Bank competition through the credit cycle: implications for SME financing

Conference draft paper presented at the Central Bank of Ireland conference *The Irish SME Lending Market: Descriptions, Analysis, Prescriptions*, March 2nd 2012.

Fergal McCann and Tara McIndoe Calder*

March 1, 2012

Abstract

We present a number of descriptive findings on competition in Irish private sector lending markets across periods of both significant economic expansion and decline. Firstly, concentration of lending to the private sector is shown to have fallen during the boom period of 2004-2008, and to have steadily risen since the onset of the crisis. Secondly, we document that the lending market for Small and Medium Enterprises (SMEs) is significantly more concentrated than that for the private sector in total. Thirdly, we observe a degree of heterogeneity in the concentration of lending to different sectors of economic activity. Fourthly, concentration of new lending flows to SMEs in 2010 and 2011 is shown to be significantly higher than concentration of the stock of credit across all sectors, suggesting that the trend is towards even higher concentration in the market. Finally, an examination of the importance of foreign banks shows that their share of private sector credit stock reached its peak just as the crisis began, and has been falling since, indicating that in times of crisis foreign market participants react by more aggressively reducing exposure than domestic banks. The likely effect on Irish firms' access to finance is discussed by placing these findings in the context of the literature on the link between banking competition and credit conditions. We conclude that the most likely outcome is that the trends presented here will mean that firms, and particularly SMEs, will experience increasingly difficult credit conditions.

Keywords: Competition, Herfindahl Index, Private Sector Credit, SMEs, Foreign Banks, Access to Finance, Financial Stability.

*E-mail: fergal.mccann@centralbank.ie and tara.mcindoecalder@centralbank.ie. The views expressed in this paper are those of the authors and do not necessarily reflect those of the Central Bank of Ireland or the ESCB. We thank Therese Grace for excellent research assistance. We would like to thank Reamonn Lydon for very helpful comments on an earlier draft. Any remaining errors are our own.

1 Introduction

This paper describes competition in lending to firms in the Irish private sector using detailed bank-level lending data on the universe of lending institutions in the market. The findings are discussed in the context of a large international literature on the effects of lending concentration and competition on firms' access to finance. We conclude that the increase in market concentration that is currently taking place in Ireland is most likely to lead to more difficult credit conditions for Small and Medium Enterprises (SMEs).

Our research has five key findings. Firstly, concentration of lending to the private sector fell during the boom period of 2004-2008, and rose steadily since the onset of the crisis. This finding provides evidence of increased market entry and expansion of previously smaller lenders during periods of prosperity, and retrenchment of all but the largest lenders during downturns. Secondly, lending to SMEs is significantly more concentrated than lending to the private sector in total. This suggests that the lending market for smaller firms, about whom information is less easily attained ("informationally opaque"), presents larger barriers to entry which protect incumbent lenders. Thirdly, we find a degree of heterogeneity in the concentration of lending to different sectors of economic activity. Fourthly, concentration of new lending flows to SMEs in 2010 and 2011 is shown to be significantly higher than concentration of the stock of SME credit across all sectors. This suggests that the trajectory is towards even higher concentration in the market. Finally, foreign banks' share of private sector credit stock peaked just as the crisis began, and has been falling since, indicating that in times of crisis foreign market participants react by more aggressively reducing exposure than domestic banks.

There are two competing hypotheses on the likely effect of a more concentrated lending market on access to finance for firms. The *Market Power Hypothesis* (MPH) predicts that the traditional Industrial Organization result should hold - a more concentrated market means more market power for the largest banks, which leads to higher prices, tougher conditions and less lending. The *Information Hypothesis* (IH), however, suggests that relationship lending, under which investments in information are required on the part of the lender, reverses the direction of the predicted effect. Under this hypothesis, a more competitive market will lead to less lending, as banks will not have the incentive to make investments in information and their relationships, particularly with small borrowers.

The paper proceeds as follows: Section 2 provides analysis of trends in concentration of the Irish private sector and SME lending markets; Section 3 highlights lessons from the literature that can provide policy conclusions for Ireland; Section 4 concludes.

2 Credit Concentration: Data and Analysis

We use the Central Bank of Ireland's *Money and Banking Statistics*. These data are available at the lender-sector-quarter level, with the sectors to which each institution lends mapping into the NACE classification of sectors of activity. A number of statistics are available at this disaggregation: the outstanding stock of credit to all private sector firms from 2000 to Q3 2011; the outstanding stock of credit to SMEs from Q4 2010 to Q3 2011; the volume of new lending flows to SMEs from Q4 2010 to Q3 2011. Due to the nature of the data available, we focus our attention on the Herfindahl-Hirschman Index (HHI) of competition, which is a measure based solely on the concentration of lending markets. While the literature has found that a more concentrated market need not necessarily be less competitive, the evidence suggests that in Ireland the trend has generally been that as markets become less concentrated, they have also been more competitive, and vice versa. Goggin et al. (2012) find evidence that lenders in the Irish mortgage market have increased standard variable rates as concentration levels in the market have increased since 2008. We calculate a HHI initially for each quarter and then for each sector-quarter. These are calculated as the sum of the square of the market share of each market participant. A higher share represents a more concentrated, or less competitive lending market. We also calculate at the same frequency and disaggregation the share of domestic banks in total lending.

2.1 Concentration in private sector lending

Figure 1 plots the HHI for all private sector (non-financial) lending, and for lending to all "core" (non-property-related, non-financial) sectors. For core sectors, the Irish banking system became steadily less concentrated from the years in which the credit boom began to accelerate (generally considered to be 2004-05) up to 2008, witnessed by a noticeable decline in the HHI. From mid-2008, however, there is a clearly visible turning point in the series, with concentration increasing ever since. This presents a clear pattern of either increased entry or increased expansion by small market participants during a boom period, followed by a contraction in competitive forces once economic conditions began to deteriorate.

The minimum value that the HHI reached in 2008 was .15, with the value for Q3 2011 standing at .19. To get a sense for whether or not a HHI of .19 represents a concentrated lending market, Table 1 reports HHIs calculated in previous studies. McCann et al. (2012) find that across 26 European countries between 2000 and 2009, 85 per cent of the country-year observations have a HHI below .2. These numbers and those of Table 1 suggest that concentration in the Irish private sector lending market is heading towards the upper end of international norms for developed countries.

Data on lending to Small and Medium Enterprises has been required by the Central Bank of Ireland since 2010. Our prior, due to the opaque nature of smaller firms, is that this market should be more concentrated than the private sector credit market. Figure 2 plots the HHI for the stock of private sector and SME credit on identical scales for Q4 2010 to Q3 2011. The figure shows a clear difference, with the SME lending market having a HHI ranging between .25 and .27 over the sample period, significantly larger than any figure observed for the whole private sector. Numerous studies have previously shown that smaller firms have more difficulty in accessing finance. The higher concentration level found in the lending market to smaller firms is a potential channel through which this difficulty may arise.

While Figure 2 outlined the difference in the HHI of outstanding credit *stocks* between private sector and SME lending, Figure 3 plots the HHI for new lending *flows* to SMEs, which gives an indication of the likely path for concentration in the market. These data are likely to be more volatile than concentration measures for credit stocks, given the difficulties experienced in the Irish financial sector and the low volume of new lending in a given quarter in 2010-11,[1] thus an average of the available data is plotted here. The figure shows that the HHI in new lending, is consistently higher than the HHI for outstanding stock. This indicates that the Irish SME lending market is currently becoming more concentrated.

Figures 4 and 5 exploit the sectoral dimension of the lending data. Figure 4 reports the concentration of outstanding credit stock of each sector of economic activity in 2004 and 2008. The picture shows a heterogeneity in concentration of lending across sectors, and a pattern of increasing competition over the credit boom. The only exception to this pattern is the construction sector, which had a HHI of .19 in 2004 and .26 in 2008. The general trend presented supports the proposition made earlier in the paper that the period of economic and credit boom in Ireland was associated with an increase in competition in the lending market. Figure 5 presents an average HHI for each sector in 2010-11, comparing the HHI for lending to all firms on the left with the HHI for lending to SMEs on the right. We observe higher concentration in the lending market for smaller firms in the majority of sectors. As mentioned previously, this higher concentration may be driven by the opaque nature of smaller firms which increases barriers to new entrants, but may also in itself contribute to credit constraints for smaller firms.

On new lending flows to SMEs, Figure 6 goes beyond the national numbers presented in Figure 3 and sheds light on the likely path for concentration of sectoral SME lending markets. With three sectors presenting HHIs above .4, and all sectors reporting a HHI greater than .25, it appears that the market for newly issued credit to SMEs in Ireland is an highly concentrated one. The logical conclusion is that lending will become more concentrated in the short run in the majority of sectors in

[1] Central Bank *Money and Banking Statistics* show that new lending to SMEs averaged roughly €500m per quarter in 2011.

the economy, with the knock-on effects for credit conditions and constraints that have been mentioned previously.

2.2 Bank Nationality

As outlined in the introduction, a large literature exists on the role that foreign-owned banks can play in decreasing credit constraints for local firms, particularly when high concentration poses the risk of increased constraints. The share of lending accounted for by foreign and domestic banks is outlined in this section. As in the previous section, we begin with the longest time series available to us, plotting the quarterly share of private sector lending stock accounted for by the domestically-owned and foreign-owned banks. Table 2 reports the banks that are defined as domestic or foreign. Ulster Bank, although present in the Irish market for over a century, is considered a foreign bank for the purposes of this analysis.

Figure 7 reports the share of domestic banks in private sector lending, with the red line representing lending to core sectors. Consistent with analysis of the HHI, a clear pattern emerges whereby during the boom period of 2004 to 2008, the market penetration of foreign banks increased significantly. This is consistent with a situation where attractive potential returns in a booming economy attract new entrants to the lending market. The post-2008 crisis has had an identical effect on foreign bank penetration to that on competition in the market, with a steady increase in the domestic share of lending from a low of 54 per cent at the end of 2009 to 64 per cent in 2011 Q3. This pattern matches the findings of Presbitero et al. (2012) who show that more distant banks in Italy are more likely to ration credit since the onset of the crisis. As with the findings on concentration previously, the lessons of the literature suggest that this trend will likely have a detrimental effect on credit conditions in the local economy.

Figure 8 shows a degree of heterogeneity in foreign bank penetration across sectors of activity. The domestic share of lending fell in the majority of sectors between 2004 and 2008, although there are notable anomalies such as the construction sector, where domestic banks' share of lending increased from 59 to 72 per cent over the boom period.

Figure 9 shows that, in the SME lending market, the domestic share in both new lending and the stock of credit are very similar at 65 and 66 per cent, indicating the the outlook is that the domestic share will remain steady. In the SME market, there are sectors such as Transport & Storage, Construction and Business & Administrative Services which are dominated by local banks, but in most sectors where the share lies around 60 per cent, indicating that a significant market share will continue to be accounted for by foreign lenders.

3 Lessons for Ireland from the literature

Figures for new lending suggest that the likely path for the SME market is towards further concentration, from a position where the market is already highly concentrated in international terms. The trajectory for foreign bank penetration also appears to be downward. The international academic literature provides numerous lessons for the likely effect of this on access to finance in the Irish real economy.

The conflicting predictions of the *Market Power Hypothesis* (MPH) and *Information Hypothesis* (IH) have been tested on numerous occasions, with a wide range of papers offering ambiguous results. The direction of the effect can depend on the sample of countries used, the additional control variables included, and the proxy used for competition in the banking sector.[2] Papers that reconcile the two views have done so in a number of ways. de Guevara and Maudos (2009) and Patti and Dell'Ariccia

[2]Papers supporting the MPH include Beck et al. (2004), Chong et al. (2011), Agostino and Trivieri (2010), Black and Strahan (2002), Jayaratne and Strahan (1998) and Cetorelli and Strahan (2006). Petersen and Rajan (1995) presented first evidence that less competitive banking systems could lead to more access to finance. Other papers supporting this hypothesis include Giannetti et al. (2008) and Zarutskie (2006).

(2004) explain that the relationship has an inverted U-shape, i.e. at very high levels of concentration, the MPH holds, but below these levels the IH holds. Carbo-Valverde et al. (2009) explain the ambiguity by relating concentration and competition to measures of market contestability and information attainment. If a market is concentrated and also is not vigorously contested, then the MPH is shown to hold.

A separate but related literature on the effect of foreign bank penetration on credit conditions exists. A number of studies, generally using data for emerging market countries, have found beneficial effects of foreign bank penetration on access to finance.[3] A more recent literature, however has found that during the crisis period, foreign bank penetration may pose additional risks to local firms, in that these banks, with less information on the local market, generally retrench at a faster pace than local banks.[4]

This literature has a number of implications for the trends presented here for Ireland. The key message of de Guevara and Maudos (2009) is that the MPH holds at the highest levels of concentration, but not at lower levels. As outlined earlier, it appears that concentration in Ireland is approaching the highest range of HHIs seen in Europe in recent decades. The key lesson of Carbo-Valverde et al. (2009) is that concentration will lead to tougher credit conditions where there is not a high degree of contestability or investment in information on the part of lenders. Evidence from Goggin et al. (2012) suggests that in the Irish mortgage market, increased concentration has not been accompanied by vigorous competitive behaviour since 2008. Furthermore, new lending figures reported by the Central Bank of Ireland have been low in 2010/11, and Lawless and McCann (2011) have shown that credit conditions in Ireland are the most difficult in the euro area currently. All of these facts suggest that, in terms of the results of Carbo-Valverde et al. (2009), Ireland appears to be in a position where increased concentration is likely to exacerbate, as opposed to ease, SME credit constraints.

Beck et al. (2004) suggest that an efficient credit registry and foreign bank penetration can mitigate the effects of bank concentration on obstacles to finance. The fact that a credit register does not exist (although it is planned to begin operating in 2013), combined with a trend towards foreign banks' lending shares falling in Ireland in recent years, suggests that these mitigating factors are not likely to be in place to reverse the predicted effects of the MPH in Ireland in the coming years. Similarly, while high GDP per capita and good insititutional quality are currently qualities of which Ireland can boast, the likely growth rate in GDP in Ireland, given current economic concerns across Europe, suggests that an increase in economic activity is also unlikely to reverse the MPH effect.

4 Conclusion

This paper presents descriptive statistics on competition in lending to firms in the Irish private sector using detailed bank-level lending data. The aim of the paper is to present a picture of competition levels in the market and to draw implications for Irish firms' credit access. From a policy perspective our key findings are as follows: the lending market for all enterprises has become more concentrated since the onset of the 2008 crisis; the lending market for SMEs is significantly more concentrated, and the trend is towards even higher concentration; foreign bank penetration has diminished in Ireland since the crisis. Having distilled the lessons from the literature on the likely effect of increased concentration and lower foreign bank penetration in the Irish SME lending market, it appears most likely is that the predictions of the *Market Power Hypothesis* will prevail, leading to tougher conditions for SMEs seeking to access finance. Policy measures such as a loan guarantee scheme, microfinance fund and credit register should help to mitigate these adverse effects somewhat, but it is clear from the analysis presented here that challenges will remain in the medium term.

[3] Examples include Giannetti and Ongena (forthcoming), George R.G. Clarke and Peria (2001), Beck et al. (2004).

[4] Peek and Rosengren (1997), Presbitero et al. (2012), Popov and Udell (forthcoming), Degryse et al. (2009), de Haas and van Horen (February 2011) all produce findings in this vein.

References

Agostino, Mariarosaria and Francesco Trivieri, "Is banking competition beneficial to SMEs? An empirical study based on Italian data," *Small Business Economics*, October 2010, *35* (3), 335–355.

Beck, Thorsten, Asli Demirguc-Kunt, and Vojislav Maksimovic, "Bank Competition and Access to Finance: International Evidence," *Journal of Money, Credit and Banking*, June 2004, *36* (3), 627–48.

Black, Sandra E. and Philip E. Strahan, "Entrepreneurship and Bank Credit Availability," *Journal of Finance*, December 2002, *57* (6), 2807–2833.

Carbo-Valverde, Santiago, Francisco Rodriguez-Fernandez, and Gregory F. Udell, "Bank Market Power and SME Financing Constraints," *Review of Finance*, 2009, *13* (2), 309–340.

Cetorelli, Nicola and Philip E. Strahan, "Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets," *Journal of Finance*, 02 2006, *61* (1), 437–461.

Chong, T.T.L., L. Lu, and S. Ongena, "Does Banking Competition Alleviate or Worsen Credit Constraints Faced by Small and Medium Enterprises? Evidence from China," Discussion Paper 2011-006, Tilburg University, Center for Economic Research 2011.

Clarke, Robert Cull George R.G. and Maria Soledad Martinez Peria, "Does Foreign Bank Penetration Reduce Access to Credit in Developing Countries?," Working Paper 2716, The World Bank November 2001.

de Guevara, Juan Fernandez and Joaquin Maudos, "Regional Financial Development and Bank Competition: Effects on Firms' Growth," *Regional Studies*, 2009, *43* (2), 211–228.

de Haas, Ralph and Neeltje van Horen, "Running for the Exit: International Banks and Crisis Transmission," Working Paper 279, De Nederlandsche Bank February 2011.

Degryse, Hans, Olena Havrylchyk, Emilia Jurzyk, and Sylwester Kozak, "Foreign Bank Entry and Credit Allocation in Emerging Markets," Working Paper WP/09/270, International Monetary Fund 2009.

di Patti, Emilia Bonaccorsi and Giovanni Dell'Ariccia, "Bank Competition and Firm Creation," *Journal of Money, Credit and Banking*, 2004, *36* (2), pp. 225–251.

Giannetti, Mariassunta, Mike Burkart, and Tore Ellingsen, "What You Sell Is What You Lend? Explaining Trade Credit Contracts," *Review of Financial Studies*, 2008, *24* (4), 1261–1298.

Giannetti, Marissunta and Steven Ongena, ""Lending by Example": Direct and Indirect Effects of Foreign Bank Presence in Emerging Markets," *Journal of International Economics*, forthcoming.

Goggin, Jean, Sarah Holton, Jane Kelly, Reamonn Lydon, and Kieran McQuinn, "Variable Mortgage Rate Pricing in Ireland," Economic Letters 2012/2, Central Bank of Ireland January 2012.

Jayaratne, Jith and Philip E. Strahan, "Entry Restrictions, Industry Evolution, and Dynamic Efficiency: Evidence from Commercial Banking," *Journal of Law and Economics*, 1998, *41* (1), pp. 239–274.

Lawless, Martina and Fergal McCann, "Credit Access for Small and Medium Firms: Survey Evidence for Ireland," Research Technical Papers 11/RT/11, Central Bank of Ireland November 2011.

McCann, Fergal, Conor Mark O'Toole, and Robert Ryan, "Bank Competition and SME Financing Across Europe," Mimeo, Trinity College Dublin March 2012.

Peek, Joe and Eric S. Rosengren, "The International Transmission of Financial Shocks: The Case of Japan," *The American Economic Review*, 1997, *87* (4), pp. 495–505.

Petersen, Mitchell A and Raghuram G Rajan, "The Effect of Credit Market Competition on Lending Relationships," *The Quarterly Journal of Economics*, May 1995, *110* (2), 407–43.

Popov, Alexander and Gregory Udell, "Cross-Border Banking, Credit Access, and the Financial Crisis," *Journal of International Economics*, forthcoming.

Presbitero, Andrea F, Gregory F Udell, and Alberto Zazzaro, "Home bias and the credit crunch: Evidence from Italy," Mimeo, 2012.

Zarutskie, Rebecca, "Evidence on the effects of bank competition on firm borrowing and investment," *Journal of Financial Economics*, September 2006, *81* (3), 503–537.

Tables and Figures

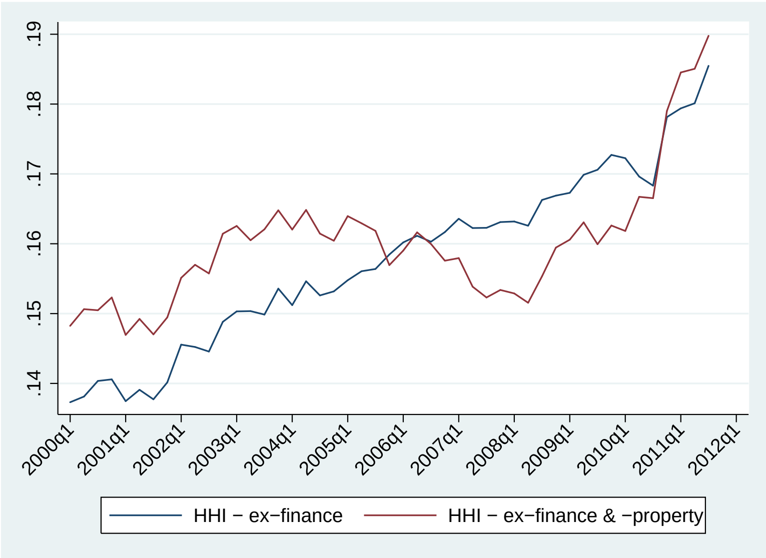
Table 1: *Herfindahl-Hirschman Indices found in previous studies.*

HHI	Source	Time Period	Country Studied
.07-.12	Carbo-Valverde et al. (2009)	1994-2002	Spain
.22	Chong et al. (2011)	2006	China
.18	Patti and Dell'Ariccia (2004)	1996-1999	Italy
.11	Agostino and Trivieri (2010)	1998-2003	Italy
.19	Cetorelli and Strahan (2006)	1977-1994	USA

Table 2: *Banks classified as domestic and foreign. Only banks which have more than 50 sector-quarter observations are reported.*

Domestic	Foreign		
AIB	Barclays	DZ-BANK IRELAND PLC	KBC
BOI	BNP	FCE BANK PLC (DUBLIN)	RABO
EBS	BOA	Helaba	RBS
IBRC	BOS	HSBC	SCOTIABANK (IRELAND)
ILP	CITI	Hypo	Ulster Bank
INBS	Commerzbank	ING	UNICREDIT BANK
NIB	Depfa	Intesa	WestLB AG
TSB BANK	DEXIA	JPMorgan	

Figure 1: *Concentration of Lending to Private Enterprise, Outstanding Stock*

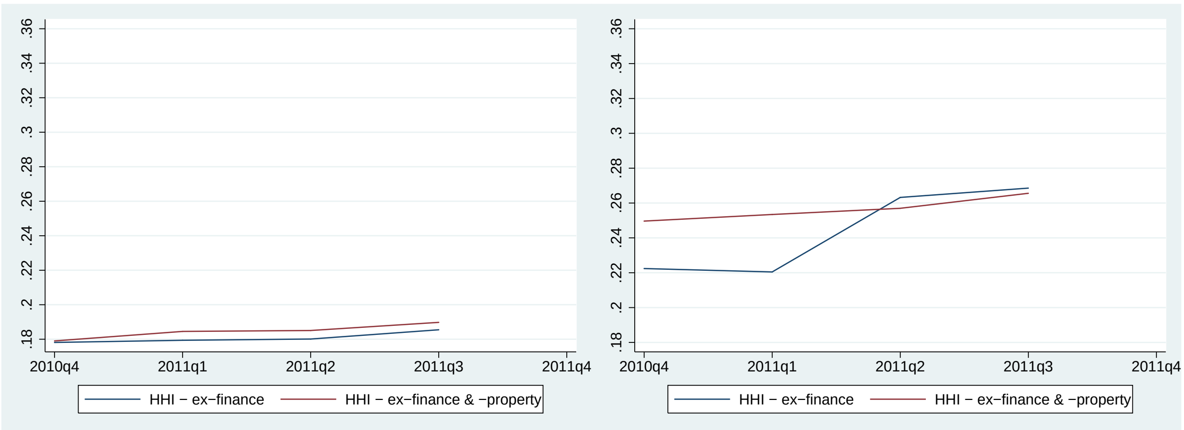


Source: Central Bank of Ireland (2011)

Figure 2: *Concentration of Lending to SME and Private Enterprise, Outstanding Stock*

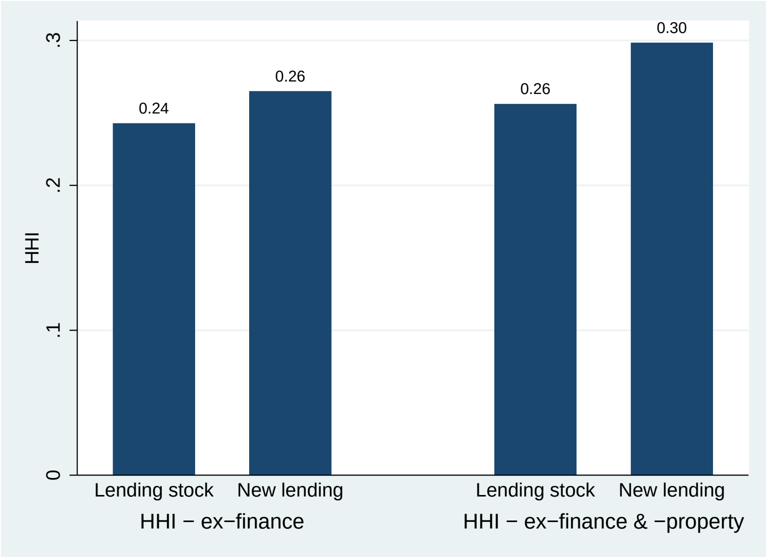
(a) Private Enterprises

(b) SME



Source: Central Bank of Ireland (2011)

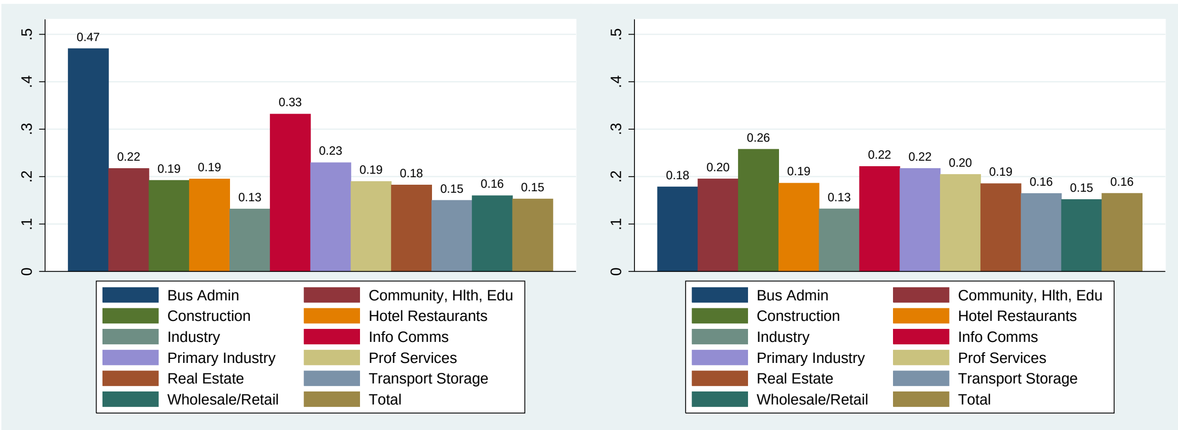
Figure 3: *Concentration of Lending to SME, 2010q4-2011q3 Average*



Source: Central Bank of Ireland (2011)

Figure 4: *Concentration of Lending to Private Enterprise by Sector, 2004 & 2008 Average*

(a) 2004 (b) 2008

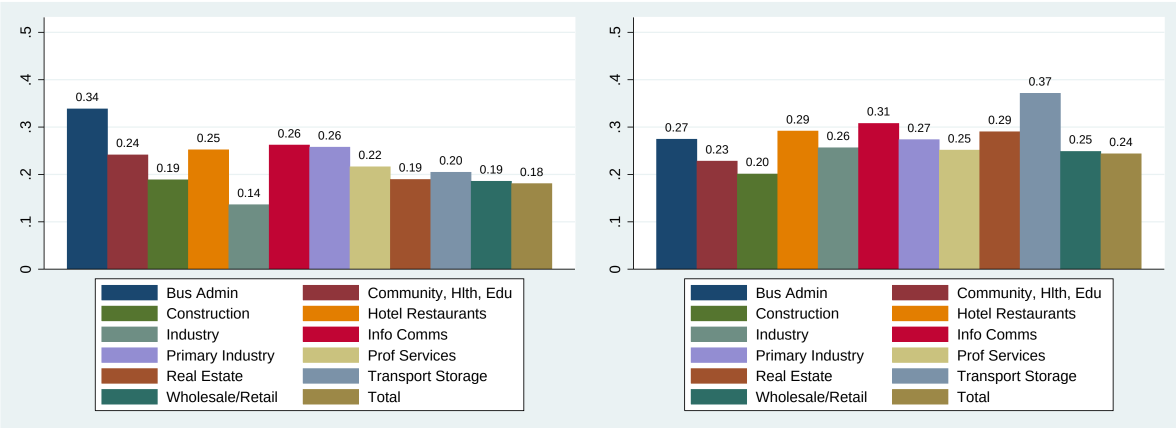


Source: Central Bank of Ireland (2011)

Figure 5: *Concentration of Lending to Private Enterprise and SME by Sector, 2010q4-2011q3 Average*

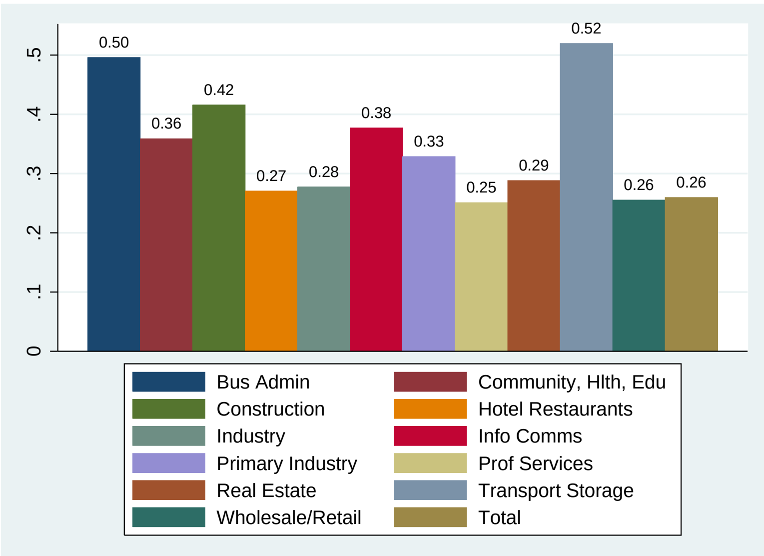
(a) Private Enterprise

(b) SME



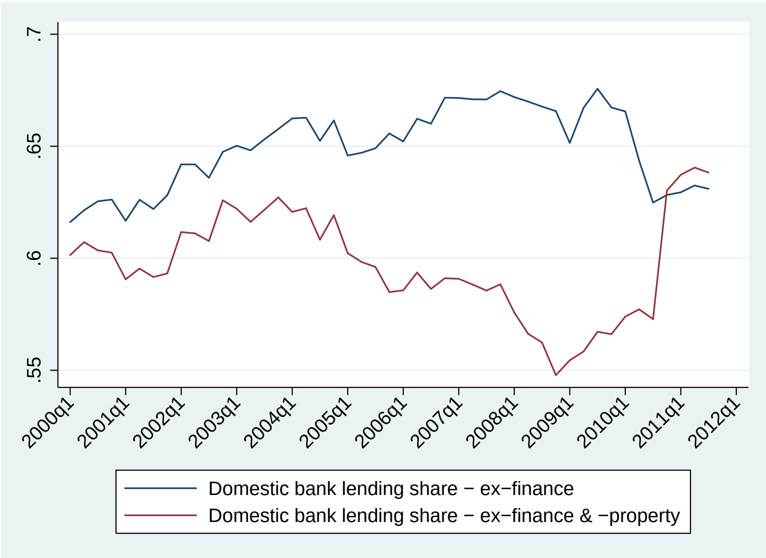
Source: Central Bank of Ireland (2011)

Figure 6: *Concentration of New Lending to SME by Sector, 2010q4-2011q3 Total*



Source: Central Bank of Ireland (2011)

Figure 7: *Domestic Share of Lending to Private Enterprise, 2000-2011*

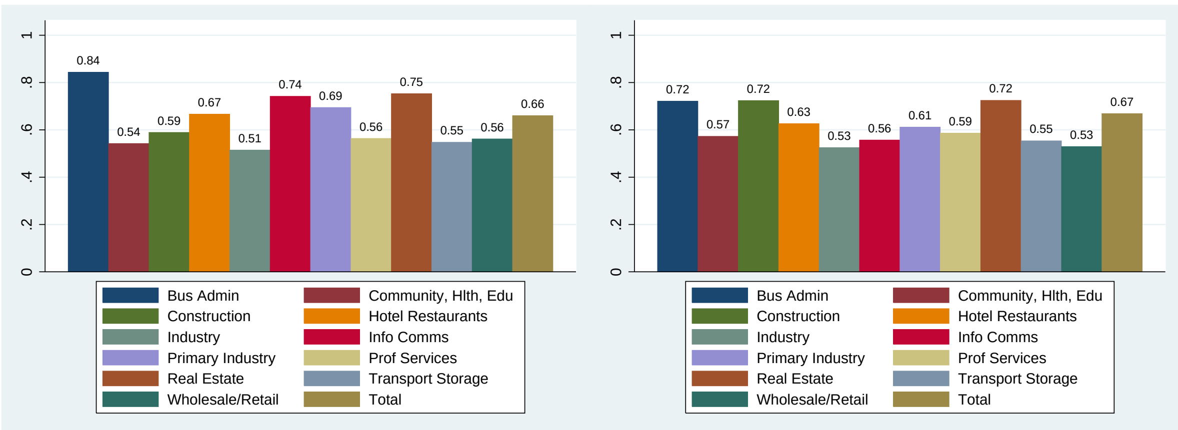


Source: Central Bank of Ireland (2011)

Figure 8: *Domestic Share of Lending to Private Enterprise, 2004 & 2008 Average*

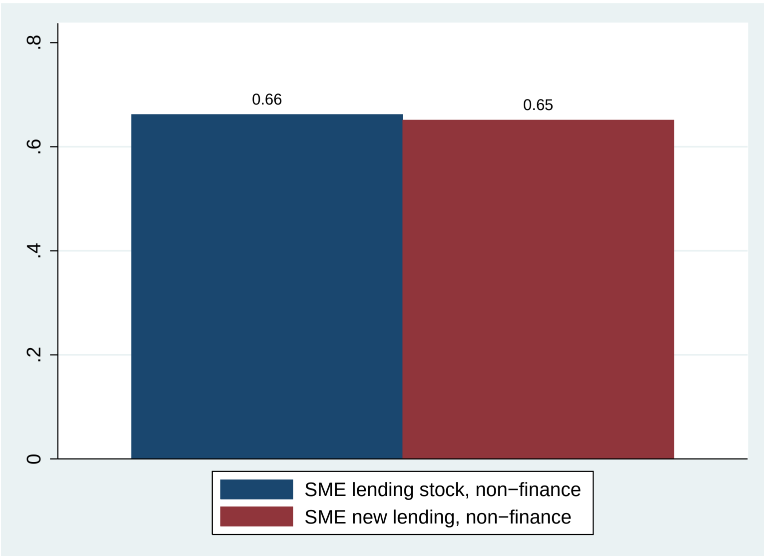
(a) 2004

(b) 2008



Source: Central Bank of Ireland (2011)

Figure 9: *Domestic Share of SME Stock and New Lending, 2010q4-2011q3 Average*



Source: Central Bank of Ireland (2011)