

# The Funding of the Irish Domestic Banking System During the Boom\*

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## **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.

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# 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.<sup>1</sup> Since 2010, the Central Bank of Ireland has published more detailed banking statistics (stretching back to 2003) that reports 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

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<sup>1</sup>See also Coates and Everett (2013).

& Permanent, Irish Nationwide and Educational Building Society).<sup>2</sup> 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.

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.<sup>3</sup> 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 (2014) 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

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<sup>2</sup>The latter group was previously described as 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). Since 201X, these other banks are no longer headquartered in Ireland.

<sup>3</sup>Everett et al (2014) provides an important guide to the funding of the Irish banking system over 2001-2012.

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 ( $LOANA$ ); (b) inter-bank deposit assets ( $INTERBANK^A$ ); and (c) other liquid assets ( $LIQ_{OTH}^A$ ).<sup>4</sup> 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 ( $BONDL^{SUBORD}$ ).

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

$$\begin{aligned} GAP &= LOANA - DEPOSITS^C \\ &= (INTERBANK^L - INTERBANK^A) + BONDL^{SENIOR} + BONDL^{SUBORD} + EQUITYL - \end{aligned}$$

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.

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<sup>4</sup>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 too much on the composition of the liquid assets category.

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 data sets.

### 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 local 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.

Figure 1 compares aggregate liabilities from the annual reports compared to the aggregate for the local 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.<sup>5</sup>

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 compete with this relatively minor player (Honohan 2010b, Regling and Watson 2010, Nyberg 2011).

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<sup>5</sup>See also Kearns (2007).

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 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 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 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.

We capture this funding shift by running regressions of the form

$$\begin{aligned}
 NETFORLIAB_t^k &= \alpha^k + \delta^k NETFORLIAB_{t-1}^k + \theta^k LIQDUM_t + \varepsilon_t & (1) \\
 NETFORLIAB_t^k &\equiv (FORLIAB_t^k - FORASSET_t^k)/ASSETS_t
 \end{aligned}$$

where  $FORLIAB_t^k$  and  $FORASSET_t^k$  denotes liabilities and assets in funding category  $k$ ,  $ASSETS_t$  are the total assets of the banking system and  $LIQDUM_t$  is a dummy variable that takes the value 0 during 2003.1-2007.7 and 1 from 2007.8 to 2008.9. We consider four foreign funding categories: (i) total; (ii) deposits/loans; (iii) bonds; and (iv) other. Table 1 shows the results. Consistent with Figure 17, there is a significant shift towards net deposit funding and away from net bond funding after August 2007.

## 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 whereas this new dataset is confined to the main locally-owned domestically-active 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 financial 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%.”*<sup>6</sup>

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.

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<sup>6</sup>FRN is the acronym for floating-rate notes.

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.<sup>7</sup> 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

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<sup>7</sup>Spreads prior to 2007 were much lower.

can be obtained from Bundesbank data in relation to German-resident investors.<sup>8</sup> Figure 30 shows the Irish bank bond holdings of German banks (MFIs), non-bank financial institutions (OFIs) and the nonfinancial sector (households, non-profit institutions serving households and non-financial corporates).<sup>9</sup> Figure 30 shows that the MFI sector was the largest investor in Irish 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.<sup>10</sup> 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 during 2003-2006 but banks increasingly relied on interbank

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<sup>8</sup>This does not include any holdings of the foreign affiliates of German institutions.

<sup>9</sup>These data are an extract from the Bundesbank's Securities Holdings database.

<sup>10</sup>A limitation is that the data do not indicate the roles of net sales versus valuation losses in determining the decline in positions.

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 attention.<sup>11</sup>

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 incipient 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).

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<sup>11</sup>See also Coates and Everett (2013) on the role of interoffice funding.

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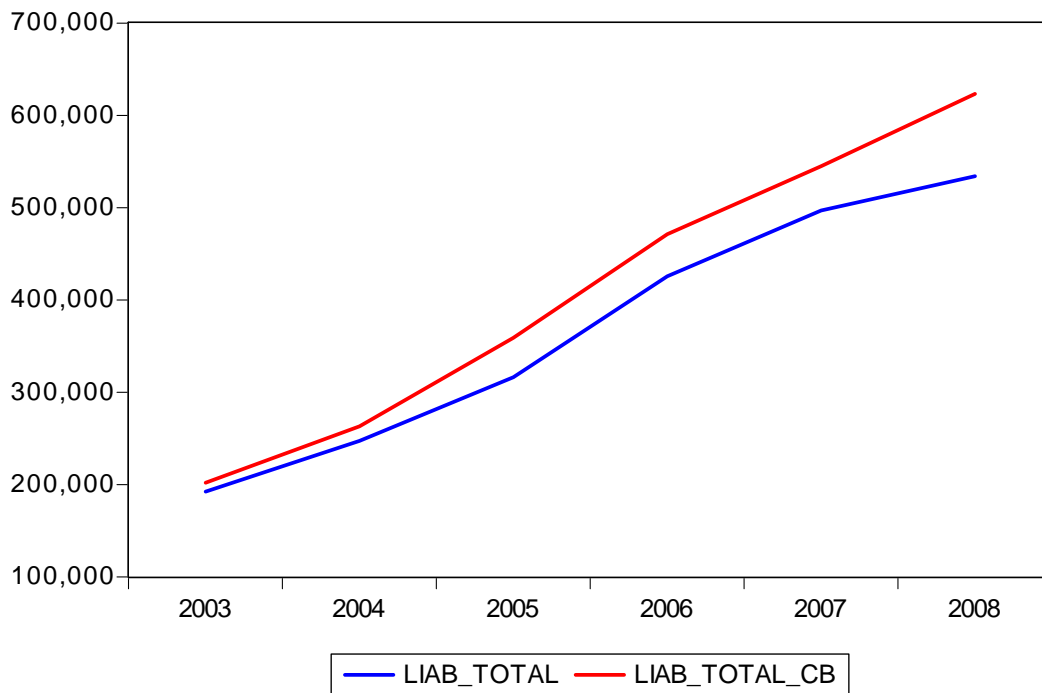


Figure 1: Aggregate Liabilities: Group Level versus Resident Offices. Note: Author's calculations based on annual reports of banks and Central Bank of Ireland data.



Figure 2: Shares in Aggregate Balance Sheet of Local Banks. Note: Author's calculations based on data in annual reports.

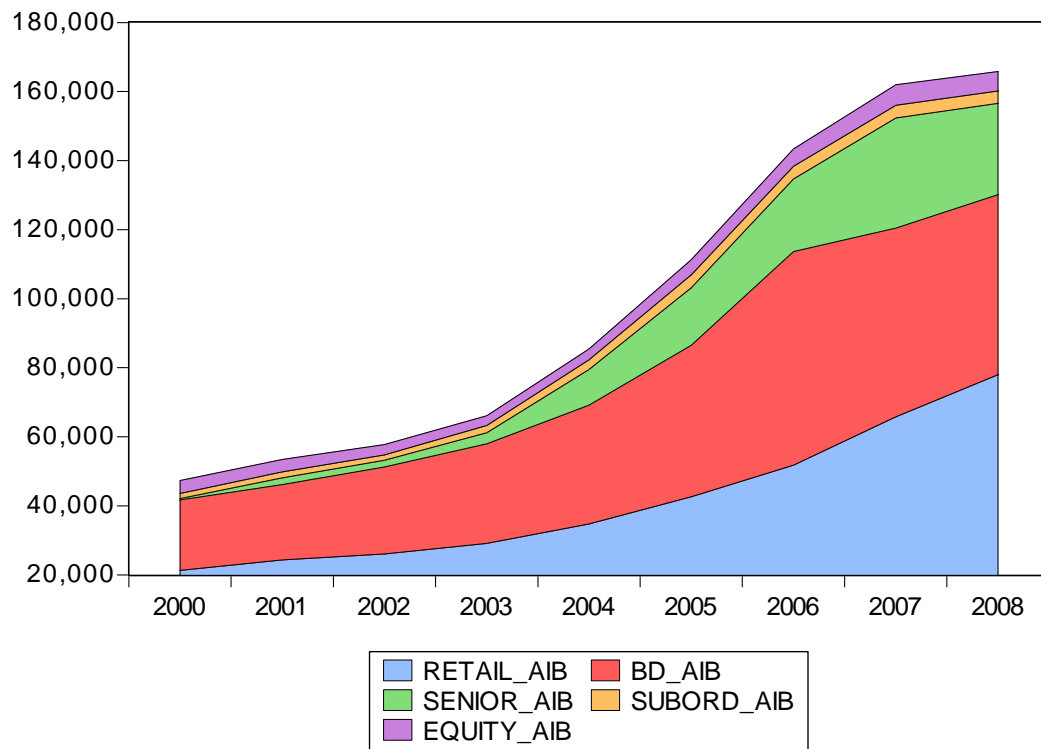


Figure 3: Composition of Liabilities: AIB. Note: Author's calculations based on data from annual reports.

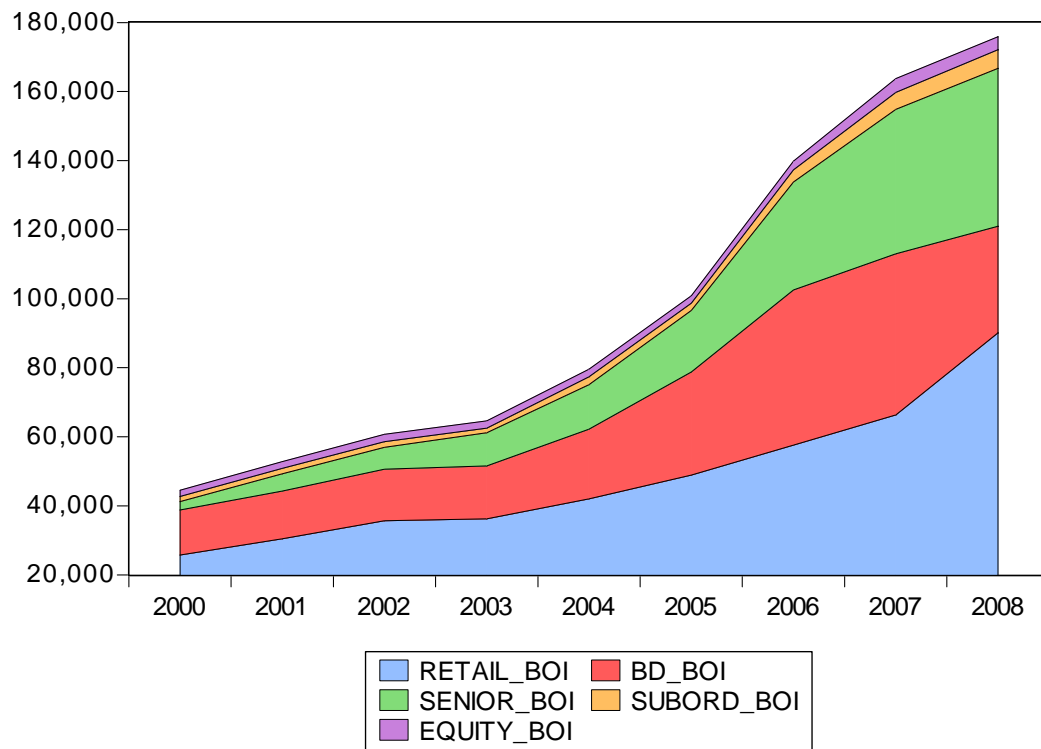


Figure 4: Composition of Liabilities: Bank of Ireland. Note: Author's calculations based on data from annual reports.

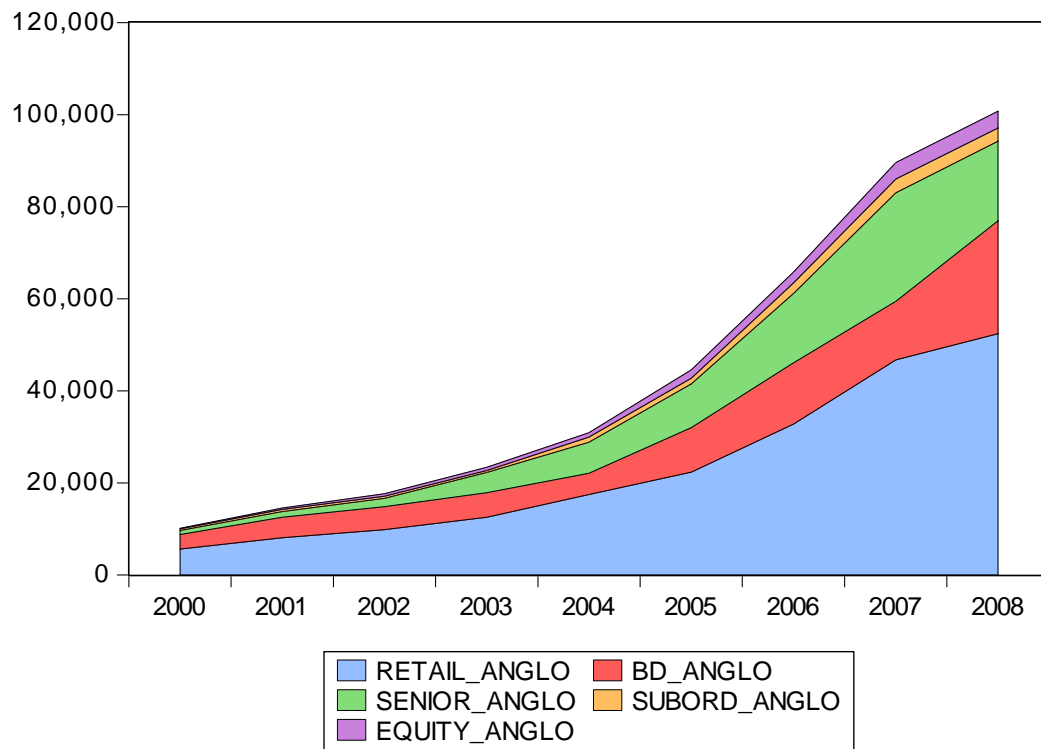


Figure 5: Composition of Liabilities: Anglo Irish Bank. Note: Author's calculations based on data from annual reports.

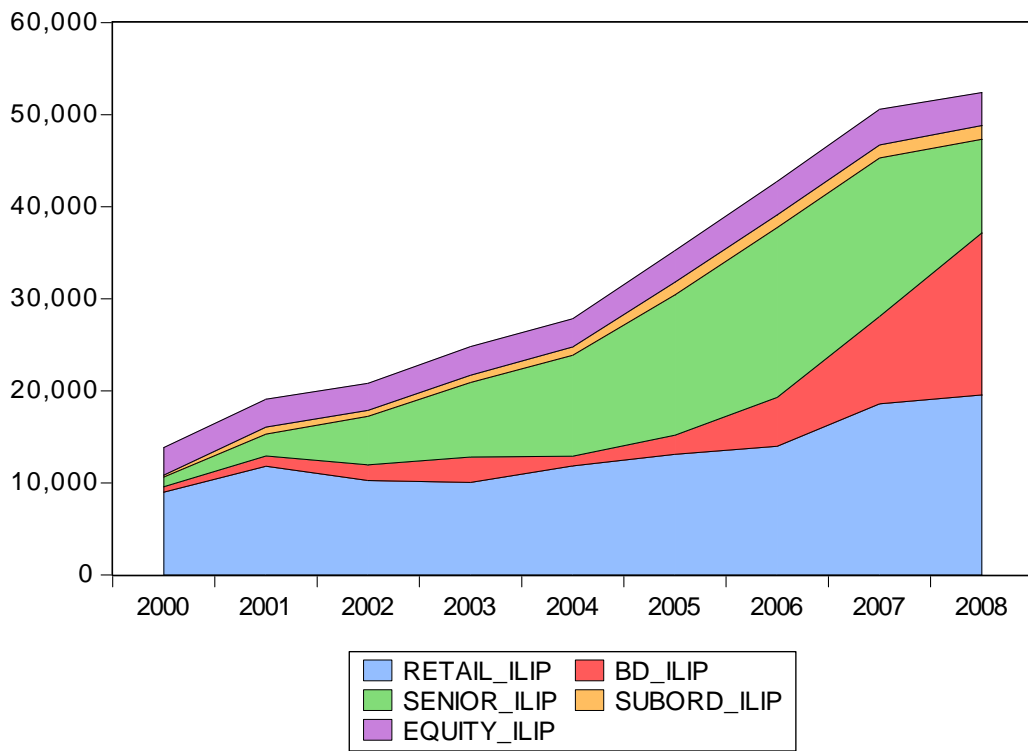


Figure 6: Composition of Liabilities: Irish Life & Permanent. Note: Author's calculations based on data from annual reports.



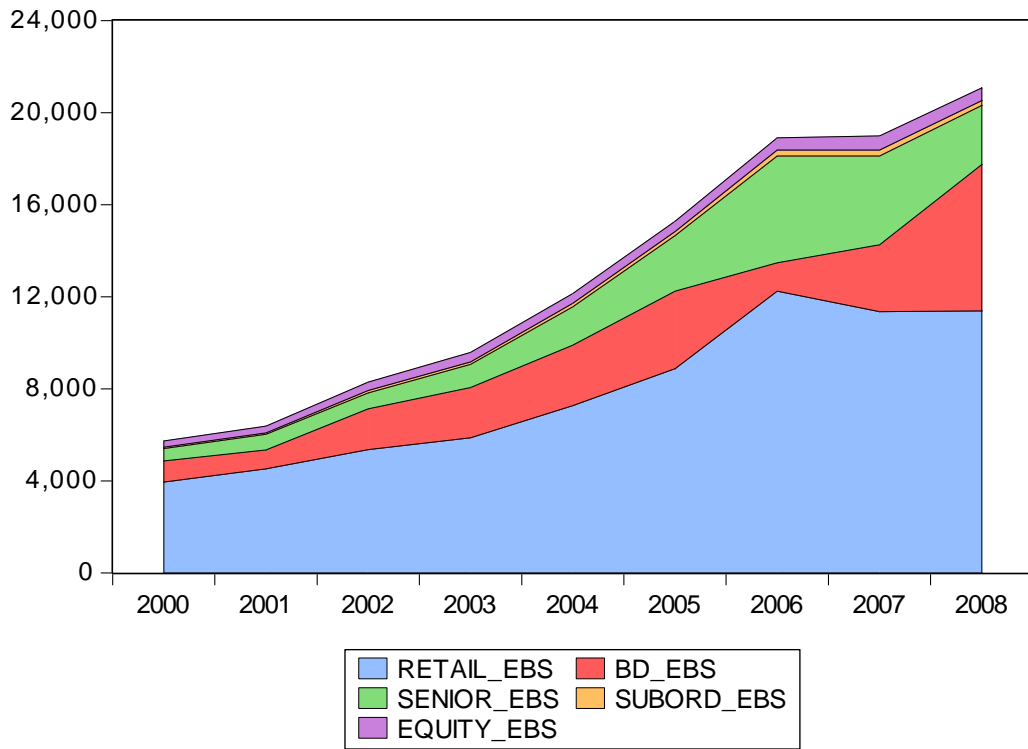


Figure 7: Composition of Liabilities: Educational Building Society. Note: Author's calculations based on data from annual reports.

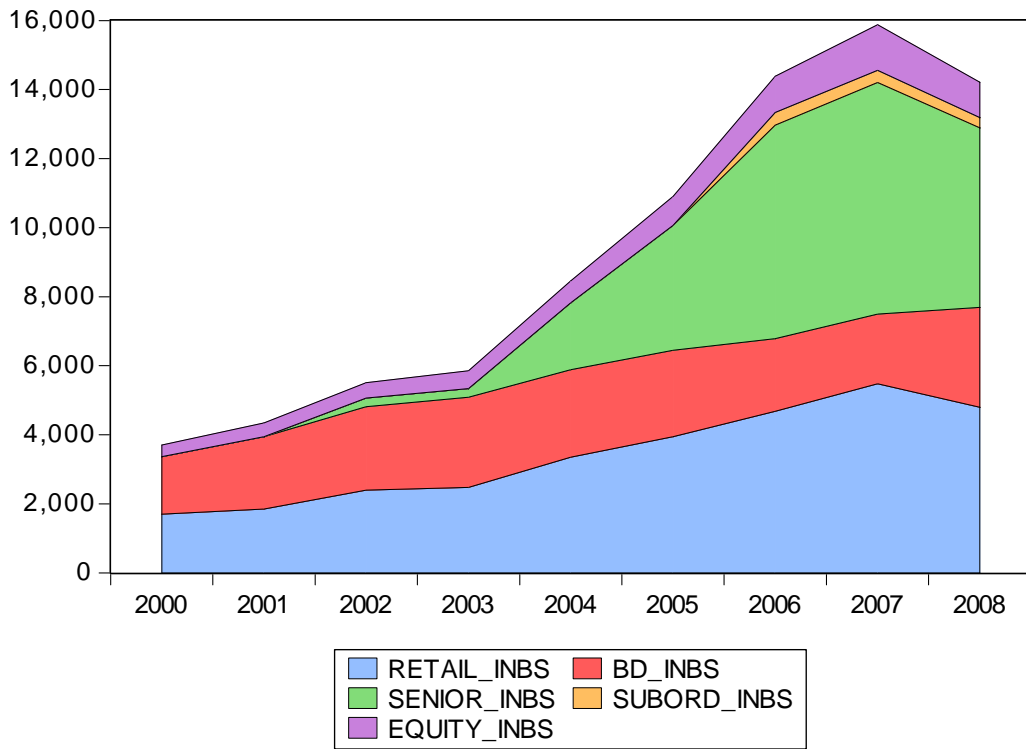


Figure 8: Composition of Liabilities: Irish Nationwide Building Society. Note: Author's calculations based on data from annual reports.

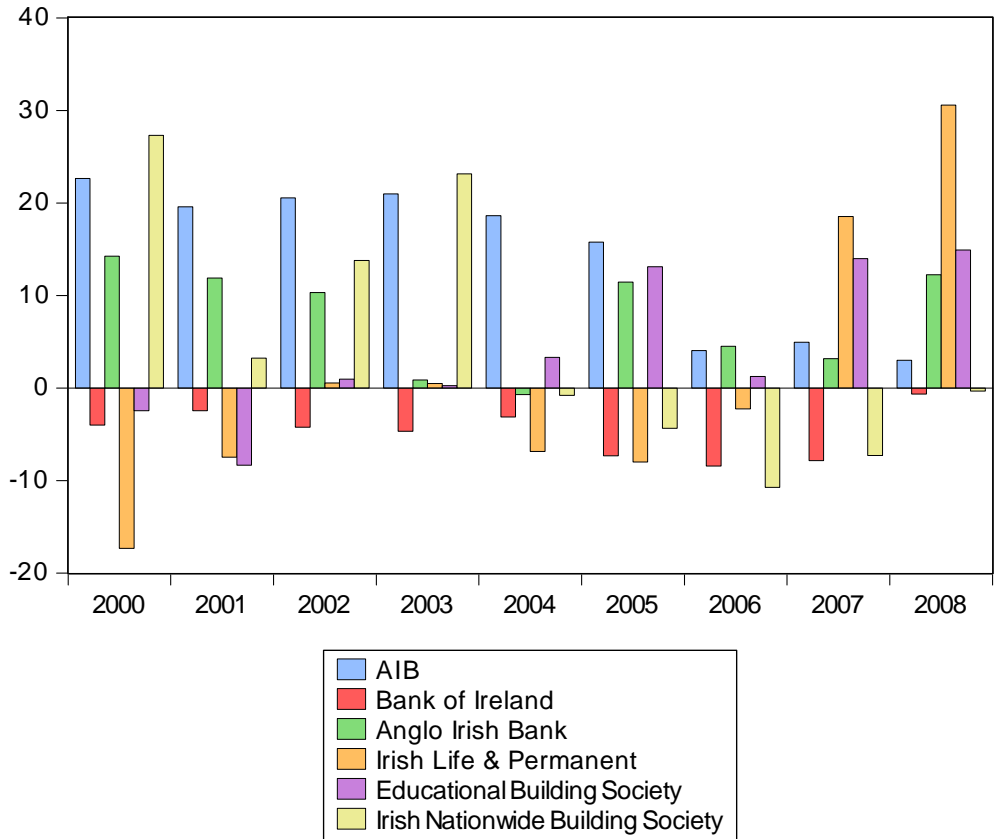


Figure 9: Net Inter-Bank Funding. Note: Scaled by total liabilities. Author's calculations based on annual reports of the banks.

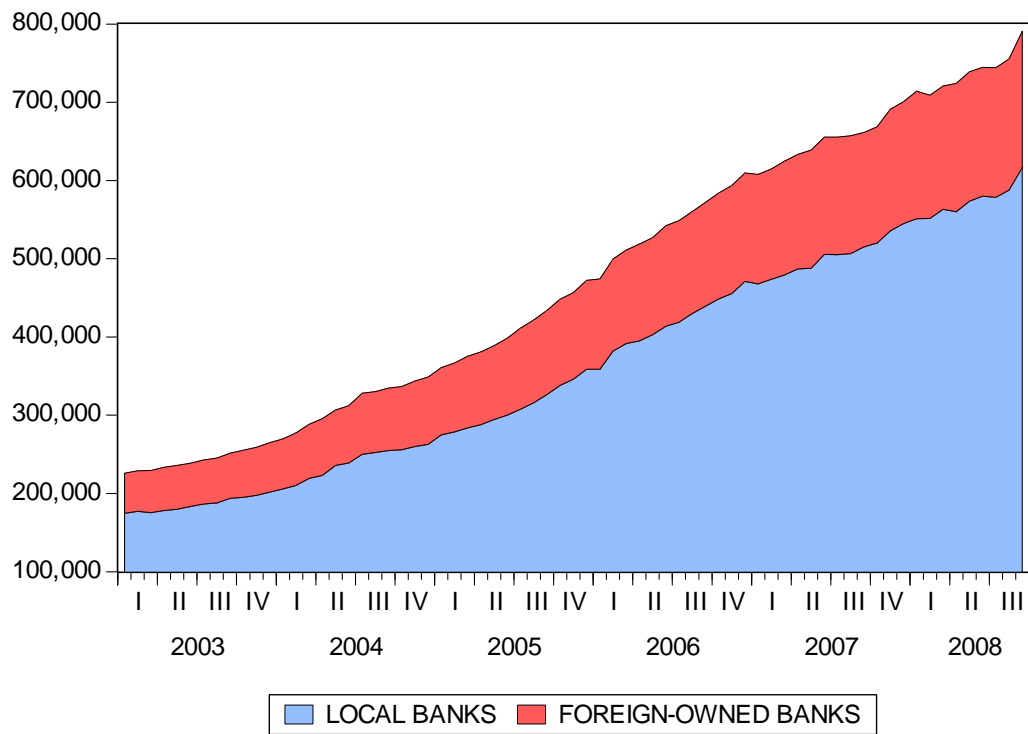


Figure 10: Total Assets of Domestic Banking System. Note: € Millions. Author's calculations based on Central Bank of Ireland dataset.

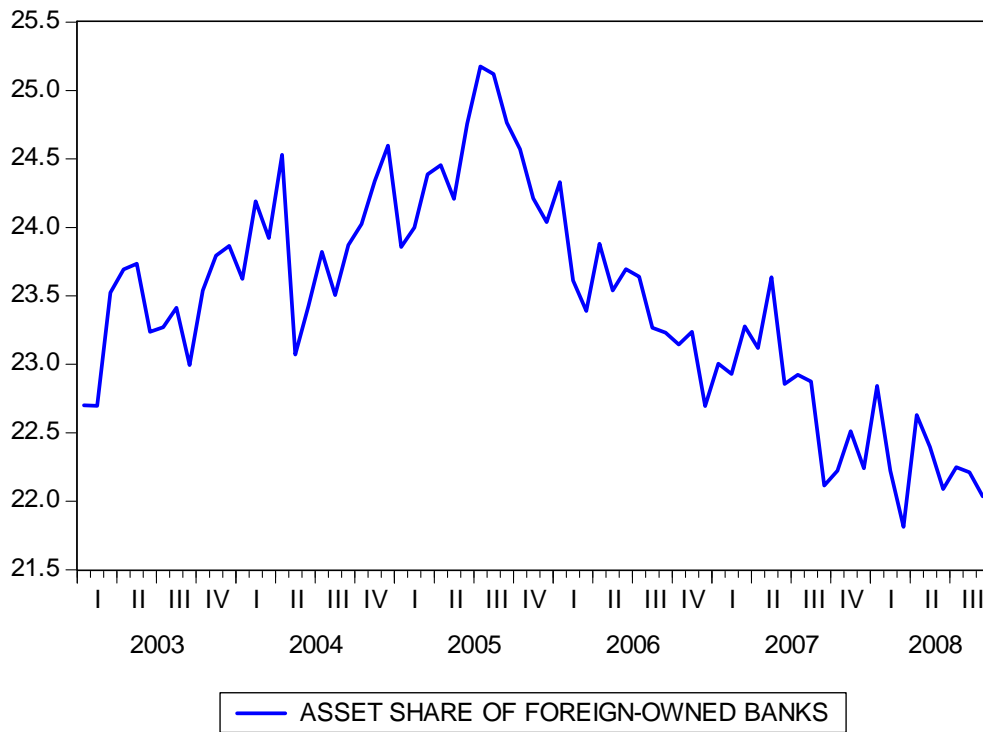


Figure 11: Asset Share of Foreign-Owned Banks. Note: Author's calculations based on Central Bank of Ireland dataset.

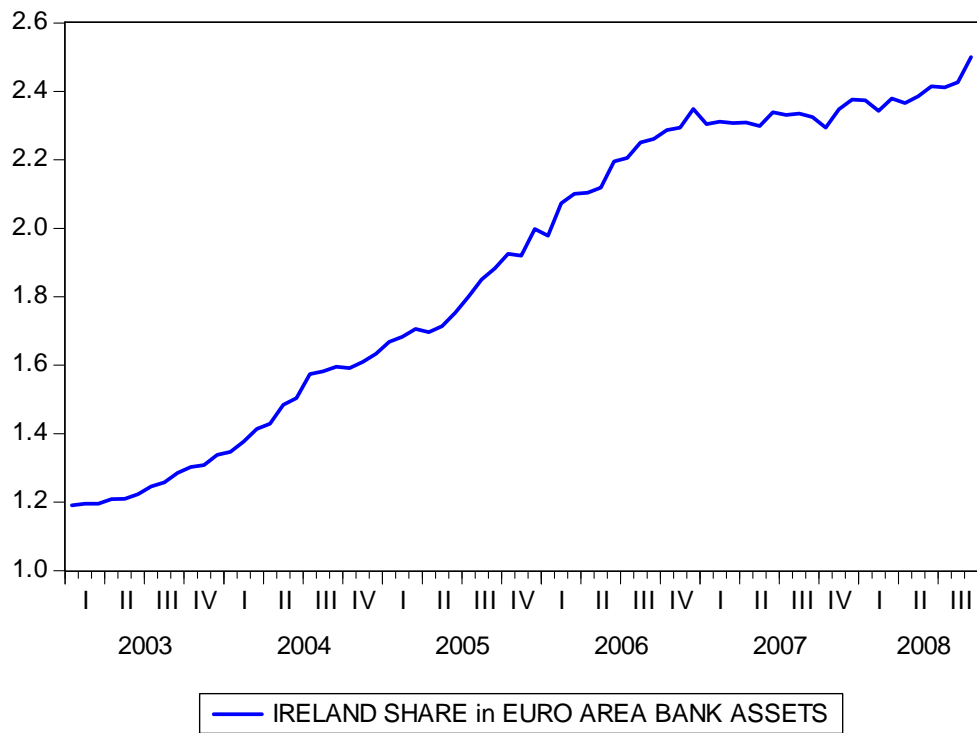


Figure 12: Bank Assets: Ratio to Euro Area Total. Note: Author's calculations based on Central Bank of Ireland and European Central Bank datasets.

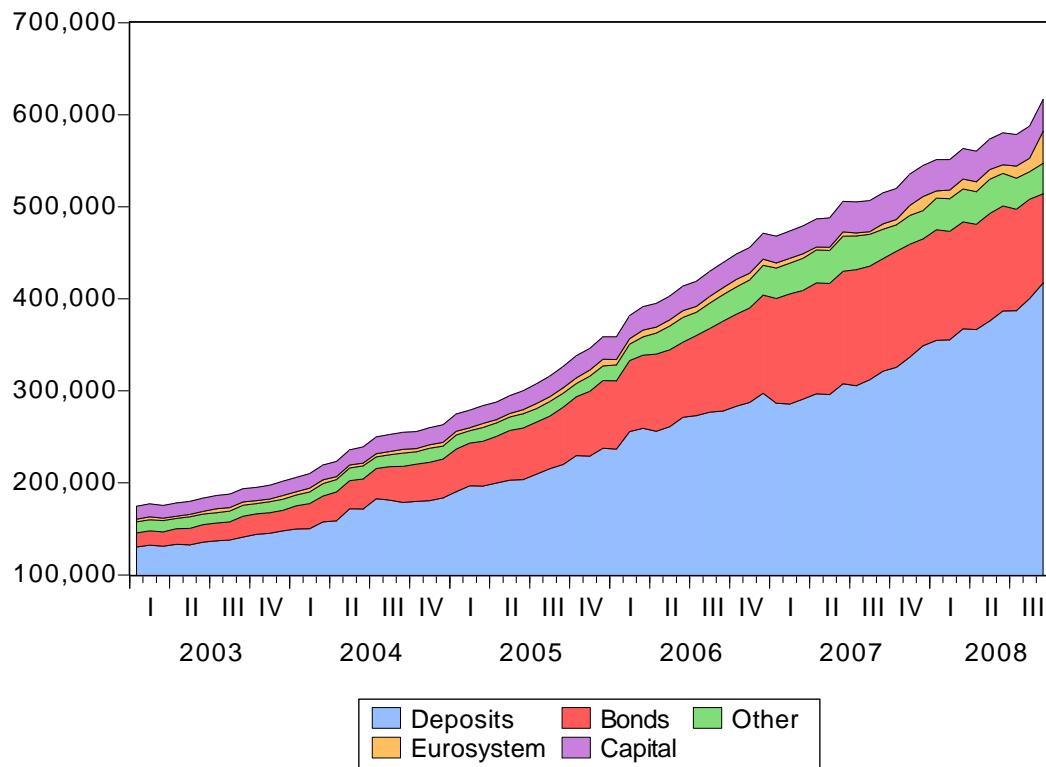


Figure 13: Composition of Liabilities: Local Banks. Note: Author's calculations based on Central Bank of Ireland dataset.

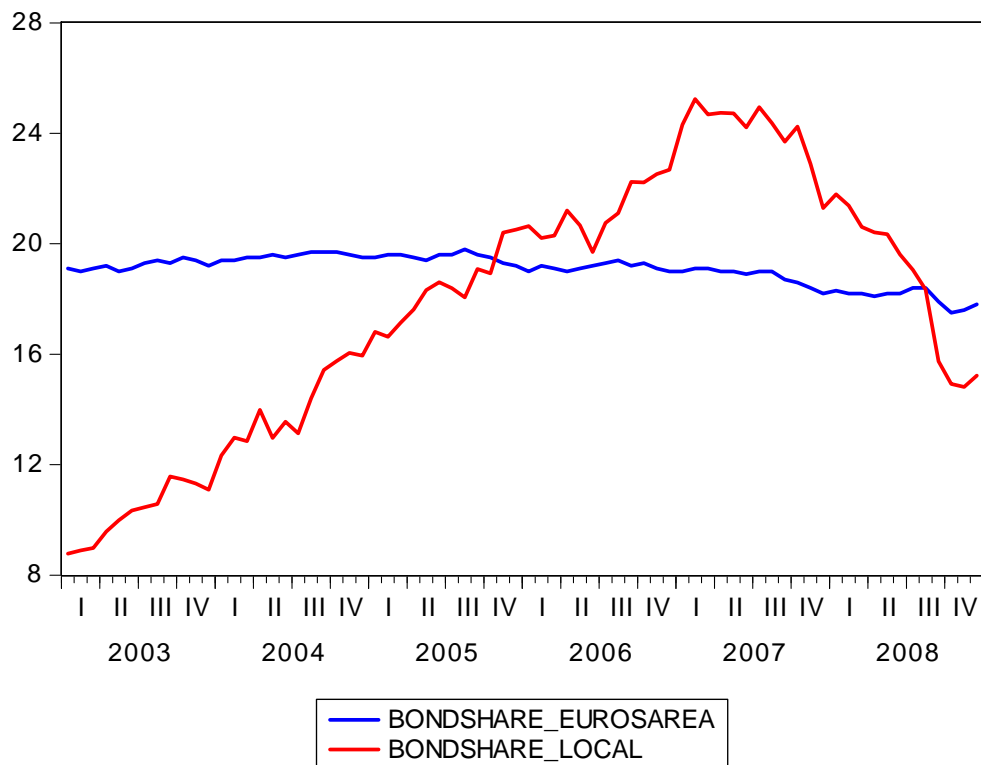


Figure 14: Share of Bond Funding in Total Liabilities: Ireland and Euro Area. Note: Author's calculations based on data from European Central Bank and Central Bank of Ireland.



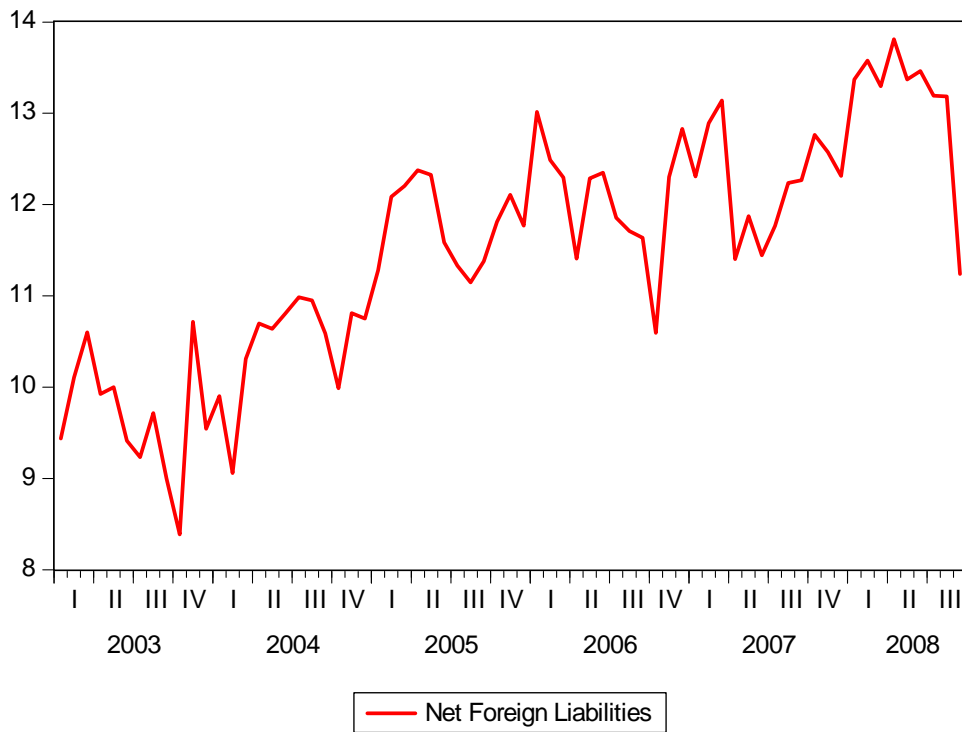


Figure 15: Net Foreign Liabilities: Local Banks. Note: Scaled by total assets. Author's calculations based on Central Bank of Ireland dataset.

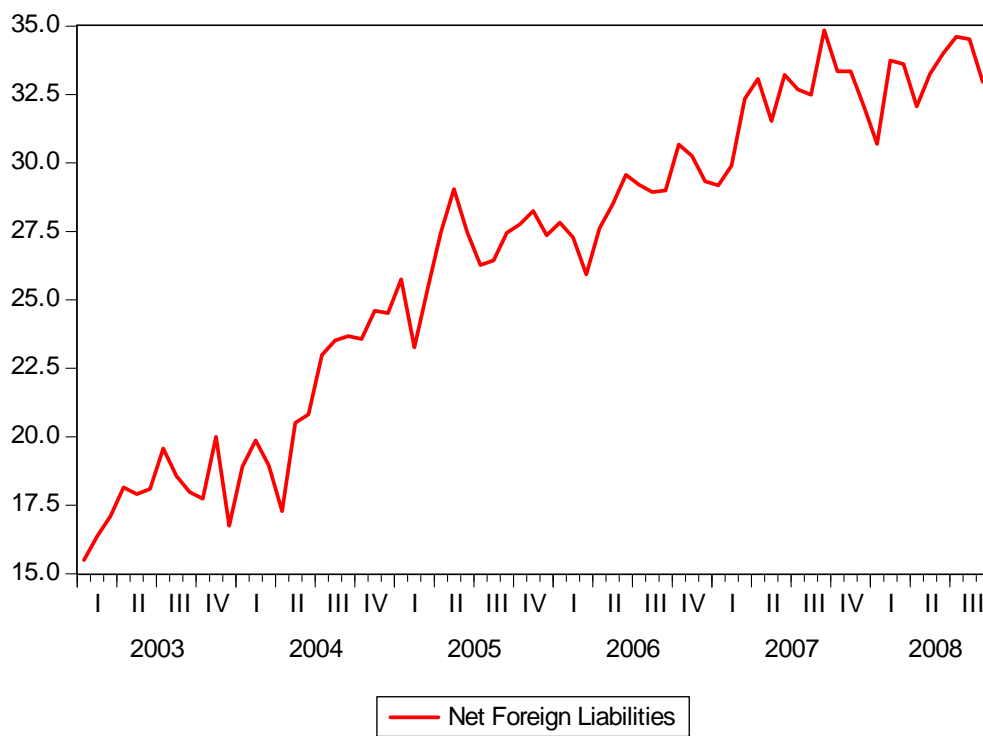


Figure 16: Net Foreign Liabilities: Foreign-Owned Banks. Note: Scaled by total assets. Author's calculations based on Central Bank of Ireland data.

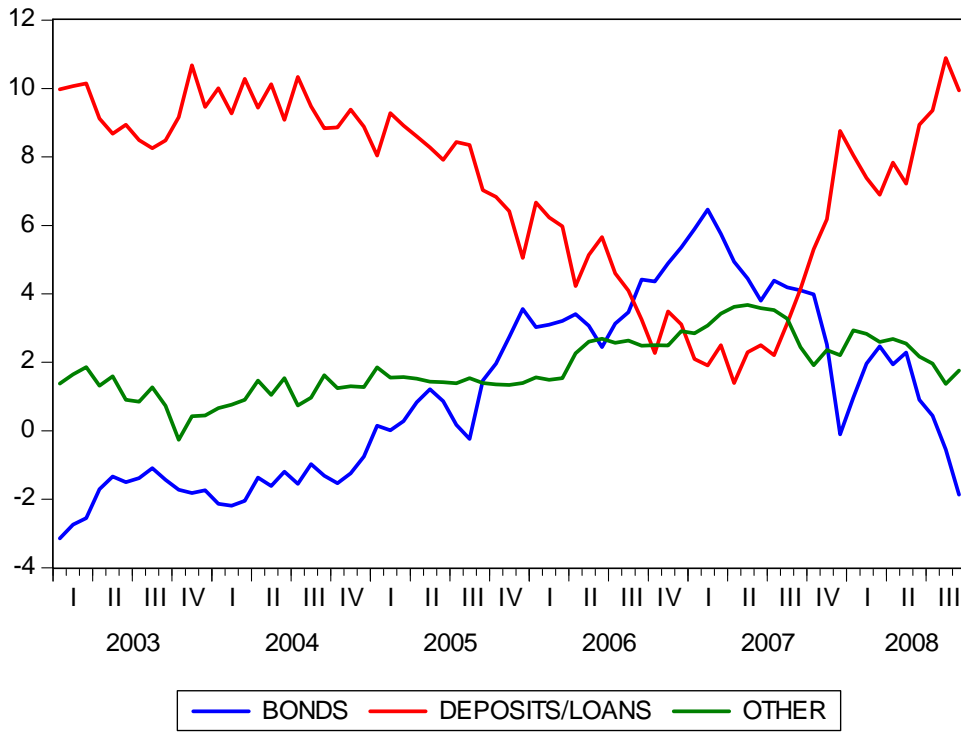


Figure 17: Composition of Net Foreign Liabilities: Local Banks. Note: Scaled by total assets. Author’s calculations based on Central Bank of Ireland dataset.

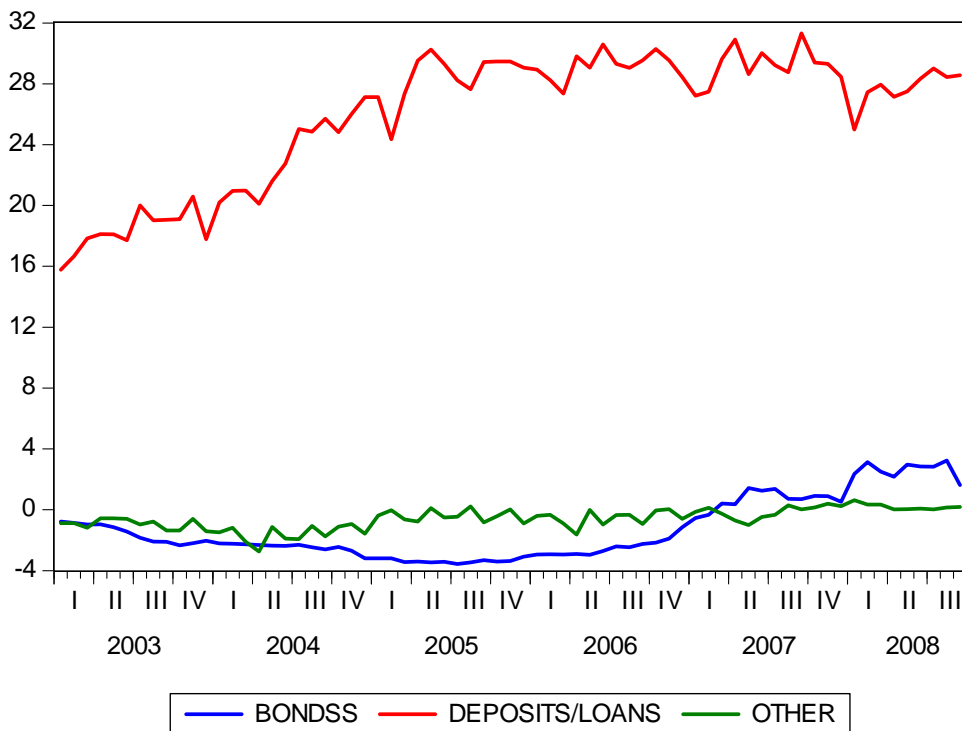


Figure 18: Composition of Net Foreign Liabilities: Foreign-Owned Banks. Note: Scaled by total assets. Author's calculations, based on Central Bank of Ireland data.

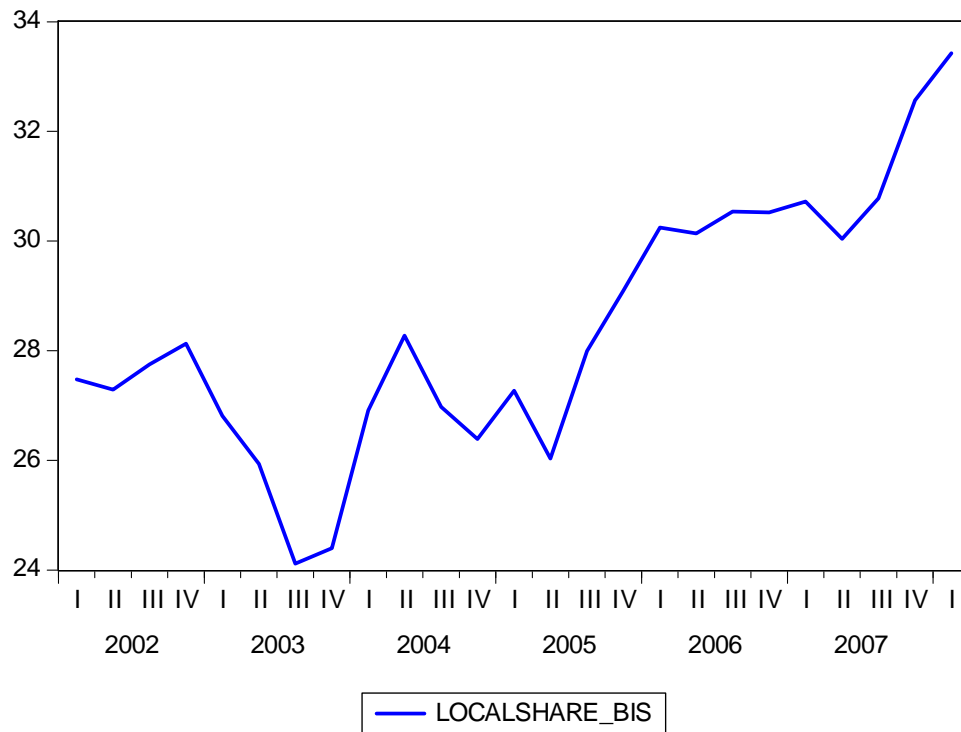


Figure 19: Share of Local Banks in Aggregate External Liabilities of Resident Banks. Note: Author's Calculations based on data from BIS and Central Bank of Ireland.

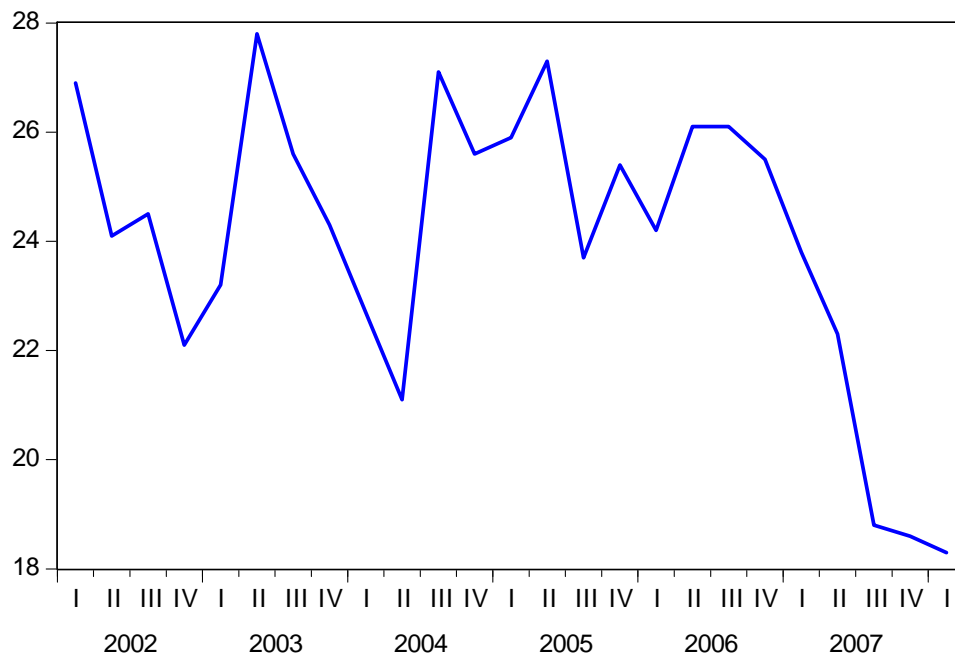


Figure 20: Share of External Liabilities Owed to NonBanks. Note: Author's calculations based on Central Bank dataset.

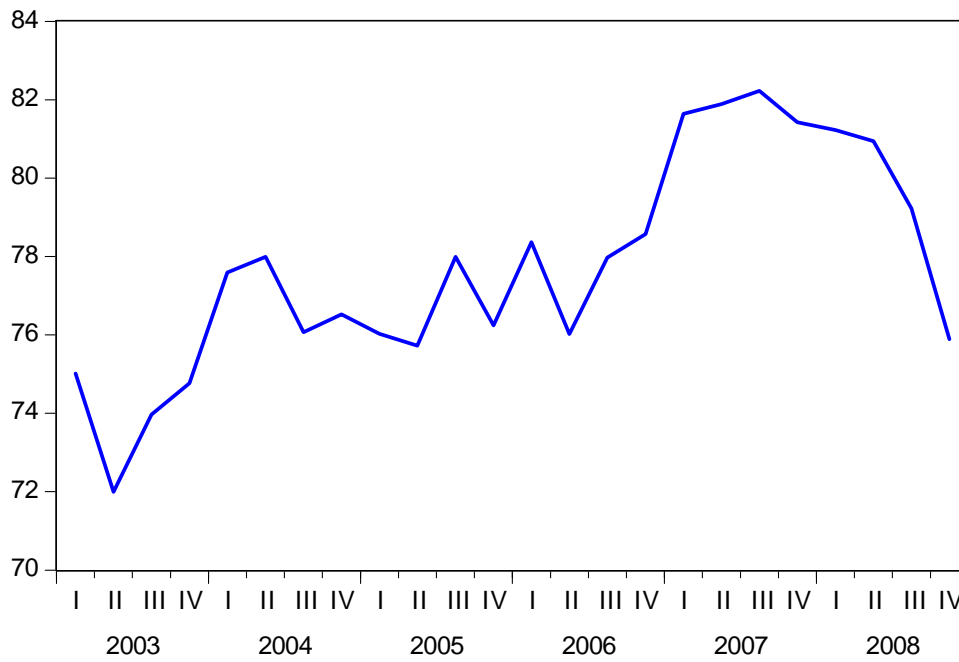


Figure 21: InterBank Share in External Deposit Liabilities. Note: Author's calculations based on Central Bank of Ireland data.

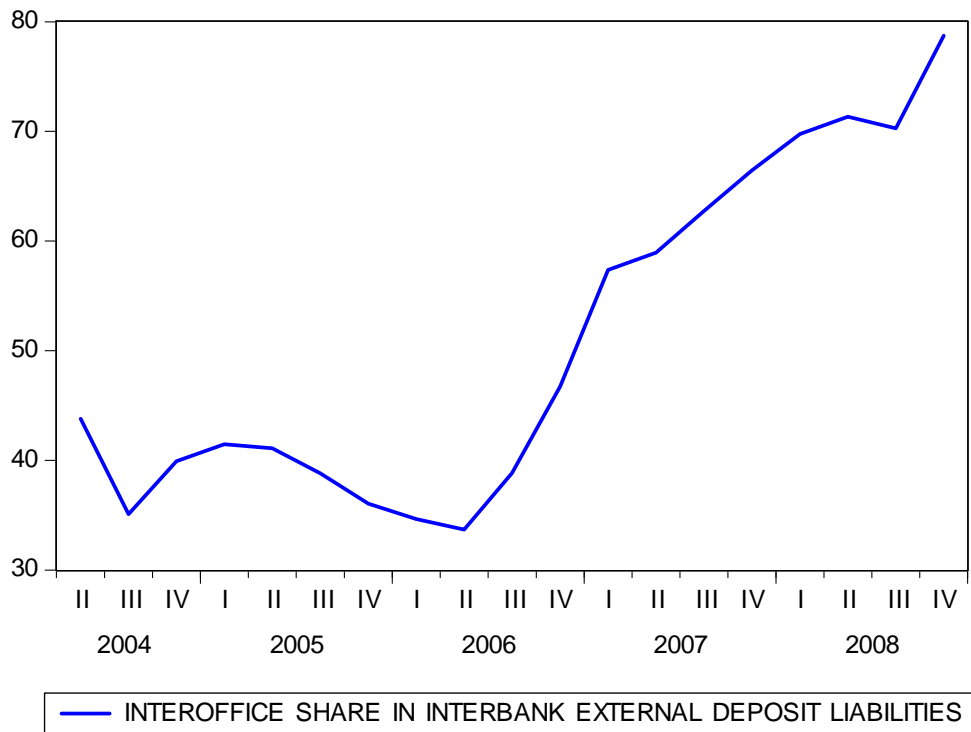


Figure 22: Inter-Office Share in Inter-Bank External Deposit Liabilities. Note: Author's calculations based on Central Bank of Ireland data.



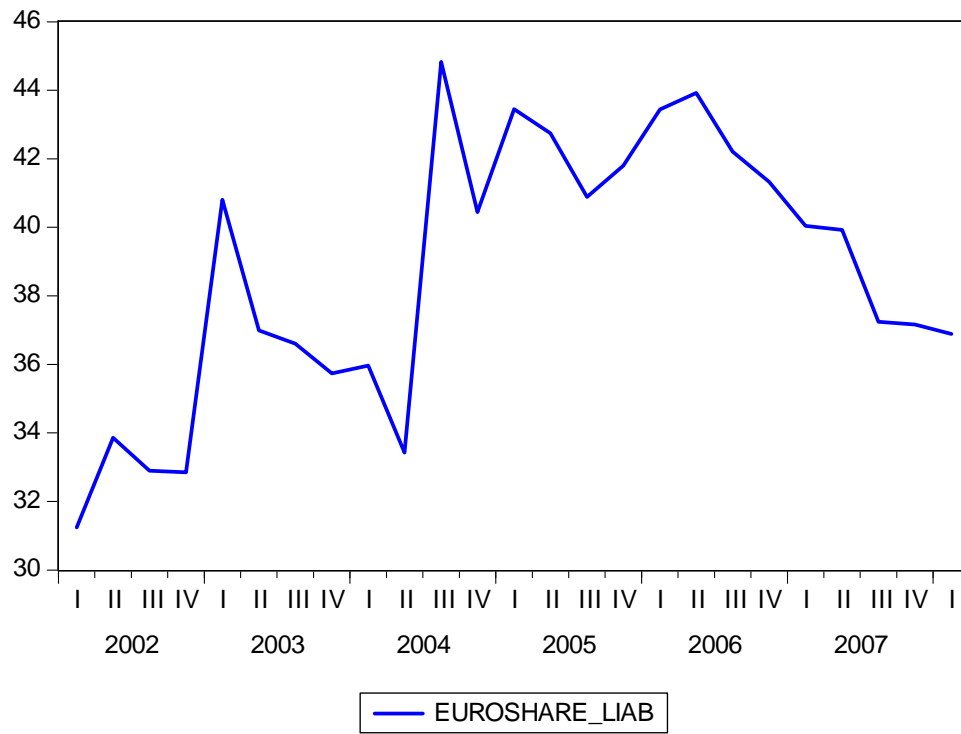


Figure 23: Share of External Liabilities Denominated in Euro. Note: Author's calculations based on Central Bank data.

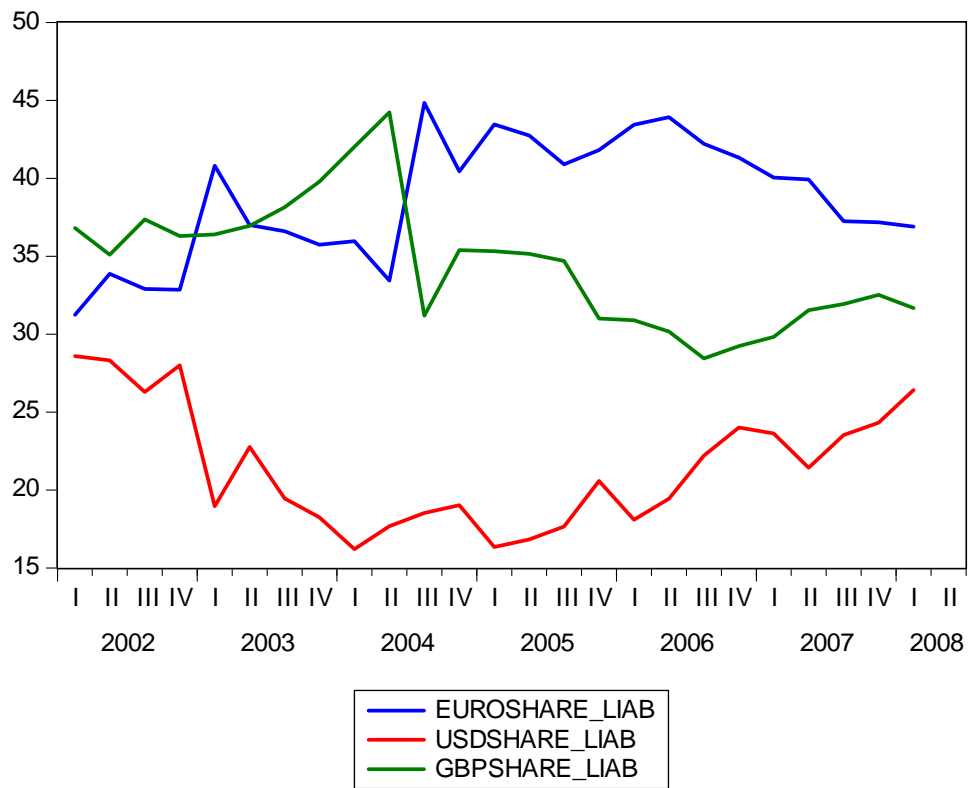


Figure 24: Currency Shares in External Liabilities. Note: Author's Calculations based on Central Bank data.

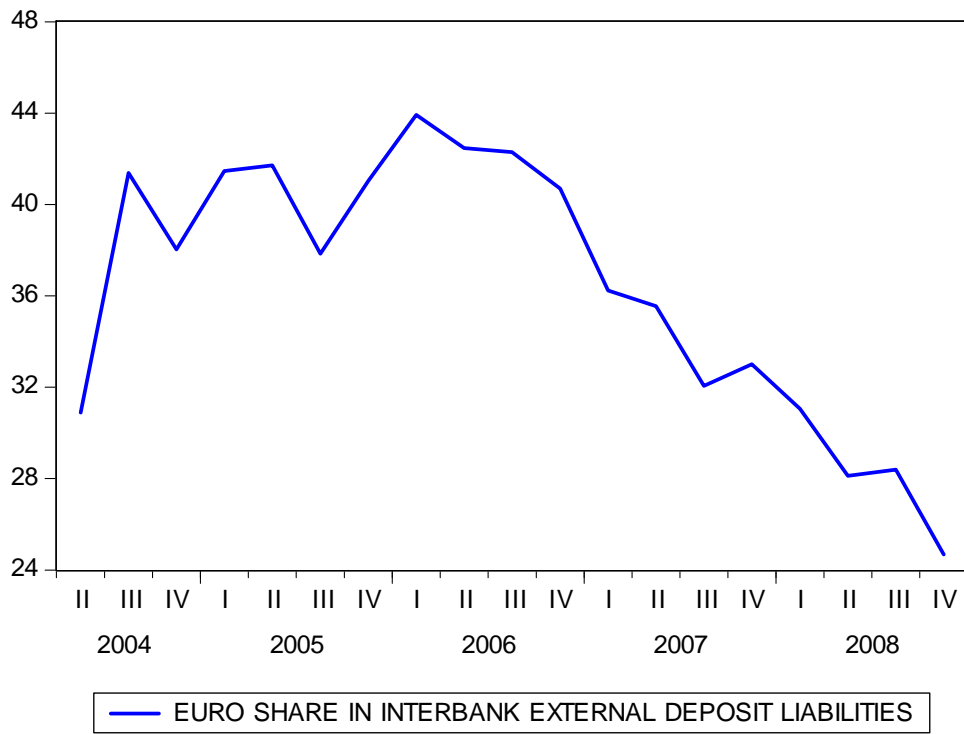


Figure 25: Euro Share in Inter-Bank External Deposit Liabilities. Note: Author's calculations based on Central Bank of Ireland data.

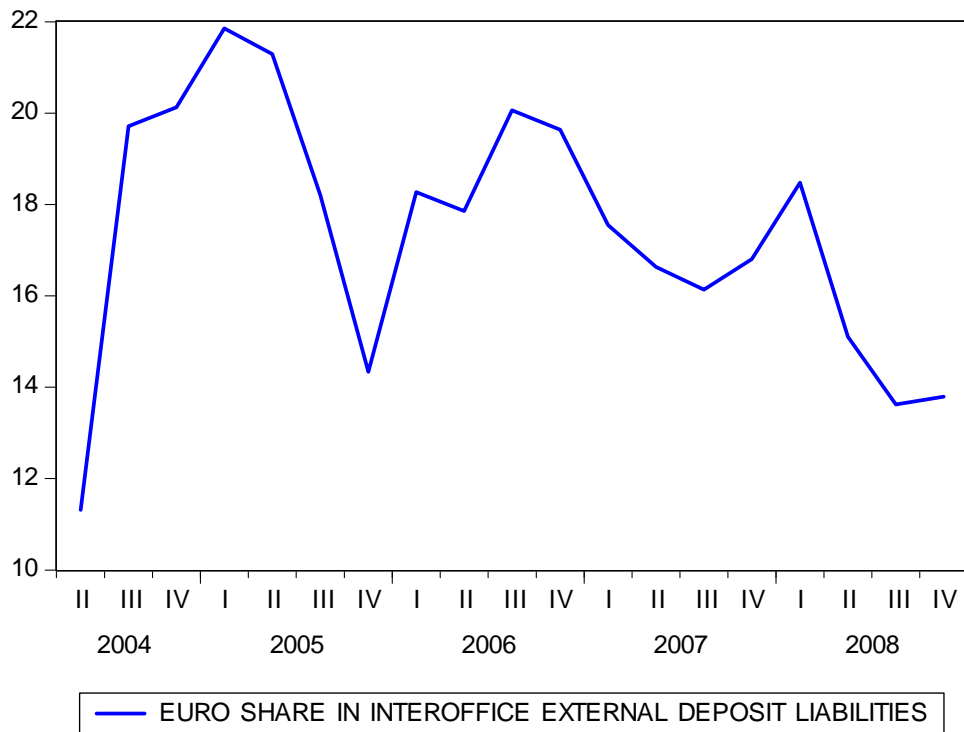


Figure 26: Euro Share in Inter-Office External Deposit Liabilities. Note: Author's calculations based on Central Bank of Ireland dataset.

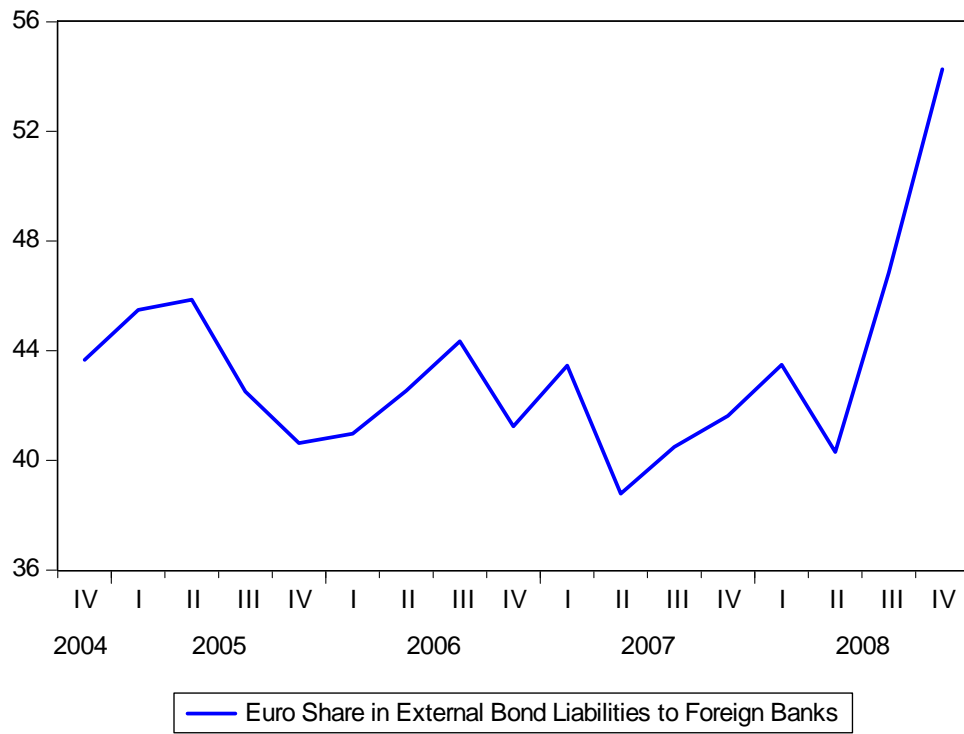


Figure 27: Euro Share in External Bond Liabilities to Foreign Banks. Note: Author's calculations based on data from Central Bank of Ireland.

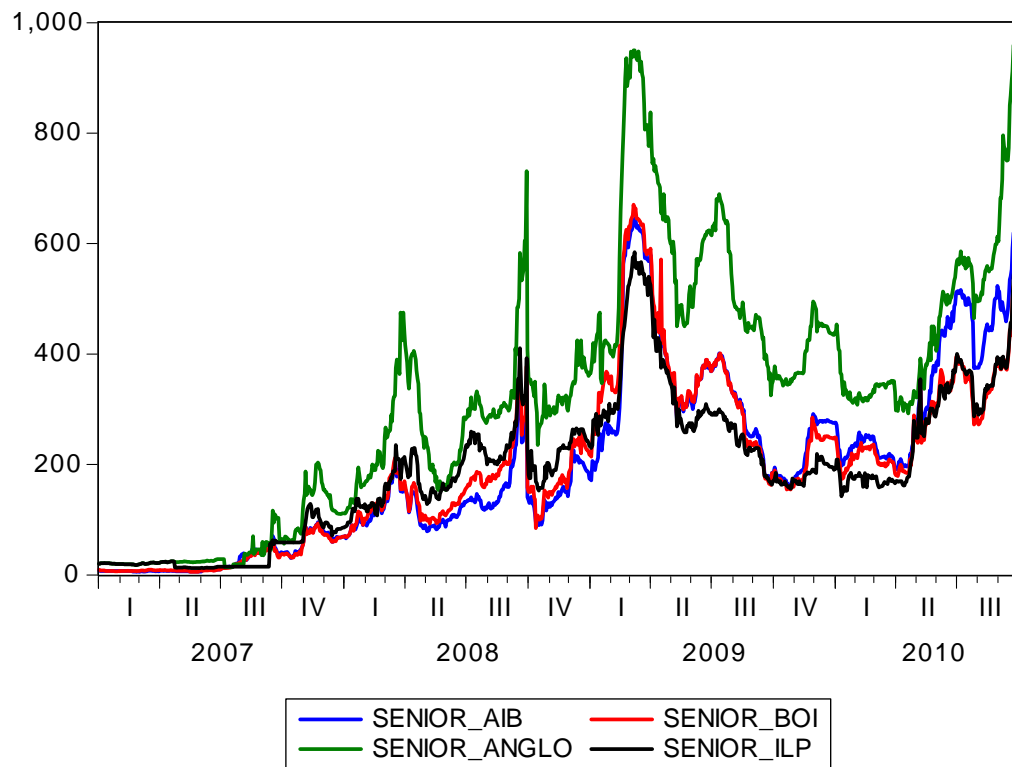


Figure 28: Spreads on Credit Default Swaps (5 year senior bonds). Note: Author's calculations based on data sourced from Datastream.

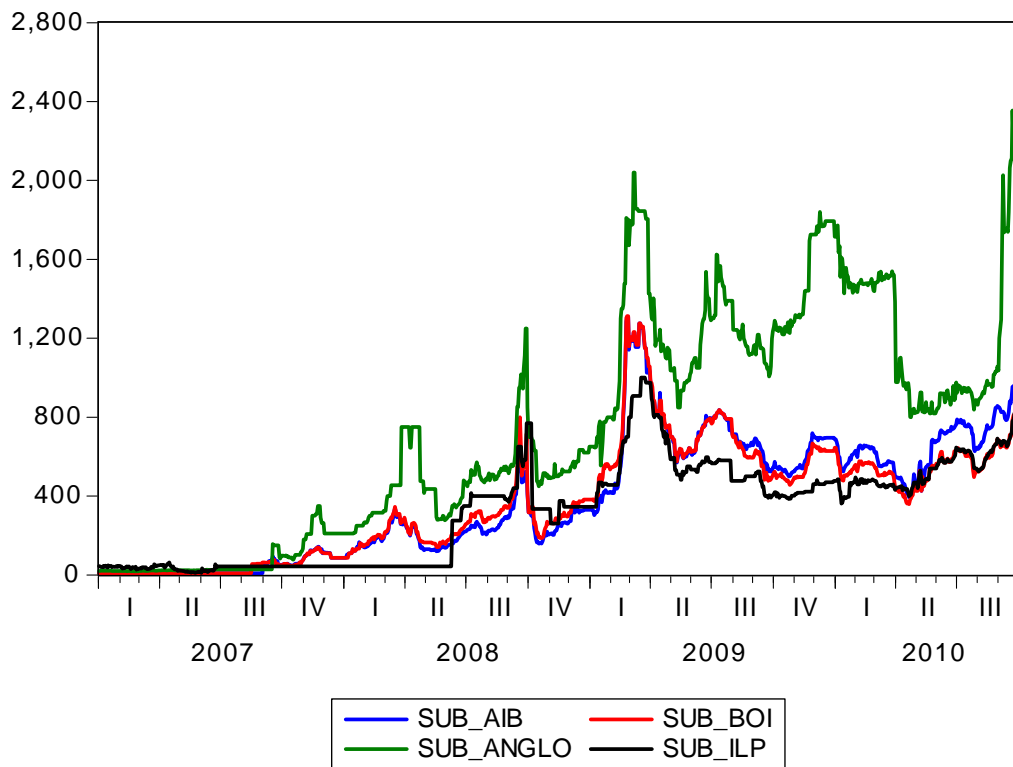


Figure 29: Spreads on Credit Default Swaps (5 year subordinated bonds). Note: Author's calculations based on data sourced from Datastream.

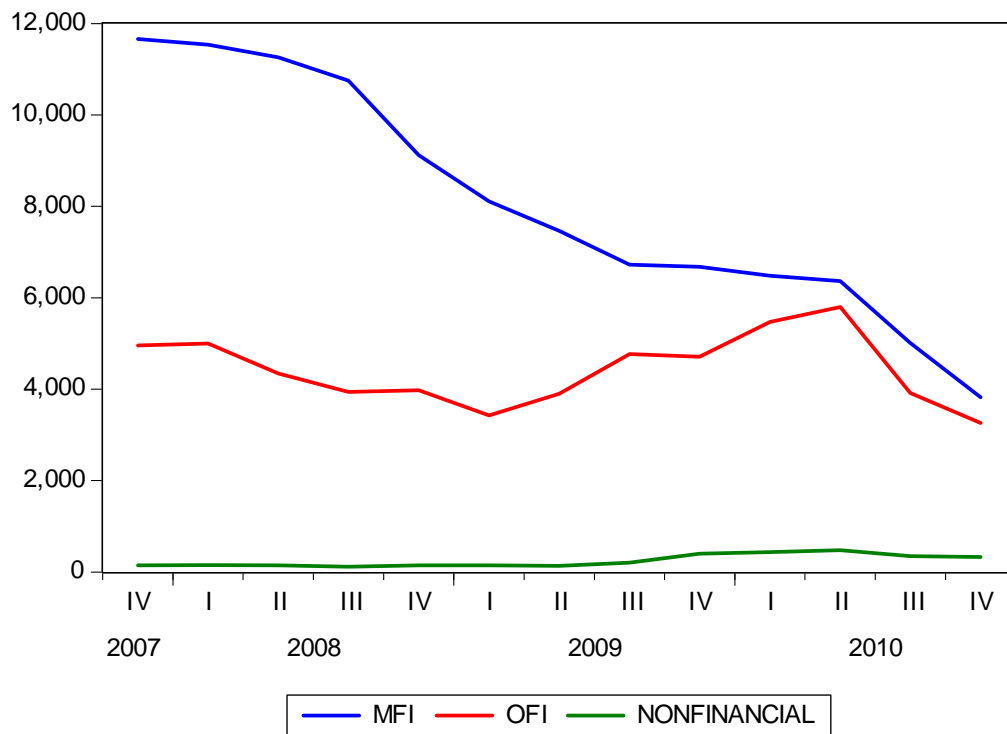


Figure 30: German Holdings of Irish Bank Bonds. Source: Author's calculations based on Bundesbank data.



Table 1: Net Foreign Liabilities of the Irish Banking System, 2003.1-2008.9

	(1)	(2)	(3)	(4)
	TOTAL	DL	BONDS	OTHER
$\alpha$	2.6 (.87)***	0.23 (.30)	0.17 (.09)*	0.16 (.11)
$NFL_{t-1}^k$	0.77 (.08)***	0.95 (.04)***	0.97 (.03)***	0.93 (.05)***
$LIQDUM$	0.33 (.25)	0.68 (.26)**	-0.55 (.20)***	-0.11 (.12)
$R^2$	0.73	0.90	0.94	0.83
$DW$	2.22	2.5	1.64	2.25

Note: Irish banking system refers to the group of Irish-headquartered domestically-active banks.  $NFL^k$  refers to net foreign liabilities in category  $k$  (TOTAL, DEPOSITS/LOANS (DL), BONDS, OTHER), scaled by total assets. \*\*\*, \*\*, \* denote significance at 1, 5 and 10 percent levels respectively.