UNIVERSITY OF SOUTHAMPTON FACULTY OF LAW, ARTS AND SOCIAL SCIENCES

School of Management

Three Studies in European Banking

by

Steve Mercieca

Thesis for the degree of Doctor of Philosophy

February 2008

To my family

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Abstract

This thesis focuses on the performance and strategy of small EU banks and their relationship with their target market segments: Small and Medium sized Enterprises (SMEs) and private households. To this end, three distinct lines of research are pursued in this thesis. We start with an investigation of whether small EU banks benefit from diversification within and across business lines, and the impact that the regulatory environment has on such diversification strategies. Second, we examine the determinants of bank financing relationships for SMEs from a bank, SME and regional dimension. Following this, we investigate the evolution of the funding strategies adopted by small EU banks and analyse whether customer deposits are still a key funding source in their overall strategic focus.

Using different economic approaches and different samples, we present robust evidence that small EU banks do not benefit from direct diversification benefits within and across business lines and an inverse association between non-interest income and bank performance is observed. Bank and firm level variables are found to have both negative and positive impacts on SME bank financing relationships, with the regional growth and financial system variables showing that relationship banking can be affected by the market and socio-economic structure of specific European regions. Customer deposits are still featuring strongly within EU small banks' balance sheets and are still the main driver in their provision of loans to SMEs/households which confirms the importance of such banks in the economic growth of regional Europe.

The empirical results give rise to numerous important public policy considerations. Against a background of increasing consolidation in European banking systems and significant changes in the regulatory environment within which financial institutions operate, our analyses suggest that small EU banks still have a major role to play in the European financial arena. The financial intermediation process between banks and SMEs/households is still prevalent and the evidence shows that this fosters growth in the regions we analyse. Obstacles that hinder such growth between SMEs and banks is limiting their potential expansion in both scale and scope.

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London, February 2008

Steve Mercieca

CHAPTER 1

INTRODUCTION

1.1 AIMS

This thesis aims to offer new insights into the performance and strategies of small EU banks. To this end, three distinct and linked analyses are conducted comprising of the diversification strategies of small banks, the bank financing relationship with SMEs, and the funding strategies of small banks.

1.2 OVERVIEW

The European Banking Sector has been undergoing a period of remarkable change in the last 20 years. Events such as globalisation, technological change, deregulation, and European integration have all had a marked impact on the European banking industry. (Goddard et al. 2007, ECB, 2006). The number of banking institutions within Europe has fallen drastically with 8,684 banking institutions in 2005 representing a decrease of 10.9% relative to 2001 according to the European Central Bank (ECB) estimates. Despite such a decrease in the number of institutions, the total assets of institutions within the EU-25 has increased dramatically by 33% between 2001 and 2005. These developments have a particular impact on the number of EU small banking institutions. According to our estimates between 1997 and 2003, the number of small banks with assets less than Euro 450mln have decreased by 24%. The research within this thesis seeks to uncover more information on the evolvement of small banks within Europe, highlighting their importance, opportunities, weaknesses and strengths. The positive contribution of such institutions particularly from a regional perspective vis-à-vis SMEs and private households towards economic growth is acknowledged in the literature (Berger et al., 2004).

In order to achieve this goal, this work focuses on three different areas relating to small EU banks. First, using the increasing dependence on non-interest income of EU banks as a rationale, we investigate the activities that small banks are adopting to move from an interest income to a non-interest income strategy. The income diversification strategies that small banks adopt to ensure their survival in an impeding consolidation environment are analysed together with a focus on the national regulatory environments, enhancing the existing scarce research literature on small EU banks. Second, since small banks, given

their regional perspective, have as target segments SMEs and households, we investigate the determinants of SME bank financing relationships. SME-related research has been at the forefront in the last couple of years due to the drive of governments to analyse a sector, that of SMEs, that in the case of Europe is one of the main economic drivers providing around 99% of businesses. Finally, having investigated the diversification strategies and SME financing relationships of small banks, and seeing that the results from the first two research threads show that small banks need to focus and optimise on their traditional banking functions, the thesis concludes with a study of small banks' funding choices and subsequent performance. We investigate how small banks fulfil the financial intermediary process of collecting deposits and delivering loans to SMEs and private households.

The results and discussion topics emanating from this thesis are various and bear important public policy considerations. The role that small banks fulfil within the EU is of considerable importance in particular in fostering the growth of small businesses. Impeding consolidation and technological progress is certainly eating away from the small bank market share, however this could effectively impact the transmission of funds to SMEs and households which are the backbone of the European economy. In sum, all these considerations confer the key rationale for the three distinctive lines of research presented in this thesis.

1.3 STRUCTURE OF THIS THESIS

This thesis is structured along three main research areas that have as focus small banks within the EU. One chapter 1s devoted to each one of the three different lines of research. Although distinct lines of research, the link between each chapter 1n achieving an overall understanding of the development of small EU banks is obtained through the research rationale of each chapter.

Chapter 2 Small European Banks: Benefits from Diversification?

This chapter presents an empirical analysis of whether small European banks benefit from diversifying into new areas of business, offshoots of existing businesses, or by extending their present lines of business. The chapter also analyses whether certain types of institutions are better able to reap the benefits of diversification and on the impact that the regulatory environment has on European banks. By analysing banks with assets of less than Euro 450mln from the 15 member countries of the EU prior to the 2004 enlargement for the whole period 1997-2003, we find that small EU banks neither benefit from diversification within nor across business lines. Non-interest income activities are inversely related to profitability and risk-adjusted performance whereas size is found to be positively related to profitability.

Chapter 3 SME-bank financing relationships within regional European areas

Chapter 3 investigates the determinants of SME bank financing relationships utilising a unique European Regional data set. The data is made up of 552 SMEs based in three European regions. We use a multi-bank financing relationship variable as the dependent variable and document differences in the number of bank relationships between regions and show the various impacts of firm, bank and market level variables. Our results show that firm and bank specific variables such as size, age, distance, bank role and bank terms are positively associated with the number of bank relationships, whereas a negative link exists between private firms, management change and the number of bank relationships. Our contribution to European regional SME research is enhanced by making use of regional growth and financial system variables that show that relationship banking may be affected by the market and socio-economic structure of a specific region.

Chapter 4 Funding Choices and Performance of small European banks

Following on from the results obtained in Chapter 2 and 3, whereby small banks do not benefit from diversification strategies, we investigate the funding strategies of small banks. Against a backdrop of a wave of bank consolidation across and throughout Europe and recognising the significant role small banks perform within the European financial system, we investigate whether small banks' funding choices have an impact on the amount of loans granted to households and SMEs within the EU. We construct a cross-country panel data set consisting of 858 individual banks from 11 EU countries for the period 2000-2005. We investigate the composition of the bank's liabilities where we observe a greater reliance on customer deposits, and subsequently find a direct positive link between customer deposits, loans to customers and net interest revenue. Regulatory and national characteristics that favour greater access and freedom of banking services are also important to ensure an adequate financial intermediary process by small banks to SMEs/households within the EU.

Chapter 5 Summary, Conclusions, and Future Research

An overall summary and concluding remarks with acknowledgment on the limitations of this work are presented in Chapter 5. An outline of a number of intellectually appealing avenues for future research is finally presented at the end of this thesis.

CHAPTER 2

Small European Banks: Benefits from Diversification?

Small European Banks: Benefits from Diversification?

Abstract

Motivated by the liberalisation and harmonisation of financial systems in Europe, we investigate whether the observed shift into non-interest income activities improves performance of small European credit institutions. Using a sample of 755 small banks for the period 1997 – 2003, we find no direct diversification benefits within and across business lines and an inverse association between non-interest income and bank performance. Our findings are robust to a set of sensitivity analyses using alternative samples and controlling for the regulatory environment. Furthermore, the results provide circumstantial evidence for the presence of economies of scale. The absence of benefits of diversification confirms findings for other banking markets and suggests small European banks enter lines of business where they currently lack expertise and experience. These results have implications for bank supervisors, regulators and bank managers.

2.1 Introduction

Motivated by the ongoing liberalisation and harmonisation of financial systems in Europe, we investigate whether small EU banks benefit from diversifying into new areas of business, offshoots of existing businesses, or by extending their present lines of business. We also analyse whether certain types of institutions are better able to reap the benefits of diversification and if our results are sensitive to controlling for the regulatory environment that European banks operate in.

The structure of European banking markets has been shaped over time by policies that encourage the provision of financial services to specific sectors of society that were on the fringe of economic development.¹ Consequently, a large number of savings and cooperative banks as well as other small independent local and regional banks are observed throughout Europe. These small banks concentrate on selected market segments, which give them a distinct comparative advantage. Through the development of long-term relationships with their customers, such banks differentiate their services and are in a better position than bigger banks to service their markets. Two of the major roles attributed to small banks are lending to small and medium sized enterprises (SMEs)² and to private households.³ Contrary to small banks, large banks suffer from organisational diseconomies when providing relationship lending together with transaction lending because of the different technologies employed (Williamson, 1988). Similarly, both Stein (2002) and Berger and Udell (2002) argue that filtering 'soft' information throughout a large bank is difficult and might potentially be lost via the various organisational channels.

Providing one believes that small banks play an important role within EU economies,⁴ it is important to identify strategies that make these banks successful. Increased credit availability, introduction of the Euro and deregulation have led banks to increase their

¹ For excellent in-depth discussions of this subject matter see Belaisch et al. (2001) and Brunner et al. (2004).

 $^{^{2}}$ The European Union defines small and medium sized enterprises as enterprises that employ fewer than 250 people, have an annual turnover not exceeding 50 million EUR, and/or annual balance sheet total not exceeding 43 million EUR.

³ A variety of studies support the hypothesis that small banks have an advantage with respect to SME lending: Berger et al. (1998), Peek and Rosengren (1998), Strahan and Weston (1998), Berger and Udell (2002).

⁴ Berger et al. (2004) offer an important examination of the relationship between small community banks and economic performance in a cross-country setting and conclude that healthy small banks are associated with faster GDP growth. DeYoung et al. (2004a) and Yeager (2004) conclude that the community bank business model is economically viable and such banks withstand economic shocks quite well.

competitive nature and seek new market segments in search of profit maximising opportunities (White, 1998; Cetorelli, 2004).⁵ The relatively stable European economic conditions resulting in lower interest rates, lower bank interest margins and lower profitability have increased banks' need to improve their efficiency levels and opt for diversification into more profitable ventures (ECB, 2004). All this begs the question: does diversification benefit small European banks?

Chapter 1 investigates different types of diversification and focuses on small EU banks.⁶ We consider banks' diversification activities that occur either through *shifts* between non-interest income and interest income activities, through diversification *within* these two types of income generating activities, or through both simultaneously. Banks can diversify into non-interest income products and services that are directly linked to an existing interest income generating activity. Alternatively, banks can also diversify within either non-interest income activities or interest income activities. The increasing shift towards non-interest income activities of banks such as commission income, trading income, fee income is demonstrated in Figure 2.1.

We examine banks from the 15 member countries prior to the 2004 enlargement of the European Union for the period 1997-2003. The majority of institutions in the sample do not have publicly traded securities. To examine the impact of a diversification index (Herfindahl Hirschmann Index) on risk-adjusted performance, we therefore employ accounting measures of bank profits such as Return on Assets (ROA) and Return on Equity (ROE) as a means to gauge bank performance. The Z-score, showing the number of standard deviations that profits must fall to push a bank into insolvency, is utilised to provide a view of how the diversification activities within small banks impact upon insolvency risk. Finally, based on the rationale that further liberalisation through EU directives adopted under the Financial Sector Action Plan (FSAP), national legislation to implement the European Company Statute, revisions to national legislation for the cooperative banking sector, the new Takeover Directive,⁷ and Basel 2 are placing more

⁵ For a brief overview on the levels of competition across a large sample of countries measured with techniques used in the new empirical industrial organisation literature see Claessens and Laeven (2004).

⁶ We define 'small' banks as those with no multi-bank affiliation that have an asset size below \notin 450m (as of 31/12/2000). All statistics are converted to this date through the GDP deflator.

⁷ European Commission, Takeover Directive (2004/25/EC), Brussels.

competitive pressure upon banks, we additionally control for the impact of the regulatory environment on diversification to test robustness of our results. Measures of bank regulation (Barth et al., 2001a, 2004) and a Banking Freedom Index, obtained from the Heritage Index Foundation are used for this analysis.

Findings indicate that small EU banks neither benefit from diversification within nor across business lines. Non-interest income activities are inversely related to profitability and risk-adjusted performance whereas size is found to be positively related to profitability. Our result that small banks do not benefit from diversification is robust to a set of sensitivity analyses involving: i) alternative samples, ii) controlling for bank type, and, iii) controlling for key features of the regulatory environment.

This chapter contributes to the research on European banking in three distinctive ways. First, to our knowledge, this is the first study to examine whether diversification benefits exist within the small banking sector in Europe. Second, this chapter adds to the research on small banks by analysing the product/revenue diversification focus that they are adopting in an increasingly competitive environment. Third, we also test whether certain types of small banks are better able to benefit from diversification.

The remainder of the chapter 1 is organised as follows. Section 2.2 reviews the prior literature and Section 2.3 explains the methodology and describes the dataset. We present empirical results in Section 2.4 and offer concluding remarks in Section 2.5.

2.2 Literature Review

2.2.1 Literature Review: Role of Small Banks in Financial Systems

Proponents of future EU banking market structures like Goodhart (1987) and Branson (1990), present the notion of an emerging two-tier financial system, with the top tier representing the pan-national commercial banks servicing sophisticated (corporates, governments, private banking) clients. This notion of a tier of leading banks is presently supported by the rise in cross-border mergers and acquisitions within European banks since the 1990s. The second tier of such a European banking system would comprise local and

regional banking markets servicing SMEs and private households. This second tier market, upon which chapter two is concentrated, comprises savings and cooperative banks together with independent local and regional banks that are the key players in such a market.

Although the division between banks into two categories is becoming increasingly clear, the present structure of the European banking system owes much to the social and financial developments throughout the nineteenth century. Government intervention and regulation of the banking system has resulted in today's environment of a large number of small banks. Policies aimed at encouraging the provision of financial services to specific sectors of society that were on the fringe of economic development has resulted in the high number of savings and cooperative institutions present throughout Europe. Savings banks were envisioned in their conception, and still serve today, as instruments for the channelling of households' savings to the industrial sector. Cooperative banks⁸ were created in response to the economic challenges that the European population faced in the 19th and early 20th centuries. The purpose above all was of providing credit and liquidity management services for non-industrial sectors of activity such as farming. The development of such institutions was initiated, supported and nurtured by governments. Both savings and cooperative banks differ in their structure throughout European countries. Belaisch et al. (2001) show that whilst in the Dutch (who has no savings banks, but one large cooperative group) and the French banks are concentrated in a few groups with a pyramidal structure, in Germany and Italy, the savings and cooperative sector consists of a great number of small independent entities. Spanish savings banks lie in a 'mid' zone in concentration terms with consolidation, mainly at the regional level, occurring between these same institutions.

Walter (1999) states that despite the presence of large nationwide financial institutions competing in local and regional markets, small institutions are proving 'adept at survival'.

⁸ Most continental European cooperative banks were established on the basis of the ideas of Hermann Schulze (1808–83) and Friedrich Wilhelm Raiffeisen (1818–88). Both men were moved by the poverty and misery they observed, especially during the famine of 1848, and noted that ordinary people had no access to credit, except perhaps from usurary lenders. They independently started to promote the idea of credit cooperatives during the middle of the 19th century, Schultze aiming at helping urban small business owners and artisans and Raiffeisen seeking to assist the rural poor. The rationale was similar to the one behind current microfinance initiatives in developing countries, namely to provide people with the tools and resources to collectively and individually help themselves.

Within Europe, consumer preferences are traditionally strong making it hard especially for non-national providers to grasp a stronghold on the respective national markets without effectively improving upon the existent services within the country. This strong consumer sentiment is a major comparative advantage in European markets and enables small banks to reinforce their stronghold on their existing markets.

The small banking market is also under the influence of increased competition and resulting in bank management having to focus on increasing efficiency to bolster profits. Murphy (2000) states that continental Europe suffers from restrictions in labour laws and regulations, reducing the actual benefits that might arise from increased competition. However, the drive to keep costs low, improve on working efficiencies, introduce new products and numerous delivery channels have seen small banks in regional sectors push towards a best practice environment. Gardener et al. (1999) point out that whilst competitive conditions have increased the level of competition within local and regional banks especially for customer deposits which are the main source of funding for such banks, there has been no major change in strategy and the focus remains on maintaining and enhancing the relationships with the main target customers.

The importance of maintaining the focus on selected market segments provides a comparative advantage for such small banks. In a study on Spanish savings banks, Carbo et al. (2002), argue that by focusing on the social aspect of banking such banks can actually establish themselves more as a nodal point in the community, enabling them to cross-sell products and services. By developing long-term relationships, such banks help to differentiate their services and are in a much better position than bigger national banks to service the market they operate in. Thus although competitive pressures have been mounting on small banks to merge with other banks, cease operations or seek liaisons with like-minded institutions, there appears to be a role for small banks to fulfil. Reiterating this view with an emphasis also on savings banks, Belaisch et al. (2001) report that, even though the regulation and organisational structures of small banks varies across European countries, the majority of such banks share the same strategic objective which is that of pursuing other goals besides generating profits. As opposed to other commercial banks that have the pressure of shareholders to over-achieve and outperform competitors, small banks

thus have a competitive advantage even though they still have to optimise their risk/return trade-off in order to remain viable.

In an international analysis of small community banking and economic performance, Berger et al. (2004) investigate how the health of such banks relative to other banks affects a nation's economy. They test whether a relatively large market share and relatively high efficiency for community banks may promote economic growth due to transmission mechanisms (being, the improved financing opportunities for SMEs that are regarded as the engine of economic growth and greater overall flows of bank credit). The authors conclude that data from both developed (including all EU countries) and developing nations is consistent with the hypothesis that relatively healthy small banks are associated with faster GDP growth. Also, the relative health of small banks is positively associated with both the SME employment share and the overall bank lending-to-GDP in both developing and developed nations.

One of the major roles attributed traditionally to small banks is SME and private household lending. This role has attracted researchers to gauge the potential advantages, if any, that small banks possess in lending to informationally opaque SMEs. Information for the execution of lending transactions for banks, irrespective of their size, can be classified as 'soft' or 'hard'. Soft information is obtained through relationship lending, whereby information is gathered through a long-term process of getting to know the customer, his market, his suppliers, threats and opportunities and other relevant information that is not easily quantified or verified. Hard information is obtained through transaction lending which is quantifiable and can be verified through credit scores, banking and financial statements. Williamson (1988) states that large banks suffer from organisational diseconomies when providing relationship lending together with transaction lending because of the different technologies employed. Both Stein (2002) and Berger and Udell (2002) state that filtering soft information throughout a large bank is difficult and might potentially be lost via the various organisational channels. Additionally this might create agency problems whereby the information held by the front office loan officer cannot easily be communicated to management due to the organisation levels within large banks. Another advantage small banks have in SME lending which enables them to build on

obtaining soft information is location. Hauswald and Marquez (2002) show that on average large banks are headquartered at longer distances from potential SME borrowers, making it more difficult to process locally obtained soft information.

Since small banks' operations tend to be focused within either a specific regional area or towards a specific segment of society (or both), the downside to being concentrated within a particular market is the risk of vulnerability to local economic shocks. Portfolio theory suggests that geographically concentrated banks are riskier than more geographically diversified banks because of heightened credit risk. Whilst the idiosyncratic segment of credit risk can be diversified away by spreading the risk over an increased number of customers, the market risk segment is associated with events beyond the banks controls. An economic downturn in a particular region can have a damaging effect on a concentrated bank due to sustained defaults. However, Yeager (2004) examines this concept on a sample of U.S. small banks and finds that such banks withstand economic shocks quite well.

Research generally supports the hypothesis that small banks have an advantage with respect to SME lending. Berger et al. (1998a), Peek and Rosengren (1998) and Strahan and Weston (1998) show that the ratio of SME loans to assets declines after large banks are involved in mergers and acquisitions. Berger et al. (2002) examine the SME loans extended by large banks and find that they lend at greater distances and have less personal contact with borrowers, consistent with the hypothesis that small banks enjoy comparative advantages when it comes to allocating SME lending. However, there are studies that show different views on this issue. Jayartne and Wolken (1999) report no evidence of a small bank cost advantage that would suggest important constraints on small businesses from the absence of small banks. Overall, the evidence on the role of small banks in small business lending shows different outcomes highlighting the complexity of defining the role of small banks in the financial system.

2.2.2 Literature Review: Diversification within Financial Institutions

Diversification in banking can be viewed as three-dimensional: i) across financial products and services, ii) through geographic expansion, and iii) through a combination of

geographic and business line diversification. Studies of cross-functional mergers provide mixed results. Cubo-Ottone and Murgia (2000) investigate Mergers and Acquisitions (M&A) in European banking and find significant positive abnormal returns associated with product diversification of banks into insurance. However, they also find that M&A with securities firms and foreign institutions did not achieve any gain. Focarelli et al. (2000), utilising Italian data on bank M&As, discover increasing returns on equity after a merger, and long-run increases in profitability for acquired banks after an acquisition. Kwast (1989) reports limited potential for risk reduction by diversifying into securities activities in the US and Wall and Eisenbeis (1984) find a negative correlation between bank earnings and securities broker/dealer earnings. Furthermore, the related literature using simulation studies widely reports limited diversification gains with respect to higher earnings and risk reduction.9 Sinkey and Nash (1993) examine commercial banks specialising in credit card lending that generated higher and more volatile returns and report a higher probability of insolvency than for banks with traditional product mixes. Demsetz and Strahan (1997) analyse stock returns of Bank Holding Companies (BHCs), and find that diversifying BHCs shift into riskier mixes of activities and hold less equity than their counterparties. Analyzing the mutual fund diversification activities of banks, Gallo et al. (1996) report that a high level of mutual fund activity is associated with greater profitability, but only slightly lower risk levels. Acharya et al. (2002) analyse a sample of Italian banks and report that diversification of bank assets is not guaranteed to produce superior performance and/or reduce risk. Stiroh (2004a) examines a sample of US community banks and finds diversification benefits within broad activity classes, but not between them, and Stiroh (2004b) emphasises increased volatility of bank earnings arising from shifting into noninterest activities such as trading. Finally, Stiroh and Rumble (2006) investigate the nexus between revenue diversification and risk-adjusted performance of US financial holding companies (FHCs) and present evidence for diversification benefits between FHCs. However, those benefits are more than offset by the increased volatility of non-interest

⁹ For example, Reichert and Wall (2000) offer evidence for gains from diversification between traditional and non-traditional banking activities. Santomero and Chung (1992) conclude that mergers between BHCs and regional securities firms usually lead to a reduction in the BHCs' risk. Boyd and Graham (1988) investigate hypothetical mergers between BHCs and life insurance companies and report that these combinations tend to decrease profit volatility and insolvency risk. Lown et al. (2000) expand on this research and show similar results. Wall et al. (1993) construct synthetic portfolios based on the accounting returns of banks and non-bank financial firms and find that banks would have experienced higher returns and lower risk if they had diversified.

activities. In addition, no performance increases are found in this study within FHCs resulting from increased diversification, whereas the negative link between shifts into non-interest activities and risk-adjusted performance persists.

2.3 Data and Methodology

We retrieve annual data for small European banks for the period 1997 - 2003 from Bankscope and classify small banks as credit institutions with an asset size less than €450 million and no multi-bank affiliation.¹⁰ 'Other' banks are by exclusion all remaining institutions. In total, 755 credit institutions satisfy our definition of a small bank throughout the seven year period. The sample is dominated by co-operative banks and savings banks, which account for 87% of the number of institutions in the dataset with the remaining classified as commercial, mortgage or credit banks. During our sampling period, the total number of small banks in Europe declined by 24% (Appendix 2.A). The 'other banks' category depicts an increase of 13%. The decline of small banks may be due to small banks ceasing operations, merging with other institutions, or due to an increase in their operations resulting in an increased asset base that has made them shift to the otherbank category. Appendix 2.B indicates that, for small banks, total assets, net income and net operating revenue have declined by 18%, 11% and 13% respectively while total loans have decreased by 14%. Other banks show by contrast an increase of 73% in total loans. Both sample sets reveal decreases of 13% in the net interest component of net operating revenue and a corresponding increase in the non-interest income component of 29% for small banks and 21% for the other banks. The commission income component of noninterest income has increased by 48% while trading income rose by 31% in small banks.

2.3.1 Diversification Measures

We construct Herfindahl Hirschmann Index (HHI) measures for each bank in order to account for diversification between major activities. The revenue HHI (HHI_{REV}) for each bank is computed from the revenue flows as follows:

¹⁰ Bankscope is a commercial database for financial institutions. The asset size cut-off (less than \notin 450m) is similar to that used in other studies of U.S. small banks including: Strahan and Weston (1998), Jayaratne and Wolken (1999), Meyer and Yeager (2001) and Stiroh (2004a). The seven year period is the maximum provided by Bankscope.

$$HHI_{REV} = \left(\frac{NON}{NETOP}\right)^2 + \left(\frac{NET}{NETOP}\right)^2 \tag{1}$$

where NETOP = NON + NET

NON captures non-interest income, NET is net interest income, and NETOP is net operating revenue. As the HHI rises, the bank becomes more concentrated and less diversified. We repeat these computations to construct measures of diversification within non-interest activities and within lending activities:¹¹

$$HHI_{NON} = \left(\frac{COM}{NON}\right)^2 + \left(\frac{TRD}{NON}\right)^2 + \left(\frac{OTOP}{NON}\right)^2$$
(2)

where NON = COM + TRD + OTOP

and COM captures commission revenue,¹² TRD is trading income and OTOP is other operating income, whereby higher values indicate greater concentration.

$$HHI_{LOAN} = \left(\frac{MTG}{LOAN}\right)^2 + \left(\frac{HPL}{LOAN}\right)^2 + \left(\frac{CORP}{LOAN}\right)^2 + \left(\frac{OTHLN}{LOAN}\right)^2$$
(3)

where LOAN = MTG + HPL + CORP + OTHLN

and MTG is mortgages, HPL captures hire purchase and leases, CORP is loans to group companies, associates, governments, municipalities and corporates and OTHLN is other loans, whereby higher values indicate again increased concentration.

2.3.2 Risk-Adjusted Performance Measures

¹¹ We eliminate banks where negative income for a particular year gives rise to a meaningless corresponding HHI such that average non-interest income and non-interest component proportions are below 1.0. However, this only applies to a very limited number of institutions in our sample and therefore is unlikely to give rise to survivorship bias. Lastly, large positive and negative ROE outliers are excluded which constrains the sample between the 1^{st} and 99^{dt} percentile.

¹² Commission Revenue includes Fee Revenue for aggregation purposes since the amount of fee income generated by the banks in the sample is extremely low.

Diamond (1984) argues that diversification effects contribute to reduced risk in financial intermediaries. Hence, we investigate the effect of diversification on three performance measures based on accounting ratios. We calculate two risk-adjusted measures of return on equity (ROE) and return on assets (ROA) by dividing average ROE and average ROA by their respective standard deviation as follows¹³:

$$RAR_{ROE} = \frac{\overline{ROE}}{\sigma_{ROE}} \qquad \qquad RAR_{ROA} = \frac{\overline{ROA}}{\sigma_{ROA}}$$
(4)

where ROE is the mean return on average equity (net income divided by equity), σ_{ROE} is its standard deviation, ROA is the mean return on assets (net income divided by assets), and σ_{ROA} is its standard deviation. A higher ratio indicates higher risk-adjusted profits. We compute the mean of each ratio for each bank individually. The mean and standard deviation for all banks in the sample is then computed on the back of such individual average measures. Since the number of standard deviations that an institution is away from insolvency can measure insolvency risk, we assess insolvency risk for each bank using a Zscore, employed by Stiroh (2004a, 2004b) based on the work by Boyd and Graham (1986a).¹⁴ This measure accounts for the mean level of bank profits and the mean equity ratio.

$$Z = \frac{\overline{ROA} + \overline{E/A}}{\sigma_{ROA}}$$
(5)

where E/A is the mean equity to asset ratio (equity capital divided by total assets). Thus, a higher Z-score indicates improved risk-adjusted performance.

¹³ Stiroh (2004) who applies these same ratios, defines these ratios as 'Sharpe ratios' defined as average profits divided by the standard deviation of profits and can be interpreted as profits per unit of risk. Sharpe ratios are typically constructed from market return data, however this is not available for non-listed small banks. This measure measure of risk-adjusted performance has recently been used by Cebenoyan and Strahan (forthcoming) and Stiroh (2004b).

¹⁴ The Z-score can be interpreted as an accounting-based measure of the distance to default. This measure of risk-adjusted performance has been used recently by Lown et al. (2000), Berger and Bonaccorsi di Patti (2001), and Stiroh (forthcoming).

We present descriptive statistics in Table 2.1. EU credit institutions have an average \in 192 million in assets, with the standard deviation indicating a large variance in terms of bank size. The different HHI measures also underpin differences in strategic focus adopted by different banks. HHI_{REV} ranges from a minimum of 0.4 to a maximum of 0.9. The proportions in both HHI_{NON} and HHI_{LOAN} exhibit ranges of between total concentration (1.0) and no concentration (0.0) indicating that banks are highly concentrated in particular activities within non-interest and lending activities.

2.3.3 Econometric Model

We utilise the OLS regression shown in Equation (6) to examine the link between diversification, measured by HHI_{REV} and the average level and volatility of the banks' profitability. This regression follows the methodology by Stiroh (2004) in a US study on diversification within community banks and large banks. This regression uses Y = [ROE, σ_{ROE} , σ_{ROA} , ROA, RAR_{ROE}, RAR_{ROA}, Z-score] as dependent variables:¹⁵

$$Y_{i} = \alpha + \beta_{1} HHI_{REV_{i}} + \beta_{2} PRP_{NON_{i}} + \beta_{3} HHI_{LOAN_{i}} + \beta_{4} PRP_{CORP_{i}}$$

$$+ \beta_{5} \overline{PRP_{HPLEASE_{i}}} + \beta_{6} \overline{PRP_{OTHLN_{i}}} + \beta_{7} \overline{HHI_{NON_{i}}} + \beta_{8} \overline{PRP_{TRD_{i}}}$$

$$+ \beta_{9} \overline{PRP_{OTOP_{i}}} + \beta_{10} \ln A + \beta_{11} \overline{(E/A)_{i}} + \beta_{12} \overline{(L/A)_{i}} + \beta_{13} d \ln(A_{i})$$

$$+ \beta_{14} d \ln(A_{i})^{2} + OBS_{i} + \gamma_{i} + \varepsilon_{i}$$
(6)

where HHI_{REV} is revenue HHI, PRP_{NON} is the proportion of non interest income in net operating revenue and the expression HHI_{LOAN} is a Herfindahl-Hirschman Index for the loan portfolio. We decompose the loan portfolio into the proportion of corporate loans to total loans, denoted by PRP_{CORP} , the proportion of hire purchase and leases to total loans,

¹⁵ We conducted robustness tests using an operating income based performance measure since both ROE and ROA are computed from net income. To this end, we estimated regressions with the ratio of operating return to total assets as dependent variable and also ran the regressions with the standard deviation of operating return to total assets as a corresponding risk measure. These results are very similar to those presented in Table 2.2 and are shown in Table 2.7.

denoted by PRP_{HPLEASE}, and the proportion of other loans, captured by PRP_{OTHLN}. We differentiate within the non-interest income stream, whereby HHI_{NON} is the non-interest proportion of net income, PRP_{TRD} is the proportion of trading in non-interest income and PRP_{OTOP} is the proportion of other operating income in non interest income. InA is log assets, (E/A) is equity to asset ratio, (L/A) is loan to asset ratio and *d*ln(A) is asset growth for bank *i*. Bars over variables indicate averages for the number of years the bank is observed. OBS_i are dummies that capture the number of years the bank is observed. We introduce this dummy to account for the fact that we eliminate observations if negative income occurs for a particular year within the seven year period. The variable γ_i is a country fixed effect and ε_i is the error term. The coefficients obtained with Equation (6) are not to be interpreted in a causal sense as we estimate a reduced-form model. Thus, our coefficients show conditional correlations between the various measures of bank performance and the pursued diversification strategies.

We anticipate a successful diversification strategy to be reflected in a positive association of ROE and ROA with our diversification variables, whereas the corresponding volatility measures are expected to be negatively related to the various diversification variables. More precisely, given that HHI_{REV} measures the degree of revenue concentration, it is assumed that β_1 will be negative in the ROE and ROA regressions. On the other hand, if diversification reduces the volatility of profits, then we expect β_1 to be positive in the σ_{ROE} and σ_{ROA} regressions. The coefficient β_2 gauges the impact of increased non-interest income upon the dependent variables. It is important to note that the regression coefficients on the individual component shares in the loan and revenue shares measure the effect of a shift from the omitted category of the component share into an alternative since one component share has to be excluded to avoid perfect collinearity. For instance, the coefficient β_2 measures the shift out of net interest income (the omitted component) into non-interest income.¹⁶ If the proportion of non-interest income increases profitability, then β_2 will be positive in the ROE and ROA regressions. By contrast, if an increase in the reliance upon non-interest income reduces the volatility of profits then β_2 will be negative in both σ_{ROE} and σ_{ROA} regressions.

¹⁶ Net Interest Income is the omitted proportion of Net Income from the equation to avoid perfect collinearity. Such an econometric approach is widely applied in economic studies (e.g., Beck et al. (2006), Stiroh (2004a), and Ongena and Smith (2000).

The other variables control for factors potentially affecting the level and volatility of profits. The equity to assets ratio and growth rates are included to proxy for non-apparent risk preferences. The impact of bank management taking on more risk to speed up growth may result in the bank having lower equity ratios. Average growth is included in levels and in quadratic form to account for the differences in growing and contracting banks. The loan to asset ratio is incorporated to capture differences in banks' asset portfolio. The observation dummy variables control for systematic differences in volatility over a number of observations. Country fixed effects are also included to account for differences in the economic environment in which banks operate.

For the purpose of our study, we average the bank-specific variables over the sampling period. In addition, we ran sensitivity tests with 1997 values to reduce simultaneity since returns and income shares are determined simultaneously. While this approach increases the noise in our measure of the banks' strategic focus (Stiroh and Rumble, 2006), we obtain similar results regarding the variables of interest. Thus, simultaneity does not seem to drive our conclusions regarding the absence of diversification effects.

2.4. Empirical Results

We present empirical results of our canonical models in Table 2.2. The regressions with average profitability (mean ROE and ROA) as dependent variable show mixed results. In terms of average profitability, reported in column 1 and 3, the coefficient HHI_{REV} is significant and negative, suggesting that concentrated revenue streams are associated with lower return on equity and lower return on assets. This is consistent with our hypothesis that less concentration contributes to higher average profitability. The coefficient on the non-interest proportion is negative and significant, providing evidence that a shift from interest income activities into non-interest income activities results in lower average profitability. This implies that small banks in Europe do not gain by diversifying outside their traditional lines of business, suggesting that it may be difficult for those institutions to get a strong foothold in non-interest activities. This may be due to the fact that traditional interest income activities are those lines of business where small European banks have the most expertise. Small banks may have less experience in non-interest activities and this ultimately hampers performance, reflected in lower average profitability. While this

finding challenges traditional intermediation theory,¹⁷ it is aligned with evidence in the corporate finance literature and with recent work by Laeven and Levine (2007) on diversification in financial conglomerates indicating that diversification gives rise to a so called 'diversification discount'.¹⁸ Denis et al. (1997) and Rajan et al. (2000) put forward that agency problems between managers and owners, and power struggles between different segments within a firm can respectively explain the finding that diversification has negative ramifications for corporate performance. Consequently, corporate finance theory suggests firms should focus so as to reap the greatest benefits from management's expertise and reduced agency problems.

We also examine the economic impact of diversification on average profitability by calculating the effect of a one standard deviation increase in the non-interest share (13.0 %), evaluated at the median non-interest share (21.0 %). An increase in non-interest activities has a two-way effect: First, a direct impact from shifting into non-interest activities and, second, an indirect effect arising from changes in diversification. More formally, this effect reflects the derivative of Equation (6) with respect to non-interest share, calculated at the median non-interest share.¹⁹ Similar to the results presented by Stiroh (2004a), we find negative net effects for average profitability and corresponding positive effects on volatility. The computations suggest that a one standard deviation increase in the non-interest income share considerably decreases risk-adjusted performance. For instance, increasing the non-interest component share by one standard deviation is associated with a significant decline in the Z-score for the average small bank in Europe from more than 58 standard deviations away from insolvency down to 48 standard deviations. Our reported standard deviation for the non-interest component is

¹⁷ See Diamond (1984) and Boyd and Prescott (1986) for detailed expositions concerning benefits of diversification in financial intermediaries based on the delegated monitoring argument.

¹⁸ This 'diversification discount' is usually measured as the difference between the value of a merged or a diversified firm and the sum of the values of the stand-alone firms corresponding to the firms that were taken over or the merged business units. For example, Berger and Ofek (1995, 1996) present evidence for value losses from diversification in the range of 15% during the late 1980s, and that value losses from diversificantly related to the probability of subsequent takeovers, with greater value losses being associated with greater takeover probability. Laeven and Levine (2007) find that the market values of financial conglomerates that engage in multiple activities are lower than if those financial conglomerates were broken into specialised financial intermediaries.

¹⁹ This exposition follows the method proposed by Stiroh (2004a).

more than twice as large as in other published work²⁰ and our slope coefficients are also substantially greater in magnitude than those reported in Stiroh (2004a). This helps explain the greater impact of the net effect found for small European banks compared with US community banks.

The decomposition of the loan portfolio indicates that moving from mortgage lending into the 'other loans' category further decreases average profitability as illustrated by a significant and negative coefficient for the variable 'other loans' whereas, the positive and weakly significant coefficient for HHI_{LOAN} suggests that average ROA increases with a more concentrated loan portfolio. This may be due to the fact that small EU banks can reap benefits from nurturing their core lending activities, a result consistent with the hypothesis that small banks are better off fostering traditionally established lines of lending activities. Moreover, this result is aligned with the findings by Acharya et al. (2002) for the Italian banking sector who also highlight diseconomies of scope. Such diseconomies of scope can arise from a lack of monitoring expertise in 'new' lending activities. HHI_{NON} is negative and significant demonstrating that increases in non-interest income concentration are associated with lower levels of ROA and ROE. Within non-interest activities, the trading variable is negative and highly significant in the two specifications. Shifting into this noninterest income activity lowers bank performance. This may be due to the fact that underperforming institutions increase their risk profile to restore profitability by engaging in risky trading activities where they lack experience. Moreover, this finding could also reflect the small banks' exposure to the capital markets that have experienced considerable asset price declines during our sampling period.

The standard deviation regressions substantiate the preceding results. The positive and highly significant coefficients for HHI_{REV} reported in column 2 and 4, in Table 2.2, highlight that banks with concentrated revenue streams exhibit higher revenue volatility. Similarly, shifting into non-interest income is positively and significantly associated with revenue volatility. This is aligned with results obtained by Stiroh (2004a, 2004b),

 $^{^{20}}$ Stiroh (2004a) reports a one standard deviation in the non-interest component share of 6.2 % whereas the corresponding figure for small EU banks is 13 % (see Table 2.1).

DeYoung and Roland (2001) and Kwast (1989).²¹ The positive coefficients of the variables that capture 'other loans', HHI_{NON}, and trading activities now exhibit the corresponding positive signs and indicate that moving into these categories gives rise to increased revenue volatility. According to DeYoung and Roland (2001), low switching costs for non-interest activities, higher financial leverage arising from differences in regulatory capital requirements, and higher operating leverage that translate revenue into higher profit volatility are the key drivers behind such findings. Additionally, the results for the standard deviation regressions also suggest that the proportion of other operating income significantly propels revenue volatility. Unsurprisingly, this category is most affected by one-off transactions and has therefore a large effect on the dependent variables.

We find evidence that HHI_{LOAN} has a significant and inverse relationship with the standard deviation of revenue, suggesting that concentrated lending activities decrease revenue volatility. We assign this finding to the benefits arising from relationship lending. Despite the fact that standard portfolio theory suggests the opposite, substantial resources devoted to the establishment of close relationships with borrowers can help small EU banks gain valuable non-public information (Stein, 2002; Berger and Udell, 2002). This non-public information not only reduces information asymmetries between borrower and lender, but also increases the bank's influence on borrower management through repeated interaction over time, intense monitoring and relationship variety (Elsas, 2005).²² Such reduced information asymmetries and increased influence translate into well-known benefits of relationship lending: enhanced decision making if borrowers face distress, pricing of loans, seeking collateral, attaching covenants to the loan, and also more efficient renegotiation of loans.²³ Moreover, recent empirical evidence in the literature on relationship banking documents that the information advantage arising from relationship banking enables the relationship-lender to be better able offering future loans and other information-sensitive products and reduce risk and uncertainty associated with the lending relationship, thereby

²¹ Stiroh (2004a, 2004b) provides evidence for increased revenue volatility arising from reliance on noninterest income for community banks and all types of banks in his sample respectively, whereas DeYoung and Roland (2001) offer empirical support for this hypothesis in a sample of commercial banks with more than US\$300m in assets and Kwast (1989) confirms these results for all different types of banks in his sample.

²² A more significant role as a lender arising from relationship banking tends to increase the bank's bargain power as substitution through another bank becomes more expensive. See Elsas (2005) for additional details. ²³ For a detailed survey of the recent literature on relationship lending see Elyasiani and Goldberg (2004).

influencing borrower conduct.²⁴ Thus, this 'relationship lending technology', e.g. the business practices, infrastructure, skills and operations, and information available to small banks, is set up in a way to translate into intertemporal smoothing of revenue volatilities over time.

The final three columns of Table 2.2 report the findings for the risk-adjusted performance measures (RAR_{ROE}, RAR_{ROA}, Z-score). Our risk-adjusted results show no significant benefits from having a more diversified revenue stream, as measured by HHI_{REV}. The coefficients on the non-interest proportion are all negative and highly significant, indicating that shifting towards non-interest activities lowers the risk-adjusted performance of small banks. In particular, the negative coefficient in the Z-score regression underscores an inverse relationship between moving into non-interest income activities and risk of insolvency. This result confirms the findings by Stiroh (2004a, 2004b) and Stiroh and Rumble (2006) for the US banking market. One possible explanation is that cross-selling of financial products to the small banks' clientele gives rise to increased exposure of different business activities to the same shock (Stiroh, 2004b). Given that many small banks in Europe operate on a locally constrained basis, it is likely that the distribution of different products to a core customer base in a localised market makes the banks more vulnerable to sudden shocks affecting certain firms or industries. This is due to the fact that all business lines will suffer concurrently and hence bank performance is adversely affected.

In terms of policy implications, this finding furthermore highlights that regulatory authorities should closely scrutinize banks that are moving into more volatile revenue streams since these sources of revenue are associated with increased default probability. This is echoed by the highly negative net effect in the Z-score regression in Table 2.2 as highlighted above. Moreover, judging the relationship between revenue volatility and risk-adjusted performance on the one hand and the banks' move into non-interest activities on the other hand, it appears that the tendency to increasingly rely on non-interest income adversely impacts upon the trade-off between risk and return for small banks in Europe.

²⁴ Bharath et al. (2007) show that relationship lending raises the probability of providing a future loan to 42 percent to an existing borrower whereas the probability is 3 percent for a non-relationship lender and Chakraborty and Hu (2006) report that private information can help reduce the need to collateralise loans.

HHI_{LOAN} is positively associated with the Z-score, implying that higher loan concentration reduces the risk of insolvency. Whilst standard portfolio theory argues that increased credit concentration has implications in terms of credit risk thus giving rise to increased probability of insolvency, relationship lending between small banks and borrowers can explain this finding. In particular, the 'long term interaction hypothesis' (Banerjee et al., 1994; Besley and Coate, 1995) implies that small banks taking part in community life share relationships of a nature other than economic. Given that small banks tend to primarily lend to SMEs, and given that credit markets for small firms are local in nature (Hannan, 1991; Petersen and Rajan, 1994), small banks can acquire valuable information through such community networks that would not be available to outsiders. This information enables small banks to monitor creditors more closely and develop early warning signals for distressed clients. Eventually, this helps avoid the build up of vulnerabilities in these institutions' loan portfolios, thereby lowering the banks' default risk. Negative and significant coefficients of the 'other loans' category and the variable that captures trading activities underline again that small EU banks cannot gain from diversifying into trading and non-traditional lending activities. Rather, such activities feed into insolvency risk and tend to decrease risk-adjusted performance. Other operating income assumes significance in the Z-score regression and appears to be a reasonably good indicator for increased insolvency risk. This may be due to the fact that bank managers, aware of impending problems within their small institutions, boost profits in the short run by 'gambling for resurrection' and use one-off transactions to show a profit in the balance sheet.

Among the control variables, the ROE regression indicates an inverse relationship with the ratio of equity to assets, whereas this association is reversed in the ROA regression. This finding is also reported by Stiroh and Rumble (2006). The equity ratio enters the equation in column 4 positively and significantly, indicating that credit institutions with higher capital buffer exhibit greater revenue volatility. This may be due to banks with higher capital ratios engaging increasingly in trading activities, which, in turn, translates into higher revenue volatility.²⁵ Column 4 also provides evidence for a positive link between the loans to assets ratio and revenue volatility and the final column reveals a negative and

²⁵ For instance, Molyneux et al. (1994) argue that a lower capital ratio implies more leverage and hence greater reliance on interest income.

significant association of the loans to assets ratio with the Z-score. Both these results are consistent with Stiroh (2004a). Finally, our results also illustrate that asset growth is significantly associated with mean profitability and that small banks can bolster their risk-adjusted performance by increasing bank size, which is consistent with research on scale economies (Hughes et al., 2001).

Stiroh (2004a), in his research on diversification within US community banks, compares such small banks to larger banks and finds that there are larger and more significant differences between community and other banks across individual business lines. Commercial and industrial lending and consumer lending appear to offer better risk-adjusted returns relative to real estate lending for large banks. Trading incomes appears to offer a worse return relative to service charges for big banks. Such divergences could be due to the different ways in which small banks operate as compared to their larger counterparts (Technology, scale, and business practices are all elements of banking that differ across size). A second possibility is that community banks do things in essentially the same way as their larger competitors, but the different markets they serve lead to different outcomes.

Basset and Brady (2001) report that small bank return on assets (ROA) has generally exceeded that for large banks since 1985, although their return on equity (ROE) is somewhat lower. Looking at competitiveness from a different perspective, Stiroh and Poole (2000) and Basset and Brady (2001) show that small banks have grown faster than large banks during the 1990s, once one controls for the effects of mergers and acquisitions. Similarly, Pilloff and Rhoades (2000) report that large diversified banks have trouble maintaining deposit shares, which they interpret as evidence against the notion that large banks have net competitive advantages. These results provide one explanation: if community banks face profitable banking opportunities and risk exposures that are not available for large banks, then this leaves areas of comparative advantage that provide a competitive opportunity for small banks. If differences in operating strategies, business focus, or technological opportunities lead to different outcomes than large banks, this may leave room for the continued existence of small banks.
2.4.1 Robustness Tests

We embark upon a set of robustness tests to check as to whether our results suffer from sample bias since German and Italian banks account for 46% and 35% of the sample population respectively. Using the methodology described in Section 2.3, we present three robustness tests. In Table 2.3, we exclude German banks from the dataset. In Table 2.4, we re-run the analysis excluding Italian banks. Finally, we present the results when German and Italian banks are simultaneously excluded in Table 2.5. We constrain the discussion of our results for the three alternative samples to the effect on the significance of HHI_{REV} and the non-interest income share and present these results to our preferred measures of performance, the risk-adjusted ROE, the risk-adjusted ROA, and the Z-score. The other four dependent variables that capture mean ROE, mean ROA, and the two corresponding risk measures widely confirm our results presented in Table 2.2.

The sensitivity analyses confirm that HHI_{REV} has no significant bearing for the riskadjusted measures apart from a weakly significant inverse association with the riskadjusted ROE when German institutions are excluded in Table 2.3. The share of noninterest income enters the risk-adjusted equations in Table 2.3 negatively and significantly with the exception of the regression for the risk-adjusted ROA when excluding German banks. The previous finding of an inverse relationship between the alternative risk-adjusted measure, return on equity, and the share of non-interest income however also holds in this specification. Column 6 in Table 2.5 provides weak evidence that the risk-adjusted return on asset increases when a larger proportion of revenue is generated with non-interest activities if German and Italian banks are excluded (Table 2.5). However, this relationship is again reversed in the alternative risk-adjusted measure, return on equity. In summary, our results for the negative impact of shifting into non-interest activities and the absence of benefits of diversification do not seem to be driven by sample selection bias.

2.4.2 Bank Type

This section examines if bank type impacts upon diversification benefits. The rationale behind testing for bank type is that different types of banks all have differing objectives and ownership structures. As a consequence, they adopt distinct approaches to diversification to achieve their strategic objectives. We retain the methodology employed in previous regressions and additionally control for bank type by introducing dummy variables that take the value one if the bank is classified as savings, co-operative, or commercial bank or zero otherwise. We capture other banks (credit, mortgage, and investment banks) in the intercept to avoid perfect collinearity. Thus, the dummy coefficients should be interpreted as the difference between the individual bank types captured by the respective dummy variable and the omitted category of other banks. Results using the four dependent variables mean ROE, mean ROA and the corresponding risk measures suggest significantly positive relationships between all bank type dummies and average profitability and corresponding negative and significant relationships between bank types and revenue volatility.

Table 2.6 depicts that bank type does not have an independent effect on RAR_{ROE}. The weak significance of the dummy for co-operative banks in the regression with RAR_{ROA} as dependent variable implies that these banks have a 1.5 % higher risk-adjusted return on assets relative to institutions in the 'other banks' category. This result is aligned with the findings by Brunner et al. (2004) who report that cooperative banks tend to reap higher returns than other banks. This may be due to distinct competitive advantages that those institutions reap from their access to private information so as to enhance decision making. The fact that a cooperative's clients are also its members, and are involved in its decisionmaking, provides them with an informational advantage over other types of banks. The dummies for savings and commercial banks enter the Z-score regressions negatively and significantly, indicating that these two types of institutions have higher relative insolvency risk in comparison to the institutions in the 'other banks' category. This may be due to the fact that savings and commercial banks are more complex organisations that have bigger problems avoiding default than other banks that only have narrow operations that allow them to manage risk more effectively. The economic impact seems large. For example, being a savings bank decreases the Z-score by 27.4 relative to the Z-score of other banks.²⁶ Our previously detected insignificance of the variable HHI_{REV} and the significantly negative impact of non-interest activities on risk-adjusted performance also hold when

²⁶ The average bank in our sample has a Z-score of 58.8. Since the Z-score measures the number of standard deviations a bank is away from exhausting its capital, the coefficient indicates that the average savings bank has a Z-score of 31.4.

bank type is included, providing further evidence that risk-adjusted performance of small EU banks is not dependent on revenue diversification.

2.4.3 Regulatory Environment

Regulatory policies regarding bank activity restrictions, statutory diversification requirements and the institutional environment in which banks operate in are likely to impact upon diversification benefits. We therefore include three regulatory variables to investigate if our results are robust when we control for such regulatory variables. If our results regarding diversification effects are driven by activity restrictions, statutory diversification requirements and the institutional environment that banks operate in, then controlling for these additional variables will drive out the significance of our key explanatory variables. While the coefficients for these regulatory variables are not to be interpreted in a causal sense as highlighted above, testing for their significance provides some information on the nexus between safety and soundness considerations arising from activity restrictions, diversification requirements and the institutional environment on the one hand, and risk-adjusted performance on the other hand. We obtain these regulatory variables from a database on financial regulation and supervision from the World Bank (Barth et al., 2001a, 2004) and from the Heritage Foundation (Appendix 2.C).

Activity restrictions is a narrow indicator of the degree to which banks face regulatory restrictions on their activities in securities markets, insurance, real estate, and owning shares in non-financial firms. The indicator is constructed as an index and takes on values between (1) and (4) for each of the four categories under consideration, whereby the activities are classified as unrestricted (1), permitted (2), restricted (3), or prohibited (4), with possible index variation between four and sixteen. Higher values indicate greater restrictions on bank activities and non-financial ownership and control. We expect that less activity restrictions enable banks to operate more freely, thereby focusing on those activities that they deem most likely to increase shareholder value. *Diversification Requirements* is a variable to examine whether banks encounter any explicit guidelines with regards to asset diversification. It captures whether banks are required to have some minimum diversification of loans among sectors or whether there exist any sector concentration limits. We control for these statutory diversification requirements by

including a dummy that takes on the value one if there are diversification requirements in place or zero otherwise. We anticipate a positive correlation between diversification requirements and profitability. *Banking Freedom* is a broad indicator of the openness of the banking system. The indicator is constructed as a composite index ranging from (1) to (5), whereby higher values indicate fewer restrictions. We average the values of the indicator for the period 1997-2003. The index provides information on whether foreign banks are allowed to operate freely, the difficulties faced when setting up domestic banks, and on government influence over the allocation of credit. We anticipate that greater Banking Freedom is correlated with increased profitability and less insolvency risk since banks operating in a more open environment tend to engage in those activities that they deem most appropriate to their strategy and objectives to manage risk appropriately. To our knowledge, these regulatory variables have never been utilised in diversification studies at the micro level.²⁷ We report the regression results in Tables 2.9a and 2.9b.

We use an F-test to examine the joint significance of the three regulatory variables. The results indicate that the additional control variables only enter the Z-score regression jointly and significantly. The coefficient for HHI_{REV} remains insignificant across all specifications and the non-interest income share enters all three regressions negatively at the one percent level. We therefore conclude that additionally controlling for the regulatory environment does not impact our inference regarding the impact of diversification on the performance of small credit institutions in Europe.

While not to be interpreted in a causal sense, it is worthwhile to mention that activity restrictions are negatively correlated with risk-adjusted performance. In fact, more restrictions on bank activities go hand in hand with an increased likelihood of insolvency. This is consistent with Beck et al. (2006) and Barth et al. (2004), who find that increased restrictions boost banking system vulnerabilities on a cross-country level and argue that a restrictive regulatory environment is an impediment to an efficient banking system. Table 2.9b also suggests that increased Banking Freedom is associated with less insolvency risk, once again aligned with the findings by Barth et al. (2004) on the cross-country level. The

²⁷ Demirguc-Kunt et al. (2004) draw upon such variables to investigate the impact of bank regulations, market structure and national institutions on the cost of intermediation but do not examine diversification effects.

regression coefficient for statutory diversification requirements never enters the equation at meaningful levels of significance.

In sum, our results provide no clear evidence of diversification benefits within or across business lines for small EU banks. Most notably, in specific activities within non-interest and interest income the findings indicate a reduction in the risk-adjusted performance for small banks. Given that our regressions exclude the largest share of the interest and noninterest generating activities for econometric reasons, the findings robustly indicate that shifting away from lines of business where the banks have the most expertise is detrimental to the performance of small EU institutions. Thus, it remains questionable if benefits can be reaped from embarking on business lines outside their traditional activities. Moreover, unless these banks are set to expand in scale, there seems to be little rationale for diversifying since our results underscore a positive link between size and performance.

2.5 Conclusion

This chapter examines the impact of diversification on the performance of small EU banks. Using a cross-country dataset for 15 countries, we find no direct diversification benefits for such institutions either within or across business lines during the period 1997 – 2003. Whilst our results are consistent with portfolio theory in that we present empirical evidence that concentrated revenue streams adversely impact average profitability and revenue volatility, our findings are not aligned with traditional intermediation theory that highlights the benefits of diversification for bank performance. In particular, the analyses suggest a negative link between non-interest income and risk-adjusted performance. These results hold against an array of robustness tests using alternative samples, testing for the effect of different types of banks, and are also substantiated when regulatory policies regarding bank activity restrictions, statutory diversification requirements and Banking Freedom are controlled for. In addition, we show that size is positively associated with profitability, consistent with research on scale economies.

Given that no direct diversification benefits are detected in this chapter, our results indicate that small banks can improve their performance by expanding their resources within their existing business lines where they possess distinctive comparative advantages. Moreover, the results suggest presence of diseconomies of scope within lending activities which may be explained by weak monitoring of activities that lie outside the small banks' traditional lending business. This result provides an illustration of the importance of specialisation for small banks and highlights that traditional intermediation theory concerning diversification effects does not seem to be applicable to small banks in Europe. Instead, our findings are aligned with the corporate finance literature and recent results for diversification discounts in financial conglomerates that support the view that firms ought to concentrate on those lines of business where management has the greatest expertise. While data limitations concerning the comparatively short sampling period mean that our results have to be taken with a note of caution, they complement a growing body of empirical research in the banking literature that indicates that small banks encounter difficulties in reaping benefits from diversification.

In terms of the regulatory environment, our analyses highlight a negative association between activity restrictions and risk-adjusted performance of small banks and a positive correlation between banking freedom and insolvency risk of small EU banks. The scope for reducing risk through diversification is of interest to both policy makers and regulatory authorities. In that respect, our results indicate that shifting into non-interest income results in an inefficient trade-off between risk and return and suggest that diversification does not contribute to increased safety and soundness of EU banks. Rather, regulatory bodies ought to allocate supervisory resources to small banks that progressively move into non-interest activities. In terms of implications for industrial organisation of banking systems, the findings imply that a banking sector where many individual institutions adopt a narrow focus is preferable over a sector that comprises a large number of diversified institutions. This represents an attractive feature from a systemic risk perspective.²⁸ Moreover, the correlated exposure of interest and non-interest activities arising from the regional constraints imposed on many small EU banks may be an impediment to reaping diversification benefits.²⁹ Thus, it might be appropriate to consider lifting these legal constraints that hamper geographical diversification for many small banks. Finally, our

²⁸ This result is consistent with Acharya et al. (2002). Additional details regarding the implications for industrial organisation of banking systems can be found in the work by Acharya (2001) and Shaffer (1994).

²⁹ For instance, Brunner et al. (2004) highlight that German savings banks operate on a 'regional principle' and therefore cannot conduct business outside of their community or municipality.

results suggest that regulatory guidelines and principles that promote diversification have to be taken with a grain of salt since diversification per se, neither guarantees greater profitability nor increases safety and soundness of small institutions in Europe.

The results do not explain the observed shift of small EU banks towards non-interest income. Currently, small banks do not appear to be able to reap benefits from shifting into non-interest income activities. We therefore attribute the shift into non-interest activities to reasons other than diversification. First, the observed change may be ascribed to reasons other than financial such as private managerial benefits that arise from diversification. For instance, running a larger institution enhances managerial power and prestige, tends to increase managerial compensation, and makes the manager indispensable to the institution.³⁰ Second, and linked to the preceding argument, the change may be attributable to ownership structure. The majority of the institutions in our sample are savings or cooperative banks that are usually owned by municipalities or their depositors and/or customers. Such ownership structure suggests the absence of influential outside equity blockholders that would exert sufficient monitoring so as to prevent appointed managers from embarking upon unprofitable lines of business. Similarly, lack of managerial ownership may be an additional factor that could influence the decision to diversify. Increased managerial ownership would make performance-reducing diversification strategies less likely since more managerial ownership indicates that managers bear a greater fraction of the costs associated with strategies that adversely affect bank performance.³¹ We therefore believe a micro-level analysis of ownership structure, governance systems and performance of small banks in Europe will provide a valuable line of enquiry and we intend to build on this in future work.

Whilst recognising that the financial sector is moving towards a harmonised framework, differences between countries still remain. Applying 'soft' data (e. g. management types, social links to communities) to examine the impact of diversification on revenue and

³⁰ See Denis et al. (1997) and the references cited therein for a more detailed overview of private benefits managers derive from diversification.

³¹ These relationships are well documented in the corporate finance literature. For instance, Denis et al. (1997) provide evidence for empirically negative relationships between managerial ownership, and outside blockholders on the one hand and diversification on the other hand in a sample for US firms during the 1980s.

performance could highlight the unique characteristics that constitute small European banks in their endeavour to maintain a position within the EU financial sector. Given our result of no direct diversification benefits within small banks, an important question for further research would be to analyse why such small banks still venture into diversifying activities if they do not reap the required benefits. Additional research could investigate the extent to which experience impacts gains through diversification. Through time banks may be able to make up in terms of experience and reap benefits from a diversified strategy in non-interest income activities.

		Small B	anks	7	Other Banks			
	1997	2000	2003	Δ%	1997	2000	2003	$\Delta^{0\!\!\prime}\!\!\circ$
Austria	71	96	74	4	45	72	97	116
Belgium	37	29	21	(43)	58	61	53	(9)
Denmark	65	76	56	(14)	28	39	46	64
Finland	0	2	2	200	14	13	9	(36)
France	106	76	43	(59)	274	346	319	16
Germany	1021	976	592	(42)	818	926	891	9
Greece	4	0	3	(25)	15	16	18	20
Ireland	2	5	6	200	41	53	48	17
Italy	430	482	446	4	197	224	266	35
Luxembourg	30	19	11	(63)	95	91	75	(21)
Netherlands	15	15	5	(67)	47	59	57	21
Portugal	4	11	8	100	38	34	27	(29)
Spain	31	32	30	(3)	112	105	116	4
Sweden	3	9	84	2700	24	34	38	58
UK	103	79	82	(20)	229	262	241	5
TOTAL	1922	1907	1463	(24)	2035	2335	2301	13

Appendix 2.A - Bank observations

For each year within sample, small banks have assets less than €450million and are not part of a multi-bank organisation. Other banks comprise all other banks excluding small banks as is defined in section 2.3 of chapter 11.

	Small Banks					Other Banks			
	1997	2001	2003 Δ%	6	1997	2001	2003	Δ%	
Total Assets (€Bln)	350.3	333.6	288.9	(17.5)	23086.6	39268.2	41397.8	79.3	
Net Income (€Bln)	1.8	0.9	1.6	(11.1)	97.5	168.7	171.8	76.2	
Net Operating Revenue (€Bln)	15.3	14.7	13.3	(13.1)	574.4	962.2	985.5	71.6	
Net Interest Income (%)	69.3	64.2	60.5	(12.7)	61.6	51.5	53.4	(13.3)	
Non Interest Income (%)	30.7	35.8	39.5	(28.7)	38.4	48.5	46.6	21.4	
Commission Income (%)	17.5	25.7	25.9	48.0	21.5	23.6	22.8	6.0	
Fee Income (%)	0.1	0.0	0.0		1.1	2.4	2.0		
Trading Income (%)	3.9	0.1	5.1	31.0	9.9	12.4	11.5	16.0	
Other Operating Income (%)	9.3	10.0	8.5		5.9	10.2	10.3		
Total Loans (€Bln)	194.5	190.8	167	(14.1)	11005.1	18335.0	19023.6	72.9	
Mortgages (%)	24.1	26.9	27.7		1.4	0.9	1.0		
Loans to Govt. Institutions (%)	0.0	0.0	0.0		17.5	16.1	16.5		
HP/Lease (%)	1.2	1.6	1.5		2.4	2.2	2.2		
Other Loans (%)	74.7	71.4	70.8		46.1	44.0	43.9		

Appendix 2.B - Summary statistics for small and other banks, 1997-2003

Small banks have assets less than €450m and are not part of a multi-bank organisation in that year. Other banks include all other commercial banks. All figures include sums for the two groups. Income shares are as a percentage of net operating revenue (net interest income plus non-interest income). Loan proportions are as a percentage of total loans.

Country Name	Activity Restrictions ¹	Asset Diversification Requirements ²	Banking Freedom ³	Legal Origin ⁴	
9 ⁴⁴					
Austria	7	Yes	1.71	German	
Belgium	9	No	2.00	French	
Denmark	10	No	1.86	Scandinavian	
France	6	Yes	3.00	French	
Germany	7	No	2.71	German	
Italy	10	No	2.14	French	
Luxembourg	6	Yes	1.71	French	
Netherlands	6	No	1.21	French	
Portugal	10	Yes	3.00	French	
Spain	6	Yes	2.71	French	
Sweden	8	No	2.29	Scandinavian	
United Kingdom	5	No	1.00	British	

Appendix 2.C - Regulatory environment and national characteristic indicators

Activity restrictions, asset diversification requirements and banking freedom are averaged over the sampling period 1997-2003

Data Sources: ^{1,2} Barth, Caprio, and Levine (2001a, 2004). World Bank Database ³ Economic Freedom Index of the Heritage Foundation ⁴ La Porta et al. (1997)

Table 2.1Summary statistics for small banks

	Mean	Standard Deviation	Minimum	Maximum
Characteristics				7.00
Average Assets (€ mln)	191.5	105.5	14.2	434.6
Return on Average Equity(%)	6.3	5.8	-101.27	31.44
Return on Average Assets (%)	0.7	1.3	-28.11	7.00
Equity to Assets (%)	10.6	9.9	2.89	99.81
Loans to Assets (%)	55.4	17.4	0.00	94.32
Number of Observations per Bank	7	1	2	7
Diversification				
HHI _{REV}	0.7	0.1	0.4	0.9
HHI _{LOAN}	0.7	0.2	0.0	1.0
HHI _{NON}	0.8	0.1	0.1	1.0
Risk-Adjusted Performance				
RAR _{ROE}	3.1	2.2	-0.7	12.7
RAR _{ROA}	3.2	2.7	-0.9	27.9
Z-score	58.8	52.5	0.3	398.4
Non Interest Income Share of				
Net Operating Revenue (%)	23	13	2	97
Shares of Non Interest Income (%)				
Commission/Non Interest	76	18	0	100
Trading/Non Interest	9	13	0	99
Other Operating Income/Non Interest	13	15	0	100
Loan Portfolio Shares (%)				
Mortgages/Loans	23	19	0	100
Corporate/Loans	0	6	0	100
Other Loans/Loans	76	21	0	100
HP & Lease/Loans	0	1	0	16
Number of Financial Institutions/Small I	Banks per Cour	ntry		
Austria	38			
Belgium	6			
Denmark	40			
France	9			
Germany	351			
ltaly	266			
Luxembourg	9			
Netherlands	2			
Portugal	I 10			
Spain	10			
Sweden				
United Kingdom	22			

Summary statistics are averages for 755 small banks. Small banks have assets less than €450 million in all years during the period 1997-2003 and are not part of a multi-bank organisation in any year.

	Mean ROE	SD ROE	Mean ROA	SD ROA	RAR _{ROE}	RAR _{ROA}	Z-score
HHI _{REV}	-6.6327**	23.5357***	-3.5514***	6.1862***	-1.8212	-1.5037	-35.9089
	(2.8654)	(3.5583)	(0.6196)	(0.8710)	(1.1925)	(1.4939)	(27.8224)
Non Interest	-4.3213**	23.0183***	-2.9707***	5.9037***	-3.4711***	-3.0869***	-69.7658***
Income Share	(2.1167)	(2.6284)	(0.4577)	(0.6434)	(0.8809)	(1.1036)	(20.5522)
HHI _{loan}	3.5307	-11.3087***	0.9201*	-2.7737***	0.9686	1.1180	51.7782**
	(2.2392)	(2.7806)	(0.4842)	(0.6806)	(0.9318)	(1.1674)	(21.7418)
Corporate	-0.6340	0.6783	-0.1840	0.4411	-1.7770	-1.2575	-40.4683
Loans	(3.6162)	(4.4905)	(0.7819)	(1.0992)	(1.5049)	(1.8854)	(35.1116)
HP/Lease	41.2469	53.5122	-0.4855	4.8333	-11.0774	-13.2307	-146.5694
	(27.9952)	(34.7638)	(6.0534)	(8.5096)	(11.6501)	(14.5961)	(271.8223)
Other Loans	-4.0546**	11.0651***	-0.8349**	2.5171***	-1.4854*	-1.8978*	-61.8330***
	(1.9165)	(2.3799)	(0.4144)	(0.5826)	(0.7975)	(0.9992)	(18.6084)
HH1 _{NON}	-4.6750**	l0.1714***	-0.9072**	2.7718***	0.1536	-0.0969	-3.3065
	(1.8174)	(2.2568)	(0.3930)	(0.5524)	(0.7563)	(0.9475)	(17.6459)
Trading	-14.3569***	28.1501***	-3.5491***	7.6439***	-2.0403**	-2.1828**	-63.3988***
	(2.1859)	(2.7144)	(0.4726)	(0.6644)	(0.9096)	(1.1396)	(21.2239)
Other Operating Income	-2.3954 (1.8190)	8.7976*** (2.2588)	0.2242 (0.3933)	1.1993** (0.5529)	-1.1585 (0.7569)	-1.2667 (0.9484)	-44.9027** (17.6621)
Equity/Assets	-0.0633**	-0.0343	0.0412***	0.0250***	-0.4887	0.0006	0.5218**
	(0.0244)	(0.0303)	(0.0053)	(0.0074)	(0.0101)	(0.1270)	(0.2366)
Log (Assets)	0.3014	-0.5789	0.0852	-0.1861	0.7458**	0.6970*	14.1730**
	(0.7451)	(0.9253)	(0.1611)	(0.2265)	(0.3101)	(0.3885)	(7.2350)
Loans/Assets	0.0001	0.0241	-0.0009	0.0095**	-0.0004	0.0036	-0.3136**
	(0.0142)	(0.0177)	(0.0031)	(0.0043)	(0.0059)	(0.0074)	(0.1381)
Asset Growth	2.4059***	-0.4422	0.3311***	-0.1342	0.4213**	0.4692**	-3.7908
	(0.4524)	(0.5618)	(0.0978)	(0.1375)	(0.1883)	(0.2359)	(4.3925)
Asset Growth ²	-0.2129***	0.0114	-0.0362***	0.0017	-0.0484**	-0.0519**	1.2992***
	(0.0463)	(0.0575)	(0.0100)	(0.0141)	(0.0193)	(0.0241)	(0.4495)
Adjusted R ²	0.23	0.31	0.27	0.36	0.08	0.06	0.13
Observations	755	755	755	755	755	755	755
Net Effect	-0.8481***	4.0084***	-0.5395***	1.0345***	-0.5299***	-0.4662***	-10.6198***

Table 2.2 All diversification measures and risk-adjusted performance

OLS regressions include all small banks (maximum assets < 6450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. Robust standard errors are reported in parentheses. RARROE is the mean ROE divided by the standard deviation of ROE. RARROA is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. The net effect is the impact of a one percent increase in the share of non-interest income on the dependent variable, evaluated at the median non-interest share. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	Mean ROE	SD ROE	Mean ROA	SD ROA	RARROE	RAR _{ROA}	Z-score
HHI _{REV}	-12.1353**	27.7912***	-5.0313***	7.5612***	-2.2140*	-2.4976	-19.5132
	(4.2807)	(5.4604)	(0.9741)	(1.3838)	(1.2950)	(1.6998)	(25.0318)
Non Interest	-6.3537**	29.9177***	-3.9971***	7.6763***	-2.3065**	-1.2985	-35.1078*
Income Share	(3.1863)	(4.0644)	(0.7251)	(1.0301)	(0.9639)	(1.2653)	(18.6322)
HHI _{loan}	3.3222	-8.6015*	1.1468	-1.9960	0.7352	0.9681	25.7915
	(3.9711)	(5.0655)	(0.9037)	(1.2838)	(1.2013)	(1.5769)	(23.2212)
Corporate	-0.4802	-0.9473	-0.2101	0.2454	-1.5569	-0.9482	-31.0483
Loans	(4.9099)	(6.2631)	(1.1173)	(1.5873)	(1.4853)	(1.9497)	(28.7114)
HP/Lease	45.4353	54.5106	-1.6318	6.6216	-14.6737	-17.4524	-274.7475
	(36.2602)	(46.2530)	(8.2514)	(11.7220)	(10.9692)	(14.3986)	(212.0341)
Other Loans	-5.1871*	11.6914***	-1.0326	2.6834**	-1.0255	-1.0970	-50.4895**
	(2.8799)	(3.6736)	(0.6554)	(0.9310)	(0.8712)	(1.1436)	(16.8407)
HHI _{NON}	-5.4920**	12.7955***	-1.6309***	3.5077***	-0.3038	-0.7630	-16.1695
	(2.6785)	(3.4167)	(0.6095)	(0.8659)	(0.8103)	(1.0636)	(15.6630)
Trading	-13.5725***	27.9711***	-3.5367***	7.5533***	-1.9488**	-2.7722**	-59.3346***
	(2.8747)	(3.6669)	(0.6542)	(0.9293)	(0.8696)	(1.1415)	(16.8097)
Other Operating Income	-6.0786* (3.4777)	13.6467** (4.4361)	0.3760 (0.7914)	1.3554 (1.1243)	0.0617 (1.0521)	0.5844 (1.3810)	-21.5735 (20.3363)
Equity/Assets	-0.0725*	-0.0342	0.0521***	0.0364***	-0.003 I	0.0009	0.1752
	(0.0400)	(0.0510)	(0.0091)	(0.0129)	(0.0121)	(0.0159)	(0.2340)
Log (Assets)	0.2558	-0.6637	0.0724	-0.1753	0.6161*	0.4909	8.4068
	(1.1446)	(1.4600)	(0.2605)	(0.3700)	(0.3463)	(0.4545)	(6.6933)
Loans/Assets	-0.0036	0.0249	-0.0016	0.0136*	0.0031	0.0117	-0.0550
	(0.0244)	(0.0311)	(0.005)	(0.0079)	(0.0074)	(0.0097)	(0.1426)
Asset Growth	3.5345***	-0.8969	0.5878***	-0.2168	0.7200**	0.7397**	-3.5066
	(0.7575) ⁻	(0.9663)	(0.1724)	(0.2449)	(0.2292)	(0.3008)	(4.4297)
Asset Growth ²	-0.2828***	0.0424	-0.0542***	0.0037	-0.0678**	-0.0701**	1.0154**
	(0.0708)	(0.0903)	(0.1610)	(0.0229)	(0.0214)	(0.0281)	(0.4138)
Adjusted R ²	0.23	0.33	0.24	0.37	0.12	0.09	0.11
Observations	404	404	404	404	404	404	404

Table 2.3 Revenue diversification and risk-adjusted performance robustness test excluding German banks

OLS regressions comprise all small banks excluding German banks (maximum assets < €450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. Standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

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	Mean ROE	SD ROE	Mean ROA	SD ROA	RARROE	RAR _{ROA}	Z-score
HHI _{REV}	-7.7332*	32.3112***	-4.1984***	8.0526***	-1.4503	-0.8389	-24.8797
	(4.1567)	(4.9881)	(0.9112)	(1.2052)	(1.8096)	(2.2879)	(43.0009)
Non Interest	-4.1257	27.3833***	-2.9461***	6.7225***	-3.7953**	-3.1696**	-83.3271**
Income Share	(2.6710)	(3.2052)	(0.5855)	(0.7744)	(1.1628)	(1.4701)	(27.6311)
HHI _{loan}	1.2552	-11.6889***	0.5696	-2.6737***	1.2725	0.8554	71.7236**
	(2.6698)	(3.2037)	(0.5852)	(0.7741)	(1.1623)	(1.4695)	(27.6186)
Corporate	-2.5076	2.6995	-0.6167	0.9319	-1.9360	-1.2582	-40.3359
Loans	(3.9952)	(4.7942)	(0.8758)	(1.1583)	(1.7392)	(2.1989)	(41.3296)
HP/Lease	21.2271	83.4681*	-3.3677	11.1714	-9.5305	-12.8538	87.2293
	(38.7322)	(46.4784)	(8.4906)	(11.2296)	(16.8617)	(21.3183)	(400.6776)
Other Loans	-2.0688	9.3509***	-0.4512	2.0292**	-1.4751	-1.6433	-62.3310**
	(2.2396)	(2.6875)	(0.4909)	(0.6493)	(0.9749)	(1.2327)	(23.1682)
HHI _{NON}	-6.2915**	10.6654***	-1.0703*	3.0596***	0.3264	-0.3382	-1.2601
	(2.5275)	(3.0329)	(0.5541)	(0.7328)	(1.1003)	(1.3911)	(26.1461)
Trading	-41.2179***	64.4156***	-9.5686***	18.1898***	-1.8128	-3.6370*	-53.4265
	(3.9335)	(4.7202)	(0.8622)	(1.1404)	(1.7124)	(2.1650)	(40.6913)
Other Operating Income	-2.4824 (2.1064)	9.1278*** (2.5277)	0.2502 (0.4617)	1.3988** (0.6107)	-1.0613 (0.9170)	-1.2891 (1.1594)	-54.5882** (21.7905)
Equity/Assets	-0.0362	-0.0618	0.0431***	0.0133	0.0023	0.0059	0.4395
	(0.0323)	(0.0388)	(0.0071)	(0.0094)	(0.0140)	(0.0178)	(0.3344)
Log (Assets)	1.1183	-0.0794	0.3034	-0.2462	0.5329	0.5960	11.5712
	(1.0975)	(1.3169)	(0.2406)	(0.3182)	(0.4778)	(0.6041)	(11.3534)
Loans/Assets	-0.0149	0.0352	-0.0031	0.0127**	-0.0007	0.0025	-0.2755
	(0.0193)	(0.0232)	(0.0042)	(0.0056)	(0.0084)	(0.0106)	(0.2001)
Asset Growth	2.3930***	-0.7764	0.3568**	-0.2787	0.2798	0.5551	-10.2829
	(0.6755)	(0.8107)	(0.1481)	(0.1959)	(0.2941)	(0.3718)	(6.9887)
Asset Growth ²	-0.2859**	0.0722	-0.0517**	0.0284	-0.0532	-0.0806	3.0683**
	(0.0947)	(0.1136)	(0.0208)	(0.0275)	(0.0412)	(0.0521)	(0.9796)
Adjusted R ²	0.36	0.51	0.38	0.57	0.06	0.05	0.10
Observations	489	489	489	489	489	489	489

Cable 2.4	
Revenue diversification and risk-adjusted performance robustness test excluding Italian bank	s

OLS regressions comprise all small banks excluding Italian banks (maximum assets < 6450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. Robust standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	Mean ROE	SD ROE	Mean ROA	SD ROA	RARROE	RAR _{ROA}	Z-score
HHI _{REV}	-31.9981**	54.1157***	-9.6983***	14.6599***	-1.5219	-2.1525	63.6892
	(11.0407)	(13.8601)	(2.6364)	(3.4929)	(3.0326)	(4.2192)	(51.1721)
Non Interest	-8.6764	38.5957***	-4.6122**	10.0723***	-1.3654**	0.05577*	-12.6045*
Income Share	(5.9621)	(7.4845)	(1.4237)	(1.8862)	(1.6376)	(2.2784)	(27.6331)
HHI _{loan}	-1.5100	-14.7561	1.2975	-2.6734	2.0551	1.4011	48.4067
	(9.4694)	(11.8876)	(2.2612)	(2.9958)	(2.6010)	(3.6188)	(43.8896)
Corporate	-5.2769	4.2175	-1.5681	1.7949	-0.9449	0.4313	12.2024
Loans	(7.9797)	(10.0175)	(1.9055)	(2.5245)	(2.1918)	(3.0495)	(36.9849)
HP/Lease	29.1886	67.7549	-1.4402	6.0953	-22.6940	-32.0230	-323.2813
	(70.5646)	(88.5845)	(16.8503)	(22.3243)	(19.3823)	(26.9664)	(327.0574)
Other Loans	-6.0299	13.0270**	-1.4391	3.1768*	-0.4945	0.0082	-17.9721
	(5.1232)	(6.4316)	(1.2234)	(1.6208)	(1.4072)	(1.9579)	(23.7455)
HHI _{NON}	-8.8716	17.5642**	-2.6477*	4.8632**	-1.1611	-2.7529	-42.7989
	(5.7911)	(7.2699)	(1.3829)	(1.8321)	(1.5907)	(2.2131)	(26.8410)
Trading	-35.0550***	60.4601***	-8.7739***	16.2406***	-2.4630	-4.5902	-66.9766*
	(7.6495)	(9.6028)	(1.8266)	(2.4200)	(2.1011)	(2.9233)	(35.4542)
Other Operating Income	-5.3767 (5.2904)	14.7815** (6.6414)	0.5296 (1.2633)	1.8028 (1.6737)	-0.3522 (1.4531)	-0.1851 (2.0217)	-48.0645* (24.5203)
Equity/Assets	-0.0125	-0.1171	0.0669***	0.0166	0.0072	0.0214	-0.0391
	(0.0820)	(0.1030)	(0.0196)	(0.0259)	(0.0225)	(0.0313)	(0.3801)
Log (Assets)	0.9824	2.1081	0.1110	0.1953	-0.2046	-0.2735	-9.6851
	(2.9122)	(3.6559)	(0.6954)	(0.9213)	(0.7999)	(1.1129)	(13.4979)
Loans/Assets	-0.0611	0.1087	-0.0159	0.0407**	0.0089	0.0264	0.3225
	(0.0598)	(0.0750)	(0.0143)	(0.0189)	(0.0164)	(0.0228)	(0.2769)
Asset Growth	11.6566***	-9.6055**	2.0809**	-2.8018**	1.9056**	2.6319**	5.6924
	(3.2422)	(4.070)	(0.7742)	(1.0257)	(0.8905)	(1.2390)	(15.0271)
Asset Growth ²	-4.1597**	3.4808*	-0.6432*	1.0849**	-0.6135	-0.7316	-3.2996
	(1.4885)	(1.8686)	(0.3554)	(0.4709)	(0.4088)	(0.5688)	(6.8989)
Adjusted R ²	0.40	0.52	0.38	0.57	0.09	0.06	0.15
Observations	138	138	138	138	138	138	138

Table 2.5 Revenue diversification and risk-adjusted performance robustness test excluding German and Italian banks

OLS regressions comprise all banks excluding German and Italian banks (maximum assets < €450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. Robust standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RARROA is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	Mean ROE	SD ROE	Mean ROA	SD ROA	RARROE	RAR _{ROA}	Z-score
HHI _{REV}	-4.2468	21.3610***	-2.9911***	5.5987 ** *	-1.6800	-1.1886	-46.8955*
	(2.8569)	(3.5781)	(0.6169)	(0.8740)	(1.2086)	(1.5160)	(28.1624)
Non Interest	-1.8474	20.2747***	-2.4967***	5.3546***	-2.9597**	-2.4268**	-74.5014***
Income Share	(2.1656)	(2.7123)	(0.4676)	(0.6625)	(0.9162)	(1.1492)	(21.3479)
HHI _{loan}	7.2102***	-15.1550***	1.6728***	-3.6440***	1.4036	1.7640	40.0438*
	(2.3158)	(2.9004)	(0.5000)	(0.7085)	(0.9797)	(1.2289)	(22.8280)
Corporate	-7.8508**	7.8078*	-1.7511**	2.1993*	-2.3186	-2.2392	-11.7856
Loans	(3.7839)	(4.7392)	(0.8171)	(1.1576)	(1.6008)	(2.0079)	(37.3007)
HP/Lease	71.1829**	24.7225	6.1637	-2.7177	-10.3961	-10.8388	-285.9842
	(27.9372)	(34.9899)	(6.0328)	(8.5468)	(11.8189)	(14.8248)	(275.3951)
Other Loans	-9.3637***	16.3299***	-1.9826***	3.8138***	-1.8640**	-2.5930**	-40.6581*
	(2.1128)	(2.6462)	(0.4562)	(0.6464)	(0.8938)	(1,1212)	(20.8275)
HHI _{NON}	-3.6735**	9.3031***	-0.6662*	2.4922***	0.0117	-0.1913	-10.1977
	(1.7944)	(2.2474)	(0.3875)	(0.5490)	(0.7591)	(0.9522)	(17.6889)
Trading	-14.7631***	28.5859***	-3.6318***	7.7240***	-2.1862**	-2.9964**	-63.1474**
	(2.1467)	(2.6887)	(0.4636)	(0.6567)	(0.9082)	(1.1392)	(21.1617)
Other Operating Income	-1.0803 (1.8042)	7.4342*** (2.2597)	0.4971 (0.3896)	0.8962 (0.5520)	-0.9552 (0.7633)	-0.9778 (0.9574)	-48.6916** (17.7855)
Equity/Assets	-0.0483**	-0.0502	0.0444***	0.0221**	0.0058	0.0079	0.5143**
	(0.0246)	(0.0308)	(0.0053)	(0.0075)	(0.0104)	(0.0130)	(0.2420)
Log (Assets)	0.1634	-0.4360	0.0572	-0.1495	0.7539**	0.7010*	15.4044**
	(0.7310)	(0.9155)	(0.1578)	(0.2236)	(0.3092)	(0.3879)	(7.2056)
Loans/Assets	0.0080	0.0184	0.0008	0.0073*	-0.0027	0.7010*	-0.3770***
	(0.0141)	(0.0177)	(0.0030)	(0.0043)	(0.0059)	(0.3879)	(0.1392)
Asset Growth	2.5822***	-0.6027	0.3714***	-0.1858	0.3821**	0.4345*	-5.0978
	(0.4458)	(0.5583)	(0.0963)	(0.1364)	(0.1886)	(0.2366)	(4.3946)
Asset Growth ²	-0.2377***	0.0324	-0.0422***	0.0093	-0.0409**	-0.0450*	1.5125***
	(0.0460)	(0.0576)	(0.0099)	(0.0141)	(0.0195)	(0.0244)	(0.4534)
Savings Bank	8.0140***	-8.3282***	1.6475***	-1.9204***	0.7953	1.2384	-27.3773*
	(1.5671)	(1.9627)	(0.3384)	(0.4794)	(0.6630)	(0.8316)	(15.4482)
Co-operative	7.3467***	-7.3712***	1.5792***	-1.7151***	1.0068	1.5104*	-23.9628
Bank	(1.5239)	(1.9806)	(0.3291)	(0.4662)	(0.6447)	(0.8087)	(15.0220)
Commercial	8.6080***	-8.1606***	1.9367***	-2.1927***	0.0641	0.5562	-42.1294**
Bank	(1.5267)	(1.9121)	(0.3297)	(0.4671)	(0.6459)	(0.8101)	(15.0496)
Adjusted R ²	0.27	0.33	0.30	0.39	0.09	0.07	0.14
Observations	755	755	755	755	755	755	755

 Table 2.6

 All diversification measures and risk-adjusted performance – Bank Specialisation

OLS regressions include all small banks (maximum assets < ϵ 450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. Robust standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of Mean ROA and mean equity/asset ratios divided by standard deviation of ROA. Use control for bank specialisation by introducing dummy variables that take the value one if the bank is classified as savings, co-operative, and commercial. Other banks (credit, mortgage, and investment) are grouped together and captured in the intercept. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	Mean ROE	SD ROE	Mean OROA	SD OROA	RAR _{ROE}	RAR _{orda}	Z-score
HHI _{REV}	-6.6327**	23.5357***	-8.6003***	13.2399***	-1.8212	-2.7135	-35.9089
	(2.8654)	(3.5583)	(1.2017)	(0.0201)	(1.1925)	(2.8972)	(27.8224)
Non Interest	-4.3213**	23.0183***	-4.4956***	13.1038***	-3.4711***	-4.9082**	-69.7658***
Income Share	(2.1167)	(2.6284)	(0.8877)	(0.0149)	(0.8809)	(2.1403)	(20.5522)
HHI _{loan}	3.5307	-11.3087***	2.2064**	-5.6293***	0.9686	-4.2851*	51.7782**
	(2.2392)	(2.7806)	(0.9395)	(0.0157)	(0.9318)	(2.2652)	(21.7418)
Corporate Loans	-0.6340	0.6783	-1.4128	1.4773	-1.7770	5.1959	-40.4683
	(3.6162)	(4.4905)	(1.5173)	(0.0254)	(1.5049)	(3.6582)	(35.1116)
HP/Lease	41.2469	53.5122	1.6456	10.8207	-11.0774	-2.1557	-146.5694
	(27.9952)	(34.7638)	(11.7462)	(0.1964)	(11.6501)	(28.3202)	(271.8223)
Other Loans	-4.0546**	11.0651***	1.6714**	5.3675***	-1.4854*	1.8289	-61.8330***
	(1.9165)	(2.3799)	(0.8041)	(0.0134)	(0.7975)	(1.9388)	(18.6084)
HHI _{NON}	-4.6750**	10.1714***	-3.0022***	5.9049***	0.1536	0.4244	-3.3065
	(1.8174)	(2.2568)	(0.7624)	(0.0128)	(0.7563)	(1.8382)	(17.6459)
Trading	-14.3569***	28.1501***	-9.9843***	17.8164***	-2.0403**	-5.8942*	-63.3988***
	(2.1859)	(2.7144)	(0.9170)	(0.0154)	(0.9096)	(2.2110)	(21.2239)
Other Operating Income	-2.3954 (1.8190)	8.7976*** (2.2588)	-0.9890 (0.7632)	2.0116 (0.0128)	-1.1585 (0.7569)	- 6.0507*** (1.8400)	-44.9027** (17.6621)
Equity/Assets	-0.0633**	-0.0343	0.0117	0.0268	-0.4887	-0.0464*	0.5218**
	(0.0244)	(0.0303)	(0.0102)	(0.0002)	(0.0101)	(0.0246)	(0.2366)
Log (Assets)	0.3014	-0.5789	-0.2809	-0.2871	0.7458**	1.3456*	14.1730**
	(0.7451)	(0.9253)	(0.3126)	(0.0052)	(0.3101)	(0.7538)	(7.2350)
Loans/Assets	0.0001	0.0241	-0.0102*	0.02571**	-0.0004	0.0599***	-0.3136**
	(0.0142)	(0.0177)	(0.0060)	(0.0009)	(0.0059)	(0.0144)	(0.1381)
Asset Growth	2.4059***	-0.4422	0.1825	-0.2727	0.4213**	-0.5536	-3.7908
	(0.4524)	(0.5618)	(0.1898)	(0.0032)	(0.1883)	(0.4576)	(4.3925)
Asset Growth ²	-0.2129***	0.0114	-0.0134	0.0123	-0.0484**	0.0158	1.2992***
	(0.0463)	(0.0575)	(0.0194)	(0.0003)	(0.0193)	(0.0468)	(0.4495)
Adjusted R ²	0.23	0.31	0.27	0.33	0.08	0.43	0.13
Observations	755	755	755	755	755	755	755

Table 2.7 All diversification measures and risk-adjusted performance - Operating Revenue

OLS regressions include all small banks (maximum assets $\leq \notin 450$ m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. Robust standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	Mean ROE	SD ROE	Mean ROA	SD ROA	RAR _{ROE}	RAR _{ROA}	Z-score
HHI _{REV}	-3.9433**	11.3058***	-1.4438***	2.8723***	-1.0891*	-0.7146	-19.7105
	(1.5156)	(1.9418)	(0.3304)	(0.4829)	(0.6070)	(0.7609)	(14.2542)
Non Interest	-1.0283	l7.4297***	-1.9662***	4.3804***	-3.0552***	-2.8124**	-70.5723***
Income Share	(1.9252)	(2.4666)	(0.4197)	(0.6134)	(0.7709)	(0.9666)	(18.1063)
HHI _{loan}	4.6298**	-9.9766***	1.0516**	-2.6217***	0.2305	0.5131	31.4018
	(2.1131)	(2.7073)	(0.4607)	(0.6732)	(0.8462)	(1.0609)	(19.8736)
Corporate	-2.7128	1.3695	-0.5561	0.7264	-1.6849	-1.1045	-38.1279
Loans	(3.7828)	(4.8465)	(0.8246)	(1.2053)	(1.5148)	(1.8992)	(35.5768)
HP/Lease	114.6191**	6.5289	7.8530	-13.4449	-12.4843	-17.2152	-179.8315
	(43.1938)	(55.3392)	(9.4160)	(13.7620)	(17.2961)	(21.6859)	(406.2269)
Other Loans	-5.1883**	10.0143***	-0.9786**	2.5750***	-0.5227	-0.9833	-47.2911**
	(1.9939)	(2.5546)	(0.4347)	(0.6353)	(0.7984)	(1.0011)	(18.7526)
HHI _{NON}	0.3773	1.4780	0.2035	0.3848	-0.1379	-0.1635	-1.3707
	(0.9093)	(1.1650)	(0.1982)	(0.2897)	(0.3641)	(0.4565)	(8.5517)
Trading	-3.9555***	4.8163***	-0.9419***	1.3841***	-0.9320**	-1.0156*	-12.6457
	(1.0843)	(1.3891)	(0.2364)	(0.3455)	(0.4342)	(0.5444)	(10.1972)
Other Operating Income	-1.7043 (1.2829)	4.7146** (1.6436)	0.2924 (0.2797)	0.7072* (0.4087)	-0.7183 (0.5137)	-0.5541 (0.6441)	-27.1116** (12.0651)
Equity/Assets	-0.0909***	0.0063	0.0331***	0.0355***	-0.0117	-0.0106	0.4836**
	(0.0243)	(0.0311)	(0.0053)	(0.0077)	(0.0097)	(0.0122)	(0.2283)
Log (Assets)	-0.4819	-0.3354	0.0841	-0.0670	0.5070*	0.4529	8.7969
	(0.7327)	(0.9387)	(0.1597)	(0.2334)	(0.2934)	(0.3679)	(6.8907)
Loans/Assets	0.0308**	-0.0181	0.0049	-0.0017**	0.0039	0.0080	-0.2150
	(0.0147)	(0.0188)	(0.0032)	(0.0047)	(0.0059)	(0.0074)	(0.1378)
Asset Growth							
Asset Growth ²							
Adjusted R ²	0.16	0.20	0.19	0.23	0.07	0.05	0.10
Observations	755	755	755	755	755	755	755

Table 2.8 All diversification measures and risk-adjusted performance - Robustness Test Beginning Period Values -

OLS regressions include all small banks (maximum assets < €450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. Robust standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	Mean ROE			SD ROE			Mean ROA			SD ROA		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
HHI _{REV}	-2.0601	-4.0731	-4.1009	21.7936***	23.8011***	23.4454***	-2.4209***	-2.8499***	-2.7994***	4.7401***	5.3758***	5.2276***
	(2.7668)	(2.8240)	(2.8084)	(3.3269)	(3.3863)	(3.3036)	(0.5992)	(0.6088)	(0.6085)	(0.8325)	(0.8514)	(0.8475)
Non Interest Income	0.6086	-1.8715	-1.8101	20.8451***	23.3707***	23.1270***	-1.9791***	-2.5013***	-2.4437***	4.7161***	5.4984***	5.3762***
Share	(1.9646)	(1.9852)	(1.9694)	(2.3623)	(2.3805)	(2.3588)	(0.4255)	(0.4280)	(0.4268)	(0.5911)	(0.5985)	(0.5943)
HHILOAN	7.1865***	3.8518**	1.1344	-5.7644**	-2.5609	-6.5948**	1.2965***	0.5712	0.4575	-1.5253***	-0.4700	-1.5331**
	(1.8056)	(1.8381)	(2.1557)	(2.1712)	(2.2041)	(2.5820)	(0.3911)	(0.3963)	(0.4671)	(0.5433)	(0.5542)	(0.6505)
Corporate Loans	-3.4946	-3.6611	-1.0587	-3.7023	-3.8650	-1.1995	-0.1066	-0.1817	0.1237	-1.1023	-1.0440	-0.5488
	(3.5123)	(3.6098)	(3.6799)	(4.2234)	(4.3285)	(4.4075)	(0.7607)	(0.7782)	(0.7974)	(1.0569)	(1.0883)	(1.1105)
HP/Lease	92.0652**	82.7559**	88.6659**	26.7449	32.8859	33.9601	10.4539*	8.0921	9.6025	-4.7805	-1.7864	-2.8356
	(27.9198)	(28.8168)	(28.4754)	(33.5726)	(34.5542)	(34.1057)	(6.0469)	(6.2124)	(6.1704)	(8.4011)	(8.6878)	(8.5931)
Other Loans	-4.6811**	-2.7939*	-0.6086	6.0611**	3.8987*	6.4545**	-0.6904*	-0.3220	-0.1176	1.1593**	0.5681	1.1225**
	(1.6702)	(1.6795)	(1.8494)	(2.0084)	(2.0139)	(2.2151)	(0.3617)	(0.3621)	(0.4008)	(0.5026)	(0.5063)	(0.5581)
HHIMON	-5.8045**	-4.7433**	-4.9009**	10.5173***	9.4498***	9.4133***	-1.0358**	-0.8108**	-0.8498**	2.9502***	2.6152***	2.6397***
	(1.8118)	(1.8508)	(1.8415)	(2.1786)	(2.2193)	(2.2056)	(0.3924)	(0.3990)	(0.3990)	(0.5452)	(0.5580)	(0.5557)
Trading	-11.0998***	-6.2205**	-6.9625***	27.0206***	21.7160***	20.9392***	-2.7045	-1.7176***	-1.8020***	7.0621***	5.5287***	5.3802***
	(2.1059)	(2.0027)	(2.0084)	(2.5323)	(2.4014)	(2.4055)	(0.4561)	(0.4318)	(0.4352)	(0.6337)	(0.6038)	(0.6061)
Other Operating	-5.6074**	-7.1091***	-6.3876***	9.6596***	11.5034***	12.6581***	-0.5075	-0.7859**	-0.7694**	1.8175***	2.2858***	2.6045***
Income	(1.7387)	(1.7651)	(1.7845)	(2.0907)	(2.1166)	(2.1373)	(0.3766)	(0.3805)	(0.3867)	(0.5232)	(0.5322)	(0.5385)
Activity Restrictions	1.1909***			-1.3161***			0.2383***			-0.3739***		
rearing resultations	(0.1953)			(0.2348)			(0.0423)			(0.0588)		
Diversification		0.9537			-0.1599			0.2984*			-0.3148	
Requirements		(0.7969)			(0.9556)			(0.1718)			(0.2403)	
Panking Eurodow			1 9017**			2 2013**			0 1531			-0.4982**
Banking Freedom			(0.6777)			(0.8117)			(0.1469)			(0.2045)
Adjusted R^2	0.16	0.11	0.12	0.29	0.26	0.27	0.20	0.16	0.16	0.31	0.28	0.28
Observations	755	755	755	755	755	755	755	755	755	755	75.5	755

Table 2.9a - Revenue diversification and risk-adjusted performance - Regulatory Environment variables

OLS regressions comprise all small banks (maximum assets < 6450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. We also include the previously incorporated control variables E/A, Loans/Assets, Ass. Growth, Ass. Growth², but do not report them for brevity. Detailed results can be obtained from the authors upon request. Robust standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. Activity Restrictions measures the degree to which banks are restricted from engaging in business of securities underwriting, insurance underwriting and selling, and from real estate investment, management, and development. Banking Freedom is an indicator of the relative openness of the banking system. Diversification Requirements is an indicator of whether banks encounter any explicit, verifiable, and quantifiable guidelines with regards to asset diversification. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	RARROE				RARROA			Z-SCORE			
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)		
HHI _{rev}	-1.6169	-1.453 6	-1.4791	-1.6627	-1.4738	-1.4651	-39.1131	-31.0899	-29.9668		
	(1.0943)	(1.0926)	(1.0896)	(1.3716)	(1.3695)	(1.3664)	(25.6929)	(25.6924)	(25.4976)		
Non Interest Income Share	-3.2407***	-3.0286***	-3.0378***	-3.0650**	-2.8095**	-2.7826**	-71.1241***	-61.4257***	-61.2491***		
	(0.7770)	(0.7681)	(0.7641)	(0.9739)	(0.9627)	(0.9582)	(18.2434)	(18.0611)	(17.8808)		
HHI _{loan}	1.9090**	2.1541**	1.6197*	2.3326**	2.5924**	2.0682**	9.0139	22.7387	53.1748**		
	(0.7141)	(0.7112)	(0.8364)	(0.8951)	(0.8914)	(1.0488)	(16.7671)	(16.7228)	(19.5722)		
Corporate Loans	-2.3352*	-2.3901*	-1.9545	-2.6524	-2.7799	-2.2240	-33.1660	-31.3330	-57.3898*		
	(1.3892)	(1.3966)	(1.4278)	(1.7412)	(1.7505)	(1.7904)	(32.6161)	(32.8409)	(33.4105)		
HP/Lease	-10.6834	-10.5823	-9.9099	-6.6963	-7.1900	-5.7042	-247.1170	-198.8420	-245.1590		
	(11.0428)	(11.1489)	(11.0481)	(13.8407)	(13.9746)	(13.8541)	(259.2710)	(262.1690)	(258.5340)		
Other Loans	-2.0970**	-2.3085***	-1.9225**	-2.7396***	-3.0387***	-2.5862**	-36.0953**	-42.6195**	-65.3193***		
	(0.6606)	(0.6498)	(0.7176)	(0.8280)	(0.8145)	(0.8998)	(15.5103)	(15.2797)	(16.7914)		
HHI _{NON}	-0.0315	-0.1196	-0.1380	-0.0310	-0.1346	-0.1738	-5.6346	-9.8314	-8.5764		
	(0.7166)	(0.7161)	(0.7145)	(0.8982)	(0.8976)	(0.8959)	(16.8246)	(16.8384)	(16.7192)		
Trading	-1.9000**	-2.3872**	-2.5125**	-2.3577**	-3.0064**	-3.1642**	-85.2643***	-103.1520***	-95.6789***		
	(0.8329)	(0.7748)	(0.7792)	(1.0440)	(0.9712)	(0.9772)	(19.5559)	(18.2201)	(18.2349)		
Other Operating Income	-1.2881*	-1.0942	-0.9470	-1.4742*	-1.1827	-1.0472	-23.1984	-18.4443	-26.7416*		
	(0.6877)	(0.6829)	(0.6924)	(0.8619)	(0.8560)	(0.8682)	(16.1459)	(16.0587)	(16.2019)		
Activity Restrictions	-0.1234 (0.0772)			-0.1676* (0.0968)			-4.2899** (1.8134)				
Diversification Requirements		0.0873			-0.2547 (0.3864)			-6.6140 (7.2499)			
Banking Freedom		(0.500.7)	-0.3242 (0.2629)		(0.5007)	-0.3689 (0.3297)		(18.9584** (6.1529)		
Adjusted R ²	0.09	0.09	0.09	0.07	0.07	0.07	0.12	0.12	0.13		
Observations	755	755	755	755	755	755	755	755	755		

Table 2.9b - Revenue diversification and risk-adjusted performance - Regulatory Environment variables

OLS regressions comprise all small banks (maximum assets < 6450m and no multi-bank affiliation). All regressions include country fixed effects and dummy variables for the number of years the bank is observed. All variables are averages for all observations of each bank. We also include the previously incorporated control variables E/A, Loans/Assets, Ass. Growth², but do not report them for brevity. Detailed results can be obtained from the authors upon request. Robust standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA and mean equity/asset ratios divided by standard deviation of ROA. Z-score is the sum of mean ROA and mean equity/asset ratios divided by standard deviation of ROA. Activity Restrictions measures the degree to which banks are restricted from engaging in business of securities underwriting, insurance underwriting and selling, and from real estate investment, management, and development. Banking Freedom is an indicator of the relative openness of the banking system. Diversification Requirements is an indicator of whether banks encounter any explicit, verifiable, and quantifiable guidelines with regards to asset diversification. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively



Figure 2.1. Increasing Proportion of Non Interest Income for Small and Other Banks.

Each line represents the proportion of non interest income in net operating revenue (net interest income plus non interest income). Small banks have assets below €450 million and are not part of a multi-bank affiliation. Other banks include all other banks by exclusion.

CHAPTER 1II

SME-Bank financing relationships within regional European areas^{*}

^{*} This version of the chapter was presented in May 2007 at an International SME conference at the University of Cagliari, 'Small business banking and financing: a global perspective'. An extension to this chapter co-authored with Simon Wolfe and Klaus Schaeck, '*Bank market structure, competition, and SME financing relationships in European regions*', has been presented in December 2007 at a Mergers & Acquisitions conference at the Federal Deposit Insurance Corporation, Arlington, Virginia and is under review with the Journal of Financial Services Research.

SME-Bank financing relationships within regional European areas

Abstract

We investigate the determinants of multiple Small and Medium Sized Enterprise (SME) bank financing relationships utilising a unique European Regional data set. The data is made up of 552 SMEs based in three European regions. We use a multi-bank financing relationship variable as the dependent variable and document differences in the number of bank relationships between regions and show the various impacts of firm, bank and market level variables. Our results show that firm and bank specific variables such as size, age, distance, bank role and bank terms are positively associated with the number of bank relationships, whereas a negative link exists between private firms, management change and the number of bank relationships. Our contribution to European regional SME research is enhanced by making use of regional growth and financial system variables that show that relationship banking may be affected by the market and socio-economic structure of a specific region.

3.1 Introduction

Motivated by the vital role played by SMEs³² in European economic growth and the ongoing debate concerning their financing arrangements, we investigate the determinants of SME-Bank financing relationships based on regional firm, bank, market and financial system architecture characteristics.³³

The importance of SMEs is widely recognised: in Europe SMEs represent 99% of all companies; they are the biggest sector of the economy with 23 million enterprises employing around 75 million people; and, are responsible for the creation of one in every two new jobs.³⁴ Not surprisingly SMEs have been at the forefront of policy makers concerns and source of funding and access to financing has remained central in this.³⁵ When SMEs deplete their reserves of self-financing, they turn predominantly to banks to finance their present and future activities and thereby making SMEs much more bank-dependent than larger enterprises. In addition, the debate over the link between bank consolidation and SME financing has become an urgent policy issue because the structure of the global banking system has been significantly affected by such consolidation³⁶. Goddard et al. (2007), de Guevara et al. (2005), and Amel et al. (2004) simultaneously observe a wave of consolidation across European banking systems resulting from an increasing number of M&As. Of particular concern is the prospect that consolidation could lead to a contraction in the number of banks that specialise

³² The EU defines small and medium sized enterprises (SMEs) as enterprises that employ fewer than 250 people, have an annual turnover not exceeding \in 50 million, and/or annual balance sheet total not exceeding \in 43 million. Micro SMEs are enterprises that employ fewer than 10 people, have an annual turnover not exceeding \in 10 million, and/or balance sheet total not exceeding \in 10 million. (Article 2 of the annex of Commission Recommendation 2003/361/EC of 6 May 2003, which applies from 01 January 2005 http://europa.eu.int/comm/enterprise/enterprise_policy/sme_definition/index_en.htm)

³³ For the purposes of our research 'Bank Financing' refers to SME financing for the following purposes: Firm start-up; Product development; Purchases of fixed assets; Cash flow; Reduction/Avoidance of overdraft facilities; Trading and trading costs; Other business/company acquisition; Expansion/growth; Share capital; Working capital; Retirement of co-director; Management buy-in/buy-out; Bridge while raising next funding round; Seasonal production/trading; Research; General corporate purposes; Staffing; Debtors financing; Bills payable; Work in progress funding; Stock purchase; Tax payments; Replacement machinery; Acquisitions; and Business development.

³⁴ Observatory for European SMEs, Enterprise Directorate-General of the European Commission, (2004), Brussels.

³⁵ European Commission report Nov 2004 Study on asset-backed securities: Impact and use of ABS on SME finance. http://ec.europa.eu/enterprise/entrepreneurship/financing/index_en.htm

³⁶ For an overview on European Banking refer to Goddard et al. (2007).

in relationship banking (i.e. small "community" banks) with the possible consequence of detrimental welfare effects on the links between local firms, especially SMEs, and local banks, and the access of such firms to loan capital.³⁷ This raises fears that consolidation decreases the number of banks specialising in relationship banking (e.g., community banks) with possibly detrimental welfare effects for local firms, especially SMEs, these firms' access to credit, and ultimately economic growth.³⁸

Following Ongena and Smith (2000), who report evidence that well developed financial systems with stronger protection of creditor rights help explain the number of bank relationships, we also test for the effect of differences in legal and financial system arrangements in the spirit of the studies motivated by La Porta et al. (1997), Levine (1999), Demirguc-Kunt and Maksimovic (1998), and Beck et al. (2006). Our analysis helps evaluate whether the effects uncovered by Ongena and Smith (2000) are also valid for SMEs in Europe.

Academic research has been investigating a very broad range of SME related issues and focus on, amongst others, relationship lending and the technologies used, SME credit availability, and, the benefits of bank-borrower relationships for SMEs (Berger and Udell, 2006; Elsas, 2005; Elyasiani and Goldberg, 2004; Ongena and Smith, 2000; Boot, 2000; Cole, 1998; Harhoff and Korting, 1998; Petersen and Rajan, 1995). Given the fragmented nature of the European Market, relationship banking studies in Europe, in particular cross-country research, are limited due to data restrictions as will be highlighted in the review of existent literature.

Our primary source of SME-level information is from the Centre for Business Research of the University of Cambridge regarding scope and scale of the relationship between 552 SME borrowers and their banks from Emilia-Romagna in the north-east of Italy, Bavaria in the south of Germany, and the south-east region of the UK. These regions are traditionally characterised by areas rich in innovative SMEs as well as local and regional banks, which are

³⁷ For an analysis of the current and potential future roles of small community banks in the U.S. refer to DeYoung et al. (2004), and refer to Mercieca et al. (2007) for the European equivalent.

³⁸ Such developments have been extensively studied for the US, see, for instance, Craig and Hardee (2007), Berger and Udell (2002), Cole et al. (2004) and Berger and Frame (2005).

the main source of financing for SMEs.³⁹ This dataset, augmented with information on financial system architecture and local market conditions, provides an excellent setting to conduct our empirical investigation as the survey data can be matched with local bank market data. As detailed further below, this is particularly beneficial since we anticipate socio-economic factors to be paralleled by local financial systems. In addition, a regional focus permits better accounting for information asymmetries that banks are expected to encounter when aiming to establish relationships with SMEs.

Our findings suggest that the determinants of SME bank financing relationships are affected by bank, firm, and financial market characteristics.⁴⁰ Firm characteristics such as size and year of incorporation have a positive association with the number of bank relationships. As expected, the more active a role that banks play within SMEs, and, the higher the amount of bank finance utilised by the SME, the higher will be the probability of having multi-bank relationships. The regional and financial system within which the SME is established also has an impact on the outcome of our results as we evidence a positive link between systems that enjoy more economic, banking freedoms, higher regional economic growths and the determinants of SME bank financing relationships.

This chapter contributes to the research on European banking in two distinctive ways. First, to our knowledge, this is the first study to investigate the determinants of SME-bank financing relationships based on a European cross-country regional basis. Second, this chapter adds to the research on regional SMEs by analysing growth variables from a regional perspective and also employing innovative development variables to investigate the importance of the socio-economic environment for SME-bank financing relationships. This is done to the entire SME sample and also based on a divide between micro SMEs and SMEs. As Guiso et al. (2004, p.

³⁹ Further details regarding composition of these three regions are provided by Martin et al. (2001). Ferri and Messori (2000) present additional details regarding socio-economic characteristics and regional financial subsystems in Italy.

⁴⁰ Elsas (2005) identifies three potential determinants of relationship financing, namely, borrower, bank, and market characteristics.

937) point out 'if local market conditions matter, they should matter the most for small firms, which have difficulty in raising funds at a distance, than for large firms'.

The remainder of the chapter 1s organised as follows. Section 3.2 reviews the prior literature and Section 3.3 explains the methodology and describes the dataset. We present empirical results in Section 3.4 and offer concluding remarks in Section 3.5.

3.2 Related Literature

Relationship banking has its roots in the seminal work of Diamond (1984), Ramakrishnan and Thakor (1984), and Boyd and Prescott (1986) who argue that banks are investors devoted to reducing monitoring, screening, or renegotiation costs.⁴¹ Bhattacharya and Thakor (1993) conclude that informational frictions – asymmetric (and proprietary) information – "provide the most fundamental explanation for the existence of (financial) intermediaries". Such information access is inherently linked to relationship banking and may point to a comparative advantage of banks. Within such a framework, firms might find it optimal to borrow from only one bank if that bank has a depth of knowledge on each individual firm. This view is counteracted however if sole relationship banks exert a monopoly access on private firm information, which can be exploited in the form of higher interest rates and by way of denying additional credit.

Sharpe (1990) and Rajan (1992) demonstrate that superior information enables a single bank to extract monopoly rents through future loans to the firm, thus distorting entrepreneurial incentives and causing inefficient investment choices. They show that competition from an additional informed bank eliminates "hold-up" costs. The implication to be deduced from Sharpe (1990) and Rajan (1992) is that firms should maintain, at most, only a few bank

⁴¹ The term '*relationship banking*' is not well defined in the literature. Boot (2000) and Berger (1998) provide instances where a financial intermediary manifests such relationship banking, as being, when it, i) invests in obtaining customer-specific information, often proprietary in nature, beyond what is publicly available, and ii) evaluates the profitability of investments through multiple interactions with the same customer over time and/or across products (different from transaction-oriented banking that focuses on single transactions with customers, or multiple identical transactions with various customers).

relationships. This stream of research is enhanced through Thakor (1996) and Von Thadden (1995) who argue that firms seeking financing from multiple banks reduce the chance of being denied credit and improving their entrepreneurial incentives. This however is counteracted by the risk of not being denied credit as the number of banks included in the firm's search is increased.

The available evidence suggests that exclusive financing relationships between banks and firms are extremely rare. In the small-firms sample utilised by Berger and Udell (1995) and Petersen and Rajan (1994), the average number of bank relations at any moment in time is a function of firm size whilst in the medium firms sample used by Elsas and Krahnen (1998), the average number of banks' relations is 5, varying between 1 and 21. This implies that both bank and borrower may enter into a multitude of debt contracts simultaneously, a phenomenon which is seldom reflected in the theoretical literature.

Firms might want to maintain multi-bank relationships for a variety of reasons. Ongena and Smith (2000) highlight three such reasons, amongst which is the diversification of bank relationships particularly when the risk of losing a given relationship is high (Detragiache et al, 2000). Secondly, a country's legal environment may influence the benefits and costs to lending through investor coalitions with coordination amongst investors that may actually help align the incentives of firm managers with the firm investors (Bolton and Scharfstein, 1996). Lastly, sole relationship banks may refinance unprofitable projects and thus reduce entrepreneurial incentives to prevent default. By complicating the refinancing process and making it less profitable, multiple-bank lending allows banks to avoid extending further inefficient credit (Dewatripont and Maskin, 1995).⁴²

One would expect that firms engaging with multiple banks should represent better risks and avail of better service rates than firms opting for single bank relationships. Empirical evidence, however, provides opposing arguments for this. Petersen and Rajan (1994) examine

⁴² Similarly, Bolton and Scharfstein (1996) show that multiple-bank lending reduces entrepreneurial incentives to default strategically because it complicates debt renegotiation.

how firm-lender relationships affect the interest rate quoted on a firm's most recent loan. They find indications that firms dealing with relatively small number of banks benefit from easier access to bank credit and from lower interest rates with the length of the relationship having a positive and significant effect on credit availability, and a positive but insignificant impact on the cost of credit. Cole (1998) who examines the effect of pre-existing relationships between a firm and its potential lender on the potential lender's decision of whether or not to extend credit to the firm, finds that a potential lender is more likely to extend credit to a firm with which it has a pre-existing relationship as a source of financial services.⁴³ The length of the relationship here was unimportant, providing support to theories of financial intermediation that posit that banking relationships generate valuable private information about the financial prospects of the financial institution's customer. The results also provide evidence that potential lenders are less likely to extend credit to firms with multiple sources of financial services, in support of the theory that the private information a financial institution generates about a firm is less valuable when the firm deals with multiple sources of financial services.

European research has so far focused on diverse aspects of the bank-firm relationship. Angelini et al. (1998) investigate the effects of bank-firm relationships on the cost and the availability of credit for Italian firms, focusing on possible differential effects related to the local and/or cooperative nature of lending banks. They find that, with banks other than cooperative banks, lending rates in Italy tend to increase in the duration of a relationship with members of cooperative banks enjoying easier access to credit, unlike non-member customers. Ferri and Messori (2000), analyse the extent and impact of relationship banking in Italy's three sub-systems (North, Centre, and South) and explain that relationship banking is more extensive in the areas were small businesses prevail, suggesting that relationship banking may be beneficial or detrimental depending on the socio-economic structure. Detragiache et al. (2000) find that in a sample of small and medium-sized Italian firms the notion of multiple

⁴³ The information that banks obtain by offering multiple services to the same customer may be of value in lending (Degryse and Van Cayseele, 2000). Nakamura (1991) argues that banks that maintain checking and saving accounts of a firm may give the bank easy access to information and thus a unique advantage in the monitoring of borrowers. This in turn would allow the bank to spread the cost of information production over several products.

banking is extremely widespread. To identify why firms may find it necessary to establish multiple relationships with banks, they develop a theoretical model where multiple banking ensures a more stable supply of credit, and reduces the risk of premature liquidation of the investment project.

Harhoff and Korting (1998) investigate lending relationships in Germany to explore the nature of firm-bank relationships and their impact on the collateral requirements, cost, and availability of external finance for SMEs. They find that the number of relationships increases with the firm's age, size, and leverage and that innovative firms have more relationships.⁴⁴ They also find that firms which have experienced financial distress have more relationships, and there is a causal relationship running from the firm's financial health to its number of creditors. Firms with more concentrated borrowing and long-lasting bank relationships fare better than other enterprises in terms of collateral requirements, interest rates, and credit availability. Elsas and Krahnen (1998) seek to provide a direct comparison between house-bank and normal bank financing.⁴⁵ Despite competition from normal bank relationships, housebanks are able to establish a distinct behavioural pattern consistent with the idea of long-term commitment, in particular, providing a kind of liquidity insurance in situations of unexpected deterioration, happens for the borrowers.

Elsas (2005) addresses the question of which factors determine whether a particular bank lender is a relationship lender and finds that variables related to the banks' information access and their influence on borrower management are important determinants in this aspect. As the bank's share of debt financing or its share of payment transactions increases the bank is more likely to be a housebank with the duration of the bank-borrower relationship not directly

⁴⁴ Farinha and Santos (2002), investigating Portuguese lending relationships, find that nearly all firms borrow for the first time from a single bank, but the likelihood of a firm substituting a single relationship with multiple relationships increases with the duration of that relationship, with firms showing more growth opportunities or poor performance, the most likely to fall within this category.

⁴⁵ According to Elsas and Krahnen (1998), *Housebank* is regarded as the premier lender of a firm, being equipped with more relevant, and more timely information than any 'normal', non housebank institution, whilst also being more committed to its client, enlarging their role as financier if the firm faces sudden and temporary difficulties.

related to housebank status. They also find that the likelihood of observing a house-bank decrease as bank concentration in local debt market increases. In highly concentrated markets however, less competition fosters lending relationships since the likelihood of observing a house-bank increases with market concentration. Analysing the determinants of the number of bank relationships, Ongena and Smith (2000) find that firms in countries with relatively stable and un-concentrated banking systems maintain more bank relationships, while firms in countries with strong judicial systems and strong creditor protections maintain fewer bank relationships.

A distinct strand of literature analyses relationships at local/regional banks. Although these studies focus on developing/rural economies we can apply these insights to our developed country sample. Banerjee et al. (1994) and Besley and Coate (1995) present the theory of "long-term interaction hypothesis" which states that agents who take part in the life of a community share relationships of various kinds, not solely economic, through which they acquire information that would be available to an outsider only at a cost. Banks operating in such regional communities (as opposed to larger financial institutions) may take advantage of such information in its financing activities and are more apt in dealing with asymmetric information and agency problems. Literature has identified a number of reasons why regional/small banks may have a comparative advantage in relationship banking, such as the ability to process 'soft'⁴⁶ information, a facilitated approach to information transfer where fewer layers of management exist, and the organisational diseconomies that large banks associate with relationship banking (Cole, 2004; Stein, 2002; Berger and Udell, 2002; Williamson, 1988). An additional advantage could stem from the possibility of applying "social sanctions" which are generally not available to ordinary commercial banks.

⁴⁶ '*Soft*' information is information that cannot be easily quantified, which is acquired by the bank officer through contact over time with the SME, the local entrepreneur, and the local community. Soft information is difficult to document and transfer to others and may also include an assessment of the future prospects of the SME gamered from past communications with SMEs suppliers, customers or neighbouring businesses (Petersen and Rajan, 1994; Berger and Udell, 1995; Degryse and Cayseele, 2000; Kano et al., 2006).

We also recognise that the three countries we are observing have differing banking structures. The integration of European banking systems has been undergoing significant changes particularly following the launch of the Single Market Programme, the transition to the Euro, and, the recent enlargements of the European Union. Despite efforts to integrate Europe's banking system, there still exists a banking segmentation that is influenced by linguistic and cultural differences, relationship lending, corporate governance rules and supervisory and lending practices (Degryse and Ongena, 2003). Within this context, Buch (2001) distinguishes between "exogenous economic borders" (legal origin and system, supervisory and corporate governance practices, political framework, language or cultural differences) and "endogenous economic borders" (mainly of information nature and may arise because of bank-firm relationship, adverse selection and information sharing between banks). The characteristics of European regional banking systems are also investigated through the analysis of structural variables by Affinito and Piazza (2005). They find that the number of banks and branches depends positively on the per capita gross regional product and population supporting the idea that the presence of linguistic minorities and smaller non financial firms favour a more local character of the regional banking system and reduces the average size of its banks.

This chapter also investigates the influence of financial system architecture on SME bank relationships. Following the studies of La Porta et al. (1997), Levine (1999), and Beck et al. (2006), who argue that differences in legal and financial systems can explain much of the variation across countries in firms' financial policies and performance, we focus on the legal and institutional frameworks of a country to observe whether these can explain differences in the financial systems across the countries in the sample. Demirgue-Kunt and Maksimovic (1998) provide empirical evidence supporting the view that the development of a country's financial system affects firm growth and financing. Rajan and Zingales (1998) show that industries that are dependent on external finance grow faster in countries with better developed financial systems. Carlin and Mayer (2003) also argue that there exists a relation between a country's financial system and the characteristics of industries that prosper in the country whilst Demirguc Kunt et al. (2006a) shows that the sensitivity of investment to cash flows depend negatively on financial development. Ongena and Smith (2000), demonstrate

that developed securities markets through lower bankruptcy costs, together with stronger investor protections may influence the number of bank relationships a firm chooses to use (La Porta, et. al, 1997).

Recent studies have established a positive association between financial sector depth and economic growth at the country, industry and firm levels (Levine, 2005). However, little is known about the breadth of financial systems across countries, the extent to which enterprises and households use financial services and their relationship to desirable outcomes. Analysing variables that relate to the penetration and outreach of financial systems can be argued to be beneficial for a better understanding of the financial sector. Firstly, a well developed financial system is important for economic development (Beck et al. 2004; Honohan 2004). Broad access helps overcome credit constraints faced by SMEs to finance investment projects thus reducing the efficiency of resource allocation. Second, one of the channels through which financial development fosters economic growth is through the entry of new firms (Klapper, 2004).

3.3 Data and Methodology

3.3.1 Data

Our primary source of firm-level information is the 2001 *Survey of the Financing of Small and Medium-sized Enterprises in Western Europe*, conducted by the Centre for Business Research of the University of Cambridge⁴⁷. The survey is carried out across three regional areas in Italy, Germany and the United Kingdom. Against a background of increasing integration of Europe's financial space, and the specific context of dramatic transformation of regional and local banking systems and the emergence of a venture capital market, the survey focuses on the financing of SMEs in three different regions of Europe between March and October 2001: South East of England, Bavaria in Southern Germany and Emilia-Romagna in Italy.

⁴⁷ The survey data can be obtained http://www.dataarchive.ac.uk/findingData/snDescription.asp?sn=4955

The survey's main vehicle is a questionnaire⁴⁸ containing 191 questions for Germany and the UK, and 188 questions for Italy. The questionnaire yielded 247 responses for the UK, 161 for Italy and 114 for Germany. Questions from the survey cover a variety of topics including the main markets serviced, the type of finance used and for what reasons, whether firms have used bank finance, the role that banks play, and whether firms have utilised Venture Capital. The dataset includes information from the postal questionnaires at a micro level, with data collected from individual SME levels. In the first section of the questionnaire, the SMEs were asked general questions about the nature of their business, its size, employment growth, and turnover. The second section was concerned with the methods of financing the SMEs used and what that finance was used for. The third section of the questionnaire covered SMEs' use of bank finance, and the fourth section asked questions on the use of venture capital finance.

The SME survey summary statistics presented in Appendix 3.A show that the UK makes up 47% of the sample with Germany and Italy having 22% and 31% respectively. In all the variables under investigation we can identify differences between the regions even though consistent patterns can be identified across the regional data. Italy is the region showing the highest incidence of multi-bank relationships (71.4%) with the UK the lowest (2.8%).⁴⁹ A 12-month mentoring pilot programme for 147 new, small businesses in the South East of England developed by Business Boffins Ltd in conjunction with the Enterprise Centre at Oxford Brookes University's School of Business and funded by a grant from the South East England Development Agency (SEEDA), confirms the trend in our data sample. Of these 147 businesses, slightly more than 50% drew upon personal savings as a source of finance. Also, according to a report by the Bank of England (2000), 75% of small firms use retained profits and cash flow from existing business to fund their development although the most important source of start-up capital is funding from the owner-manager themselves.

⁴⁸ The questionnaire is accessible on the University of Cambridge website

⁽http://www.dataarchive.ac.uk/doc/4955%5Cmrdoc%5Cpdf%5C4955userguide.pdf)

⁴⁹ For Italy, Pagano et al. (1998) report the mean number of bank credit relationships per firm to be 13.9 and Ongena and Smith (2000) report a mean of 15.2. For German firms, Elsas and Krahnen (1998) and Ongena and Smith (2000) report mean figures of 6.0 and 8.1 respectively. Ongena and Smith (2000) report mean figures of 2.9 relationships per UK firm.

The definition of bank financing we are utilising for purposes of our research implies financing that is intended for, amongst others, acquisition investment, cash-flow, tax, and for enabling the SME to remain a going concern. It excludes SMEs having a relationship solely through having a checking account or simple savings account with a bank. 42% of the entire sample does not use any banks for their financing activities implying that they either use other forms of financing such as by borrowing from family and friends, or else use their own reserves for financing purposes. Such a notion of self-financing is also consistent with Beck et al. (2005a) who show in their sample data that small firms finance a smaller share of their investment with formal sources of external finance.

The survey does not provide actual figures for turnover. Rather the SMEs are classified into five categories, whereby higher values indicate greater turnover. Both average turnover and average number of employees for all SMEs are greater for those that move from zero to one and from one to more than one bank financing relationships. This is in line with previous studies highlighting that size is positively correlated with the number of bank relationships, e.g, Petersen and Rajan (1994). Descriptive statistics for the country-specific and regional variables are also presented in Appendix 3.A. Even though there are notable differences in the regional sample, patterns of consistent data can be observed in Appendix 3.A. The average turnover for all SMEs is greater for those SMEs that have more than one bank financing requirements. Such a consistent trend in all SMEs is also manifested in the employee data, where SMEs that have on board more employees have more than one bank relationship.

3.3.2 Methodology

We employ firm-level regressions of the number of bank relationships on firm, market and regional/country specific variables. The regression specification follows broadly the methodology applied by Ongena and Smith (2000). The dependent variable used in the econometric model is the multi-bank relationship variable. SMEs are categorised between those having no bank financing relationships, having one relationship, and having multiple
bank financing relationships⁵⁰. We report estimates of the firm-level model using a Tobit specification. Because the dependent variable is discrete-valued, ordinary least squares (OLS) estimates of the parameters will be biased as well as inconsistent. The Tobit specification accounts for truncation of the number of bank relationships below one, but assumes the distribution is otherwise continuous. We subdivide further our sample into micro SMEs and SMEs (all sample less micro SMEs) to enable us to focus more closely on the financing relationship determinants of different types of SMEs.

3.3.3 Variables used ⁵¹

The number of bank relationships, which we employ as our dependent variable, has been previously utilised as a variable in research related to relationship banking. Elsas (2005), Ongena and Smith (2000), Cole (1998), Harhoff and Korting (1998), Petersen and Rajan (1994), and, Houston and James (1996), all use the number of bank relationships as a proxy for the intensity of bank competition. Apart from Ongena and Smith (2000) however, none of these studies examine the determinants of the number of bank relationships. The variables utilised, with their source and respective explanation, are shown in more detail in Appendix 3.B.

3.3.3.1 Firm-level variables

As a measure of firm size and possibly an indication of market power in financing negotiations, we employ the firm-level variable *Turnover*. We expect SMEs with a larger turnover to have a positive impact on the number of bank relationships. Principally, as shown by Detragiache et al. (2000), as firms become larger they may have to rely on multiple banking to allow banks to diversify firm-specific credit risk. Additionally, firm 'complexity' and more growth opportunities are likely to increase proportionally with size with larger

⁵⁰ The survey does not provide the precise number of bank relationships beyond one. This hampers the use of a Poisson model that could otherwise be used to estimate the actual number of lending relationships.

⁵¹ The most commonly used proxy for relationship lending in applied empirical work is the duration of a bankborrower relationship (see e.g., Petersen and Rajan, 1994; Berger and Udell, 1995; and Ongena and Smith, 2001)

borrowing requirements also inducing larger firms to rely on multiple banking. Turnover is utilised as a proxy for firm size in a number of studies (Elsas, 2005; Farinha and Santos, 2002; Ongena and Smith, 2000; Elsas and Krahnen, 1998; and Cole, 1998). The number of employees is also available through the ESRC survey and we also apply this variable as an additional proxy for firm size. Detragiache et al. (2000) and Farinha and Santos (2002) also make use of the number of employees as proxy for firm size.

To determine the impact of entrepreneurial innovation on SME bank financing we make use of a *Research and Development* (R&D) dummy variable denoting whether SMEs engage in R&D or not. Von Thadden (1995) uses a measure of R&D to denote the amount of innovation intensity as a proxy for entrepreneurial control rents. A negative correlation between the extent of entrepreneurial control rents and the probability of single banking also supports the hypothesis that multiple banking serves to reduce rent appropriation by banks. Alternatively, Yosha (1995) shows that R&D intensity may be associated with single banking if information leakages to competitors are more likely with multiple lenders. Elsas (2005) also controls for R&D as a proxy for informational opaqueness. The degree of informational opaqueness about future prospects should be related to the demand for relationship lending.

We use *Age* as a control variable to assess whether the year of SME incorporation has any impact on the number of bank relationships. Older firms may face less severe adverse selection problems when seeking finance and should be more likely to have access to credit and financial services because they show that they have survived the critical start-up period and have generated reputational effects throughout the years (Diamond, 1991). Berger and Udell (1995) also point out that age reflects public information obtained as a result of reputation and has to be distinguished from the length of the relationship since the latter reflects private information available only to the potential lender obtained from monitoring. Detragiache et al. (2000) argue that if building banking relationships is a process that consumes time, then age may be positively correlated with the number of relationships. Cole

(1998) and Degryse and Cayseele (2000) also use firm age as a proxy for public information and reputation respectively.

To represent organisational form and to distinguish between public and private firms we include a dummy variable, *Firm Type*. Public firms will have easier access to the capital markets and this might impact the number of bank relationships they maintain. As in Elsas (2005), Degryse and Cayseele (2000), and Cole (1998) we include this variable since the degree of informational asymmetry may vary with organisational form due to the agency conflicts between owners, managers, and creditors and due to the varied degrees of liability. Another variable *Ownership Change* is captured to determine whether SMEs ownership changes have any bearing on the number of bank relationships. The *Amount of Bank Finance Used* is employed to assess how much the SME depends on financing from banks.

3.3.3.2 Bank-level variables

The survey provides us with information about the *Role* that banks have within SMEs. Such roles that ultimately influence SMEs are either a seat on the firm's board, technical, management, or marketing and sales advice and other roles. A similar variable is utilised by Elsas (2005) who relates the variable Influence to the monitoring role of relationship lenders and the bargaining power over the respective borrowers.

We utilise the variable *Distance* to determine whether this has any impact on the number of bank financing relationships. Because of the informational opacity of SMEs, distance can be an important factor in bank financing⁵², given that the collection of soft information usually requires contact between lender and borrower that is facilitated by geographic proximity.

⁵² Several studies examine whether distance between lender and borrower has been changing over time and provide contrasting results. Petersen and Rajan (2002), Cyrnak and Hannan (2000), and, Wolken and Rohde (2002) all find that distance has increased, whilst Degryse and Ongena (2004), in contrast, find that distance did not increase.

Other bank related variables that we employ are *Terms* and *Bank Type*. As a soft measure of the relationship strength between SMEs and banks the variable Terms enables us to measure whether SMEs view the terms given by their bank as favourable. Bank Type is self-explanatory and denotes whether banks are either Regional or National. Since a particular SME can obtain bank financing from either Regional or National banks, or both, then the two bank types are not mutually exclusive and are both included in the quantitative analysis. Recent theoretical work suggests that bank organisational structure may matter because banks with different organisational structures may have different incentives to produce soft information (Stein, 2002). Small regional banks may have a comparative advantage in producing soft information, while banks with multi layered hierarchies may perceive this as a comparative disadvantage.

3.3.3.3 Market Structure Variables

Regional indicators for our three regional areas are obtained through the REGIO database, which is Eurostat's⁵³ harmonised regional statistical database that covers the main aspects of economic and social life within the EU. We extract information on three variables, namely, *Regional GDP*, *Regional Economically Active Population*, and, *Regional Patent Applications to the European Patent Office*. We expect these variables to positively impact upon the number of bank financing relationships.

To control for the nexus between SMEs and the business environment, we obtain the variables *Time to Start Business* and *Cost to Start Business* from the World Bank Doing Business Survey (2005). These regressors capture important factors that enhance or constrain business investment, productivity and growth respectively. We expect them to be positively related to the number of bank relationships.

⁵³ Eurostat is the EU main statistical portal with a defined mission 'to provide the European Union with a highquality statistical information service'.

We adapt variables from the World Business Environment Survey (WBES)⁵⁴ survey conducted in 1999 and 2000 over 10,000 firms in 80 countries (World Bank database). Variables include financing constraints, GDP growth, private credit, domestic bank share, and foreign bank share. We adapt variables that assess whether, amongst others, financial and legal obstacles affect firms' growth. The survey asks enterprise managers to rate the extent to which Financing and Legal problems presented obstacles to the operation and growth of their businesses. The variables take the values of 1-4, with 1 indicating no obstacle and 4 indicating a major obstacle. *Financing* and *Legal* obstacles are applied to our model to examine the impact that they might have on firms' bank financing relationships since as argued in Schiffer and Weder (2001) small firms are more likely to face tougher obstacles in obtaining finance and accessing legal systems.

To test for the effect that the regulatory environment might have on bank relationships for regional European SMEs, we employ variables drawn from a new database on financial regulation and supervision adapted from Barth et al. (2001, 2004). *Economic Freedom* is a composite of institutional factors determining economic freedom, with higher scores signifying greater freedom. *Banking Freedom* is an indicator of the openness of the banking system and is a composite index of whether foreign banks are allowed to operate freely, the difficulties faced when setting up domestic banks, government influence over the allocation of credit, and whether banks are free to supply provision of insurance products and securities to customers. Ranging from 1 to 5 and available from the Economic Freedom Index of the Heritage Foundation, the values are averaged for the period 1997-2003 with higher values indicating fewer restrictions on banking freedoms.

Additional variables we make use of are *Access to Financial Services* which captures the geographic and demographic penetration of the banking system measured over the number of bank branches relative to population and area⁵⁵; and, *Stock Market Capitalization / GDP*,

⁵⁴ A detailed discussion of the survey is provided by Batra et al. (2003).

⁵⁵ Such indicators have to be treated with a note of caution since limitations exist. These measures assume a uniform distribution of bank outlets within a specific country's area and population. However, in countries one might find concentration particularly in urban areas.

Stock Market Total Value Traded / GDP to measure the influence of Stock Market Development on the number of bank relationships given that well developed securities markets might function as a substitute for the transaction services of banks.

3.4 Results

Our findings for the entire sample are shown in Tables 3.1 through to 3.3. In Table 3.1, column 1 we exclusively employ the firm-level variables *Firm Age*, *Firm Type*, *Ownership Change*, *R&D*, and *Turnover*.

As a proxy for size, *Turnover* is positively associated with multi-bank financing relationships indicating that as firms become larger they tend to associate themselves with more banks. This result supports evidence by Ongena and Smith $(2000)^{56}$, Cole (1998) and Cole and Wolken (1995) who show that larger firms are more likely to resort to multiple banking sources⁵⁷. *Firm Type* shows a negative association with the dependent variable, denoting that private firms are less likely to have more than one bank relationship when compared to public firms. This suggests that more opaque firms tend to have less bank relationships as providers of funds that do not have access to 'soft' information will incur greater monitoring costs. *Firm Age* demonstrates a positive link to the number of bank relationships, possibly indicating that firms that survive the initial firm stages are more likely to enjoy positive relations with banks. This contrasts with Detragiache et al. (2000), Cole (1998) and Farinha and Santos (2002) who find no statistical significance for firm age. If we construe age as a proxy for public information, then we can explain this positive coefficient as showing that as firms increase their years in trading, they gain more reputation and can provide greater assurances for banks.

Ownership Change shows a negative association with the multi-bank financing demonstrating that SMEs that change ownership are more likely to resort to less bank financing relationships.

⁵⁶ Larger firms, as measured by domestic sales, maintain more bank relationships than small firms do and firms with higher world-wide sales maintain fewer domestic bank relationships, suggesting that firms with high foreign sales substitute bank relationships in foreign countries for some domestic bank relationships.

⁵⁷ Although not reported in Table 3.1, we have employed the number of Employees as a proxy for size and the results are identical.

This could be due to the fact that banks are more reluctant to engage in providing services to firms that have changed ownership and would require an assessment of whether the new SME management is able to provide them with the necessary creditworthy requirements. Also, new ownership structures could have different corporate strategies and could also have new non-bank financing opportunities. Investment in R & D is shown to be negatively linked to multibank relationships, thus demonstrating that SMEs that engage in R&D are more likely to have an exclusive relationship with one bank. This negative association is weakly statistically significant and contrasts with Detragiache et al. (2000) who use indicators of a firm's attitude to innovate, and show that all but one have a negative effect on the probability of single banking. The inverse association between bank financing and innovation and development could also be the result of the SME being averse to engage multiple banks due to information leakages especially in their start-up days (Yosha, 1995).

Column 2 of Table 3.1 introduces six Bank-level variables alongside the Firm-level variables. The results for firm-level variables confirm what we have explained in the preceding paragraphs. *Distance* is positively linked to our dependent variable, indicating that as the distance between SME and bank increases, SMEs are more likely to engage in multi-bank financing relationships. This could be explained if SMEs that have a physical distance from a bank, could possibly not feel that they have an exclusive relationship with a bank, as opposed with a firm that has a more close physical connection to a local/community bank. Since geographically close lenders would incur lower costs in gathering the required information, borrowers would likely receive better terms on loans when they are in close proximity to the bank. New technologies also have an impact because the availability of financing could be sourced from more distant locations enabling SMEs to engage in multiple financing strategies with different financial intermediaries.

Bank Role is also positively associated with multi-bank relationships. The role the bank plays within an SME may vary from a board seat to marketing and managerial advice and as banks play a more defining role with SMEs we show that this is likely to increase the amount of bank financing that each SME will opt for. This can be explained if we consider that SMEs are

eager to capture as much positive synergies as possible with the bank and use the bank's experience to help them in their specific market. Our finding contrasts with Elsas (2005) who, for a sample of German firms, find no significant difference when relating the number of relationship banks to the indicator for influence on management.

The *Terms* applied by a bank to its customers, whether they are reasonable or not, is positively associated with the dependent variable. As banks provide more favourable terms, it stands to reason that SMEs will have the possibility and interest to opt for multi-bank relationships. Banks may offer reasonable terms to SMEs in a bid to capture more firms in the market, or also as a sign of trust and confidence in the SMEs that utilise the banks' services. The results are consistent with Harhoff and Korting (1998) who show that mutual trust between bank and firm appears to have a strong beneficial effect on interest rates. The *Amount of Bank Finance* used is positively linked to multi-bank relationships and as expected as the SME increases in size and depth of trading, they will most likely require more than one financial service provider. *Bank Type*, whether Regional or National, is associated positively to multi-bank relationships, indicating that SMEs are equally likely to select a Regional or National bank as they increase the number of banks that they opt to have working relationships with.

In Tables 3.2 and 3.3 we apply market, financial, institutional variables as described in Section 3.3.3. When applying the *Financing* and *Legal* obstacles we achieve interesting results in Table 3.2. Multiple bank financing relationships are negatively associated with Financing and Legal obstacles. As Financing obstacles increase, SMEs are less inclined to have more than one bank relationship since the financial services environment makes it harder to develop new opportunities. Moreover, SMEs with one relationship would be more prone to maintain and nurture an existing bank relationship, anticipating that having one healthy banking relationship would be to the firms' advantage. Legal obstacles are significantly and negatively related to the dependent variable. A higher level of legal obstacles will require greater knowledge of the legal environment and requires market expertise (something which SMEs might not have in abundance given their local/community nature). As shown in Beck et al. (2005a), the extent to

which financial and legal underdevelopment constrain a firm's growth depends very much on a firm's size. Smallest firms are consistently the most adversely affected by all obstacles.

With respect to the variables relating to the Business Environment, the variable relating to the setting up of the SMEs, namely the *Cost to Start a Business*, shows that as it costs more to set up SMEs it induces such SMEs to engage in multi-bank financing relationships. This can be explained by the fact that the more costs that businesses incur towards set-ups, the more use of financial support they will need, particularly in the instances where they do not have self-financing or avenues for equity capital. The advice given by banks that have been through previous SME set-up experiences could prove invaluable for SMEs and having more than one bank providing this role might prove beneficial.

Economic Freedom and *Banking Freedom* both come in as positive and highly significant indicating that as institutional factors and the banking and financial system are more open, then SMEs will have no obstacles to embark on diverse bank relationships, depending on their needs and the objectives they seek to address through such relationships (financial, advisory, risk mitigation, etc.). In assessing whether the *Access to Financial Services* has any implication on the number of SME bank relationships, we employ the number of bank branches per sq/km (Table 3.3). The results show that this variable is positively associated with multi-bank relationships, indicating that countries with more access to financial services provide more opportunities for SMEs to develop more financial relationships. As shown in Beck et al. (2005b), countries with greater financial services access suggesting scale economies in banking service delivery. Higher branch intensity in geographic and demographic terms would indicate higher possibilities of access and the opportunity to use financial services by households and enterprises.

The measures of *Stock Market* development show highly significant associations with multibank relationships. We report a strong negative association between the number of bank relationships and the development of equity markets as shown by the variables Stock Market Capitalisation and Stock Market Total Value Traded. We attribute such a result to the fact that SMEs that resort more to equity funding have a substantial part of their financial needs met through equity. A similar result, although with a weak dependence, is reported by Ongena and Smith (2000).

The economic tests corroborate our conjecture that regional factors affect the number of bank relationships. Higher *Regional GDP growth* and a larger *Regional Population* are all significantly positively associated with our dependent variable. SMEs are likely to expand in scope and scale when the local economy prospers and innovates. This makes them diversify their financing relationships. Moreover, our result concerning regional population is aligned with Affinito and Piazza (2005) whose results indicate that an economically active local population requires wider access to banking services. As in the R&D variable employed previously, the variable relating to the number of *R&D regional patents* comes in negatively, indicating that SMEs that are undergoing research and innovation are more likely to be involved in exclusive relationships. This could be due to the fact that they are still settling themselves up, thus wanting more security with a bank that can provide them with exclusivity in their relationship.

3.4.1 Robustness Tests

We divide the sample of 522 observations into SMEs and micro SMEs, resulting in 241 and 281 observations respectively. By doing this we can rerun our tests based on these two samples ensuring that the results highlighted above are consistent even with sub-samples of the same dataset. Table 3.4 shows the canonical model based on such micro and small samples and the results are consistent with what we have already reported. The additional market structure, bank and firm level variables are also employed as control variables for the SME and micro SME subdivision and the results are reported in Table 3.7 and 3.8.

Furthermore we exploit the fact that our dataset only provides information on the number of bank relationships for zero, one, or multiple bank relationships and test the sensitivity of our results to the specification of the econometric model. We employ a logit model with the dependent variable showing multiple bank relationships that are either 0 (being a firm with one bank relationship) or 1 (being a firm with more than one bank relationship). The results are shown in Tables 3.5 and 3.6 and show consistency with the regression results that were reported for the Tobit model.

3.5 Conclusion

Against a background of increasing consolidation in European banking systems and marked changes in the regulatory environment which financial institutions operate in, this chapter seeks to establish the effect of such changes on the determinants of the number of SME bank financing relationships in three distinct European regions. In this respect the opening up of the European banking market with cross-border mergers and acquisitions could prove to be a major development in the debate over SME financing. Employing data from a cross-sectional survey of SMEs, we find differences in the number of bank financing relationships across the South-East of England, Bavaria in Germany, and Emilia-Romagna in Italy. To our knowledge, this chapter provides the first comprehensive insight of SME bank financing relationship determinants on a European regional level.

We find that as SMEs grow in size, through the proxies turnover and employees, they are more inclined towards opting for multiple bank financing relationships. Bank variables that facilitate SME financing possibilities such as when they assume a more active influential role within the SME, the provision of attractive financing terms and the availability of bank financing, all have a positive impact on SME bank relationships for the entire sample, including micro SMEs. Our finding that the roles that bank play within SMEs have an impact on the determinants of the number of bank relationships is in contrast to Elsas (2005) and is a potential avenue for extended future research. The age of incorporation, previously investigated by amongst others, Detragiache et al. (2000), Cole (1998) and Farinha and Santos

(2002), is found to have no statistical significance and is positively linked to the number of bank relationships, possibly indicating age as a proxy for public information. This shows that as firms' years in trading increases, their reputation grows and thus they can provide more credible assurances to banks.

The link between R&D and bank financing is consistently negative throughout our chapter, under both the direct firm variable and also through the regional patents variable, showing that SMEs that are investing resources in R&D could still be in their initial corporate stages and will not need to rely on multiple sources of bank financing. This is more so when considering that such SMEs might be concerned about potential information leakages if having to divulge information as suggested by Yosha (1995).

Our study also analyses measures that capture information on the local economic environment and regarding design features of the institutional system on the country-level. In that respect, we find that regional GDP growth, regional population, and a stimulating local entrepreneurial environment foster the establishment of multiple lending relationships, whereas legal and financing obstacles are an impediment to multiple relationships.

With respect to the market system and regulatory impact on the determinants of SME bank financing, we report that as more banking and economic freedoms are observed in the financial system, the more availability that SMEs have in embarking on further financing activities, a result consistent with literature on financial system architecture. Furthermore, whilst increased legal and financing obstacles hinder the amount of SME bank financing relationships, the regional growth variables we apply show that a positive association exists between economic growth and financing activities, having beneficial welfare ramifications on a regional basis.

Overall our results show that European regional SMEs that are either micro entities or are still in their initial development life-cycle will lean towards self-financing or financing from single banks with the incidence most likely being local/regional banks due to the particular nature of small firms. More attractive bank terms and a more active bank role is a positive determinant in multiple bank financing. Competition also enhances the opportunities for seeking alternative financing with the SMEs being provided a wider choice of intermediaries. Finally, the respective country's financial system architecture is also an important determinant for our regional SME sample with a more transparent and effective market system prompting enhanced possibilities for SME financing.

These findings bear important policy implications. The finding that legal obstacles are an impediment to diversifying lending relationships indicates that policies aimed at encouraging SMEs to expand in scope and scale (which often requires setting up additional bank relationships) are bound to be unsuccessful if legal institutions are not amended accordingly. Finally, removing barriers and obstacles that hamper setting up multiple bank relationships imposed on banks will enable SMEs to develop and mature by making use of more sophisticated financial services, thus ultimately promoting economic growth.

Data limitations concerning the comparatively small sample size suggest that our results have to be taken with a note of caution. Nonetheless, our findings complement a growing body of empirical work in the banking literature with respect to SMEs and their interaction with financial institutions. The chapter can be extended in other directions. Obviously, it would be interesting to examine our hypotheses with a larger cross-country sample, including less developed economies. Another intellectually appealing avenue for future work would be to analyse the effect of venture capital and private equity on SME financing and the way SMEs interact with their banks.

			Italy			Germa	iny		UK	
Bank Relation	ships	0	1	>1	0	1	>1	0	1	>1
Total Observations % of all Observations % of Total Observations		12.4	161 31% 16.1	71.4	55.3	114 22% 20.2	24.6	54.3	247 47% 42.9	2.8
Oldest Trading SMEs Youngest SMEs		1932 1999	1927 1999	1905 2001	1900 2001	1868 2001	1602 2001	1926 2001	1926 2001	1959 1998
Changed owne since establishe	rship ed operations	8	8	39	46	15	15	119	95	6
Turnover	Sum	56	65	368	133	59	77	200	214	15
	Average Median St.Dev	2.8 3 1.23	2.5 2 1.14	3.2 4 1.03	2.11 2 1.02	2.57 3 0.95	2.75 3 1.08	1.49 1 0.86	2.02 2 0.99	2.14 2 1.07
Private Compa Public Compa	ny ıy	4 16	9 17	33 82	48 15	20 3	20 8	131 3	106 0	7 0
Employees	Sum	40	41	256	133	62	87	195	205	18
	Average Median St.Dev	2 1.5 1.21	1.58 1 0.95	2.23 2 1.21	2.11 2 1.14	2.70 3 1.33	3.11 3 1.45	1.46 1 1.00	1.93 1 1.27	2.57 2 1.72
Whether SME	s invest in R&D	20	12	65	41	12	13	50	49	3
Distance (mile Whether Bank	s) between bank and SME Average Median St.Dev Terms given to	0 0 0	1.12 1 0.33	1.10 1 0.32	0 0 0	1.13 1 0.34	1.25 1 0.52	0 0 0	1.41 1 0.85	1.43 1 0.53

Appendix 3.A: SME Survey Summary Statistics

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SMEs are Favourable?	0	26	94	0	20	22	0	85	4
Bank Institution Type Regional Bank National Bank	0 0	23 3	105 10	0 0	9 15	24 20	0 0	101 2	6 2
Amount of Bank Finance Used		1.88			1.18			0.75	
Branches/sq. km		102.05			116.90			45.16	
Regional GDP		109.06			369.60			238.30	
Regional Population		1.865			6.177			4.156	
Regional Patent Applications (number)		754			5902			1930	
Stock market / GDP		0.6007			0.6356			1.6958	
Legal Obstacles		2.27			2.14			1.51	
Financing Obstacles		1.98			2.60			2.21	
Time to start business (days)		23			45			18	
Cost to start business (% of income/capita)		16.7			5.8			0.9	
Banking Freedom		2.14			2.71			1.00	
Economic Freedom									
Activity Restrictions		10			7			5	

.

Variable	Description	Source
Multi-bank relationships	Dependent Variable Whether SME has 0, 1, or more than 1 bank relationship	Cambridge SME Survey
Country Dummies	Country/Regional dummies Two country dummies (no dummy for UK)	Cambridge SME Survey
Turnover	Firm-specific characteristics Turnover for year 2001. Variable takes value of 1if< £499k; value of 2 if between £500k and £999k; value of 3 if between £1m - £9.9m; value of 4 if between £10m –over.	Cambridge SME Survey
Year	Ranges between 1700-2001 and is the difference between 2001 and the year the SME began trading.	Cambridge SME Survey
Ownership	Takes value of 1 if the company is still under the same ownership, 0 otherwise.	Cambridge SME Survey
Employees	Employees for year 2001. Variable takes value of 1 if between $1 - 9$; value of 2 if between $10 - 19$; value of 3 if between 20 - 49; value of 4 if between $50 - 99$; value of 5 if >=100.	Cambridge SME Survey
R&D Expenditure	Take value of 1 if SME invests in R& D, 0 otherwise.	Cambridge SME Survey
Type of Company	Whether the SME is public or private company	Cambridge SME Survey
Amount of Bank Finance Used	The amount of Bank Finance utilised by the SME	Cambridge SME Survey
Bank Role	Bank-specific characteristics Takes value of 1 if Bank plays a role for SME being either a seat on the firm's board; technical	Cambridge SME Survey

Appendix 3.B: Description of Variables for Cross-Sectional Analysis

	advice; management advice; marketing and sales advice; and other roles; 0 otherwise.	
Terms	Takes value of 1 if bank's terms are reasonable, 0 otherwise.	Cambridge SME Survey
Bank Institution Type	Regional Bank if 1, National bank as 0 otherwise. Italy regional banks are Cooperative, Local and Regional banks; with National and other banks considered as National Banks. Germany regional banks are Sparkassen, Raiffeisen, Volksbank, Regionale rivatbank; with Uberregionale rivatbank, Postbank, Spardabank, Sonstige and other banks considered as National Banks. UK regional banks are Clearing banks; with Investment Banks considered as National Banks.	Cambridge SME Survey
Distance	Distance of main bank from firm. Variable takes value of 1 if < 10 miles; value of 2 if between $10 - 49$ miles; value of 3 if >= 50 miles.	Cambridge SME Survey
	Market-specific characteristics	
Doing Business	Regulations that enhance or constrain business activity and compares more than 130 countries on the basis of quantitative indicators of business regulations. The focus is on domestic, primarily smaller, companies.	World Bank Survey (2005)
	Time (days) to start business (2003) Cost (% of income per capita) to start business (2003)	
Economic freedom	A composite of 10 institutional factors determining economic freedom, averaged over the 1995-99: trade policy, fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property rights, regulation, and black market activity. The index ranges 1 to 5, with a high score signifying greater freedom (calculated 6 minus the economic freedom index of the Heritage Foundation).	Barth et al. (2004)
Banking freedom	An indicator of relative openness of banking and financial system, averaged over the period 1995-99:	Barth et al. (2004)

specifically whether the foreign banks and financial services firms are able to operate freely. how difficult it is to open domestic banks and other financial services firms, how heavily regulated the financial system is, the presence of state-owned banks. whether the government influences allocation of credit, and whether banks are free to provide customers with insurance and invest in securities (and vice-versa). The index ranges in value from 1 (very low) to 5 (very high), calculated as 6 minus the banking freedom index of the Heritage Foundation.

Financial sector development

Financing Firms to rate on scale of 1-4, how problematic Beck, D.Kunt obstacle specific financing issues are for the operation and and growth of their business. These are i) collateral Maksimovic requirements of banks and financial institutions: ii) (2005)bank paperwork and bureaucracy; iii) high interest rates; iv) need for special connections with banks and financial institutions; v) banks lacking money to lend; vi) access to foreign banks; vii) access to non-bank equity; viii) access to export finance; ix) access to financing for leasing equipment; x) inadequate credit and financial information on customers; and xi) access to long-term loans.

Legal Businesses asked whether i) information on laws Beck, D.Kunt **Obstacle** and regulations was available; ii) if the and interpretation of laws and regulations Maksimovic was consistent; and iii) if they were confident that the (2005)legal system upheld their contract and property rights in business disputes 3 years ago, and continues to do so now. Businesses asked whether their country's courts are i) fair and impartial; ii) quick; iii) affordable; iv) consistent; and v) enforced decisions.

Access toBranches per 10002 km & Number of branches per
100,000 peopleMaria Soledad
Martinez Peria
, Thorsten Beck
and AsliServicesMeasure of the outreach of the financial sector in
terms of access to banks' physical outlets. Question
asked: 'How many bank branches do depositMaria Soledad
Martinez Peria
and Asli

money banks have (combined for all banks) in your

	country?' (Italy, Germany, UK: Regulator Survey, 2002)	
	Indicators of Stock Market Size, Activity and Efficiency	
Stock Market Capitalisation / GDP	Value of listed shares divided by GDP. Indicator of Stock Market Size.	Beck et al. (2000)
Stock Market Total Value Traded / GDP	To measure activity or liquidity of the stock markets which is defined as total shares traded on the stock market exchange divided by GDP.	Beck et al. (2000)
Regional GDP	Regional Economic Indicators Gross domestic product (GDP) at current market prices	REGIO Database
Regional Population	Economically active population by sex and age	REGIO Database
Regional Patent applications	All Patent applications to the EPO by priority year at the regional level.	REGIO Database

	All sa	imple
	(1)	(2)
Firm Age	0.7013 (0.1186)***	0.1575 (0.0610)**
Firm Type	~0.5558 (0.1199)***	-0.3542 (0.0582)***
Ownership Change	-0.4275 (0.1086)***	-0.3037 (0.0527)***
R&D investment	-0.2023 (0.1044)*	-0.1183 (0.0527)**
Tumover	0.2963	0.0637 (0.0279)**
Distance (firm-bank)	(0.0007)	0.1996
Bank Role in Firm		0.3084
Bank Terms		0.2165
Amount of Bank Finance used		(0.0651)*** 0.0450 (0.0225)**
Regional Bank		1.1774
National Bank		0.9196 (0.0852)***
Pseudo R ²	0.20	0.40
Observations	522	522

Table 3.1 **Firm-Level Tobit Regressions**

Dependent variable: Multi-bank relationships with 0 being a firm with no bank financing relationships, 1 being a firm with one bank financing relationship and 2 representing firms with more than one bank financing relationship.

(1) shows the firm-specific characteristics with Turnover as a measure of firm size

(2) shows firm- and bank-specific characteristics
***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Firm Age	0.1486	0.1162	0.1569	0.1050	0.1264	0.1481
	(0.0606)**	(0.0556)**	(0.0605**	(0.0554)*	(0.0564)**	(0.0589)**
Firm Type	-0.2726	-0.0567	-0.3479	0.0192	-0.1214	-0.2733
	(0.0624)***	(0.0634)	(0.0580***	(0.0665)	(0.0620)*	(0.05900
Ownership Change	-0.2552	-0.1123	-0.2992	-0.0680	-0.1537	-0.2516
	(0.0536)***	(0.0528)**	(0.0525***	(0.0536)	(0.0526)**	(0.0523)***
R&D investment	-0.1187	-0.0896	-0.1147	-0.0908	-0.0930	-0.1051
	(0.0518)**	(0.0479)*	(0.0525**	(0.0471)*	(0.0489)*	(0.0513)**
Turnover	0.0543	0.0169	0.0615	0.0102	0.0257	0.0486
	(0.0276)**	(0.0259)	(0.0278**	(0.0256)	(0.0263)	(0.0273)*
Distance (firm-bank)	0.2050	0.2487	0.2041	0.2434	0.2437	0.2213
	(0.0498)***	(0.0467)***	(0.0506***	(0.0457)***	(0.0477)***	(0.0497)***
Bank Role in Firm	0.1963	0.3592	0.3584	0.2214	0.3973	0.4142
	(0.0685)**	(0.0571)***	(0.0693***	(0.0559)**	(0.0595)***	(0.0658)***
Bank Terms	0.1890	0.1914	0.2246	0.1560	0.2067	0.2270
	(0.06429**	(0.0591)**	(0.0651***	(0.0582)**	(0.0603)**	(0.0635)***
Amount of Bank Finance	0.0549	0.0562	0.0426	0.0668	0.0513	0.0433
used	(0.0223)**	(0.0206)**	(0.0225*	(0.0203)**	(0.0209)**	(0.0220)**
Financing Obstacle	-0.5662					
	(0.1662)***					
Legal Obstacle		-0.8244				
		(0.1004)***				
Time to Start New			0.0055			
Business			(0.0033)			
Cost to Start New Business			. ,	0.0458		
				(0.0050)***		
Economic Freedom				()	1.4010	
					(0.1932)***	
Banking Freedom					()	0.1987
5						(0.0450)***
						× /
Pseudo R^2	0.41	0 44	0.40	0.46	0.43	0.41
Observations	522	522	522	522	522	522

Table 3.2: Firm-Level Tobit Regressions – Access to Finance and Institutional Environment

Dependent variable: Multi-bank relationships with 0 being a firm with no bank relationships, 1 being a firm with one bank relationship and 2 representing firms with more than one bank relationship. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Firm Age	0.1334	0.1418	0.1396	0.1540	0.1222	0.1103
-	(0.0571)**	(0.0599)**	(0.0597)**	(0.0610)**	(0.0561)**	(0.0552)**
Firm Type	-0.1675	-0.2139	-0.1963	-0.3224	-0.0945	-0.0195
	(0.0610)**	(0.0644)**	(0.0649)**	(0.0603)***	(0.0626)	(0.0643)
Ownership Change	-0.1835	-0.2196	-0.2088	-0.2850	-0.1365	-0.0890
	(0.0525)***	(0.0540)***	(0.0541)**	(0.0532)***	(0.0527)**	(0.0530)*
R&D investment	-0.0961	-0.1158	-0.1147	-0.1199	-0.0915	-0.0884
	(0.0497)*	(0.0510)**	(0.0508)**	(0.0524)**	(0.0485*	(0.0474)*
Turnover	0.0323	0.0465	0.0441	0.0606	0.0219	0.0124
	(0.0266)	(0.0273)*	(0.0272)	(0.0278)**	(0.0261)	(0.0257)
Distance (firm-bank)	0.2383	0.2112	0.2131	0.2004	0.2462	0.2496
· · · ·	(0.0484)***	(0.0491)***	(0.0489)***	(0.0503)***	(0.0473)***	(0.0462)***
Bank Role in Firm	0.4127	0.1645	0.1579	0.2419	0.3842	0.3238
	(0.0614)***	(0.0666)**	(0.0660)**	(0.0699)**	(0.0585)***	(0.0560)***
Bank Terms	0.2151	0.1771	0.1740	0.2019	0.2009	0.1798
	(0.0613)***	(0.0633)**	(0.0629)**	(0.0650)**	(0.0598)***	(0.0585**
Amount of Bank Finance	0.0483	0.0594	0.0605	0.0500	0.0532	0.0598
used	(0.0212)**	(0.0220)**	(0.0219)**	(0.0226)**	(0.0208)**	(0.0204)**
Access to Financial Services	0.0073	(·)		()	,	
	(0.0011)***					
Regional GDP	(0,,)	0.1043				
		(0.0039)***				
Regional Population		(000007)	0.1121			
Anglorian a characteri			(0.0023)***			
Regional Patents			(0.0023)	-0.0234		
Regional Latents				(0.102/1)***		
Stock Market Capitalisation				(0.1924)	0.5000	
Stock Market Capitalisation			•	-	-0.3077	
Stock Market Total Value					(0.0003)	-0 8504
Traded						(0.0000+
ITAUGU						(0.0303)
$\mathbf{P}_{seudo} \mathbf{P}^2$	0.42	0.42	0.42	0.41	0.43	0.45
Observations	522	522	522	522	522	522

Table 3.3: Firm-Level Tobit Regressions - Regional and Financial System Characteristics

Dependent variable: Multi-bank relationships with 0 being a firm with no bank relationships, 1 being a firm with one bank relationship and 2 representing firms with more than one bank relationship. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

Table 3.4										
Robustness	Tests:	Firm-Level	Tobit	Regressions	for	Micro	SME	and	Small	SME
samples										

	Micro SM	E sample	Small S	ME sample
	(1)	(2)	(3)	(4)
Firm Age	0.5882 (0.2476)**	-0.0455 (0.1123)	0.7389 (0.1302)***	0.2526 (0.0729)***
Firm Type	-0.7689 (0.2706)***	-0.2968 (0.1131)***	-0.4725 (0.1277)***	-0.3575 (0.0678)***
Ownership Change	-0.6893 (0.2164)***	-0.3172 (0.0952)***	-0.2778 (0.1220)**	-0.2698 (0.0636)***
R&D investment	-0.0693 (0.1924)	-0.0486 (0.0889)	-0.3216 (0.1230)**	-0.1646 (0.0645)**
Turnover	0.3868 (0.2235)**	0.0637 (0.0990)*	0.2968 (0.0812)**	0.1191 (0.0469)**
Distance (firm- bank)		0.2630 (0.0927)**		0.1701 (0.0602)**
Bank Role in Firm		0.1901 (0.1202)		0.3274 (0.0729)***
Bank Terms		0.2314 (0.1040)**		0.1791 (0.0831)**
Amount of Bank Finance used		0.2188 (0.0912)**		0.0353 (0.0235)
Regional Bank		1.0950 (0.1536)***		1.1637 (0.1019)***
National Bank		0.7834 (0.2070)***		0.9074 (0.0963)***
Pseudo R ²	0.29	0.37	0.20	0.48
Observations	241	241	281	281

Dependent variable: Multi-bank relationships with 0 being a firm with no bank financing relationships, 1 being a firm with one bank financing relationship and 2 representing firms with more than one bank financing relationship.

(3) shows the firm-specific characteristics with Turnover as a measure of firm size

(4) shows firm- and bank-specific characteristics

***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Firm Age	0.3446	0.1714	0.2930	0.2554	0.1514	0.2027
	(0.3876)	(0.4132)	(0.3980)	(0.4086)	(0.4150)	(0.4087)
Firm Type	1.7621	0.5687	2.1622	0.3444	0.8609	1.6837
	(0.3782)***	(0.4214)	(0.3539)***	(0.4450)	(0.4057)**	(0.3690)***
Ownership Change	-1.0080	-0.3187	-1.3036	-0.1178	-0.5107	-1.0187
	(0.3354)**	(0.3690)	(0.3156)***	(0.3828)	(0.3576)	(0.3292)***
R&D investment	-0.5330	-0.3371	-0.4928	-0.3647	-0.3493	-0.4272
	(0.3346)	(0.3654)	(0.3336)	(0.3629)	(0.3615)	(0.3451)
Turnover	0.5473	0.4194	0.6447	0.3866	0.4575	0.5741
	(0.1784)**	(0.1878)**	(0.1775)**	(0.1883)	(0.1863)**	(0.1817)**
Distance (firm-bank)	0.4433	0.0827	0.4527	0.0844	0.1612	0.3588
	(0.3512)	(0.4140)	(0.3489)	(0.3984)	(0.4046)	(0.3698)
Bank Role in Firm	0.7867	0.3175	0.2709	0.6501	0.5942	0.6875
	(0.4417)**	(0.3924)	(0.4325)	(0.4158)	(0.4048)	(0.4320)
Bank Terms	0.8814	0.9922	0.6657	1.1941	0.8705	0.6846
	(0.4251)**	(0.5195)**	(0.4191)	(0.5219)**	(0.4972)**	(0.4446)
Amount of Bank Finance used	0.0718	0.1211	0.0426	0.2164	0.0782	-0.0056
	(0.1431)	(0.1474)	(0.1362)	(0.1501)	(0.1452)	(0.1390)
Financing Obstacle	-0.9341	. ,	, ,	. ,	. ,	
e	(1.1048)**					
Legal Obstacle		-0.7993				
0		(0.8058)***				
Time to Start New Business		. ,	0.0471			
			(0.0224)**			
Cost to Start New Business				0.2412		
				(0 0390)***		
Economic Freedom				(0.0320)	0.4908	
					(0.4957)***	
Banking Freedom					()	0.4446
						(0.3144)***
						```
Pseudo $R^2$	0.46	0.57	0.47	0.47	0.45	0.40
Observations	305	305	305	305	305	305

Table 3.5: Robustness Test: Logit Regressions - Access to Finance and Institutional Environment

Dependent Variable: Multi-bank relationships with 0 being a firm with one bank relationship, 1 being a firm with more than one bank relationship. ***, **, * indicates statistical significance at the 1%, 5% and 10% respectively. Robust standard errors in parentheses.

	(1)	(2)	(3)	(4)	(5)
Firm Age	0.3272	0.3218	0.3526	0.1527	0.1565
	(0.3886)	(0.3894)	(0.3891)	(0.4149)	(0.4145)
Firm Type	1.4730	1.3892	2.0277	1.0916	0.7347
	(0.3914)***	(0.3953)**	(0.3665)***	(0.3948)**	(0.4121)**
Ownership Change	-0.7964	-0.7365	-1.2038	-0.6573	-0.4289
	(0.3474)***	(0.3507)**	(0.3237)***	(0.3491)***	(0.3625)
R&D investment	-0.5170	-0.5104	-0.5346	-0.3661	-0.3426
	(0.3388)	(0.3401)	(0.3316)	(0.3575)	(0.3534)
Turnover	0.4975	0.4849	0.6015	0.4891	0.4408
	(0.1798)**	(0.1802)**	(0.1769)***	(0.1852)**	(0.1870)**
Distance (firm-bank)	0.4036	0.3899	0.4693	0.2224	0.1267
	(0.3565)	(0.3581)	(0.3465)	(0.3951)	(0.4093)
Bank Role in Firm	0.9759	1.0163	0.5097	0.7001	0.4998
	(0.4486)**	(0.4503)**	(0.4349)	(0.4150)**	(0.3990)*
Bank Terms	0.9687	0.9932	0.7932	0.7986	0.9183
	(0.4389)**	(0.4435)**	(0.4159)**	(0.4806)*	(0.5069)**
Amount of Bank Finance used	0.1268	0.1412	0.0143	0.0518	0.0949
	(0.1456)	(0.1462)	(0.1400)	(0.1435)	(0.1462)
Regional GDP	0.0096	· · ·	. ,	. ,	, ,
C	(0.0026)***				
Regional Population	. ,	0.6173			
<u> </u>		(0.1576)***			
Regional Patents		<b>、</b>	0.0002		
-			(0.0001)***		
Access to Financial Services			( )	0.0456	
				(0.0084)***	
Stock Market Capitalisation				(010001)	-0.0429
					(0.5247)***
Pseudo $R^2$	0.48	0.48	0.45	0.53	0.46
Observations	305	305	305	305	305

Table 3.6: Robustness Test: Logit Regressions - Regional and Financial System Characteristics

Dependent Variable: Multi-bank relationships with 0 being a firm with one bank relationship, 1 being a firm with more than one bank relationship. ***, **, * indicates statistical significance at the 1%, 5% and 10% respectively. Robust standard errors in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Financing Obstacle	-0.9001						
Legal Obstacle	(0.3387)***	0.4357					
Bank Branches per sa km		(0.1817)**	0.0022				
Dank Branches per sq. km.			(0.0020)				
Stock Market Capitalisation				-0.2554			
Stock Market Total Value Traded				(0.1202)	-0.4816		
Time to Start New Business					(0.1791)**	0.0041	
The to start ivew business						(0.0071)	
Cost to Start New Business							0.0300
							(0.0092)
Pseudo R ²	0.38	0.39	0.38	0.39	0.39	0.38	0.40
Observations	241	241	241	241	241	241	241
	100						
	(8)	(9)	(10)	(11)	(12)	(13)	
Supervisory Power	-0.1102 (0.0367)**						
Economic Freedom	(,	0.6750					
		(0.3492)**					
Banking Freedom			0.0558				
Regional GDP			(0.000))	-0.2288			
5				(0.7957)**			
Regional Population				*	-0.0001		
Regionari opulation					(0.4687)**		
Regional Patents						-0.8858	
						(0.4392)**	
Pseudo $R^2$	0.39	0.40	0.38	0.42	0.43	0.42	
Observations	241	241	241	241	241	241	

## Table 3.7: Firm-Level Tobit Regressions – Micro SME sample

Dependent variable: Multi-bank relationships with 0 being a firm with no bank relationships, 1 being a firm with one bank relationship and 2 representing firms with more than one bank relationship. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

Table 3.8: Firm-Level Tobit Regressions – Small SME samp	le
----------------------------------------------------------	----

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Financing Obstacle	-0.7789		10412				
Legal Obstacle	(0.1725)***	0 8968					
Softri Connere		(0.1289)***					
Bank Branches per sq. km.			0.0059				
Stock Market Capitalisation			(0.0014)***	-0.5062 (0.0841)***			
Stock Market Total Value Traded				(0.0011)	-1.0177 (0.1273)***		
Time to Start New Business					(0.12/3)	-0.0020	
Cost to Start New Business						(0.0050)	0.0596 (0.0063)***
Pseudo R ²	0.47	0.54	0.51	0.53	0.55	0.48	0.56
Observations	281	281	281	281	281	281	281
	(8)	(9)	(10)	(11)	(12)	(13)	-
Supervisory Power	-0.2315 (0.0257)***						
Economic Freedom	(	1.2989 (0.2411)***					
Banking Freedom		(/	0.1009				
Regional GDP			(0.0010)	-0.2295			
Regional Population				(0.1142)	-0.2757		
Regional Patents					(0.0612)***	-0.6768 (0.1994)***	
Pseudo R ²	0.56	0.52	0.49	0.48	0.51	0.47	
Observations	281	281	281	281	281	281	

Dependent variable: Multi-bank relationships with 0 being a firm with no bank relationships, 1 being a firm with one bank relationship and 2 representing firms with more than one bank relationship. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

# **CHAPTER 4**

# Funding choices and Performance of European small banks

# Funding choices and Performance of European small banks

#### Abstract

Against a backdrop of a wave of bank consolidation across and throughout Europe, we investigate the funding choices and related performance of small EU banks. Recognising the significant role small banks perform within the European financial system, we investigate whether small banks' funding choices have an impact on the amount of loans granted to households and SMEs within the EU. We construct a cross-country panel data set consisting of 858 individual banks from 11 EU countries for the period 2000-2005. We investigate the composition of the bank's liabilities where we observe a greater reliance on customer deposits, and subsequently find a direct positive link between customer deposits, loans to customers and net interest revenue. Regulatory and national characteristics that favour greater access and freedom of banking services are also important to ensure an adequate transmission of credit by small banks to households and SMEs within the EU.

# 4.1 Introduction

Since the early 1990s deregulation and technological change within the European financial landscape have combined to intensify the competitive pressure on all banks.⁵⁸ These pressures are reflected in the steady substantial decline in the total number of banking firms and a sharp increase in the aggregate share of industry output concentrated in the hands of the largest banking organizations.⁵⁹ This ongoing banking consolidation has motivated empirical research on bank performance as researchers have sought to explain this structural trend and its implications. A number of these studies, in particular US related, have focused on the performance of community banks, because small locally oriented banking companies play a crucial role in providing relationship-based loans to opaque borrowers such as Small and Medium size Enterprises (SMEs)⁶⁰ and households within national economies.

Seminal work by Diamond (1984), Ramakrishnan and Thakor (1984), and Boyd and Prescott (1986), argue that banks are investors devoted to reducing monitoring, screening, or renegotiation costs. Bhattacharya and Thakor (1993) conclude that informational frictions – asymmetric (and proprietary) information – "provide the most fundamental explanation for the existence of (financial) intermediaries". Such information access is inherently linked to relationship banking and may point to a comparative advantage of banks. The most basic of banking models implies that banks acting as financial intermediaries, reallocate the resource of economic units (Allen and Santomero, 2001) by collecting deposits and then lending this money to individuals/firms that have financing requirements ensuring in the process an efficient intermediation process. The observed trend towards globalisation has in many ways hindered this process of 'traditional' banking with disintermediation being increasingly apparent, affecting the lending and deposit taking of banks.

⁵⁸ See Goddard et al. (2007), DeYoung et al. (2004) for an extensive review of the changing environment for banks over time.

⁵⁹ Mercieca et al. (2007), report that during the period 1997-2003 small banks in the EU have decreased by 24% over the period.

⁶⁰ The European Union defines SMEs as enterprises that employ fewer than 250 people, have an annual turnover not exceeding  $\leq 50$  million, and/or annual balance sheet total not exceeding  $\leq 43$  million.

Small banks that rely more heavily on deposit taking and lending for their survival are clearly more affected through such a process. Norden and Weber (2006) who examine the evolution of funding modes of German banks and its implications for lending and profitability, show that German banks rely heavily on deposits as a funding mode, corroborating evidence by Bassett and Brady (2002) and Gilkeson, List, and Ruff (1999) that this is also the case in the US. Hackethal (2004) argues that the structural decline of deposits due to the trend of disintermediation on the banks' liability side could result in German savings banks losing their competitive advantage. Given that most depositors look to engage in banking relationships with banks in their local markets (Amel and Starr-McCleur, 2002), small banks that have a regional focus and that are under competitive pressure from larger banks that are expanding their network, either through geographic coverage or outright takeover of competitive small banks, are under constant pressure to attract new depositors. Substantiating this, the literature has identified a 'wholesale funding advantage' whereby small banks are at a disadvantage to larger banks in attracting funding with larger banks offering lower loan rates than small banks (Berger et al., 2006). Larger institutions have greater access to wholesale funds (at least beyond some point within which it is in their interest to attract the increasingly marginal retail depositors) that in some markets can be cheaper than retail funds (Hannan and Prager, 2004; Kiser, 2004, and, Park and Pennacchi, 2005). Certain EU countries (e.g., Germany) through their savings banks networks enjoy on the other hand an advantage through retail customer deposits (on which low interest rates are given) which in the end results in them being more competitive than wholesale funding.

Research shows that small "community" banks either due to their corporate structure or due to not having adequate resources find it difficult to embrace non-traditional banking strategies (based on non-interest income activities) and are much more dependent on portfolio lending and intermediation income than larger banks in the current environment.⁶¹ As seen in chapter 2, small EU banks are still willing to branch out and diversify within and across business lines, even though the results for the sample period do not show this being done successfully. Until these diversification strategies into the non-

⁶¹ The continued heavy emphasis on traditional portfolio lending by community banks rather than noninterest income is documented in DeYoung and Rice (2004a), DeYoung and Rice (2004b), and Mercieca et al. (2007).

traditional banking stream are feasible for these small banks, one of the most important strategic choices that the respective bank management must make is what kind/s of traditional lending and market funding avenue to pursue.

Following on from Chapter 2, were we investigated the effects of revenue diversification within small EU banks, the conclusion reached is that such banks do not benefit from diversification into non-traditional streams of revenue. Thus, given the 'traditional' (lending and intermediation income) banking activities undertaken by small banks, the liabilities side of such banks is of the utmost importance to enable them to maintain a steady revenue source. Small banks within the EU have an important role to fulfil with respect to SMEs/households, where they provide financing services and especially lending facilities. Given such an importance of small banks, the way that they fund their lending activities to SMEs assumes an important role. Compared to large banks, small banks rely more on deposits (retail versus wholesale customers), given that their size and resources makes it harder for them to raise funding through other forms e.g., bond issues (ECB, 2006). Both of these reliances on wholesale funds/retail deposits can pose specific risks. Such reliance on retail deposits can expose small banks to a risk since banks as institutions are inherently fragile (Allen and Gale (2001), Diamond and Rajan (2001), and Freixas and Rochet (1999)). This fragility arises because banks provide liquidity by financing themselves with deposits that are demand deposits. These deposits create a risk for the bank due to unanticipated withdrawals that may be precipitated by adverse perceptions of depositors about the bank's payoffs (Chari and Jagannathan (1988)), to macroeconomic shocks (Gorton (1988)) or perceived excessive bank portfolio risk (Calomiris and Kahn (1991)). Wholesale funding also can prove to be as risky when compared to retail deposit funding. A most recent example in the UK following a global credit crunch has clearly demonstrated how fragile banks as institutions can be even within the developed world, when they have a reliance on wholesale funding. Given the long-standing relationships that small EU banks have developed with their customers and the intrinsic positioning they have within selected communities, they can partly mitigate this risk through such longterm relationships.

The impact of bank lending based on the amount of funding banks have at their disposal has been researched also through monetary policy transmissions. Research on the existence of a 'bank lending channel' which postulates the existence of a channel of monetary policy transmission through bank credit has yielded varied results. US studies (Kashyap and Stein, 1995, 1997; and Kishan and Opiela, 2000) show that a bank lending channel exists and is mainly transmitted through small and balance sheet constrained banks (relatively illiquid or undercapitalised). According to Kashyap and Stein (1995), the lending channel should be more important for small banks, which have a very simple capital structure and are financed almost exclusively with deposits and common equity.

On the EU front, De Bondt (1998, 1999) finds evidence of a bank lending channel in some EU countries, whilst Favero et al. (1999) find no evidence of the bank lending channel in any country although they find that banks in different countries respond in different ways to protect the supply of loans from the liquidity squeeze. Altunbas et al. (2002) find that across the EMU systems, undercapitalised banks (of any size) tend to respond more to changes in policy. In a study investigating the existence of cross-sectional differences in the effectiveness of the bank lending channel for monetary policy transmissions in Italy, Gambacorta (2005) shows that small banks (mainly credit cooperative banks) are more liquid and better capitalized. This result fits with the standard idea that smaller banks need buffer stocks of securities to compensate their limited ability to raise external finance on the capital market. This interpretation is confirmed on the liability side, where the percentage of deposits (overnight deposits, certificates of deposits, and, savings accounts) is greater among small banks, while their bond issuances are more limited than for large banks. Based on a sample of Italian banks, Gambacorta (2005), shows that for small banks the ratio of deposit to loans is on average greater than one. Credit and cooperative banks have high capacities in local deposit markets and fund-raising often represents their main business. They have a high percentage of core deposits and therefore a lower need to raise other forms of external funds. Throughout this chapter, we do not investigate the effect of monetary policy transmission.

Like deregulation, advances in information, communications, and financial technologies over the past two decades have increased the competitive pressures on commercial banks.

For example, mutual funds, online brokerage accounts, and money market funds have provided attractive investment options for depositors; as a result, core deposits have become less available for all size classes of banks (Genay, 2000). As stated by De Young (2002), since community banks have fewer non-deposit funding options than large banks (for example, small banks typically do not have access to bond financing), it costs them more to attract and retain core deposits.⁶² Small banks have also been defined by their tendency to rely more on retail and insured deposits for their funding than large banks have done (Keeton et al. 2003). Moreover, given this emphasis, it is not surprising that community banks usually charge lower fees for deposit services.

It should be noted, however, that the fee advantage held by smaller institutions, though still present, has been declining; the decline may indicate that small banks are seeking to exploit fee income somewhat more than they have in the past (Federal Reserve Board (1999); Kimmelman (1999)). Community banks, because they rely on retail deposits and need to attract them, also appear to pay higher rates on retail deposits than large banks competing in multiple markets (Hannan and Prager (2004)). Paying the higher rates has been feasible because surviving small banks have been able (until very recently) to earn a higher rate of return on their assets, maintaining profitability even while growing more rapidly than large banks over the past two decades (Bassett and Brady, 2002). Rosen (2002) shows that bank depositors may be reluctant to switch banks for small differences in interest rates, and thus banks that are entering markets where they have no or low market shares will have to offer higher deposit rates to attract new customers, since it is difficult to attract new banking customers (Berger and Dick, 2003).

Research on the funding choices of European banks, with particular reference to small banks has been extremely limited given the restrictive nature of the financial data available. EU banking markets are still characterised by important structural differences across member states (reflecting cultural diversity and distinct legislative and supervisory systems)⁶³. Related to our chapter, such differences can be witnessed in household savings behaviour and households' investment preferences that differ across countries (investments

⁶² There is evidence consistent with this view in the Federal Reserve's Survey of Retail Pricing and Fees (1997, 1998, 1999), which reports that small banks tend to charge lower fees on deposit accounts.

⁶³ European Central Bank, 2006, 'EU Banking Structures'.

in deposits versus investments in non-bank financial products such as mutual funds and life insurance contracts). Depositor behaviour also has an impact on the funding structures of banks we are analysing. Working under the assumption that these community banks service opaque SMEs and regional households, the deposit market of these small banks is concentrated in selected particular regional markets. Research by (Flannery (1982), Neumark and Sharpe (1992), Davis and Korobow (1987), Heffernan (1992) and Zephirin (1994)) has shown that even though banks might offer lower market rates on deposits, depositors are willing to accept such lower rates due to for example the costs involved in switching deposit accounts, the additional services provided such as free checking services or convenient branch locations. The level of service can vary significantly among banks in the same market, and given the nature of small EU banks which target specific communities, such ancillary services offered are an enticing way of securing and expanding the funding sources.

A mention on Deposit Insurance is necessary at this stage given the significant role it plays in a country's financial stability. Deposit Insurance, which is a scheme introduced to protect banks from depositor runs has been extensively reviewed in the literature in respect of the risk taking of banks. Governments are increasingly using deposit insurance as a tool to ensure banking system stability and to protect bank depositors from incurring large losses due to bank failures. Literature that focuses on bank's excessive risk taking due to deposit insurance offer contrasting results with Hovakimian et al. (2003), Demirgüç-Kunt and Detragiache (2002) Demirgüç-Kunt and Kane (2002) suggesting that generous depositor protection schemes may increase a bank's incentives to take risks and increase moral hazard problems. On the other hand, Gropp and Vesala (2004) provide evidence that the existence of an explicit deposit insurance scheme per se might reduce risk-taking incentives, since an explicit scheme may provide a commitment to limit the safety net to insured depositors. The countries we are analysing in our sample all have financial safety nets which include explicit and implicit deposit insurance, bank regulation and supervision, central bank lender of last resort facilities, and bank insolvency resolution procedures. Demirgüç-Kunt et al., (2006b) show that the countries analysed in this chapter all have explicit deposit insurance schemes. We do not investigate further deposit insurance, since

this falls beyond the scope of this chapter whilst keeping in mind that all countries are on the same level playing field having an explicit deposit insurance scheme in place.

We will attempt to analyse and bridge the research gap on the funding activities of small⁶⁴ EU banks and its subsequent implications on their lending abilities during the period 2000-2005. More precisely, our chapter will analyse, i) the evolution of different types of deposits as experienced by different banking institutional types; and, ii) the relationship between deposits and other sources of funding, the lending business and revenue performance. The remainder of this chapter is organised as follows. Section 2 explains the methodology used in our analysis, describes the data set and presents summary statistics. In section 3 we analyse our empirical results. Finally, section 4 concludes and provides some avenues for future research.

# 4.2 Data and Methodology

We retrieve annual data for small EU banks for the period 2000–2005 from Bankscope and classify small banks as credit institutions with an asset size less than €450 million⁶⁵ and no multi-bank affiliation in each of the sample years. Based on such criteria the number of banks in the sample is 858 institutions and includes a mix of Cooperative, Savings, Commercial, and 'Other' (by exclusion all remaining institutions) banks. Banks' core activities may also have an impact on their funding structure. Commercial banks with a broad base of activities generally have a diversified funding structure. Within that group, the smaller institutions tend to have more customer and interbank funding, while the larger institutions may have easier access to market funding and securitisation. Savings and cooperative banks (i.e. liability driven) and building societies are mainly financed by client deposits (especially longer-term deposits), with less recourse to wholesale funding. Mortgage banks (i.e. asset driven) are mainly financed by securitisation and other forms of

 ⁶⁴ We define 'small' banks as those with no multi-bank affiliation that have an asset size below €450million.
⁶⁵ Bankscope is a commercial database for financial institutions. The asset size cut-off (less than

Earlyscope is a commercial database for inflation institutions. The asset size cut-on (less main  $\notin$ 450million) is similar to that used in other studies related to small banks including: Strahan and Weston (1998), Jayaratne and Wolken (1999), Stiroh (2004a) and Mercieca et al. (2007). Bankscope provides a seven year maximum period of data, however the data for the year 2006 with respect to deposits and assets is not complete, hence the period covered is 2000-2005.
market funding. Investment banks have a variety of other liabilities, mainly related to their financial market activities (e.g. short positions on their trading portfolio).

Within the total sample (Figure 4.2) there has been a growth in total assets of 27.4% between 2000 and 2005. Such a growth in assets has been fuelled by a growth in total customer loans of 26.1% (Figure 4.3). Mortgages alone have increased by 58% during the period under consideration. The liabilities side of the banks' balance sheet similarly shows growth, coming predominantly from Customer deposits (household/individuals). Customer deposit types, demand and savings, have increased by 28.1% over the period. Non-customer deposits (which includes deposits by Municipalities and Governments, Commercial, and Banking institutions) and Money Market Funding have actually decreased slightly between 2000 and 2005. Given the increase in customer deposits and no increase in non-customer deposits and money market funding, then we can assume that a substantial portion of the increases in customer loans are being funded through increases in customer's deposits.⁶⁶

In the individual bank institution type, the greatest increase in total assets was within the Cooperative banks with a 31.1% increase. Customer deposits for all bank types increased, with the lowest increase within the Savings banks (19.8%) and the highest growth registered by the "Other" banks (36.2%). Interestingly, non-customer deposits have shown a decrease within all bank types with the exception of Savings banks that have an increase of 21% over the period. Money Market Funding also increased mostly within the Savings bank sample (46%) which leads one to conclude that savings banks are diversifying their sources of funding which could also be due to their affiliation with the Landesbanks that might provide cheaper sources of funding within the inter-bank market. Loans have experienced increases in all of our four bank type classifications with mortgages being the prime growth leader in all cases.

⁶⁶ According to an ECB report (2006), overall, there have been very few changes in banks' funding structure over the period 2000-2005 with customer deposits still being the main part of EU banks' liabilities. Their share stood at 33% at the end of 2005, compared with 32% at the end of 2000. These deposits are mainly constituted by households, but also include wholesale deposits from non-financial corporations and non-bank financial institutions. Conversely, inter-bank liabilities dropped from 23% to 17% of total liabilities between 2000 and 2005. While money market funding rose from 10% to 13%, capital market funding remained constant at around 23% of total liabilities. Overall, the share of market funding rose from 34% to 36%. Finally, other funding sources, which are mainly linked with banks' financial market (trading) operations, rose from 7% to 10%.

Based on the total sample, average deposit rates, which are computed as annual interest expenses as a percent of average deposits held over the year, have decreased during the period from 3.65% in 2000 to 2.47% in 2005. Of course, this measure is to be considered with caution because it presumes a uniform level of interest rates for all kinds of deposits. Whilst the spread/profit margin is a key variable in any bank's competitiveness, we cannot include such a variable because there is no such micro-data in our data source, i.e., Bankscope. The alternative, i.e., calculating average interest rates and spreads from interest expenses/income and loan/deposit volume, would be very imprecise because it would presume the same level of interest rates for all kinds of deposits/loans.

With respect to the banks' country of origin, the sample consists of a total of 11 countries, all members of the EU prior to the two membership enlargements in 2004 and 2007 (Table 4.1). The largest number of observations is coming from Germany (397) and Italy (286), with cooperative banks being the greatest sub-sample in both instances (in total cooperative banks make up 73.2% of the total sample).

The variables we utilise in our study can be categorised as funding items, asset items, performance measures, and, bank and national/regulatory characteristics (Table 4.2). We analyse changes of the balance sheet items to show the growth (or non-growth) of each variable on an annual and independent basis and not as a ratio of other variables. This ensures we do not create dependencies between the variables in question. Bank characteristics are captured by the variables Growth (Growth rate of Total Assets), Size (logarithm of Total Assets), Institution Type (Cooperative, Savings, Commercial, and Other banks being the reference variable). National Characteristics are captured by the variable Country of Origin with the United Kingdom as reference.

### 4.2.1 Risk-adjusted performance measures

We also investigate the effect of funding sources on two performance measures that are based upon recognised accounting ratios that are common ground for the majority of banks. We thus extend the analysis by calculating two risk-adjusted measures of return on equity and return on assets by dividing return on equity and return on assets by the respective standard deviation as follows:

$$RAR_{ROE} = \frac{\overline{ROE}}{\sigma_{ROE}}$$
(1)  
$$RAR_{ROA} = \frac{\overline{ROA}}{\sigma_{ROA}}$$

Where ROE is the mean return on equity (net income divided by equity),  $\sigma_{ROE}$  is its standard deviation, ROA is the mean return on assets (net income divided by assets), and  $\sigma_{ROA}$  is its standard deviation. A higher ratio indicates higher risk-adjusted profits.

#### 4.2.2 Econometric Model

The regression models are estimated using the fixed effects panel data approach with an unbalanced panel data sample. The fixed effects panel data approach has been extensively used in the banking literature (e.g., Munemo et al. 2007, Avery and Samolyk, 2004), however the below methodology is unique in the banking literature given that to the best of our knowledge this has not been utilised yet.. These are set out as follows in equations (2) to (5), with index *i* referring to bank *i* and *t* to period *t*:

$$\Delta LNCST_{it} = \alpha + \beta_1 \Delta MMF_{it} + \beta_2 GROWTH_{it} + \beta_3 \Delta RETDEP_{it} + \Delta EQTY_{it} \beta_4 + \beta_5 \Delta NCUSTDEP_{it} + CountryDummies_{it} + \mu YearDummies_{it} + \varepsilon_{it}$$
(2)

$$\Delta NIR_{i_{t}} = \alpha + \beta_{1} \Delta MMF_{i_{t}} + \beta_{2} GROWTH_{i_{t}} + \beta_{3} \Delta RETDEP_{i_{t}} + \beta_{4} \Delta EQTY_{i_{t}} + \beta_{5} \Delta NCUSTDEP_{i_{t}} + CountryDummies_{i_{t}} + \mu YearDummies_{i_{t}} + \varepsilon_{i_{t}}$$
(3)

$$RAROE_{i_{t}} = \alpha + \beta_{1} \Delta MMF_{i_{t}} + \beta_{2} GROWTH_{i_{t}} + \beta_{3} \Delta RETDEP_{i_{t}} + \beta_{4} \Delta EQTY_{i_{t}} + \beta_{5} \Delta NCUSTDEP_{i_{t}} + CountryDummies_{i_{t}} + \mu YearDummies_{i_{t}} + \varepsilon_{i_{t}}$$
(4)

 $RAROA_{i_{t}} = \alpha + \beta_{1} \Delta MMF_{i_{t}} + \beta_{2} GROWTH_{i_{t}} + \beta_{3} \Delta RETDEP_{i_{t}} + \beta_{3$ 

 $\beta_4 \Delta EQTY_{i_t} + \beta_5 \Delta NCUSTDEP_{i_t} + CountryDummies_{i_t} + \mu YearDummies_{i_t} + \varepsilon_{i_t}$  (5)

Where,  $\Delta$ MMF is changes in money market funding, GROWTH is bank asset growth,  $\Delta$ RETDEP is changes in customer retail deposits,  $\Delta$ NCUSTDEP is changes in noncustomer deposits,  $\Delta$ EQTY is changes in bank equity, AVGDPST is the average deposit rate,  $\Delta$ LNCST is the change in loan to customers,  $\Delta$ NIR is changes in net interest revenue, and, RAROE and RAROA are the risk-adjusted returns on equity and assets respectively. We introduce country and year dummies to control for macro-economic effects and time series trends.

In equation (2) we investigate whether changes in funding affects the availability of lending to SMEs and households, with focus on the interaction between customer deposits and loans to customers. Based on our sample data analysis of the funding structure in Section 4.2 we are assuming that a drying up of customer deposits will make it harder for small banks to engage in intermediation services. We anticipate a positive relationship between changes in customer deposits and changes in loans to customers. This of course impacts the banks' asset/liability structure.

In equation (3) we examine whether changes in the banks' funding sources have an impact on their respective net interest revenues. Customer deposits, in particular demand deposits that might carry no interest cost at all, are typically cheaper than non-customer deposits and funding on the money markets. A decrease in customer deposits would thus lead to a decrease in net interest revenue. We would expect a positive relationship between increases in customer deposits and net interest revenue. Different banks due to their structures and country of origin will also have different costs when funding their activities. For example, in Germany, the savings banks who can rely on borrowing from their regional Landesbanks will have more access to the money markets than other banks. We aim to test such country effect scenario under our robustness tests. Money market funding can serve not only as a buffer for lending-refinancing imbalances but might replace structural funding gaps. The structure of the bank might have an impact to this effect, as for example, in Germany the savings banks who can rely on borrowing from their regional Landesbanks will have more access to the MMF as a funding source. If this is the case then we would expect that changes in funding sources with a higher percentage of deposits will result in a decline of the net interest revenues.

Equations (4) and (5) investigate whether changes in funding sources have an impact on risk-adjusted return measures. The funding sources could be utilised in a variety of ways by the banks, and how this is utilised in relation to the risk they consequently take up could have an impact on their risk-return profile.

### 4.3 Empirical Results

We present empirical results of our models in Table 4.3. The regressions with  $\Delta$ LNCST as dependent variable show that all the funding choices are positively related and highly significant to  $\Delta$ LNCST. Small banks are meeting their funding requirements through these three funding choices to ensure no funding shortfall. This demonstrates that small banks are channelling more than one funding source towards lending to households/SMEs which is one of their main strategic objectives. Having analysed the sample data, there is a substantial bias from banks towards customer deposits and so we can link these two data points to conclude that customer deposits are the main driving force in the increases in lending to customers. This demonstrates the relationship between funding and lending in small banks, with lending being a main focus given that this is where small banks possess an advantage over their larger counterparts.

We also examine if different institution types have different funding sources and strategies⁶⁷. The rationale behind testing for bank type is that these banks, although sharing similarities, all have differing objectives and ownership structures. As a consequence, they adopt distinct approaches to funding to achieve their strategic objectives. To avoid perfect collinearity, 'Other' banks (credit, mortgage, and investment banks) are captured in the intercept. The dummy coefficients are interpreted as the difference between the individual

⁶⁷ There is evidence from Spain that the institutional form (commercial banks versus savings banks) clearly matters for the management of credit risk (Salas and Saurina, 2002).

bank types captured by the respective dummy variable and the omitted category of other banks. In the  $\Delta$ LNCST regression, all bank type dummies enter positively and significantly, with the size of the coefficients for commercial banks being largest.

Furthermore we regress  $\Delta$ NIR on all the funding sources to assess the effect these have on changes in net interest revenue (revenue coming from interest income sources such as lending, etc.). Customer Retail deposits have a positive and highly significant relationship with  $\Delta$ NIR showing that as the amount of customer deposits increase this is reflected in increases in net interest revenue. We interpret this as arising from the link between customer deposits and lending by banks. As banks increase their share of deposits, they then increase their share of lending, and subsequently this has an impact on the amount of net interest revenue that arises from interest income generated from loans. Customer Retail deposits usually bear lower interest rates (or none at all if deposits are short-term) than other forms of funding and this is evidenced also by the negative association that MMF shows with respect to  $\Delta$ NIR. The spread/profit margin in this instance would widen and result in a higher margin. As noted by De Young (2004), money market funding is a pure financing activity with no possibility of generating service charges or other income from depositor relationships. MMF is viewed more as a temporary buffer for any lendingrefinancing imbalances as opposed to being established as a structural funding requirement. Bank equity demonstrates positive and significant, although to a lower significance level, relationship with  $\Delta$ NIR.

We apply the risk-adjusted ROE and ROA as dependent variables to the bank's funding sources and the results in both instances show a positive relationship between changes in customer deposits and the respective RAROE and RAROA measures. Customer deposits and equity are the funding sources that exhibit positive and significant coefficients with respect to both risk-adjusted measures. Customer deposits which also had a positive relationship with net interest revenue is a main financial intermediation activity for small banks and as observed in Chapter 2, it is within such activity strongholds that small banks can extract most value. The intermediation process of the transferring of customer deposits into loans to both SMEs and households are resulting in higher risk-adjusted returns. The negative relationship between MMF and RAROE and RAROA further confirms our

finding that returns are cheaper through deposits than through the money markets. Noncustomer deposits enters the regression negatively however is not significant. Increases in equity do not carry an immediate burden on the return on the bank, although of course this return has to be maximised for the equity stakeholders.

#### 4.3.1 Regulatory and National Characteristics

Various factors that operate at the country-level might affect the amount of loans to customers that is given out by small EU banks. Regulatory policies regarding bank activity restrictions and the institutional environment within which banks operate are likely to impact upon the link between funding and lending at EU banks. We therefore include four regulatory and national characteristic variables to investigate if our results are robust when we control for such variables.

To test for the effect that the regulatory environment might have on the lending activities of EU small banks, we employ two variables drawn from a database on financial regulation and supervision adapted from Barth et al. (2001, 2004). *Activity restrictions* is an indicator of the degree to which banks face regulatory restrictions on their activities in securities markets, insurance, real estate, and owning shares in non-financial firms. Higher values indicate greater restrictions on bank activities and non-financial ownership and control. *Banking Freedom* is an indicator of the openness of the banking system and is a composite index of whether foreign banks are allowed to operate freely, the difficulties faced when setting up domestic banks, government influence over the allocation of credit, and whether banks are free to supply provision of insurance products and securities to customers. Ranging from 1 to 5 and available from the Economic Freedom Index of the Heritage Foundation, the values are averaged for the period 1997-2003 with higher values indicating fewer restrictions on banking freedoms.

To test for the effect of the access of financial services we apply indicators from Beck et al. (2005b). We employ the variables *Geographic branch penetration: number of bank branches per 1,000 km*² and *Geographic ATM penetration: number of bank ATMs per 1,000 km*². These indicators measure the outreach of the financial sector in terms of access to banks' physical outlets. The indicators of branches and ATMs per square kilometers

help characterize the geographic penetration of the banking sector. They can be also interpreted as proxies for the average distance of a potential customer from the nearest physical bank outlet. Higher geographic penetration would thus indicate smaller distance and thus easier geographic access. Both area- and population-based ratios of the number of branches and ATMs have limitations as indicators of access to physical banking outlets. Most importantly, these measures assume a uniform distribution of bank outlets within a country's area and across its population. However, in reality, in many countries bank branches and ATMs are concentrated in urban areas of the country and are accessible only to individuals living within or close to urban areas.

We apply these National and Regulatory variables to the Changes in Loans to customers and to the Changes in Net Interest Revenues variables (Tables 4.4 and 4.5). The variables relating to Bank and ATM access and Banking Freedom all enter positively and significantly. As more geographic bank penetration and a more liberal banking system is shown in the countries in our sample this is having a positive effect on the amount of loans to customers. Households/SME deposits emanating from easier access to banks and their technologies attract more deposits. Given the reliance on small banks on customer deposits to fund loans to customers this explains the positive relationship between Bank access and Loans to Customers. Banking Freedom, in the form of easier access to Money Market Funds, Equity increases and Inter bank loans all have a positive impact on the amount of loans to customers. A more open and free banking system, as measured by the Banking Freedom Index, enables a smoother transmission system from small banks to households/SMEs in the form of loans. Such a finding has to be interpreted with a note of caution and is solely focused on the use of the Banking Freedom Index, given that on a general level, regulatory and government activities where the driving force behind the conception of savings and cooperative banks in Europe. Activity restrictions, which is the inverse of Banking Freedom, shows a negative relationship with the amount of loans to customers. The explanation applied to Banking Freedom applies in the inverse to Activity Restrictions, i.e., as more restrictions are placed on banks, then this will have a negative impact on their ability to attract funding and subsequently to transform these into loans.

### 4.3.2 Robustness Tests

We embark upon a set of robustness tests to check as to whether our results suffer from sample bias since German and Italian banks account for a large proportion of the sample population. Using the methodology described in Section4.2, we present two robustness tests in Table 4.6 and 4.7. First we exclude German and Italian banks from the dataset. Then, we re-run the analysis excluding all Cooperative banks irrespective of the country of origin. Cooperative banks are the largest bank institution type within our sample. In both instances we see that the results expressed for the whole sample is reiterated, thus ensuring that our main results are robust to sample bias. The main motive of the chapter that small banks' loans distribution is channelled primarily and most profitably through customer deposits is substantiated through these robustness tests.

### 4.4 Conclusion

Throughout this chapter we examine the funding methods of small EU banks and the resultant implications for SMEs and household lending and bank profitability. We base our analysis on a dataset of EU banks that have a maximum asset size of Euro 450m over each year in the period 2000-2005. Our results show that changes in customer deposits are positively related to changes in loans to customers highlighting the important financial intermediary role that small EU banks have within the European financial system. This is most important with respect to SMEs and households and in particular SMEs that are a main growth driver within the respective economies. The impact of focus on customer deposits also has ramifications on the bank profitability with changes in net interest revenues and risk-adjusted returns demonstrating positive relationships. This is in contrast to the negative association between money market funding and net interest revenues.

All this supports the view that, as suggested by the literature on the analysis of financial systems (Merton, 1995), the function of deposits matters. Deposits are exclusively provided by banks and are a pronounced feature of small banks which channel these funds towards opaque borrowers. The 'soft' information gathered through deposits as a funding source also has an influence on the future relationship between SMEs/households because such information gathering can serve as the basis for additional financing transactions between bank and customer. The uniqueness of these lending relationships gives small banks a form of 'bargaining power' over borrower and can exploit this in the interest of

both parties to the transaction. Such a transmission also has positive ramifications for the growth of the economy due to the transmission of funds between banks and SMEs/households that would otherwise find it hard to service their financing needs through larger national banks.

As the number of small banks continues to decrease due to the increasing competitive pressures of consolidation and competition and technological advancements, the banking needs of SMEs/households have to be kept into consideration and attention has to be warranted towards the devolution of the intermediary activities of banks. Alternative investment options for depositors in the form of for example online accounts are putting pressures on small banks with respect to attracting deposits. This is more pronounced due to the fact that core deposits represent a base of customers with which a bank can potentially build and extend banking relationships. Supervisory authorities have to monitor the long-run evolution of national and cross-border inter-bank activities and its impact on systemic liquidity and credit risk. Areas of future research should concentrate on the impact that foreign banks have on the provision of deposits and whether the evolution of cross-border activities is impacting the viability of small banks.









Table 4.1	• Number of Ban	k Observations	Based on	Country	and Institution 7	Type
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Country Name	Commercial Bank	Cooperative Bank	Savings Bank	Other Banks	Grand Total
AUSTRIA	16	25	28	2	71
BELGIUM	1	1	2	6	10
DENMARK	11	0	15	1	27
FRANCE	18	0	0	8	26
GERMANY	33	321	40	3	397
IRELAND	1	0	0	1	2
ITALY	5	280	0	1	286
LUXEMBOURG	5	1	0	1	7
NETHERLANDS	1	0	0	1	2
SWEDEN	0	0	1	0	1
UK	12	0	1	16	29
Grand Total	103	628	87	40	858

Table 4.2:	Variables	categories	and definitions

Variable	Variable	Definition ^a
category		
Funding Items	<b>ANCUSTDEP</b>	Deposits from non-customers
		(municipalities/government, other,
		commercial, and, bank deposits)
	<b>ARETDEP</b>	Deposits from retail customers
	ΔΕQΤΥ	Bank Equity
	$\Delta$ <b>MMF</b>	Money Market Funding
Asset Items	ΔLNCST	Loans to customers
Bank	GROWTH	Log [(total assets in t) / (total assets in t-1)]
<b>Characteristics</b>		
	SIZE	Log (total assets)
	GROUP	Sector (Cooperative, Savings, Commercial,
	s	and Other, banks)
	COUNTRY	All 11 EU countries in sample
	YEAR	2000 - 2005
	AVGDPST	Average Deposit Rate
	ΔNIR	Net Interest Revenue
National	Banking	Adapted from Barth et al. (2001)
<b>Characteristics</b>	Freedom	
	Activity	Adapted from Barth et al. (2001)
	Restrictions	
	ATM Access	Beck et al. (2005b)
	<b>Bank Branch</b>	Beck et al. (2005b)
	Access	
		Geographic branch (ATM) penetration refers to the
		Demographic branch (ATM) penetration refers to the
		number of branches (ATMs) per 100,000 people.
		Reported indicators are based on data collected via a
		regulatory survey. The questions asked were as
		branches do deposit money banks have (combined for
		all banks) in your country?" Number of ATMs – "How
		many ATMs (automated cash withdrawal machines)
		are there in your country?"

^a The  $\Delta$ -variables and GROWTH are percentage changes of absolute balance items

.

	<b>∆ LNCST</b>	ΔNIR	RAROE	RAROA
Asset Growth	0.3851***	0.3217***	0.6821	0.7707
	(0.0270)	(0.0258)	(0.6760)	(0.6363)
$\Delta$ Customer	0.2796***	0.1036***	0.9385**	0.8834**
Retail Deposits	(0.0189)	(0.0181)	(0.4738)	(0.4460)
$\Delta$ Non-Customer	0.0086**	0.0013	-0.0393	-0.0657
Deposits	(0.0038)	(0.0037)	(0.0967)	(0.0909)
∆ Money Market	0.0090***	-0.0072**	-0.1581**	-0.1452**
Funding	(0.0027)	(0.0026)	(0.0692)	(0.0651)
∆ Bank Equity	0.2417***	0.3456*	1.6119**	1.2721**
	(0.0210)	(0.0201)	(0.5256)	(0.4947)
Cooperative	0.0358**	-0.0009	-0.8534**	-1.0258**
Bank	(0.0140)	(0.0141)	(0.3505)	(0.3299)
Savings Bank	0.0407**	-0.0083	-0.4135	-0.5315
	(0.0147)	(0.0146)	(0.3675)	(0.3459)
Commercial bank	0.0467***	-0.0038	-1.8175***	-1.9706***
	(0.0129)	(0.0131)	(0.3241)	(0.3051)
Yr 2005	0.0158**	0.0002	0.2420	0.2176
	(0.0066)	(0.0067)	(0.1655)	(0.1558)
Yr 2004	0.0307 ***	0.0180***	0.0154	-0.0256
	(0.0066)	(0.0067)	(0.1649)	(0.1553)
Yr 2003	0.0302 ***	0.0313***	-0.1742	-0.2058
	(0.0066)	(0.0066)	(0.1646)	(0.1550)
Yr 2002	0.0264 ***	0.0292***	-0.2417	-0.2656*
	(0.0065)	(0.0063)	(0.1640)	(0.1544)
Adjusted R ²	0.47	0.34	0.37	0.40
Observations	4212	4212	4212	4212

### Table 4.3 Regression: Funding Sources

OLS regressions comprise all banks (maximum assets <  $\epsilon$ 450m and no multi-bank affiliation). All regressions include country fixed effects. Standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA.

***, **, * indicates statistical significance at the 1%, 5%, and 10% level respectively.

	∆ LNCST	∆ LNCST	<b>∆ LNCST</b>	∆ LNCST
Asset Growth	0.4710***	0.4767***	0.4633***	0.4330***
	(0.0268)	(0.0269)	(0.0270)	(0.0270)
∆ Customer Retail	0.2764***	0.2745***	0.2662***	0.2637***
Deposits	(0.0193)	(0.0194)	(0.0193)	(0.0191)
∆ Non-Customer	0.0043	0.0041	0.0045	0.0058
Deposits	(0.0039)	(0.0039)	(0.0039)	(0.0039)
$\Delta$ Money Market	0.0085**	0.0084**	0.0086**	0.0087**
Funding	(0.0028)	(0.0028)	(0.0028)	(0.0028)
$\Delta$ Bank Equity	0.1957***	0.1946***	0.2112***	0.2244***
	(0.0211)	(0.0211)	(0.0211)	(0.0210)
Cooperative Bank	0.0416***	0.0297**	0.0458***	-0.0114**
1	(0.0107)	(0.0104)	(0.0109)	(0.0106)
Savings Bank	0.0075	-0.0018	0.0159	-0.0182
Ū.	(0.0120)	(0.0121)	(0.0122)	(0.0121)
Commercial bank	0.0290**	0.0225*	0.0422***	0.0162
	(0.0118)	(0.0118)	(0.0120)	(0.0117)
Yr 2005	0.0199**	0.0201**	0.0190**	0.0172**
	(0.0068)	(0.0068)	(0.0068)	(0.0067)
Yr 2004	0.0339 ***	0.0340***	0.0332***	0.0317***
	(0.0067)	(0.0067)	(0.0067)	(0.0067)
Yr 2003	0.0330***	0.0331***	0.0324***	0.0310***
	(0.0067)	(0.0067)	(0.0067)	(0.0067)
Yr 2002	0.0282***	0.0283***	0.0280***	0.0270***
	(0.0067)	(0.0067)	(0.0067)	(0.0066)
Bank Branch	0.0006***			
Access	(0.9080)	0 000 54 44		
ATM Access		0.0005***		
Banking Freedom		(010) 20)	0.0384***	
Activity			(0.0056)	-0.0166***
Restrictions				(0.0014)
Adjusted R ²	0.47	0.44	0.43	0.45
Observations	4212	4212	4212	4212

 Table 4.4

 Regression: Funding Sources with Regulatory and National Characteristic variables – Loans to Customers

OLS regressions comprise all banks (maximum assets  $\leq 6450$ m and no multi-bank affiliation). All regressions include country fixed effects. Standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. ***, **, ** indicates statistical significance at the 1%, 5%, and 10% level respectively.

	ΔNIR	$\Delta$ NIR	ΔNIR	ΔNIR
Asset Growth	0.2957***	0.2943***	0.2997***	0.3044***
	( 0.0252)	(0.0251)	(0.0253)	(0.0255)
∆ Customer Retail	0.1017***	0.1019***	0.1053***	0.1063***
Deposits	(0.0181)	(0.0181)	(0.0181)	(0.0180)
∆ Non-Customer	0.0009	0.0010	0.0008	0.0005
Deposits	(0.0036)	(0.0036)	(0.0036)	(0.0036)
∆ Money Market	-0.0070**	-0.0070**	-0.0069**	-0.0069**
Funding	(0.0026)	(0.0026)	(0.0026)	(0.0026)
∆ Bank Equity	0.3626***	0.3633***	0.3566***	0.3543***
	(0.0198)	(0.0198)	(0.0198)	(0.0198)
Cooperative Bank	0.0056	0.0095	0.0030	0.0218**
	(0.0100)	(0.0098)	(0.0102)	(0.0101)
Savings Bank	-0.0019	0.0017	-0.0054	0.0055
	(0.0113)	(0.0113)	(0.0114)	(0.0114)
Commercial bank	-0.0073	-0.0047	-0.0127	-0.0037
	(0.0111)	(0.0111)	(0.0112)	(0.0111)
Yr 2005	-0.0096	-0.0097	-0.0092	-0.0089
	(0.0063)	(0.0063)	(0.0063)	(0.0063)
Yr 2004	0.0084	0.0084	0.0087	0.0090
	(0.0063)	(0.0063)	(0.0063)	(0.0063)
Yr 2003	0.0234***	0.0234***	0.0237***	0.0240***
	(0.0063)	(0.0063)	(0.0063)	(0.0063)
Yr 2002	0.0252***	0.0251***	0.0253***	0.0255***
	(0.0063)	(0.0063)	(0.0063)	(0.0063)
Bank Branch	0.0002**			
Access	(0.8511)			
ATM Access		0.0002**		
Banking Freedom		(0.0300)	$0.0155^{***}$	
Activity			(0.0055)	-0.0045***
Restrictions				(0.0014)
Adjusted R ²	0.33	0.33	0.35	0.34
Observations	4212	4212	4212	. 4212

 Table 4.5

 Regression: Funding Sources with Regulatory and National Characteristic variable – Net Interest

 Revenue

OLS regressions comprise all banks (maximum assets  $\leq$  450m and no multi-bank affiliation). All regressions include country fixed effects. Standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. ***, **, ** indicates statistical significance at the 1%, 5%, and 10% level respectively.

	<b>△ LNCST</b>	ΔNIR	RAROE	RAROA
Asset Growth	0.2873***	0.1857***	0.1666***	0.0135***
	(0.0609)	(0.0512)	(0.6551)	(0.6870)
∆ Customer Retail	0.2018***	0.0745**	0.6470*	0.5348*
Deposits	(0.0404)	(0.0340)	(0.4354)	(0.4566)
$\Delta$ Non-Customer	0.0058	0.0093	0.0643	0.0576
Deposits	(0.0129)	(0.0109)	(0.1394)	(0.1461)
$\Delta$ Money Market	0.0162	-0.0498**	-0.1803*	-0.1610**
Funding	(0.0243)	(0.0204)	(0.2617)	(0.2744)
$\Delta$ Bank Equity	0.3286***	0.1772***	0.9758***	0.1325***
1 2	(0.0640)	(0.0539)	(0.6887)	(0.7222)
Cooperative Bank	-0.0033	-0.0621**	-0.8537***	-0.1086***
- 1	(0.0329)	(0.0277)	(0.3542)	(0.3714)
Savings Bank	0.0080	-0.0388	0.3221	0.3471
C C	(0.0291)	(0.0245)	(0.3134)	(0.3286)
Commercial bank	0.0354	-0.0345*	-0.6202**	-0.9466***
	(0.0231)	(0.0195)	(0.2492)	(0.2613)
Yr 2005	0.01467	0.0012	0.1791	0.2464
	(0.0241)	(0.0203)	(0.2598)	(0.2724)
Yr 2004	0.0442*	0.0104	0.0211	0.1224
	(0.0241)	(0.0203)	(0.2601)	(0.2728)
Yr 2003	0.0067	-0.0314	0.2010	0.2074
	(0.0242)	(0.0204)	(0.2606)	(0.2733)
Yr 2002	0.0237	-0.0196	-0.0919	-0.0906
	(0.0241)	(0.0203)	(0.2599)	(0.2726)
Adjusted R ²	0.19	0.11	0.13	0.15
Observations	844	844	844	844
	7	0-1-1	0-1-1	

 Table 4.6
 Regression: Robustness Tests: Excluding Germany and Italy banks from sample

OLS regressions comprise all banks (maximum assets  $\leq 6450$ m and no multi-bank affiliation). All regressions include country fixed effects. Standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. ***, **, ** indicates statistical significance at the 1%, 5%, and 10% level respectively.

	∆ LNCST	ΔNIR	RAROE	RAROA
Asset Growth	0.3392***	0.1275**	0.3417***	0.3468***
	(0.0559)	(0.0470)	(0.7068)	(0.6881)
A Container Datail	0.2410***	0.0007**	0.5227*	0 5077*
$\Delta$ Customer Retail	$0.3418^{***}$	0.0907**	0.5337*	0.50/3*
Deposits	(0.0304)	(0.0298)	(0.4492)	(0.4373)
$\Delta$ Non-Customer	0.0124	0.0042	0.1165	0.1088
Deposits	(0.0124)	(0.0101)	(0.1529)	(0.1489)
*		· · ·	· · · ·	
∆ Money Market	0.0125	-0.0388**	-0.0835	-0.0670**
Funding	(0.0225)	(0.0184)	(0.2778)	(0.2704)
A Bank Equity	0 0765***	0 2374***	0 2054***	0 4566***
A Dank Equity	(0.0703)	(0.0518)	(0.2034)	(0.7590)
	(0.0203)	(0.0510)	(0.7790)	(0.7590)
Savings Bank	0.0439*	-0.0244	-0.7298**	-0.7800**
C	(0.0258)	(0.0212)	(0.3195)	(0.3111)
Commercial bank	0.0451**	-0.0222	-0.8557***	-0.9989***
	(0.0225)	(0.0184)	(0.2780)	(0.2706)
Yr 2005	0.0137	-0.0059	0 2626	0 3129
	(0.0220)	(0.0180)	(0.2716)	(0.2644)
Yr 2004	0.0190	-0.0164	0.2295	0.3029
	(0.0220)	(0.0180)	(0.2712)	(0.2641)
V- 2002	0.0027	0.0000	0 1720	0 1002
11 2005	-0.0037	-0.0089	(0.1720)	(0.2658)
	(0.0221)	(0.0181)	(0.2750)	(0.2030)
Yr 2002	0.0015	0.0059	-0.0351	-0.0464
	(0.0220)	(0.0180)	(0.2718)	(0.2647)
	- /		. ,	. ,
A line of $D^2$	0.22	0.05	0.01	0.01
Adjusted R ⁻	0.23	0.25	0.21	0.21
Observations	1112	1112	1112	1112
	1112	1112	1112	1112

 Table 4.7

 Regression: Robustness Tests: Excluding Cooperative Banks from sample

OLS regressions comprise all banks (maximum assets  $\leq 6450$ m and no multi-bank affiliation). All regressions include country fixed effects. Standard errors are reported in parentheses. RAR_{ROE} is the mean ROE divided by the standard deviation of ROE. RAR_{ROA} is the mean ROA divided by the standard deviation of ROA. ***, **, ** indicates statistical significance at the 1%, 5%, and 10% level respectively.

Appendix 4.A		ALNCSTMR	GROWTH	ARETDEP	ANCSTDEP	ΔTDEP	AMMF	ΔΕQΤ	ΔINR	RAROE	RAROA
Cooperative Banks	Avg.	0.08	0.11	0.12	0.04	0,11	0.08	0.08	0.05	3.91	3.77
2001	Min	-0.35	-0.14	-0.76	-1.00	-0.23	-1.00	-0.18	-1.00	-1.68	-1.59
	Max	1.91	2.30	3.13	4.80	2.28	26.00	2.84	2.32	29.86	28.70
	Avg.	0.09	0.08	0.08	-0.02	0.08	0.07	0.07	0.06	3.60	3.43
2002	Min	-0.26	-0.24	-0.12	-1.00	-0.28	-0.78	-0.18	-1.00	-0.74	-0.83
	Max	1.31	1.39	1.48	5.00	1.40	23.00	1.40	1.36	22.62	29.19
	Avg.	0.09	0.06	0.06	-0.01	0.06	0.09	0.07	0.06	3.62	3.43
2003	Min	-0.22	-0.16	-0.19	-1.00	-0.19	-1.00	-0.32	-1.00	-1.66	-1.68
	Max	0.94	1.08	0.96	3.64	0.97	16.17	1.35	1.28	28.93	29.88
	Avg.	0.07	0.06	0.05	0.03	0.05	-0.01	0.07	0.04	3.84	3.62
2004	Min	-0.28	-0.16	-0.13	-1.00	-0.21	-1.00	-0.10	-0.45	-1.74	-1.76
	Max	0.92	0.91	0.87	5.63	0.87	5.00	1.28	0.94	28.05	28.19
	Avg.	0.06	0.05	0.04	0.07	0.04	0.00	0.09	0.02	4.16	3.98
2005	Min	-0.33	-0.10	-0.12	-1.00	-0.12	-1.00	-0.22	-0.26	-1.10	-1.14
	Max	0.97	0.57	0.77	5.55	0.77	6.00	1.24	0.90	27.22	27.90
		ALNCSTMR	GROWTH	ARETDEP	∆NCSTDEP	∆TDEP	$\Delta$ <b>MMF</b>	∆EQT	ΔINR	RAROE	RAROA
Commercial Banks	Avg.	0.06	0.06	0.10	0.06	0.08	-0.01	0.05	0.00	2.15	2.02
2001	Min	-1.00	-0.31	-1.00	-1.00	-0.38	-0.86	-0.37	-1.00	-1.48	-1.55
	Max	1.42	0.93	1.35	3.88	1.69	1.55	1.14	0.64	10.65	9.57
	Avg.	0.02	0.01	0.03	0.00	0.01	-0.02	0.02	0.01	2.16	2.09
2002	Min	-0.76	-0.50	-0.61	-1.00	-0.81	-0.89	-0.49	-0.61	-1.59	-1.61
	Max	1.38	0.76	2.11	4.00	1.14	0.19	0.53	1.06	10.62	8.84
	Avg.	0.04	0.02	0.04	0.07	0.03	-0.02	0.03	-0.01	2.31	2.20
2003	Min	-0.90	-0.66	-0.57	-1.00	-0.72	-1.00	-0.56	-0,50	-1.55	-1.58
	Max	1.34	0.74	0.83	4.62	1.25	1.10	0.57	0.90	12.46	8.00
	Avg.	0.11	0.06	0.07	0.09	0.07	-0.02	0.07	0.01	2.42	2.39
2004	Min	-1.00	-0.72	-1.00	-1.00	-0.74	-1.00	-0.39	-0.74	-1.15	-1.16
	Max	3.28	0.88	2.42	3.58	1.29	0,44	1.42	1.64	8.29	10.16
	Avg.	0.11	0.12	0.11	0.12	0.14	0.03	0.05	0.03	2.65	2.48
2005	Min	-0.60	-0.22	-0.42	-1.00	-0.32	-0.23	-0.16	-0.50	-1.73	-1.67

			<b>ALNCSTMR</b>	GROWTH	ARETDEP	ANCSTDEP	ATDEP	AMMF	ΔΕQΤ	AINR	RAROE	RAROA
Savings Banks	5	Avg.	0.05	0.07	0.07	0.07	0.06	0.02	0.08	0.03	3.77	3.54
	2001	Min	-0.10	-0.02	-0.26	-1.00	-0.33	-1.00	-0.03	-0.22	-1.66	-1.58
		Max	1.23	1.14	1.30	5.82	1.19	2.00	1.06	1.10	16.48	15.05
		Avg.	0.04	0.05	0.05	0.05	0.05	0.00	0.07	0.04	3.37	3.23
	2002	Min	-0.17	-0.03	-0.04	-1.00	-0.04	-0.67	-0.04	-0.41	-0.57	-0.61
		Max	0.30	0.27	0.53	1.90	0.53	0.48	0.45	0.28	14.00	16.74
		Avg.	0.03	0.04	0.03	0.08	0.04	0.04	0.08	0.03	3.85	3.73
	2003	Min	-0.23	-0.06	-0.21	-0.70	-0.20	-0.37	-0.08	-0.13	-0.47	-0.48
		Max	0.35	0.22	0.37	0.97	0.41	4.00	0.46	0.31	15.45	15.73
		Avg.	0.04	0.04	0.04	0.06	0.04	0.00	0.07	0.00	3.80	3.77
	2004	Min	-0.18	-0.06	-0.08	-1.00	-0.08	-1.00	-0.22	-1.00	-1.28	-1.37
		Max	0.47	0.27	0.24	2.47	0.20	0.70	0.40	0.20	14.90	14.90
		Avg.	0.05	0.05	0.05	0.11	0.05	-0.01	0.08	0.01	3.77	3.82
	2005	Min	-0.07	-0.10	-0.06	-0.73	-0.07	-0.71	-0.19	-0.15	-1.74	-1.76
		Max	0.50	0.42	0.83	2.82	0.37	0.01	0.46	0.44	16.19	14.07
		· · · · ·	ALNCSTMR	GROWTH	ARETDEP	<b>ANCSTDEP</b>	ΔΤΟΕΡ	<u>∆MMF</u>	ΔΕQΤ	ΔINR	RAROE	RAROA
Other Banks		Avg.	0.09	0.11	0.09	0.04	0.19	0.00	0.08	0.08	3.93	4.27
								0.07	0.00	0.05	0.00	0.00
	2001	Min	-0.58	-0.18	-0.59	-1.00	-0.28	-0.86	-0.02	-0.25	0.00	0.00
	2001	Min Max	-0.58 1.21	-0.18 0.54	-0.59 0.79	-1.00 2.86	-0.28 2.86	-0.86 <u>1.43</u>	-0.02	-0.25	21.53	21.19
	2001	Min Max Avg.	-0.58 1.21 0.07	-0.18 0.54 0.03	-0.59 0.79 0.05	-1.00 2.86 0.15	-0.28 2.86 0.02	-0.86 1.43 0.20	-0.02 0.34 0.04	-0.25 <u>0.69</u> -0.01	<u>21.53</u> 4.25	<u>21.19</u> 4.26
	2001	Min Max Avg. Min	-0.58 <u>1.21</u> 0.07 -0.67	-0.18 0.54 0.03 -0.66	-0.59 0.79 0.05 -0.43	-1.00 2.86 0.15 -1.00	-0.28 2.86 0.02 -0.70	-0.86 <u>1.43</u> 0.20 -0.59	-0.02 0.34 0.04 -0.10	-0.25 0.69 -0.01 -0.68	21.53 4.25 -0.15	<u>21.19</u> 4.26 -0.18
	2001	Min Max Avg. Min Max	-0.58 1.21 0.07 -0.67 1.31	-0.18 0.54 0.03 -0.66 0.36	-0.59 0.79 0.05 -0.43 1.16	-1.00 2.86 0.15 -1.00 2.81	-0.28 2.86 0.02 -0.70 0.51	-0.86 <u>1.43</u> 0.20 -0.59 8.10	-0.02 0.34 0.04 -0.10 0.38	-0.25 0.69 -0.01 -0.68 0.88	21.53 4.25 -0.15 19.86	21.19 4.26 -0.18 20.59
	2001	Min Max Avg. Min Max Avg.	-0.58 1.21 0.07 -0.67 1.31 -0.01	-0.18 0.54 0.03 -0.66 0.36 0.07	-0.59 0.79 0.05 -0.43 1.16 0.02	-1.00 2.86 0.15 -1.00 2.81 -0.01	-0.28 2.86 0.02 -0.70 0.51 0.07	-0.86 1.43 0.20 -0.59 8.10 0.03	-0.02 0.34 0.04 -0.10 0.38 0.01	-0.25 0.69 -0.01 -0.68 0.88 -0.01	21.53 4.25 -0.15 19.86 4.07	21.19 4.26 -0.18 20.59 4.30
	2001 2002 2003	Min Max Avg. Min Max Avg. Min	-0.58 1.21 0.07 -0.67 1.31 -0.01 -0.56	-0.18 0.54 0.03 -0.66 0.36 0.07 -0.46	-0.59 0.79 0.05 -0.43 1.16 0.02 -0.82	-1.00 2.86 0.15 -1.00 2.81 -0.01 -1.00	-0.28 2.86 0.02 -0.70 0.51 0.07 -0.55	-0.86 1.43 0.20 -0.59 8.10 0.03 -0.06	-0.02 0.34 0.04 -0.10 0.38 0.01 -0.29	-0.25 0.69 -0.01 -0.68 0.88 -0.01 -0.47	21.53 4.25 -0.15 19.86 4.07 -1.18	21.19 4.26 -0.18 20.59 4.30 -1.15
	2001 2002 2003	Min Max Avg. Min Max Avg. Min Max	-0.58 1.21 0.07 -0.67 1.31 -0.01 -0.56 0.43	-0.18 0.54 0.03 -0.66 0.36 0.07 -0.46 1.04	$ \begin{array}{r} -0.59 \\ 0.79 \\ 0.05 \\ -0.43 \\ 1.16 \\ 0.02 \\ -0.82 \\ 0.64 \end{array} $	-1.00 2.86 0.15 -1.00 2.81 -0.01 -1.00 1.67	-0.28 2.86 0.02 -0.70 0.51 0.07 -0.55 1.67	-0.86 1.43 0.20 -0.59 8.10 0.03 -0.06 0.94	-0.02 0.34 0.04 -0.10 0.38 0.01 -0.29 0.28	-0.25 0.69 -0.01 -0.68 0.88 -0.01 -0.47 0.45	21.53 4.25 -0.15 19.86 4.07 -1.18 20.63	21.19 4.26 -0.18 20.59 4.30 -1.15 22.02
	2001 2002 2003	Min Max Avg. Min Max Avg. Min Max Avg.	-0.58 1.21 0.07 -0.67 1.31 -0.01 -0.56 0.43 -0.04	-0.18 0.54 0.03 -0.66 0.36 0.07 -0.46 1.04 0.02	$ \begin{array}{r} -0.59 \\ 0.79 \\ 0.05 \\ -0.43 \\ 1.16 \\ 0.02 \\ -0.82 \\ 0.64 \\ 0.00 \end{array} $	-1.00 2.86 0.15 -1.00 2.81 -0.01 -1.00 1.67 -0.02	-0.28 2.86 0.02 -0.70 0.51 0.07 -0.55 1.67 0.00	-0.86 1.43 0.20 -0.59 8.10 0.03 -0.06 0.94 -0.01	-0.02 0.34 0.04 -0.10 0.38 0.01 -0.29 0.28 0.05	-0.25 0.69 -0.01 -0.68 0.88 -0.01 -0.47 0.45 0.00	21.53 4.25 -0.15 19.86 4.07 -1.18 20.63 4.60	21.19 4.26 -0.18 20.59 4.30 -1.15 22.02 4.64
	2001 2002 2003 2004	Min Max Avg. Min Max Avg. Min Max Avg. Min	-0.58 1.21 0.07 -0.67 1.31 -0.01 -0.56 0.43 -0.04 -1.00	-0.18 0.54 0.03 -0.66 0.36 0.07 -0.46 1.04 0.02 -0.67	$ \begin{array}{r} -0.59 \\ 0.79 \\ 0.05 \\ -0.43 \\ 1.16 \\ 0.02 \\ -0.82 \\ 0.64 \\ 0.00 \\ -0.55 \end{array} $	-1.00 2.86 0.15 -1.00 2.81 -0.01 -1.00 1.67 -0.02 -0.81	-0.28 2.86 0.02 -0.70 0.51 0.07 -0.55 1.67 0.00 -0.77	-0.86 1.43 0.20 -0.59 8.10 0.03 -0.06 0.94 -0.01 -0.45	-0.02 0.34 0.04 -0.10 0.38 0.01 -0.29 0.28 0.05 -0.66	-0.25 0.69 -0.01 -0.68 0.88 -0.01 -0.47 0.45 0.00 -1.00	21.53 4.25 -0.15 19.86 4.07 -1.18 20.63 4.60 -0.27	$ \begin{array}{r}     0.00 \\     21.19 \\     4.26 \\     -0.18 \\     20.59 \\     4.30 \\     -1.15 \\     22.02 \\     4.64 \\     -0.25 \\ \end{array} $
	2001 2002 2003 2004	Min Max Avg. Min Max Avg. Min Max Avg. Min Max	-0.58 1.21 0.07 -0.67 1.31 -0.01 -0.56 0.43 -0.04 -1.00 0.39	-0.18 0.54 0.03 -0.66 0.36 0.07 -0.46 1.04 0.02 -0.67 0.62	$ \begin{array}{r} -0.59 \\ 0.79 \\ 0.05 \\ -0.43 \\ 1.16 \\ 0.02 \\ -0.82 \\ 0.64 \\ 0.00 \\ -0.55 \\ 0.67 \end{array} $	-1.00 2.86 0.15 -1.00 2.81 -0.01 -1.00 1.67 -0.02 -0.81 0.88	-0.28 2.86 0.02 -0.70 0.51 0.07 -0.55 1.67 0.00 -0.77 0.88	-0.86 1.43 0.20 -0.59 8.10 0.03 -0.06 0.94 -0.01 -0.45 0.21	-0.02 0.34 0.04 -0.10 0.38 0.01 -0.29 0.28 0.05 -0.66 0.35	-0.25 0.69 -0.01 -0.68 0.88 -0.01 -0.47 0.45 0.00 -1.00 1.06	21.53 4.25 -0.15 19.86 4.07 -1.18 20.63 4.60 -0.27 19.80	$ \begin{array}{r}     0.00 \\     21.19 \\     4.26 \\     -0.18 \\     20.59 \\     4.30 \\     -1.15 \\     22.02 \\     4.64 \\     -0.25 \\     21.34 \\ \end{array} $
	2001 2002 2003 2004	Min Max Avg. Min Max Avg. Min Max Avg. Min Max Avg.	$\begin{array}{r} -0.58 \\ 1.21 \\ 0.07 \\ -0.67 \\ 1.31 \\ -0.01 \\ -0.56 \\ 0.43 \\ -0.04 \\ -1.00 \\ 0.39 \\ 0.06 \end{array}$	$\begin{array}{c} -0.18 \\ 0.54 \\ 0.03 \\ -0.66 \\ 0.36 \\ 0.07 \\ -0.46 \\ 1.04 \\ 0.02 \\ -0.67 \\ 0.62 \\ 0.07 \end{array}$	$ \begin{array}{r} -0.59 \\ 0.79 \\ 0.05 \\ -0.43 \\ 1.16 \\ 0.02 \\ -0.82 \\ 0.64 \\ 0.00 \\ -0.55 \\ 0.67 \\ 0.02 \end{array} $	-1.00 2.86 0.15 -1.00 2.81 -0.01 -1.00 1.67 -0.02 -0.81 0.88 0.13	-0.28 2.86 0.02 -0.70 0.51 0.07 -0.55 1.67 0.00 -0.77 0.88 0.10	-0.86 1.43 0.20 -0.59 8.10 0.03 -0.06 0.94 -0.01 -0.45 0.21 0.00	$\begin{array}{c} -0.02 \\ 0.34 \\ 0.04 \\ -0.10 \\ 0.38 \\ 0.01 \\ -0.29 \\ 0.28 \\ 0.05 \\ -0.66 \\ 0.35 \\ 0.09 \end{array}$	$\begin{array}{r} -0.25 \\ 0.69 \\ -0.01 \\ -0.68 \\ 0.88 \\ -0.01 \\ -0.47 \\ 0.45 \\ 0.00 \\ -1.00 \\ 1.06 \\ 0.04 \end{array}$	21.53 4.25 -0.15 19.86 4.07 -1.18 20.63 4.60 -0.27 19.80 4.44	$ \begin{array}{r}     0.00 \\     21.19 \\     4.26 \\     -0.18 \\     20.59 \\     4.30 \\     -1.15 \\     22.02 \\     4.64 \\     -0.25 \\     21.34 \\     4.49 \\ \end{array} $
	2001 2002 2003 2004 2004	Min Max Avg. Min Max Avg. Min Max Avg. Min Max Avg. Min	$\begin{array}{r} -0.58 \\ 1.21 \\ 0.07 \\ -0.67 \\ 1.31 \\ -0.01 \\ -0.56 \\ 0.43 \\ -0.04 \\ -1.00 \\ 0.39 \\ 0.06 \\ -1.00 \end{array}$	-0.18 0.54 0.03 -0.66 0.36 0.07 -0.46 1.04 0.02 -0.67 0.62 0.07 -0.69	$\begin{array}{r} -0.59\\ 0.79\\ 0.05\\ -0.43\\ 1.16\\ 0.02\\ -0.82\\ 0.64\\ 0.00\\ -0.55\\ 0.67\\ 0.02\\ -0.96\\ \end{array}$	-1.00 2.86 0.15 -1.00 2.81 -0.01 -1.00 1.67 -0.02 -0.81 0.88 0.13 -1.00	-0.28 2.86 0.02 -0.70 0.51 0.07 -0.55 1.67 0.00 -0.77 0.88 0.10 -0.92	-0.86 1.43 0.20 -0.59 8.10 0.03 -0.06 0.94 -0.01 -0.45 0.21 0.00 -0.42	$\begin{array}{c} -0.02 \\ 0.34 \\ 0.04 \\ -0.10 \\ 0.38 \\ 0.01 \\ -0.29 \\ 0.28 \\ 0.05 \\ -0.66 \\ 0.35 \\ 0.09 \\ -0.51 \end{array}$	$\begin{array}{r} -0.25\\ 0.69\\ -0.01\\ -0.68\\ 0.88\\ -0.01\\ -0.47\\ 0.45\\ 0.00\\ -1.00\\ 1.06\\ 0.04\\ -0.92\end{array}$	21.53 4.25 -0.15 19.86 4.07 -1.18 20.63 4.60 -0.27 19.80 4.44 -1.65	$\begin{array}{r} 0.00\\ 21.19\\ 4.26\\ -0.18\\ 20.59\\ 4.30\\ -1.15\\ 22.02\\ 4.64\\ -0.25\\ 21.34\\ 4.49\\ -1.81\end{array}$

TOTAL SA	MPLE – EUR '000s	2005	2004	2003	2002	<b>2001 2001 20</b>		
	Total Asset	196,649,006	187,425,635	179,941,151	173,131,912	166,206,848	154,379,667	
А	Deposits - Demand	38,761,844	37,751,123	35,331,388	35,794,670	33,443,739	29,202,070	
В	Deposits - Savings	39,648,792	40,125,470	38,746,035	37,547,521	35,608,149	34,786,486	
С	Deposits - Sub 3 months	3,903,358	3,463,156	3,253,477	3,243,374	3,158,741	2,806,584	
	Deposits - 3-6 months	-	-	-	-	-	-	
	Deposits - 6 months-1 year	228,795	198,153	150,707	233,226	281,226	241,484	
	Deposits - 1-5 years	133,799	27,388	21,017	72,099	59,353	85,811	
	Deposits - 5 years +	12,857,300	9,389,900	8,601,214	4,322,929	4,514,355	3,575,144	
	Deposits (No split available)	30,720,537	30,221,022	31,113,681	30,878,417	29,995,031	27,883,701	
A+B+C	Customer Deposits	126,254,424	121,176,212	117,217,518	112,092,236	107,060,594	98,581,279	
DI	Municipalities / Government Deposits	40,064	56,731	133,934	107,587	121,482	95,370	
ii	Other Deposits	240,349	230,464	238,057	257,262	309,043	279,163	
iii	Commercial Deposits	-		-	-	-	-	
iv	Banks Deposits	24,506,761	23,709,200	23,491,680	24,269,486	24,762,039	24,452,798	
l+ii+iii+	iv Non-customer deposits	24,787,174	23,996,394	23,863,670	24,634,335	25,192,563	24,827,331	
A+B+C+D	Total Deposits	151,041,598	145,172,606	141,081,188	136,726,572	132,253,157	123,408,610	
	Total Money Market Funding	2,443,186	2,461,570	2,471,535	2,395,298	2,446,381	2,477,929	
	Total Equity	18,042,314	16,546,684	15,460,570	14,704,183	14,076,028	13,340,284	
	Net Interest Revenue	5,228,432	5,153,555	5,009,491	4,818,094	4,609,543	4,467,443	
	Mortgages	38,282,627	36,045,064	31,666,392	31,376,968	28,748,203	24,236,582	
	Other Loans	72,861,095	70,404,780	70,141,637	65,825,064	63,748,665	64,330,529	
	Total Customer Loans	117,252,955	111,879,807	106,989,380	102,095,619	97,319,242	92,978,325	

Cooperative Banks - EUR '000s		2005 2004		2003	2002	2001	2000	
		Total Asset	140,404,400	135,050,800	129,154,700	122,951,900	116,347,600	107,112,100
А		Deposits - Demand	29,072,800	28,893,700	27,126,300	28,119,000	26,134,400	22,726,700
В		Deposits - Savings	32,752,000	33,339,900	32,030,600	31,076,100	29,039,600	28,470,800
С		Deposits - Sub 3 months	977,800	965,300	789,400	696,100	702,200	590,500
		Deposits - 3-6 months	-	-	-	-	-	-
		Deposits - 6 months-1 year	6,100	4,500	3,900	4,600	3,700	4,300
		Deposits - 1-5 years	8,800	7,500	6,400	6,500	6,700	6,800
		Deposits - 5 years +	12,819,000	9,350,200	8,553,700	4,218,300	4,430,300	3,453,900
		Deposits (No split available)	17,700,500	17,990,500	19,080,500	19,392,100	18,775,700	17,341,700
A+B+C		Customer Deposits	93,337,000	90,551,600	87,590,800	83,512,700	79,092,600	72,594,700
D	i	Municipalities / Govt. Deposits	-	-	-	-	-	-
	ii	Other Deposits	-	-	-	-	-	-
	iii	Commercial Deposits	-	-	-	-	-	-
	iv	Banks Deposits	12,602,300	12,557,200	12,355,800	12,523,400	12,817,200	12,894,100
	i - iv	Non-customer deposits	12,602,300	12,557,200	12,355,800	12,523,400	12,817,200	12,894,100
A+B+C+D		Total Deposits	105,939,300	103,108,800	99,946,600	96,036,100	91,909,800	85,488,800
		Total Money Market Funding	2,136,400	2,167,500	2,148,000	2,057,700	2,049,900	2,009,100
		Total Equity	11,653,200	10,677,200	10,039,900	9,436,100	8,863,000	8,295,600
		Net Interest Revenue	3,840,403	3,791,400	3,674,300	3,495,600	3,307,300	3,180,700
		Mortgages	31,471,900	29,824,200	25,924,100	25,835,700	23,255,500	18,865,100
		Other Loans	55,717,500	53,713,100	53,459,600	48,993,900	47,552,000	48,599,800
		Total Customer Loans	87,220,511	83,538,200	79,387,900	74,830,500	70,836,300	67,466,600
		Total Customer Deposits/Assets Total Non-Customer	66.5%	67.1%	67.8%	67.9%	68.0%	67.8%
		Deposits/Assets	9.0%	9.3%	9.6%	10.2%	11.0%	12.0%

Other banks - EUR '000s		2005	2004	2003	2002	2001	2000	
		Total Asset	10,335,713	9,579,993	9,422,122	9,153,047	9,291,275	8,755,791
А		Deposits - Demand	512.413	680.093	735 813	605 220	610 346	561 010
В		Deposits - Savings	336,300	324,800	326,300	277,000	289,100	283,100
С		Deposits - Sub 3 months	443,496	389,215	419,176	430.736	415.547	477 332
		Deposits - 3-6 months	-	-	-		-	-
*		Deposits - 6 months-1 year	67,760	24,267	21,964	119,319	159.261	132.418
		Deposits - 1-5 years	65,394	1,134	848	44,808	34 987	39,665
		Deposits - 5 years +	-	-	-	38,100	30,600	27,000
		Deposits (No split available)	3,005,362	2,665,578	2,471,060	2,000,499	2,004,578	1,730,676
A+B+C		Customer Deposits	4,430,725	4,085,087	3,975,161	3,515,682	3,544,420	3,252,110
D	i	Municipalities / Government Deposits	-	19,730	31,434	114.026	102,360	106.331
	ii	Other Deposits	24,422	25,310	25,616	24.957	33.836	28.858
	iii	Commercial Deposits	-	-	-	-		
	iv	Banks Deposits	2,692,777	2,632,651	2,791,724	3,159,611	3.261.421	3.003.725
	i+ii+iii+iv	Non-customer deposits	2,717,198	2,677,691	2,848,774	3,298,594	3,397,617	3,138,914
A+B+C+D		Total Deposits	7,167,653	6,774,481	6,906,527	6,802,610	6,946,008	6,378,374
		Total Money Market Funding	61,881	68,936	79,735	76,998	70,381	108,329
		Total Equity	1,664,243	1,444,664	1,220,782	1,215,856	1,178,698	1,120,461
		Net Interest Revenue	245,003	225,565	215,677	216,695	217,061	217,009
		Mortgages	2,332,962	2,169,964	1,969,792	1,913,668	1.877.903	1.868.782
		Other Loans	1,978,878	1,762,907	1,752,402	1,792,004	1,665,626	1,555,558
		Total Customer Loans	6,184,887	5,790,606	5,747,074	5,659,314	5,420,451	5,113,595
		Total Customer Deposits/Assets	42.9%	42.6%	42.2%	38.4%	38.1%	37.1%
		Total Non-Customer Deposits/Assets	26.3%	28.0%	30.2%	36.0%	36.6%	35.8%

# **CHAPTER 5**

# CONCLUSION

### 5.1 INTRODUCTION

This final chapter provides overall concluding remarks for each one of the three preceding chapters. In particular, this conclusion highlights the individual chapters' idiosyncratic contributions to the literature, acknowledges the inherent limitations of the studies and also provides avenues for future research. An overall summary concludes this thesis highlighting the holistic contribution to the European banking literature.

# 5.2 CHAPTER 2: SMALL EUROPEAN BANKS: BENEFITS FROM DIVERSIFICATION?

This chapter examines the impact of diversification on the performance of small EU banks. Using a cross-country dataset for 15 countries, we find no direct diversification benefits for small credit institutions either within or across business lines during the period 1997 – 2003. In particular, the analyses suggest a negative link between non-interest income and risk-adjusted performance. Given no direct diversification benefits are detected in this chapter, our results indicate that small banks can improve their performance by expanding their resources within their existing business lines where they possess distinctive comparative advantages. The results emanating from this chapter do not explain the increased reliance of small European banks towards non-interest income with small banks not appearing to be able to reap benefits from shifting into non-interest income activities. The results moreover suggest presence of diseconomies of scope within lending activities which may be explained by weak monitoring of activities that lie outside the small banks' traditional lending business. With respect to the regulatory environment, our analyses highlight a negative association between activity restrictions and risk-adjusted performance of small banks and a positive correlation between banking freedom and insolvency risk of small European banks.

This chapter can be extended through future research by conducting a micro-level analysis of ownership structure, governance systems and the ensuing related performance of small banks in Europe. Additionally, applying 'soft' data to examine the impact of diversification on revenue and performance could highlight the unique characteristics that constitute small EU banks in their endeavour to maintain a position within the EU financial sector. Additional research could investigate the extent to which experience impacts gains through diversification.

Data limitations concerning the comparatively short sampling period and the unavailability of market data for the banks in the sample signify that our results have to be taken with a note of caution. Notwithstanding this, Chapter 2 contributes to a growing body of empirical research in the banking literature that indicates that small banks encounter difficulties in reaping benefits from diversification.

# 5.3 CHAPTER 3: SME-BANK FINANCING RELATIONSHIPS WITHIN REGIONAL EUROPEAN AREAS

This chapter seeks to establish the effect of the latest developments in European banking on the determinants of the number of SME bank financing relationships in three distinct European regions. Employing data from a cross-sectional survey of SMEs, we find differences in the number of bank financing relationships across the South-East of England, Bavaria in Germany, and Emilia-Romagna in Italy. To our knowledge, this chapter provides the first comprehensive insight of SME bank financing relationship determinants on a European Regional level.

We find that as SMEs grow in size, through the proxies turnover and employees, they are more inclined towards opting for multiple bank financing relationships. Bank variables that facilitate SME financing possibilities, the provision of attractive financing terms and the availability of bank financing, all have a positive impact on SME bank relationships. With respect to the local economic environment we find that regional GDP growth, regional population, and a stimulating local entrepreneurial environment foster the establishment of multiple lending relationships having beneficial welfare ramifications on a regional basis, whereas legal and financing obstacles are an impediment to multiple relationships. Overall our results show that European regional SMEs that are either micro entities or are still in their initial development life-cycle will lean towards self-financing or financing from single banks with the incidence most likely being local/regional banks due to the particular nature of small firms. More attractive bank terms and a more active bank role is a positive determinant in multiple bank financing. Finally, the respective country's financial system architecture is also an important determinant for our regional SME sample with a more transparent and effective market system prompting enhanced possibilities for SME financing.

The finding that legal obstacles are an impediment to diversifying lending relationships indicates that policies aimed at encouraging SMEs to expand in scope and scale (which often requires setting up additional bank relationships) are bound to be unsuccessful if legal institutions are not amended accordingly. Removing barriers and obstacles that hamper setting up multiple bank relationships imposed on banks will enable SMEs to develop and mature by making use of more sophisticated financial services, thus ultimately promoting economic growth.

The small sample size suggests that we have to constrain our study to incorporate just three EU countries, albeit possibly three of the largest EU countries in terms of economic growth. Nonetheless, our findings complement a growing body of empirical work in the banking literature with respect to SMEs and their interaction with financial institutions. This chapter can be extended in other directions. Obviously, it would be interesting to examine our hypotheses with a larger cross-country sample, including less developed economies. Another intellectually appealing avenue for future work would be to analyse the effect of venture capital and private equity on SME financing and the way SMEs interact with their banks. An analysis of the effect of the intangible role that banks have on SMS also would enable a greater understanding of SME/Bank relationships.

## 5.4 CHAPTER 4: FUNDING CHOICES AND PERFORMANCE OF EUROPEAN SMALL BANKS

Throughout this chapter we examine the funding methods and risk-adjusted performance of EU small banks and the resultant implications for SMEs and household lending. We base our analysis on a dataset of EU small banks over the period 2000-2005. Our analysis shows that customer deposits are still a main funding option for small banks, and a positive association exists between increases in customer deposits and increases in both loans to customers and net interest revenue. In contrast, the negative association between money market funding and net interest revenues highlights the cost differentials that are prevalent in the funding choices of small EU banks. Summed up, small banks within the EU still play an important role as financial intermediaries with SMEs/households and this role is exacerbated due to the fact that SMEs in particular are a major growth driver within the respective economies. Deposits as a funding choice are a pronounced feature of small banks which re-channel such funds towards opaque borrowers. Additionally the 'soft' information gathered through deposits as a funding source also has an influence on the future relationship between SMEs/households because such information gathering can serve as the basis for additional financing transactions between bank and customer. Such a transmission also has positive ramifications for the growth of the economy due to the transmission of funds between banks and SMEs/households that would otherwise find it hard to service their financing needs through larger national banks.

Data limitations that could enhance the study exist within our sample set in particular to the breakdown of deposits by tenor. Additionally, the study focuses solely on the link between funding choices and lending / risk-adjusted performance. The setting of economic conditions prevalent in the economy (e.g., interest rates, deposit insurance) is taken as given and not identified, and so this chapter needs to be read with such a limitation in mind. This chapter could be extended through a study on the impact that foreign banks have on the provision of deposits and whether the evolution of cross-border activities is impacting the viability of small banks.

### 5.5 SUMMARY

Throughout this thesis we have analysed small EU banking institutions in an era of financial, political, regulatory and technological developments. Overall, although the number of such

institutions are decreasing due to factors such as competition and foreign bank entry, the main result emanating from this research highlights towards a comparative advantage of small banks in regional, community banking. The same reason for which small banks were instituted in the first place, i.e. to provide financial intermediation to the regional areas and the fledgling European entrepreneurial industries, is precisely the advantage that small banks have over their larger counterparties. Through three individual studies we contribute to the existing banking literature by showing that the traditional intermediation banking process is, and will remain, core to small banks survival in the industry. Such a focus on their expertise coupled with a focus on their target market segments, SMEs and households should result in small banks maintaining a healthy market share. This of course does not preclude small banks from letting their guard down in terms of improving efficiency and innovation even within their existing mainstream businesses, ensuring in such a process that they remain a source of finance to Europe's economic growth drivers: SMEs and private households.

### **BIBLIOGRAPHY**

- Acharya, V., I. Hasan, and A. Saunders, 2002. "Should banks be diversified? Evidence from individual bank loan portfolios". Bank for International Settlements, Working Paper, No.118.
- Acharya, V., 2001. "A Theory of Systemic Risk and Design of Prudential Bank Regulation". Working Paper, Stern School of Business, New York University.
- Affinito, M., and Piazza, M., 2005. "What determines banking structures in European regions?". Bank of Italy, Working Paper.
- Allen, F., and D. Gale, 2001. "Comparing Financial Systems". The MIT Press.
- Allen, F., Santomero, A.M, 2001. "What do Financial Intermediaries do?". *Journal of Banking & Finance* 25, 271-294.
- Altunbas, Y., Fazylov, O., and P. Molyneux, 2002. "Evidence on the bank lending channel in Europe". *Journal of Banking and Finance*, 26, 2093-2110.
- Amel, D., Barnes, C., Panetta, F., and Salleo, C, 2004. "Consolidation and efficiency in the financial sector: A review of the international evidence". *Journal of Banking and Finance*, Vol. 28, pp. 2493 – 2519.
- Amel, Dean F., Starr-McCluer, M, 2002. "Market definition in banking: Recent evidence". *The Antitrust Bulletin* 47 (1), 63–89.
- Angelini, P., Di Salvo, R., and Ferri, G., 1998. "Availability and cost of credit for small businesses: Customer relationships and credit cooperatives". *Journal of Banking and Finance*, 22, 925-954.
- Avery, R.B. and Samolyk, K.A, 2004, "Bank Consolidation and Small Business Lending: The Role of Community Banks". *Journal of Financial Services Research*, Vol. 25, pp. 291-325.
- Banerjee, A. V., T. Besley, and T. W. Guinnane, 1994. "Thy neighbours keeper: The design of a credit cooperative theory and a test". *Quarterly Journal of Economics* 109, 491 – 515
- Bank of England, 2000. "Finance for Small Firms", 7th Report
- Barth, J., G. Caprio, and R. Levine, 2004. "Bank Supervision and Regulation: What Works Best?". Journal of Financial Intermediation 13 (2), 205-248.

- Barth, J., G. Caprio, and R. Levine, 2001. "Banking Systems around the Globe: Do Regulation and Ownership Affect Performance and Stability?". In: F. Mishkin (ed.), Financial Supervision and Regulation: What Works and What Does'nt. Chicago University Press, Chicago, IL, 31-88.
- Bassett, B., Brady, T., 2002. "What drives the persistent competitiveness of small banks?" Finance and Economics Discussion Series working paper 2002-28. Board of Governors of the Federal Reserve System.
- Basset, William F. and Thomas F. Brady, 2001. "The Economic Performance of Small Banks, 1985-2000." *Federal Reserve Bulletin*, November, 719-728.
- Batra, G., Kaufmann, D., and Stone, A., 2003. "The Firms Speak: What the World Business Environment Survey Tells us about Constraints on Private Sector Development". World Bank mimeo.
- Beck, T., A. Demirguc-Kunt, A., and R. Levine, 2006. "Bank Concentration, Competition, and Crises: First Results". *Journal of Banking and Finance* 30,1581-1603.
- Beck, T., Demirguc-Kunt, A., and Maksimovic, V., 2005a. "Financial and Legal Constraints to Growth: Does Firm Size Matter?". *Journal of Finance*, Vol. LX, no.1.
- Beck, T., Demirguc-Kunt, A., and Martinez Peria, M.S., 2005b. "Reaching Out: Access to and use of Banking Services Across Countries". World Bank Research Report, Third Draft.
- Beck, T., Demirguc-Kunt, A., Maksimovic, V., 2004. "Financing patterns around the world: Are small firms different?" World Bank.
- Belaisch, A., L. Kodres, J. Levy and A. Ubide, 2001. "Euro-Area Banking at the Crossroads". IMF Working Paper, WP/01/28, Washington, D.C.: International Monetary Fund.
- Berger, A.N. and G.F. Udell, 2006. "A more complete conceptual framework for SME finance". *Journal of Banking and Finance*, Volume 30, 11 pp. 2945-2966.
- Berger, A.N. and G.F. Udell, 2002. "Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisational Structure". *Economic Journal* 112, F32-F53.

- Berger, A.N. and G.F. Udell, 1998. "The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle". *Journal of Banking and Finance* 22, 613-673.
- Berger, A.N. and G.F. Udell, 1995. "Relationship lending and lines of credit in small firm finance". *Journal of Business* 68, 351-382.
- Berger, A.N. and S. W. Frame, 2005. "Small business credit scoring and credit availability".Federal Reserve Bank of Atlanta Working Paper 2005-10, May 2005
- Berger, A.N. I. Hasan and L.F. Klapper, 2004. "Further Evidence on the Link between Finance and Growth: An International Analysis of Community Banking and Economic Performance". *Journal of Financial Services Research* 25 (2/3), 169-202.
- Berger, A.N., Dick, A.A., 2003. "Entry into Banking Markets and the First-Mover Advantage". Working Paper, Federal Reserve Board.
- Berger, A.N., A. Saunders, J.M. Scalise and G.F. Udell, 1998. "The Effects of Bank Mergers and Acquisitions on Small Business Lending". *Journal of Financial Economics* 50 (2), 187-229.
- Berger, P.G. and E. Ofek, 1996. "Bustup takeovers of value-destroying diversified firms". Journal of Finance 51, 1175-1200.
- Berger, P.G. and E. Ofek, 1995. "Diversification's effect on firm value". *Journal of Financial Economics* 37, 39-65.
- Besley, T. and S. Coate, 1995. "Group Lending, repayment incentives and social collateral". *Journal of Development Economics*, 46, 1-18.
- Bharath, S., S. Dahiya, A. Saunders, and A. Srinivasan, 2007. "So what do I get? The banks's view of lending relationships". *Journal of Financial Economics*, Vol. 85, no.2, 368-419.
- Bhattacharaya, S., and Thakor, A.V., 1993. "Contemporary banking theory". *Journal of Financial Intermediation*, 3, 2-50.
- Boot, A.W.A, 2000. "Relationship Banking: What do we know?". Journal of Financial Intermediation, 9, 7-25.
- Boot, A.W.A., and Thakor, A.V., 1999. "Can relationship banking survive competition?". *Journal of Finance*, 55 (2), 679–713.

- Bolton, P., Scharfstein, D. 1996. "Optimal debt structure and the number of creditors". Journal of Political Economy, 104, 1-25.
- Boyd, J. H. and E. Prescott, 1986. "Financial Intermediary Coalitions". *Journal of Economic Theory* 38, 211-232.
- Boyd, J. H. and S. L. Graham, 1988. "The profitability and risk effects of allowing bank holding companies to merge with other financial firms: A simulation study". Federal Reserve Bank of Minneapolis Quarterly Review 12, 1 − 19.
- Boyd, J. H. and S. L.Graham, 1986. "Risk, regulation, and bank holding company expansion into non-banking". Federal Reserve Bank of Minneapolis Quarterly Review 10, 2 17.
- Branson, W.H., 1990. "Financial market integration, macroeconomic policy and the EMS" in Brago de Macedo, J. & C. Bliss (eds.) Unity with Diversity within the European Economy: The Community"s Southern Frontier (Cambridge University Press).
- Brunner, A., J. Decressin, D. Hardy and B. Kudela, 2004. "Germany"s Three-Pillar Banking System: Cross-Country Perspectives in Europe". IMF Occasional Paper 23, Washington, D.C.: International Monetary Fund.
- Buch, C.M. 2001. "Distance and International Banking". Kiel Institute of World Economics WP, no. 1043, Kiel, Germany.
- Calomiris, C.W., and C.M. Kahn, 1991. "The Role of Demandable Debt in Structuring Optimal Banking Arrangements". *American Economic Review*, 81, 497-513.
- Carbo, S., Gardener, E.P.M, and Williams, J., 2002. "Efficiency in Banking: Empirical Evidence from the Savings Banks Sector". The Manchester School, Vol. 70, Issue II.
- Carlin, W, and Mayer, C., 2003. "Finance, Investment and Growth". Journal of Financial Economics 69 (1), 191-226.
- Cebenoyan, A. Sinan and Philip E. Strahan, 2004 ."Risk Management, Capital Structure and Lending at Banks". *Journal of Banking and Finance*, 28:1, 19-43.
- Cetorelli, N., 2004. "Real Effects of Bank Competition". Journal of Money, Credit, and Banking, 36 (3), 543-558.
- Chakraborty, A., and C. X. Hu, 2006. "Lending relationships in line-of-credit and non-lineof-credit loans: Evidence from collateral use in small business". *Journal of Financial Intermediation* 15, 86-107.

- Chari, V.V., and R. Jagannathan, 1988. "Banking Panics, Information, and Rational Expectations Equilibrium". *Journal of Finance*, 43, 749-761.
- Claessens, S. and L. Laeven, 2004. "What drives bank competition? Some international evidence". *Journal of Money, Credit and Banking* 36, 563-583.
- Cole, R. A., L. G. Goldberg and L. J. White, 2004. "Cookie-cutter versus character: The micro structure of small business lending by large and small banks". *Journal of Financial and Quantitative Analysis*, Vol. 39, pp. 227-251
- Cole, R. 1998. "The importance of relationships to the availability of credit". *Journal of Banking and Finance* 22, 959-977.
- Cole, R.A. and Wolken, J.D. 1995. "Sources and uses of financial services by small businesses: Evidence from the 1993 National Survey of Small Business Finances". Federal Reserve Bulletin 81, 629-670.
- Craig, S. G., and P. Hardee, 2007. "The impact of bank consolidation on small business credit availability". *Journal of Banking and Finance*, Vol. 31, pp. 1237-1263
- Cubo-Ottone, A., and M. Murgia, 2000. "Mergers and Shareholders Wealth in European Banking". *Journal of Banking and Finance* 24 (6), 831-859.
- Cyrnak, A., and Hannan, T. 2000. "Non-local lending to small businesses". Board of Governors of the Federal Reserve System Working Paper.
- Davis, R. G., and L. Korobow, 1986. "The Pricing of Consumer Deposit The Non-Rate Dimensions". Federal Reserve Bank of New York, Quarterly Review 11, 14-18.
- DeBondt, G.J, 1999. "Credit channels in Europe: Cross-country investigation". Research Memorandum WO&E no.569, De Nederlandsche Bank, February.
- DeBondt, G.J, 1998. "Credit channels in Europe: Bank-level panel data analyses". Research Memorandum WO&E no.567, De Nederlandsche Bank, June.
- Degryse, H., and van Cayseele, P. 2000. "Relationship lending within a bank-based system: Evidence from European small business data". *Journal of Financial Intermediation*, 9, 90-109.
- Degryse, H., and Ongena, S. 2004. "The impact of technology and regulation on the geographical scope of banking". Oxford Review of Economic Policy, Vol.20 pp.571-590.

- Degryse, H., and Ongena, S. 2003. "Distance, lending relationships, and competition". Discussion Paper 02-16. Centre for Economic Studies, KU Leuven.
- De Guevara, J. F., J. Maudos, and F. Perez, 2005. "Market power in European banking sectors". *Journal of Financial Services Research*, Vol. 27, pp. 109-137
- Demirguc-Kunt, A., Love, I., and Maksimovic, V. 2006a. "Business Environment and the Incorporation Decision". *Journal of Banking and Finance*.
- Demirguc-Kunt, Asli & Kane, Edward J. & Laeven, Luc, 2006b. "Determinants of depositinsurance adoption and design". Policy Research Working Paper Series 3849, The World Bank.
- Demirguc-Kunt A., L. Laeven and R. Levine, 2004. "Regulations, Market Structures, Institutions, and the Cost of Financial Intermediation". *Journal of Money, Credit, and Banking*, 36 (3), 593-622.
- Demirgüç-Kunt, A., and E. Detragiache, 2002. "Does deposit insurance increase banking system stability? An empirical investigation". *Journal of Monetary Economics* 49 (7), 1373–1406.
- Demirgüç-Kunt, A., and E. Kane, 2002. "Deposit Insurance Around the Globe: Where Does it Work?". *Journal of Economic Perspectives*, Vol. 16 (2).
- Demirguc-Kunt, A., and Maksimovic, V., 1998. "Law, finance, firm growth". *Journal of Finance* 53, 2107-2137.
- Demsetz, R.S., and P.E. Strahan, 1997. "Diversification, Size and Risk at Bank Holding Companies". *Journal of Money, Credit, and Banking* 29 (3), 300-313.
- Denis, D. J., D. K. Denis, and A. Sarin, 1997. "Agency Problems, Equity Ownership, and Corporate Diversification". *Journal of Finance* 52, 135–160.
- Detragiache, E, Garella, P, and Guiso, L. 2000. "Multiple versus Single Banking Relationships: Theory and Evidence". *Journal of Finance*, Vol. LV, no.3, 1133-1161.
- Dewatripont, M., and Maskin.E., 1995. "Credit and efficiency in centralised and decentralised economies". *Review of Economic Studies*, 62, 541-555.
- DeYoung, R., W.C. Hunter, and G.F. Udell, 2004. "Past, Present, and Probable Future for Community Banks". *Journal of Financial Services Research* 25 (2/3), 85-133.
- DeYoung, R. and T.Rice, 2004a. "How Do Banks Make Money? the Fallacies of Fee Income". Federal Reserve Bank of Chicago Economic Perspectives 28 Fourth Quarter, 34-51.
- DeYoung, R. and T. Rice, 2004b. "Noninterest Income and Financial Performance at U.S. Commercial Banks". Financial Review 39, 101-127.
- DeYoung, R., and Duffy. D., 2002. "The challenges facing community banks: In their own words". Federal Reserve Bank of Chicago, Economic Perspectives, Fourth quarter.
- DeYoung R., and K.R. Roland, 2001. "Product Mix and Earnings Volatility at Commercial Banks: Evidence from a Degree of Total Leverage Model". *Journal of Financial Intermediation* 10, 54-84.
- Diamond, D.W., and R.G. Rajan, 2001. "Liquidity Risk, Liqudity Creation, and Financial Fragility: A Theory of Banking". *Journal of Political Economy*, 109, 287-327.
- Diamond, D., 1991. "Monitoring and reputation: The choice between bank loans and directly placed debt". *Journal of Political Economy* 99, 688-721.
- Diamond, D.W., 1984. "Financial Intermediation and Delegated Monitoring". *Review of Economic Studies* 51, 393-414.
- Elsas, R., 2005. "Empirical determinants of relationship lending". *Journal of Financial Intermediation* 14, 32-57.
- Elsas, R., and Krahnen, J.P. 1998. "Is Relationship Lending Special? Evidence from creditfile data in Germany". *Journal of Banking and Finance*, 22, 1283-1316.
- Elyasiani, E. and L. G. Goldberg, 2004. "Relationship lending: A survey of the literature". Journal of Economics and Business 56, 315-330.
- European Central Bank, 2006. "Report on EU Banking Structure". European Central Bank, October.
- European Central Bank, 2004. "Report on EU Banking Structure". European Central Bank, November.
- Farinha, L.A, and Santos, J.A.C. 2002. "Switching from Single to Multiple Bank Lending Relationships: Determinants and Implications". *Journal of Financial Intermediation*, 11, 124-151.

- Favero, C.A., Giavazzi, F., and L. Flabbi, 1999. "The transmission mechanism of monetary policy in Europe: Evidence from banks' balance sheets". National Bureau of Economic Research, Working Paper no.7231.
- Federal Reserve Survey of Retail Pricing and Fees (1997, 1998, and 1999). Federal Reserve Bank, U.S.
- Ferri, G., and Messori, M. 2000. "Bank-firm relationships and allocative efficiency in Northeastern and Central Italy and in the South". *Journal of Banking and Finance*, 24, 1067-1095.
- Flannery, Mark J., 1982. "Retail Bank Deposits as Quasi-Fixed Factors of Production". American Economic Review 72 (June), 527-536.
- Focarelli, D., F. Panetta, and C. Salleo, 2000. "Why do Banks Merge?". *Journal of Money, Credit, and Banking* 34 (4), 1047-1066.
- Freixas, X., and J.C. Rochet, 1999. "Microeconomics of Banking". The MIT Press.
- Gallo, J.G., V.P. Apilado, and J.W. Kolari, 1996. "Commercial bank mutual fund activities: Implications for bank risk and profitability". *Journal of Banking and Finance* 20, 1775-1791.
- Gambacorta, L., 2005. "Inside the Bank Lending Channel". *European Economic Review* 49, 1737–1759.
- Gardener, E., P. Molyneux, and J. Williams, 1999. "European Savings Banks: Coming of Age?" (Lafferty Publications: Dublin).
- Genay, H., 2000. "Recent trends in deposit and loan growth: Implications for small and large banks". Chicago Fed Letter, Federal Reserve Bank of Chicago, No.160.
- Gilkeson, J.H, List, J.A, and Ruff C.K., 1999. "Evidence of early withdrawal in time deposit portfolios". *Journal of Financial Services Research* 15, 103-122.
- Goddard, J., Molyneux, P., Wilson, J.O.S, Tavakoli, 2007. "European Banking: An overview". *Journal of Banking and Finance*, 31, 1911-1935.
- Goodhart, C.A.E, 1987. "Structural change in the British Capital Markets" in Goodhart, C.A.E, D. Currie & D.T. Llewellyn (eds.) The Operation and Regulation of Financial Markets (Macmillan: London).

- Gorton, G., 1988. "Banking Panics and Business Cycles". Oxford Economic Papers, 40, 751-781.
- Gropp, R., and Vesala, J., 2004. "Deposit insurance, moral hazard and market monitoring". *Review of Finance* 8 (4), 571–602.
- Guiso, L., P. Sapienza, and L.Zingales, 2004. "Does local financial development matter?" *Quarterly Journal of Economics,* Vol. 119, pp. 929-969.
- Hannan, T.H., 2006. "Retail deposit fees and multi-market banking". *Journal of Banking & Finance* 30, 2561–2578
- Hannan, Timothy H., Prager, Robin A., 2004. "The competitive implications of multimarket bank branching". *Journal of Banking and Finance* 28, 1889–1914.
- Hannan, T., 1991. "Bank commercial loan markets and the role of market structure: Evidence from surveys of commercial lending". *Journal of Banking and Finance* 15, 133-149.
- Harhoff, D., and Korting, T. 1998. "Lending Relationships in Germany empirical evidence from survey data". *Journal of Banking and Finance* 22, 1317-1353.
- Hauswald, R., and R. Marquez, 2002. "Competition and Strategic Information Acquisition in Credit Markets". Working Paper, University of Maryland.
- Hackethal, A., 2004. "German Banks and Banking Structure". In: Krahnen, Jan Pieter, and Reinhard H. Schmidt, eds. The German Financial System, Oxford: Oxford University Press, pp. 71-105.
- Heffernan, Shelagh A., 1992. "A Computation of Interest Equivalences for Nonprice Characteristics of Bank Products". *Journal of Money, Credit, and Banking* 24, 162-172.
- Honohan, P., 2004. "Financial Development, growth and poverty: how close are the links?".World Bank, Policy Research Working Paper Series 3203.
- Hovakimian, A., Kane, E.J., and L. Laeven, 2003. "How country and safety-net characteristics affect bank risk-shifting". *Journal of Financial Services Research* 23 (3), 177–204.
- Houston, J., and James, C., 1996. "Bank information monopolies and the mix of private and public debt claims". *Journal of Finance* 51, 1863-1889.

- Hughes, J.P., L.J. Mester, and C. Moon, 2001. "Are Scale Economies in Banking Elusive or Illusive?" Evidence Obtained by Incorporating Capital Structure and Risk-Taking into Models of Bank Production". *Journal of Banking and Finance* 25 (12), 2169-2208.
- Jayaratne, J., and J. Wolken, 1999. "How Important are Small Banks to Small Business Lending? New Evidence from a Survey of Small Firms". *Journal of Banking and Finance* 23 (2-4), 427-458.
- Kano, M., Uchida, H., Udell, G.F., Watanabe, W., 2006. "Information Verifiability, Bank Organisation, Bank Competition and Bank-Borrower Relationships". RIETI Discussion Paper Series 06-E-003.
- Kashyap, A.K., Stein, J.C., 1997. "What do a million banks have to say about the transmission of monetary policy". National Bureau of Economic Research, Working Paper no.6056.
- Kashyap, A.K., Stein, J.C., 1995. "The impact of monetary policy on bank balance sheets". Carnegie Rochester Conference Series on Public Policy 42, 151–195.
- Keeton, W., J. Harvey, and P. Willis, 2003. "The Role of Community Banks in the U.S. Economy". Federal Reserve Bank of Kansas City Economic Review (Q2):15–43.
- Kimmelman, J., 1999. "Small Banks Neglecting an Edge: Lower Fees". American Banker.
- Kishan, R.P, Opiela, T.P., 2000. "Banks size bank capital and the bank lending channel". *Journal of Money, Credit and Banking* 32, 121-141.
- Kiser, Elizabeth K., 2004. "Modeling the Whole Firm: The Effects of Multiple Inputs and Financial Intermediation on Bank Deposit Rates". Paper, Finance and Economics Discussion Series 2004–07, Federal Reserve Board.
- Klapper, L.F., Laeven, L.A., and Rajan R.G., 2004. "Business Environment and Firm Entry: Evidence from International data". World Bank Working Paper no.3232.
- Kwast, M. L., 1989. "The Impact of Underwriting and Dealing on Bank Returns and Risks". Journal of Banking and Finance 13 (1), 101-125.
- Laeven, L., and R. Levine, 2007. "Is there a Diversification Discount in Financial Conglomerates?". *Journal of Financial Economics*, Vol. 85, Issue II, 331-367.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and R. Vishny, 1998. "Law and Finance". J. Public Econ. 106, 1113–1155.

- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R.W, 1997. "Legal determinants of external finance". *Journal of Finance* 22, 1131-1150.
- Levine, R. 2005. "Finance and growth: Theory and Evidence". Handbook of Economic Growth in Philippe Aghion and Steven Durlauf eds, The Netherlands, Elsevier Science.
- Levine, R. 1999. "Law, finance, and economic growth". *Journal of Financial Intermediation* 8, 8-35.
- Lown, C. S., C. L. Osler, P. E. Strahan and A. Sufi, 2000. "The changing landscape of the financial services industry: What lies ahead?". Federal Reserve Bank of New York Economic Policy Review 6, 39 – 55.
- Martin, R., Sunley, D and Turner, D., 2001. "The restructuring of local banking systems across Europe: implications for regional business development". Cambridge Centre for Business Research, University of Cambridge.
- Mercieca, S., Schaeck, K., Wolfe, S., 2007. "Small European Banks: Benefit from Diversification?" *Journal of Banking and Finance*, 31, 1975-1998.
- Merton, Robert C. 1995. "A Functional Perspective of Financial Intermediation". *Financial Management* 24 (Summer), 23-41.
- Meyer, A.P., and T.J. Yeager, 2001. "Are Small Rural Banks Vulnerable to Local Economic Downturns?". Review, Federal Reserve Bank of St Louis, March/April, 25-38.
- Molyneux, P., D. M. Lloyd-Williams, and J. Thornton, 1994. "Competitive Conditions in European Banking". *Journal of Banking and Finance* 18, 445-459.
- Munemo, J., Bandyopadhyay, S., and Basistha, A, 2007. "Foreign Aid and Export Performance: A Panel Data Analysis of Developing Countries". Federal Reserve Bank of St. Louis, Working Paper 2007-023A
- Murphy, N.B. 2000. "European Union financial developments: the Single market, the Single Currency, and banking". FDIC Banking Review, 13, 1, pp. 1-18.
- Nakamura, L.I., 1991. "Commercial bank information: Implications for the structure of banking". Federal Reserve Bank of Philadelphia, WP 92-1.

- Neumark, D., and S. A. Sharpe, 1992. "Market Structure and the Nature of Price Rigidity: Evidence from the Market for Consumer Deposits". *Quarterly Journal of Economics* 107, 657-680.
- Norden, L., and Weber, M., 2006. "Funding modes of German banks: structural changes and its implications". Centre for Economic Policy Research (CEPR), London.
- Ongena, S., Smith, D.C. 2000. "What determines the number of Bank Relationships? Cross Country Evidence". *Journal of Financial Intermediation* 9, 25-56.
- Ongena, S., and Smith, D., 2001. "The Duration of Bank Relationships". Journal of Financial Economics, 61, 449-475.
- Pagano, M., Panetta, F., and Zingales, L., 1998. "Why do companies go public? An empirical analysis". *Journal of Finance* 53, 27-64.
- Park, K., Pennacchi, G., 2005. "Harming Depositors and Helping Borrowers: The Disparate Impact of Bank Consolidation". Working Paper, University of Illinois.
- Peek J., and E. S. Rosengren, 1998. "Bank Consolidation and Small Business Lending: It"s Not Just Bank Size That Matters". *Journal of Banking and Finance* 22, 799-819.
- Petersen, M. A. and R.G. Rajan, 1994. "The benefits of lending relationships: Evidence from small business data". *Journal of Finance* 49, 3–37
- Petersen, M.A., and Rajan, R.G., 2002. "Does distance still matter? The information revolution in small business lending". *Journal of Finance* 57, 2533-2570.
- Petersen, M.A., and Rajan, R.G., 1995. "The effect of credit market competition on lending relationships". *Quarterly Journal of Economics* 110, 406-443.
- Pilloff, Steven J. and Stephen A. Rhoades, 2000. "Do Large, Diversified Banking Organizations Have Competitive Advantages?" Review of Industrial Organization, 16(3), 2873-302.
- Rajan, R., H. Servaes, and L. Zingales, 2000. "The Cost of Diversity: The Diversification Discount and Inefficient Investment". *Journal of Finance* 55, 35-80.
- Rajan, R.G., 1992. "Insiders and outsiders: The choice between informed and arm"s-length debt". *Journal of Finance*, 47, 1367-1400.
- Ramakrishnan, R.T.S., and Thakor, A.V., 1984. "Information reliability and a theory of financial intermediation". *Review of Economic Studies* 51, 415-432.

- Reichert, A.K., and L.D. Wall, 2000. "The Potential for Portfolio Diversification in Financial Services". *Economic Review*, Federal Reserve Bank of Atlanta, (Third Quarter), 35-51.
- Rosen, R.J., 2007. "Banking market conditions and deposit interest rates". *Journal of Banking and Finance* 31, 3862-3884.
- Rosen, R.J., 2002. "What goes up must come down? Asymmetries and persistence in bank deposit interest rates". *Journal of Financial Services Research*, 21 (3), 173-193.
- Salas, V., and Saurina, J., 2002. "Credit risk in two international regimes: Spanish commercial and savings banks". *Journal of Financial Services Research* 22, 203-224.
- Santomero, A.M., and E.J. Chung, 1992. "Evidence in Support of Broader Banking Powers". Financial Markets, Institutions and Instruments 1 (1), New York University, Salomon Center, 1-69.
- Schiffer and Weder, 2001. "Firm size and the business environment: Worldwide survey results". Discussion Paper No. 43, International Finance Corporation, Washington, D.C.
- Shaffer, S., 1994. "Pooling Intensifies Joint Failure Risk". *Research in Financial Services* 6, 249–280.
- Sharpe, S.A. 1990. "Asymmetric information, bank lending and implicit contracts: A stylized model of customer relationships". *Journal of Finance* 45, 1069-1087.
- Sinkey, J.F. Jr., and R.C. Nash, 1993. "Assessing the Riskiness and Profitability of Credit-Card Banks". *Journal of Financial Services Research* 7, 127-150.
- Stein, J.C., 2002. "Information Production and Capital Allocation: Decentralised vs. Hierarchical Firms". *Journal of Finance* 57, 1891-1921.
- Stiroh, K.J., 2004a. "Do Community Banks Benefit from Diversification?" Journal of Financial Services Research 25 (2/3), 135-160.
- Stiroh, K.J., 2004b. "Diversification in Banking: Is Noninterest Income the Answer". Journal of Money, Credit, and Banking, 36 (5), 853-882.
- Stiroh, K., and A. Rumble, 2006. "The Dark Side of Diversification: The case of U.S. financial holding companies". *Journal of Banking and Finance*, 30 (8), 2131-2432.

- Stiroh, Kevin J. and Jennifer P. Poole, 2000. "Explaining the Rising Concentration of Banking Assets in the 1990s." Current Issues in Economics and Finance, Federal Reserve Bank of New York, 6(9).
- Strahan, P.E., and J.P. Weston, 1998. "Small Business Lending and the Changing Structure of the Banking Industry". *Journal of Banking and Finance* 22, 821-845.
- Thakor, A.V, 1996. "Capital requirements, monetary policy, and aggregate bank lending: Theory and empirical evidence". *Journal of Finance* 51, 279-324.
- Von Thadden, E.L, 1995. "Long-term investments, short-term investment and monitoring". *Review of Economic Studies*, Vol. 62, pp. 557-575
- Wall, L.D., A.K. Reichert and S. Mohanty, 1993. "Deregulation and the Opportunities for Commercial Bank Diversification". *Economic Review*, Federal Reserve Bank of Atlanta, September/October, 1-25.
- Wall, L.D., and R.A. Eisenbeis, 1984. "Risk Considerations in Deregulating Bank Activities". *Economic Review*, Federal Reserve Bank of Atlanta, May, 6-19.
- Walter, I., 1999. "Financial service strategies in the euro-zone". EIB Cahiers Papers, 4, 1, pp. 145-168.
- White, W., 1998. "The Coming Transformation of Continental European Banking?" BIS WP, No. 54.
- Williamson, O., 1988. "Corporate Finance and Corporate Governance". Journal of Finance 43, 567-591.
- Wolken, J., and Rohde, D., 2002. "Changes in the location of small businesses' financial suppliers between 1993 and 1998". Federal Reserve Board Memo.
- Yeager, T.J., 2004. "The Demise of Community Banks? Local Economic Shocks are not to Blame". *Journal of Banking and Finance* 28 (9), 2135-2153.
- Yosha, O., 1995. "Information disclosure costs and the choice of financing source". *Journal* of Financial Intermediation 4, 3-20.
- Zephirin, M.G., 1994. "Switching Costs in the Deposit Market". *Economic Journal* 104, 455-461.