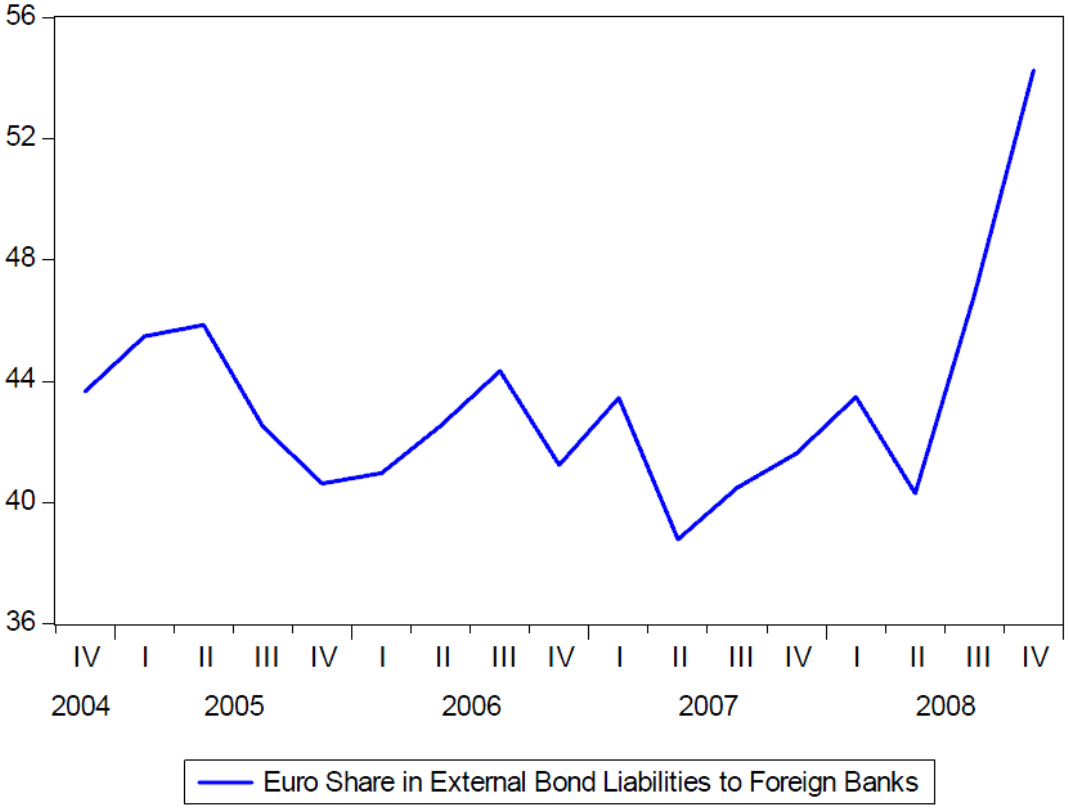
Note: Author's calculations based on Central Bank of Ireland data.

Figure 26: Euro Share in Inter-Office External Deposit Liabilities.



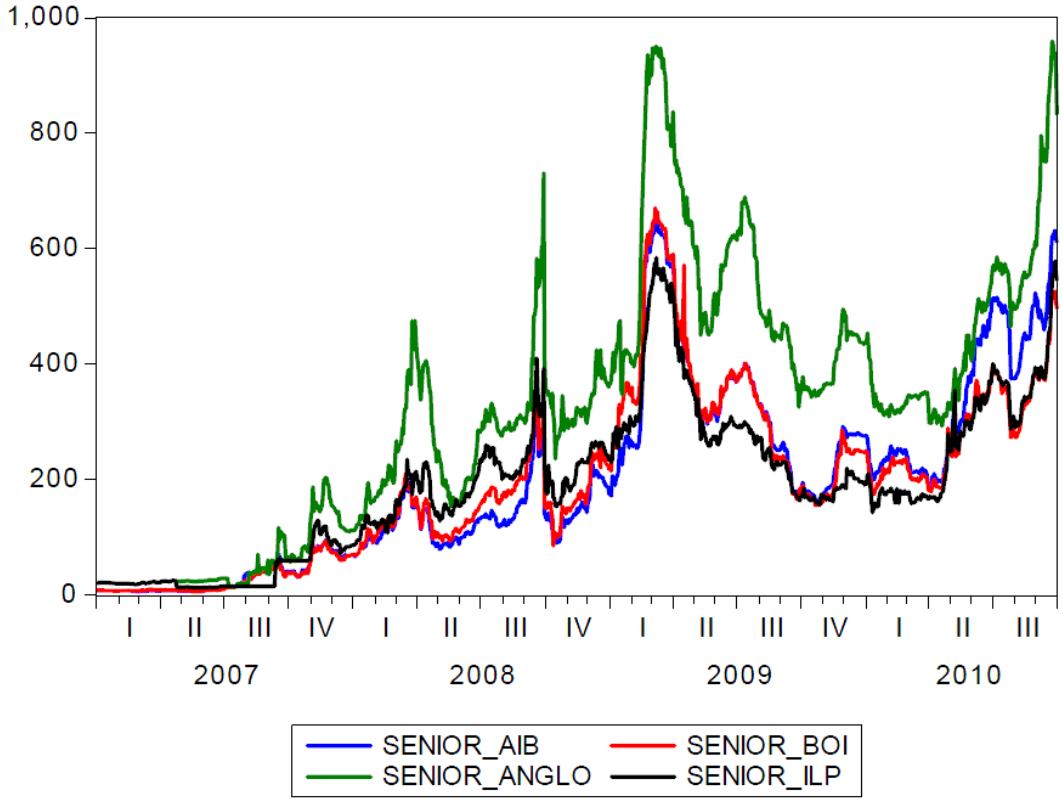
Note: Author's calculations based on Central Bank of Ireland dataset.

Figure 27: Euro Share in External Bond Liabilities to Foreign Banks.



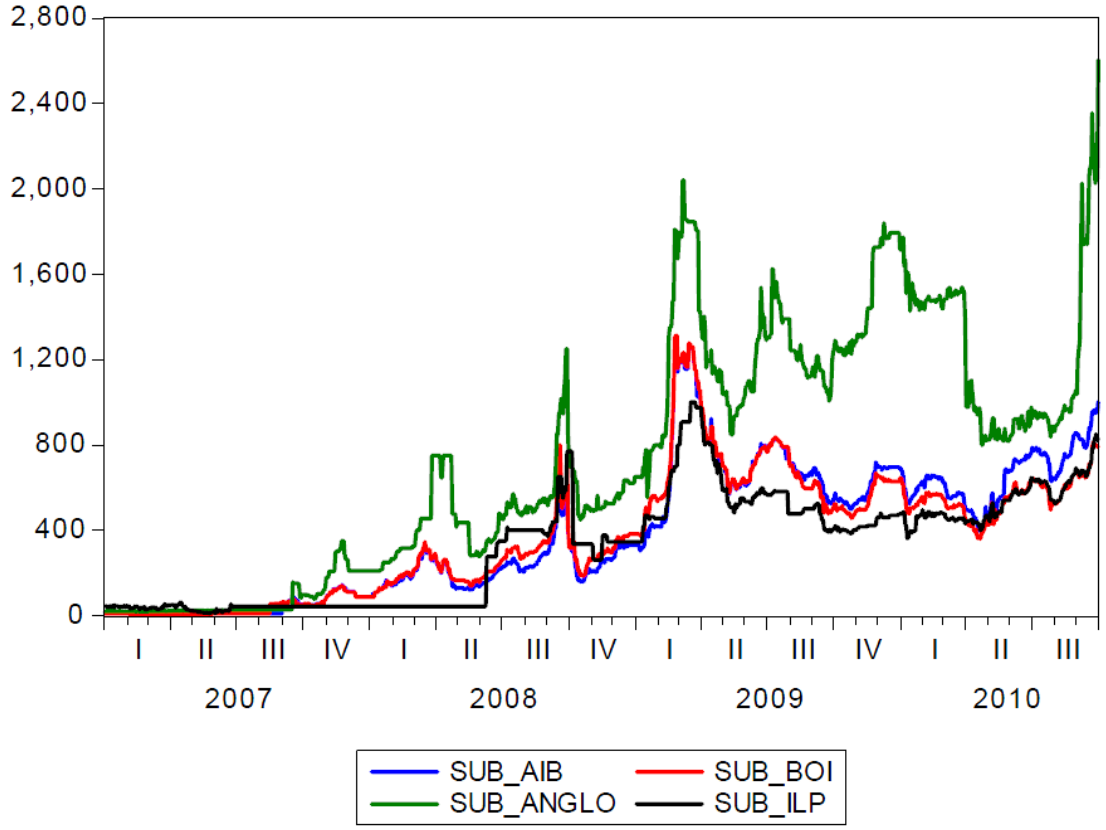
Note: Author's calculations based on data from Central Bank of Ireland.

Figure 28: Spreads on Credit Default Swaps (5 year senior bonds).



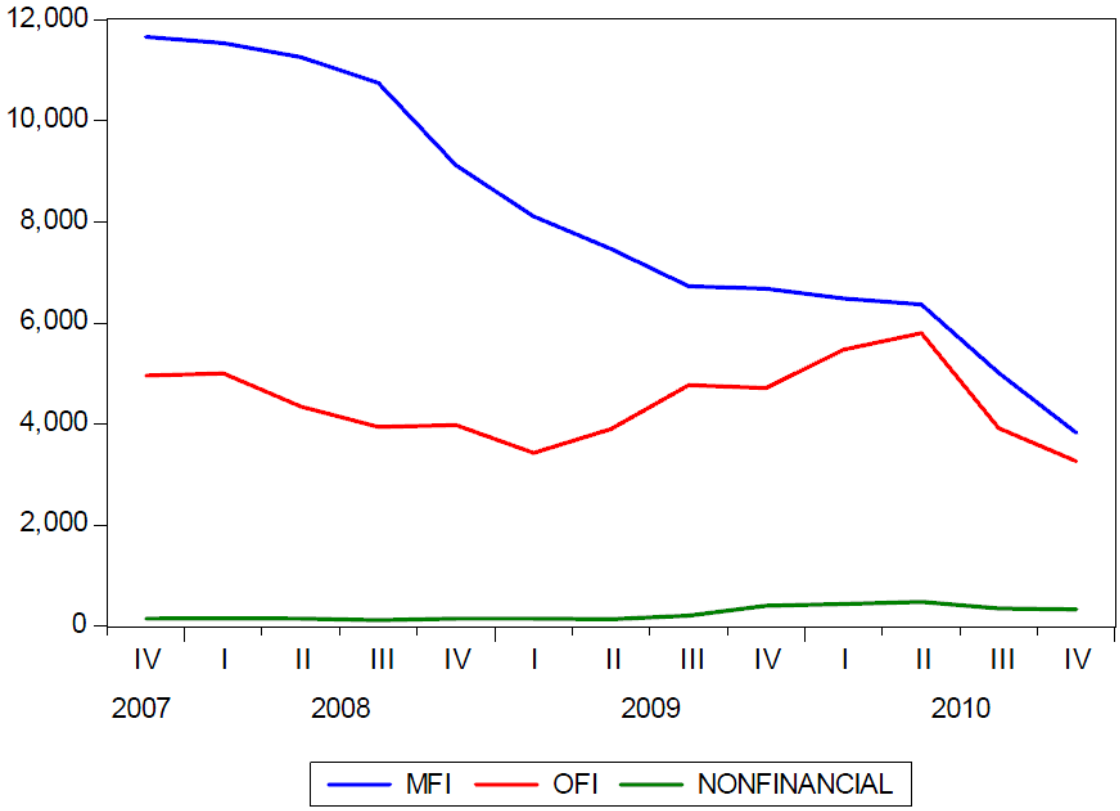
Note: Author's calculations based on data sourced from Datastream.

Figure 29: Spreads on Credit Default Swaps (5 year subordinated bonds).



Note: Author's calculations based on data sourced from Datastream.

Figure 30: German Holdings of Irish Bank Bonds.



Source: Author's calculations based on Bundesbank data.

Table 1: Subordinated Bond Issues by Irish Banks 2002-2008.

Note: the details on the securities are drawn from the Thomson One database, *Euroweek*, *Wall Street Journal* and annual financial reports of the banks.

Issue Date	Security issued	Proceeds mil. USD	Description
Bank of Ireland PLC			
03/10/2003	**6.250% Perpetual Subord Bonds**	557.40	Bank of Ireland UK Holdings PLC - GBP 350 million of 6.25% callable preferred securities with a perpetual maturity at 99.443. Spread U.K. 2021 gilts plus 192 basis points. Guarantor the governor and company of the Bank of Ireland.
25/11/2003	Mdm-Trm Sub Nts due '13	706.79	Bank of Ireland - 600 million euros of tier-two floating-rate notes at 35 basis points above 3-month euro interbank offered rate due Dec 19 2013, at 99.858, via BNP Paribas and HSBC. Fees 0.35%.
02/11/2004	4.625% Subord Bonds due '19	820.64	Bank Of Ireland - 650 million euro of lower-tier-II callable bonds. Maturity Feb. 27, 2019; coupon: 4.625%; reoffer: 99.588; payment: Feb. 25, 2004; spread: 42 basis points above midswaps or 55.8 basis points above 4.25% January 2014 bundesobligation; call: Feb. 26, 2014, at par, if not called coupon rises by 100 basis points; ratings: A1 (Moody's), single- A (S&P); listing: London; interest: annual, then quarterly after coupon rise.
22/02/2005	6.250% Subord Bonds due	795.76	BOI Capital Funding (No.1) LP - 600 million euro in Tier 1 preferred securities. Maturity: perpetual; coupon: 6.25% in first two years, 10 basis points above 10- year CMBS from third year; price: 100; payment: March 2, 2005; guarantor: Bank of Ireland; ratings: A2 (Moody's), single-A- minus (S&P); listing: Amsterdam; interest: annual.
21/06/2005	Mdm-Trm Sub Nts due '17	729.13	Rating: A1. Amount: 600m euro lower tier two capital. Maturity: 3 July 2017. Issue price: 99.805. Coupon: three month Euribor plus 30bp until 3 July 2012; three month Euribor plus 80bp thereafter. Call option: at par from 3 July 2012. Spread at re-offer: three month Euribor plus 33bp.
09/09/2005	Mdm-Trm Sub Nts due '15	339.20	-
13/12/2005	4.875% Sub MT Bank Nts due '17	614.67	Bank of Ireland - GBP 350 million of subordinated bonds. Maturity: Dec. 22, 2017; coupon: 4.875%; price: 99.271; payment: Dec. 22, 2005; spread: 62 basis points above gilts; call: Jan. 22, 2013, at par; ratings: A1 (Moody's), single-A (Standard & Poor's Ratings Group); listing: Dublin; interest: annual.
20/01/2006	**5.571% Perpetual Gtd Sub Bonds**	800.00	The Preferred Securities bear interest at a rate of 5.571% per annum to but excluding 1 February 2016 and thereafter at a floating rate of interest of 1.68% per annum above the rate for US$ Libor three month US dollar deposits.
27/01/2006	**0% Perpetual Gtd Sub Bonds**	400.00	On 27 January 2006 BOI Capital Funding (No.2) LP (the Issuer) issued US$800m Fixed Rate/Variable Rate Guaranteed Non-voting Non-cumulative Perpetual Preferred Securities (the Preferred Securities) having the benefit of a subordinated guarantee by the Bank, each with a liquidation preference of US$1,000.
09/12/2006	**6.43% Perpetual Gtd Sub Bonds**	937.05	BOI Capital Funding { GBP 500 million of bonds was priced with the following terms. Maturity: perpetual; coupon: 6.4295%; reoffer price: par; payment: Sept. 20, 2006; spread: 185 basis points over the 4.75% September 2015 gilt; call: April 4, 2017, thereafter the coupon steps up to 150 basis points over 3 month Libor; guarantor: The Governor and Co. of the Bank of Ireland; ratings: A2 (Moody's), A-minus (SP) denominations: GBP 50,000; listing: Ireland.
15/01/2007	Mdm-Trm Sub Nts due '17	969.02	Bank of Ireland - 750 million euro of floating-rate notes. Maturity: Jan. 24, 2017; coupon: 20 basis points more than three-month euribor; price: 99.863; payment: Jan. 23, 2007; ratings: A1 (Moody's), single-A (S&P); listing: Dublin; interest: quarterly.
28/06/2007	Mdm-Trm Sub Nts due '18	599.38	Bank of Ireland -$600 million of oating-rate notes. Maturity: July 5, 2018; coupon: 22 basis points more than three-month Libor; price: 99.897; payment: July 5, 2007; ratings: Aa2 (Moody's), single-A-plus (S&P); listing: Dublin; interest: quarterly. The bonds are being sold under the borrower's euro medium-term note program.
31/07/2008	9.250% Mdm-Trm Sub Nts due '20	891.20	Bank of Ireland - A GBP 450 million, 2020-dated, subordinated, lower-tier-two bond. Maturity: Sept. 7, 2020; coupon: 9.25%; issue: 99.846; payment: Aug. 7, 2008; spread: 370 basis points more than midswaps; ratings: Aa3 (Moody's), A (S&P), A+ (Fitch Inc.); listing: Dublin; interest: annual.

Issue Date	Security issued	Proceeds mil. USD	Description
Allied Irish Banks PLC			
11/12/2003	5.625% Mdm-Trm Sub Nts due '30	585.49	Allied Irish Banks PLC - GBP 350 million of subordinated bonds. Maturity: Nov. 29, 2030; coupon: 5.625%; price: 99.924, reoffer price: 99.924; payment date: Nov. 26, 2003; spread: 65 basis points above Gilts; call option: callable Nov. 26, 2025, if not called, coupon steps up 100 basis points to 145 basis points above three-month Libor; ratings: A1 (Moody's), single-A-minus (S&P); listing: London; interest: annual.
17/12/2004	Subord Bonds due '15	530.79	Allied Irish Banks PLC - 400 million euro subordinated floating-rate note. Maturity: March 23, 2015; coupon: 30 basis points above the three-month euro interbank offered rate; price: 99.901; reoffer: 99.901; payment: Dec. 23, 2004; call: March 23, 2010, at par; ratings: A1 (Moody's), single-A-minus (S&P), A+ (Fitch Inc.); listing: Dublin; interest: quarterly.
25/02/2005	5.250% Mdm-Trm Sub Nts due '25	955.15	Allied Irish Banks PLC - GBP 500 million, lower Tier 2 bond. Maturity: March 10, 2025; coupon: 5.25%; reo_er: 99.321; payment: March 10, 2005; spread: 56 basis points above 8% gilts; call: March 10, 2020, when the coupon resets to pay 100 basis points above London interbank o_ered rate; ratings: A1 (Moody's), single-A-minus (S&P).
08/10/2005	**5.250% Perpetual Mdm-Trm Sub Nts**	713.96	Allied Irish Banks PLC - GBP 400 million of upper tier-2 notes. Maturity: perpetual; coupon: 5.25%; price: 99.343; spread: 88 basis points above Apr 2015 gilt; payment: Aug. 31, 2005; listing:Dublin; interest: annually; ratings: A1 (Moody's), single-A-minus (S&P).
10/07/2005	Mdm-Trm Sub Nts due '17	609.06	Allied Irish Banks PLC - 500 million euro of subordinated lower tier-2 bonds. Maturity: Oct. 24, 2017; coupon: 25 basis points above three-month euro interbank offered rate; price: 99.935; payment: Oct. 24; call: Oct. 24, 2012, if not called coupon will step up 50 basis points; ratings: A1 (Moody's), single-A (S&P), A+ (Fitch); listing: Dublin.
28/05/2008	Mdm-Trm Sub Nts due '23	1,385.49	Allied Irish Bank PLC - GBP 700 million bond issue. Maturity: Jul 5, 2023; coupon: 7.875%; reoffer: 99.948; spread: 250 basis points more than midswaps; call option: 10 years after issue; ratings: Aa3 (Moody's), A (S&P), A+ (Fitch Inc.); interest: semiannual.
Issue Date	**Security issued**	**Proceeds mil. USD**	**Description**
Anglo Irish Bank Corp PLC			
15/07/2002	**7.625% Perpetual Subord Bonds**	246.93	Anglo Irish Asset Finance - GBP 160 million offering of 7.625% perpetual maturity Tier 1 noninnovative capital securities was priced at 99.362.
03/07/2003	**7.625% Perpetual Gtd Sub Bonds**	67.96	Guarantor: Anglo Irish Bank Corp plc Rating: Baa2/BBB+ (Moody's/Fitch). Amount: 90m tier one capital. (increased 11/03/03 from 40m and fungible with 160m issue launched 15/07/02). Maturity: perpetual. Issue/re-offer price: 106.00 (increase priced at 106.681). Coupon: 7.625%. Spread at re-offer: 260bp over the 6%. December 2028 Gilt.
03/11/2003	**7.625% Perpetual Subord Bonds**	85.73	Anglo Irish Asset Finance PLC - GBP 200 million, increased from GBP 160 million, of 7.625% tier-one noninnovative capital securities with a perpetual maturity at 106. Spread 260 basis points above gilts. Guarantor Anglo Irish Bank Corp.
16/06/2004	Subord Bonds due '14	898.98	Anglo Irish Bank Corp. - 750 million euro of lower Tier 2 floating-rate notes. Maturity: June 25, 2014; coupon: 45 basis points above three-month European interbank offered rate; price: 99.763, reoffer price: 99.763; payment date: June 25, 2004; call option: June 25, 2009 at par and callable on each subsequent interest-payment date; ratings: A3 (Moody's), single-A-minus (Fitch); listing: London; interest: quarterly.
21/09/2004	**6.000% Perpetual Subord Bonds**	740.10	Anglo Irish Capital U.K. - 600 million euro subordinated perpetual bond. Maturity: perpetual; coupon: 6% in first year and thereafter coupon pays 25 basis points above the 10-year constant maturity swap, subject to a cap of 9%; price: 100; reoffer: 100; payment: Sept. 30, 2004; call: in 2010 at par; guarantor: Anglo Irish Bank Corp.; ratings: Baa1 (Moody's), A- (Fitch Inc.); listing: Luxembourg, Euronext Amsterdam; interest: semiannual. Sales are restricted to the U.S., U.K., Ireland and Luxembourg.
06/03/2005	**6.750% Perpetual Subord Bonds**	543.47	-
27/09/2005	5.250% Sub Notes due '15	526.05	Anglo Irish Bank Corp. - GBP 300 million of bonds. Maturity: perpetual; coupon: 5.25%; price: 99.235; payment: Oct. 5, 2005; spread: 100 basis points above 4.75% gilt due 2015; ratings: A3 (Moody's), A- (Fitch Inc.); listing: Dublin; interest: annual.

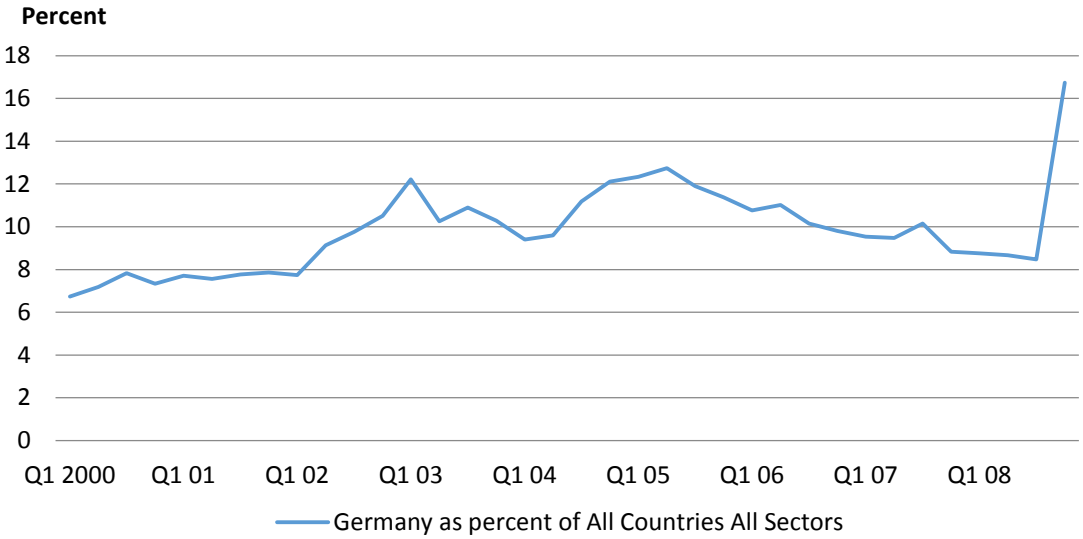
28/09/2005	4.800% Sub Notes due '17	200.00	The US$35m Subordinated Notes Series B 2017 bear interest at 4.80% per annum to 28 September 2012 and thereafter reset at three month LIBOR plus 0.93% per annum.
28/09/2005	4.710% Sub Notes due '15	200.00	The US$165m Subordinated Notes Series A 2015 bear interest at 4.71% per annum to 28 September 2010 and thereafter reset at three month LIBOR plus 0.92% per annum.
06/07/2006	Mdm-Trm Sub Nts due '16	639.41	Anglo Irish Bank - 500 million euro of notes. Maturity: June 21, 2016; coupon: 30 basis points above three-month euribor; price: 99.767; payment: June 21, 2006; spread: 35 basis points above three-month euribor; call: June 21, 2011, at par; ratings: A3 (Moody's), A-minus (S&P); listing: Dublin; interest: quarterly.
19/09/2006	**5.219% Perpetual Subord Bonds**	760.62	Anglo Irish Capital - 600 million euro of bonds. Maturity: perpetual; coupon:5.219%; price: par; reoffer price: par; payment: Sept. 29, 2006; spread: 120 basis points above midswaps; call: Sept. 29, 2016; guarantor: Anglo Irish Bank Corp.; ratings: Baa1 (Moody's); A (Fitch Inc.); listing: Dublin.
17/05/2007	**6.949% Perpetual Subord Bonds**	691.15	"On 1 June 2007 the limited partners of the Anglo Irish Capital UK (3)LP ('issuer') contributed capital in the form of Stg350m Fixed Rate/Floating Rate Guaranteed Non-Voting Non-Cumulative Perpetual Preferred Securities ('preferred securities') issued at par in the denomination per preferred security of Stg50,000 and integral multiples of Stg1,000 thereabove (subject to investors holding a minimum interest of Stg50,000). The preferred securities have the benefit of a subordinated guarantee by Anglo Irish Bank Corporation Limited ('guarantor'). The issuer is a limited partnership organised under the laws of England and Wales and its general partner is Anglo Irish Capital GP Limited, a wholly owned subsidiary of the guarantor. The preferred securities are perpetual and have no repayment date. However, they are redeemable in whole, but not in part, at the option of Anglo Irish Capital GP Limited and subject to the prior approval of the Financial Regulator in Ireland, at their issue price together with any outstanding payments on 1 June 2017, or on any distribution payment date thereafter. Cash distributions to the limited partners are payable semi-annually in arrears on 1 June and 1 December each year up to and including 1 June 2017, and thereafter quarterly in arrears on 1 March, 1 June, 1 September and 1 December. The distribution rate on the preferred securities was fixed at 6.949% per annum to 1 June 2017 and thereafter resets at three month LIBOR plus 1.39% per annum. Anglo Irish Bank Corporation Limited has guaranteed the holders of the preferred securities with respect to their rights to distributions and on liquidation. The guarantee gives, as nearly as possible, the holders of the preferred securities rights equivalent to those which the holders would be entitled to if they held preferred securities in Anglo Irish Bank Corporation Limited itself. No distributions can be paid in respect of the preferred securities by the issuer or the guarantor if the guarantor is not in compliance with applicable regulatory capital adequacy requirements."
06/05/2007	Mdm-Trm Sub Nts due '17	1,013.55	The EUR750m Callable Floating Rate Subordinated Notes 2017 were issued on 19 June 2007, and bear interest at three month EURIBOR plus 0.25% to 19 June 2012 and thereafter at three month EURIBOR plus 0.75% per annum. They are callable in whole or in part at the option of the Bank, subject to the prior approval of the Financial Regulator in Ireland, at their principal amount together with any outstanding payments on 19 June 2012 or on any coupon date thereafter.
Issue Date	**Security issued**	**Proceeds mil. USD**	**Description**
Irish Life & Permanent PLC			
23/06/2003	Mdm-Trm Sub Nts due '13	173.46	Rating: A2 Amount: Euro 150m subordinated debt Maturity: July 7, 2013 Issue price: 100.00 Coupon: three month Euribor plus 70bp until 07/07/08; thereafter three month Euribor plus 120bp Call option: at par from 07/07/08.
31/10/2006	Step-Up Sub Bds due '16	63.59	-
31/01/2007	**5.250% Perpetual Subord Bonds**	258.38	Rating: A-/A. Amount: Euro 200m upper tier two capital. Maturity: perpetual. Issue/re-offer price: 99.173. Coupon: 5.25% until 8 February 2017; thereafter coupon steps up to three month Euribor plus 203bp. Call option: at par from 8 February 2017. Spread at re-offer: 103bp over mid-swaps.
04/05/2007	Mdm-Trm Sub Nts due '17	100.31	Irish Life & Permanent. euro 75m. A1/A+.24 Apr 2017. N/A. EO+27.5bp. r
05/04/2007	Mdm-Trm Sub Nts due '17	406.37	Irish Life & Permament. Mandated euro 300m+.
20/06/2008	Indexed Sub Bds due '18	7.81	-

VOTE OF THANKS PROPOSED BY DERMOT COATES, CENTRAL BANK OF IRELAND

This detailed and insightful paper avails of previously published bank-level and aggregate data in addition to further data made available by the Central Bank of Ireland with regard to the liabilities of the principal domestically-active Irish banks. The foregoing is utilised to construct an analysis of the funding of the Irish banking system in the years directly preceding the onset of the Financial Crisis with a particular emphasis upon some key themes. These include (i) the funding pattern of the domestic banking system during the period 2003-08 and the increasing reliance upon interbank funding and (ii) the role of foreign-resident bank counterparties (particularly, affiliates of the local Irish banks).

The principal source of comparative data on sources of cross-border bank funding is the International Banking Statistics dataset, compiled by the Bank for International Settlements (or BIS). The headline statistics for Ireland, however, have been distorted by the inclusion of German Pfandbrief banks in the past. Indeed, the complexity of the Irish banking system and the external orientation of many of those credit institutions that are resident here, in particular the role of the IFSC, poses challenges in interpreting these data. The objective of the recent Central Bank of Ireland Economic Letter *('Interpreting data for Ireland in the International Banking Statistics'*) has been to mitigate some of these challenges by means of explaining the conceptual and methodological frameworks underlying these data and to assist in interpreting the different data relating to Ireland by demonstrating the impact of key developments during the Financial Crisis.

Chart 1: Irish-resident Bank Liabilities vis-á-vis Germany, 2000-2008

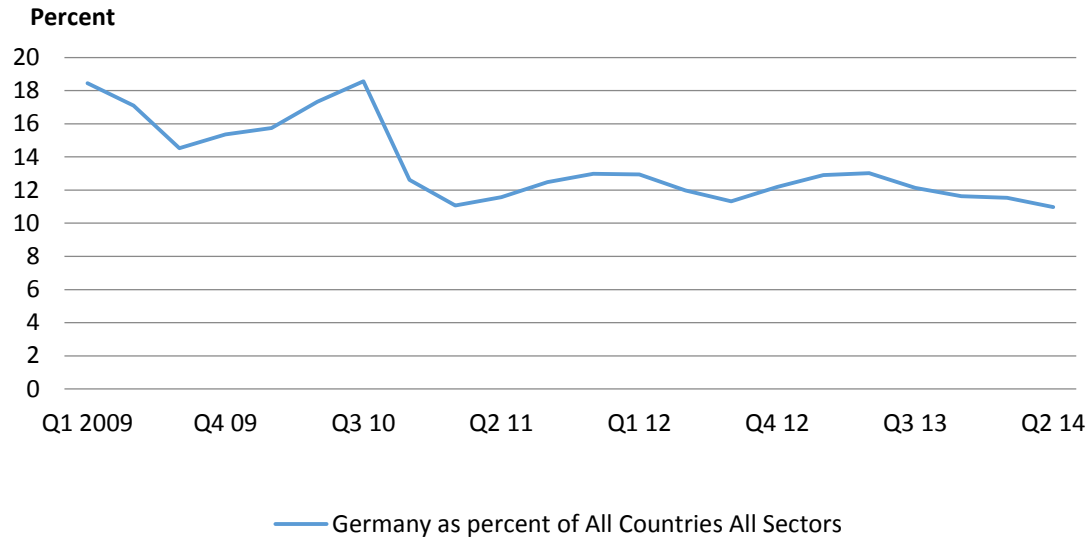


Source: - Bank for International Settlements – Locational Banking Statistics (Residency Basis)

The Locational Banking Statistics[1] demonstrate that the liabilities of all Irish-resident banks to German counterparties stood at approximately 10 per cent of the total international liabilities of the these banks by early-2008 and had been at this level for several years. This, however, was to increase to almost 18 per cent on foot of the provision of extensive support by German authorities to stabilise the Hypo Real Estate Group (or HRE) by end-2008. A large portion of the €50 billion support provided to the HRE Group was channelled to its Irish-resident banking subsidiaries.[2] The state support received by the HRE Group significantly influenced banking flows between Ireland and Germany at this time. In late 2010, the HRE Group transferred a large portion of the balance sheet of its Irish-resident banking subsidiaries to a German-resident resolution vehicle. Thereafter, the liabilities of Irish-resident banks to Germany fell back to around 11 per cent in 2011. This reduction reflected the aforementioned portfolio transfer from HRE Group.

[1] A sub-set of the broader International Banking Statistics (IBS); the locational data references all resident credit institutions on an unconsolidated basis. The IBS also include consolidated data sub-sets.
[2] Including Depfa Bank plc.

Chart 2: Irish-resident Bank Liabilities vis-á-vis Germany, 2009-2014

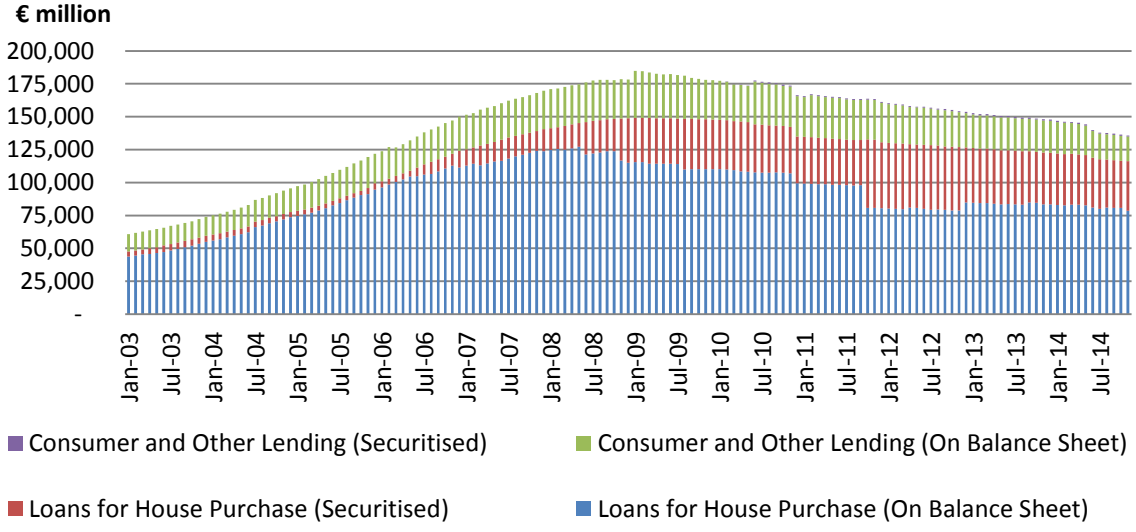


Source: - Bank for International Settlements – Locational Banking Statistics (Residency Basis)

By contrast, the Consolidated Banking Statistics indicated that German claims, on an immediate borrower basis, on Ireland accounted for 23 per cent of total claims by 2008, albeit that this relates to reported claims by German banks on *all* sectors of the Irish economy (rather than merely Irish-resident banks). Indeed, claims on the non-bank sector in Ireland were proportionately most significant. This figure also began to climb throughout 2008 before beginning to fall back from 2011 onwards. On an ultimate risk basis, the equivalent figure for German claims in 2008 is even higher but this is misleading. Such data was not reported by German authorities until late-2013 such that the time series overstates claims by German banks on the Irish economy.

Securitisation had also come to play an important role in the funding of Irish banks. In 2008, securitised loans for house purchases amounted to approx. €17bn. By late-2011, this had peaked at some €52 billion alongside the securitisation of other consumer loans (albeit that the latter is still in absolute terms). The guaranteed banks accounted for approx. 50 per cent of this €52 billion. Securitised loans for house purchases accounted for 32 per cent of all consumer-related lending by 2011.

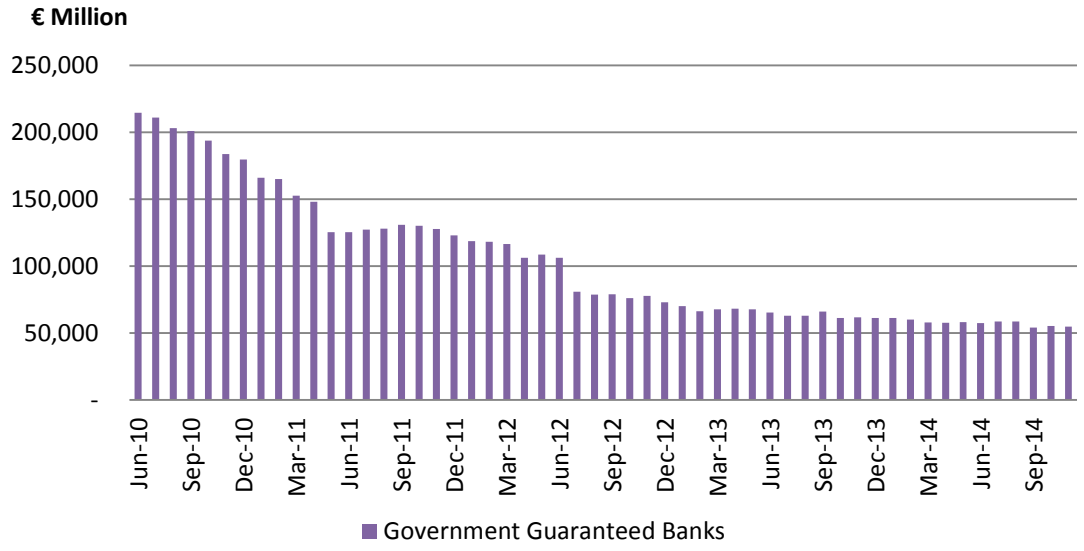
Chart 3: Loans to Irish Residents (Outstanding Amounts, including Securitisations), 2003-2014



Source: Table A.6 Money and Banking Statistics, Central Bank of Ireland

Finally, interbank funding, and the flow of funds between related banks, is another important consideration. In effect, foreign (affiliated) branches of local banks have acted as funding arms as seen in the phenomenon of retrenchment to home markets. In early-2010, deposits from affiliated banks amounted to almost €500 billion for all Irish-resident banks, albeit that this figure fell back by approximately 70 per cent by late-2014. In the case of the guaranteed banks, the equivalent figure in 2010 was more than €210 billion.

Chart 4: Affiliated Bank Funding, 2010-2014



Source: Central Bank of Ireland

DISCUSSION

Gabriel Fagan: I would like to thank Philip for this excellent and comprehensive paper. I have one question. It is argued that shifts in actual bank market shares during the boom period were relatively small. This casts doubt on one standard explanation for the rapid rise in credit during the boom, increased competition , due to the entry of foreign banks into the market and the aggressive by Anglo Irish bank, was an important factor driving the credit boom. However, the data on market shares are ex-post and the small changes actually observed may simply reflect the fact that incumbents responded effectively (by easing credit conditions) to defend their market shares. Therefore, can we really be confident that the small observed changes in market shares is sufficient evidence to justify downplaying the role of heightened competition in driving the credit boom?

Michael Terry: How did we allow two banks control 80% of the market? If we allowed two farmers to control 80% of our food production and one of them died we would have a lot of hungry people. Why did we dispose of our state controlled banks? In 1911 Sir Winston Churchill proclaimed that the government must become the owners, or at any rate the controllers, at the source of at least a proportion of the supply of natural oil which they required. By buying 51% of BP in 1913 the British Government signalled that oil was too important to be left to the oil companies.

Stefan Gerlach: I would like to encourage the author to address the push-vs-pull question raised by the first discussant. As economists we are interested in understanding the relative importance of supply and demand factors in accounting for these flows. The paper looks at these flows from an Irish perspective. It would also be interesting, perhaps in another paper, to look at them from the perspective of the lenders. Perhaps these flows made good sense for British and German investors from a portfolio diversification perspective, in particular given the removal of exchange risk following the adoption of EMU?

Mary Everett: I would like to thank Philip for his extremely interesting analysis of Irish banks' funding.
I have one comment and one question. You note the gap widens between the group level data sourced from banks' annual reports and the residency data sourced the Central Bank of Ireland during the mid-2000s. The difference between these datasets is important. As part of the Irish contribution to the International Banking Research Network initiative (http://www.ny.frb.org/IBRN/index.html), the research I conducted with a couple of Central Bank colleagues found that developments in Irish banks' internal capital markets were important during this period. We found that Irish-owned retail banks had net intra-bank assets – i.e. were net funders of

their foreign affiliates – during the mid-2000s, whereas foreign-owned retail banks in Ireland had net intra-bank liabilities as they were drawing on funding from their foreign parent banks.

We also found that Irish-owned banks increased their reliance on this internal capital market funding from their affiliates at early stages of the global financial crisis in the attempt to offset the effects of liquidity withdrawals they experienced at this time, and became net borrowers vis-à-vis their foreign affiliates. During mid-2010 we found this source of internal capital market funding fell. Possibly arising from the inability of these foreign affiliates to be able to continue to fund their parents, or due to prudential measures, for example "ring fencing" which was adopted by the regulatory authorities in some European countries which constrained the transfer of liquidity by subsidiaries to their foreign parent banks. In terms of my question, given the insight residency data provides analysts to the geographic and currency profiles of bank funding, do you think there is a role for bank regulators to monitor these sources of funding and potential concentration, bearing in mind that the data employed by bank regulators is on a consolidated group level basis?

Noel O'Gorman: I commend Philip for an interesting paper, based on diligent research work. Your analysis demonstrates that the Irish banks encountered increasing difficulty in funding their operations, from quite early in 2007. That trend suggests that market players were already becoming sceptical of the 'Irish story'. You wondered to what extent the growing difficulty in funding, with its implications, was known in bank management suites, in their board-rooms, and in regulatory offices. If it was known in those quarters, then the question arises as to why banks did not adjust their lending policies, and, if not, why there was not a response from boards of the banks, and the financial regulator.

Austin Hughes: Professor Lane is to be congratulated for focussing attention on the critical importance of having adequate, accurate and appropriately disaggregated data if macro prudential policy is to be effective. As others have mentioned, this throws up a wide range of questions in terms of the behaviour of various agents, private and public, domestic and external, through this critical time in Ireland's recent past. A key task will be to frame both the questions and the data in the manner that sheds most light on behaviour. For example, an examination of various institutions share of the aggregate balances sheet may understate the extent of changes in the Irish Banking landscape. The evolution of shares of new lending is probably a better indicator of the substantial change in competitive conditions through this period. So, institutions' shares of changes in the aggregate balance sheet may be a more appropriate barometer of the raised temperature of the lending market in Ireland through this time.

I would add that the chart which shows the share of bond funding in total liabilities and compares this to the Euro area norm emphasises the importance of putting dramatic changes in the Irish banking landscape into a broader context. This chart suggests that in 2003 the low share of bond funding in Ireland was something of an outlier. As such it may hint that Ireland might have been seen as attractive from an international investor perspective for the development of such assets/funding vehicles. Viewed in this light these data would seem consistent with the view that international supply- as distinct from domestic demand, was a key driver of the massive inflows seen through the boom period. The importance of the international context is also clear in the changing composition of funding evident in data for later years. In circumstances where global funding conditions were deteriorating, an appreciation of comparative changes in Irish funding sources might have given some sense of the risks that were soon to crystallise.

Finally, the data show that a significant amount of the increased funding came in Sterling and US dollars rather than Euro, a development that might seem to run counter to the view that the explosion in balance sheets owed something to the elimination of exchange rate risk on Ireland's entry into EMU. Of course, recourse to sterling/ dollar funding not only reflects longstanding ties, it reflects the dominant roles and depth of the respective financial centres and their impact on pricing. The reality is that managing exchange rate risk in Euro was altogether different from managing exchange rate risk in the Irish pound and this facilitated rapid growth in 'foreign currency' elements of Irish banks balance sheets.'

Joe Durkan: There may be some merit in more disaggregated analysis. Bank of Ireland was slower in increasing its property related lending than Allied Irish Bank. The imperative, as both banks saw, it was to recover market share, as institutional investors were concerned about the decrease in market share resulting from the loan activity of Anglo-Irish Bank and the UK banks that had entered the market. The slower reaction of Bank of Ireland may have mitigated the effect on them. On a separate issue did yields on government paper reflect the collapse of bank share prices-did markets anticipate that ultimately taxpayers would pick up the tab for the excesses of the bubble.

Pat McArdle: I join others is thanking Philip for a most interesting analysis. I have just two comments. First, I support what Gabriel Fagan and others have said about market shares. The charts reveal that Anglo Irish did, in fact, increase its market share significantly in an era of no effective regulation. This put pressure on other banks to respond. A post hoc study of market shares risks missing the critical dynamic, i.e. the excessive competition which prevailed and prompted rapid responses to preserve market shares. This has to be understood in the context of the conditions of the time, viz. media cheerleaders for Anglo and Nationwide, shareholders demanding matching share performance and dividends, foreign investors who were even more focused on share performance and, of course, CEO's whose remuneration packages encouraged them to take risks and to try to emulate others. My other point relates to the flows of funds identified. I wonder has Philip looked at the TARGET 2 balances? My recollection is that these show that in the early years of the crisis in particular, the flows out of Ireland ended up almost totally in Germany and that the scale of the flows was greater than those identified in some of the slides presented.

Mary Doyle: The comment was made that banks would have been in less difficulty in terms of liquidity if the different liquidity attributes and flows of the different liabilities were taken into account in the lead up to the financial crisis. This relates in particular to deposits placed in Irish banks by overseas financial institutions, which were particularly liquid and disappeared rapidly when the Irish banking situation deteriorated. Different outflow rates for different types of funding is now a firmly established feature of liquidity measurement. With the new EU Capital Requirement Regulation and subsequent Liquidity Coverage Delegated Act from the Commission, specific liquidity outflows are determined for various types of bank funding. Separate liquidity out flows are set for example for stable retail deposits; where deposit guarantee schemes are in place; more fluid internet deposits etc. Funds from corporates and financial institutions are at the higher end of the liquidity scale and so are considered a less stable source of funding in determining the adequacy of a bank's liquidity ratio. Personnel will be occupied for years in banks modelling and determining their own individual liquidity inflows and outflows, to ensure their funding situation satisfies the new more detailed liquidity requirements. This is one lesson learnt world-wide from the crisis.

Seán Lyons: On the issue of market shares and rivalry, the standard industrial organisation approach would be to start at the level of relevant product markets, which in this case is probably business unit level. For example, the competitive pressure exerted by Anglo Irish Bank would have fallen mainly on commercial, corporate and SME lending units rather than other parts of competitor banks, so the scale of the threat to managers in these businesses would have seemed much greater than a comparison of shares of total liabilities (essentially sector level market share) might suggest. Obviously to look at business unit shares would require more granular data than is presently available.

Stephen McDonagh: The focus of the paper was on the liability side of balance sheet, with assets obviously equal to liabilities. The evolution of the composition of these liabilities was very interesting. Would a similar comparison of the asset side evolution have indicated a potential problem/risk (short-term liabilities vs long-term assets) to the individual bank balance sheets?