

The Forging of a Common Market

Retail Banking Integration in the Nordic and Baltic Countries

Master's thesis in Finance
Stockholm School of Economics
Johan Spetz[♣] and Jakob Wanag[♠]

Abstract: In this thesis we employ a partial adjustment model to quantify the level of integration in the Nordic and Baltic retail banking market. Based on assumptions regarding market contestability and takeover threat we are able to use convergence in profitability as a proxy for integration. Our results clearly show that the overall level of integration is high, but that there are differences across bank types, countries and time periods. As expected, convergence is generally higher for listed banks than savings banks and government sponsored banks. Removing all observations from 2008 accentuates this difference as the financial crisis seems to exaggerate the rate of convergence for savings banks and government sponsored banks, especially “from below”. The high level of integration indicates that the Nordic and Baltic countries are a single retail banking market, which has major implications for bank strategy and public policy.

Keywords: *Banking, profitability, integration, Partial Adjustment Model.*

Tutor: Peter Englund
Discussants: David Enander (18801) and Jonas Wikfeldt (21085)
Presentation: Room 550, 16 November 2009

We would like to thank our tutor Peter Englund for all his help and advice, and Per-Olov Edlund for his valuable input on econometric issues.

[♣] 20054@student.hhs.se

[♠] 20143@student.hhs.se

Table of Contents

1. Introduction	1
2. Literature	3
2.1. The integration process	3
2.1.1. Forces working in favor of continued integration	3
2.1.2. Forces working against of continued integration	3
2.2. Measuring retail banking integration.....	4
2.2.1. Traditional metrics	4
2.2.2. Integration studies on Nordic data.....	5
2.3. A new metric for retail banking integration	5
2.3.1. The need for a new approach.....	5
2.3.2. Focus on convergence in profitability	6
3. The Nordic and Baltic retail banking market	7
3.1. The geographical and industry scope	7
3.2. Common features of the Nordic and Baltic retail banking market.....	7
3.2.1. Similar structural changes	7
3.2.2. Regulatory harmonization	8
3.2.3. Akin business cycles	8
3.3. Persisting national differences.....	9
3.3.1. Retail banking market composition.....	9
3.3.2. The financial crisis of 2008	11
3.4. The major retail banking groups in the Nordic and Baltic region	11
4. Methodology	12
4.1. Defining integration	12
4.2. Hypotheses	12
4.3. Partial adjustment model	13
4.4. Our model specifications.....	14
4.5. Variables.....	14
4.6. Data	15
4.7. Categories.....	16
4.8. Sample descriptives.....	17
5. Results	19
5.1. Convergence in retail bank profitability.....	19
5.2. Convergence from above and from below	20
5.3. Effects of the financial crisis of 2008.....	20
5.4. Summary of results.....	21
6. Robustness tests.....	22

6.1. Model functionality	22
6.2. The validity of our results	22
6.2.1. Interpreting the results.....	22
6.2.2. Further validation of country specific effects.....	23
6.2.3. Comparing our results to previous research	23
6.3. Return on equity as profitability measure	24
7. Analysis.....	25
7.1. Overall integration.....	25
7.2. Convergence in profitability across bank types, countries and profitability	25
7.2.1. Integration among listed banks.....	25
7.2.2. Integration among unlisted commercial banks.....	26
7.2.3. Integration among savings banks and government sponsored credit institutions.....	26
7.2.4. Country effects	27
7.2.5. Relative performance effects.....	28
7.3. General impacts of 2008: Is integration dependent on the business cycle?	28
7.4. Wrapping up: Implications for bank strategy and public policy	29
7.5. The ambiguous effects of high integration in banking.....	29
8. Discussion of limitations	31
8.1. Difficulties with unbalanced panel data	31
8.2. Sample size and data comparability	31
8.3. The validity of our assumptions and proxy	31
8.4. Difficulties in testing the difference between estimated coefficients.....	32
9. Conclusions and further research	33
References	34
Appendix A – Tables.....	37
Table I: M&A activity 1997-2007 forging the large retail banking groups in the Nordic and Baltic region.....	38
Table II: Our sample of Nordic and Baltic retail banks during the years 2008-1999.	39
Table III: The group of Nordic and Baltic retail banks excluded from our sample.	40
Table IV: Our sample ROA and Δ ROA.	40
Table V: Results table for type specific convergence tests both including and excluding 2008 observations.....	41
Table VI: Results table for country specific convergence tests and both country and type specific convergence tests, including and excluding 2008 observations.	42
Table VII: Results table for convergence tests for banks with below and above average ROA, including and excluding 2008 observations.	43
Table VIII: Results table for the randomized convergence test.	44
Table IX: Results table for regression using the second lag of the dependent variable as an instrument for the lagged dependent variable.	44
Table X: Results table for dummy variable regression with country fixed effects.	44
Table XI: Results table for convergence in ROE robustness test.....	45
Appendix B – Figures.....	46

Figure I: Chart comparing the largest Nordic retail banking conglomerates in terms of size, measured in total book value of assets.	46
Figure II: The composition of our sample in terms of country of incorporation.....	46
Figure III: The composition of our sample in terms of bank type.....	47
Figure IV: The development of average ROA for all banks 2000 – 2008.	47
Figure V: The development of average ROA for all listed banks 2000 – 2008.	47
Figure VI: The development of average ROA for all savings banks 2000 – 2008.	48

1. Introduction

Banks play a vital role in the economy as they provide the infrastructure for channeling savings into funding of productive projects, managing and allocating various kinds of risk, and facilitating efficient payments. The more efficiently the financial system works, the better the rest of the economy will work. One could say that the financial system is the oil that makes the machinery run more smoothly (Srejber (2006)). Consolidation within the banking industry, globalization and capital market integration have rendered the role of banks increasingly important and complex (McGuire and Tarashev (2008)). In the recent financial crisis, the crucial role of the banking system was brutally obvious for many individuals and corporations, as credit became scarce and expensive.

New regulation and technology are introduced to spur international integration of the banking industry, especially at a European level (Cabral et al (2002)). The intention from policy makers is to increase efficiency in the industry by promoting cross-border competition and ultimately to provide consumers with good quality services at lower prices. One example of such a measure is the removal of many barriers to entry in European national banking markets, following studies showing that new market entry is always socially beneficial except when bank failure is very likely or very costly (Kaa (2004)). Greater competition and better opportunities to make use of economies of scale and synergies should in turn result in a wider range of investment and financing services and more efficient pricing of these services (Srejber (2006)).

Over the course of the past decades, retail banks in the Nordic region have expanded their operations abroad. Already in the early 1990's, observers pointed out the increasing relevance, not least for the regulator, of treating the Nordic countries as one retail banking market (Marquart (1998)). The leading Nordic banks themselves consider the whole region as their home market (Danske Bank (2009), Nordea (2009) and others).

Banking integration is an important issue to explore since properly defining the market and understanding its structure has great implications both for banks' strategic decisions and governments' risk assessments and policy development. In addition, the potential social benefits of a more integrated financial system are substantial. There is increasing evidence that integration leads to more efficient banks and growth of the real economy (Heikensten (2004)).

This thesis examines retail banking integration in the Nordic and Baltic countries. We employ a recently developed methodology that focuses on convergence in profitability (measured as return on assets) across banks. Our purpose is to quantify integration in the Nordic and Baltic retail banking market as a whole, as well as in different market segments. We will mainly focus on integration across national borders and between the commercial bank, savings bank and government sponsored bank market segments. By including these three bank types, we capture the lion's share of the retail banking

industry. We hope to add to the present body of literature on the integration process of Nordic and Baltic retail banking. Our regional focus makes our study unique in its kind.

This thesis is structured as follows. Section two sets the stage for our study by offering a brief introduction to the literature on retail banking integration as well as to some empirical studies done so far on the Nordic and Baltic region. Section three provides a description of the different national markets and presents the notion of a single market. Section four presents the methodology employed in our study. Our most important findings are presented in section five, followed by robustness tests in section six. We present our analysis of the results in section seven, followed by a discussion on our study's limitations in section eight. Finally, our conclusions and suggestions for further research are summarized in section nine.

2. Literature

In this section, our aim is to briefly present the more recent literature on retail banking integration. First, we present the forces in play when it comes to integration; both forces contributing to the integration process and forces working against it. Second, we review the most common measurements of integration used by researchers and what they have told us about banking integration in the Nordic and Baltic countries. Third, we introduce a new metric for banking integration proposed by Gropp and Kashyap (2009), and the rationale behind it.

2.1. The integration process

2.1.1. Forces working in favor of continued integration

Most observers agree that the retail banking industry is becoming more and more integrated on the back of commercial and financial globalization (Berger et al (2003), Perez et al (2005), Cabral et al (2002)). The obstacles to global integration in the banking industry have been significantly and continuously reduced over the past two decades. Among the contributing factors have been the removal of restrictions on cross-border banking, technological advances, and general increases in non-financial activities that demand international banking services (Berger et al (2003)).

Heikensten (2004) summarizes the academic literature on banking integration and finds evidence of economies of scale in retail banking, which should explain domestic consolidation, international expansion and integration. Another significant factor contributing to integration is the development of techniques for remote access to retail banking services. Telephone and internet banking lower entry barriers and increase market contestability (Cabral et al (2002), Corvoisier and Gropp (2009)). Regulatory changes are also lifting barriers to cross-border bank mergers and acquisitions (M&A), spurring market contestability and integration (Buch and DeLong (2004), Köhler (2007), Köhler (2008)).

2.1.2. Forces working against of continued integration

However, factors working against a global integration process persist. Despite the reduced barriers, the integration of the banking industry in most developed countries has fallen far short of the expectations of many observers. Berger et al (2003) argue that foreign banks may be at significant competitive disadvantages in providing the price, quality, and mix of services that best suit local customers, and that such disadvantages may limit the integration of the banking industry. Berger et al (2002) argue that the banking industry may never become fully globally integrated (one global market), even after adjusting to deregulation, technological progress and increased cross-border non-financial activity.

The European Central Bank (ECB), while a solid promoter of retail banking integration, acknowledges that there is still a long way to go in many European markets (ECB (2004)). ECB researchers see how some of the inherent characteristics of the traditional loan and deposit business

create costs of entry, thus constraining cross-border expansion of commercial banking, even in a common currency area like the Euro-zone. For instance, a wide branch network is still somewhat of a necessity in order to gain retail banking market shares. Since branch networks involve large investments, incumbent banks have a major competitive advantage (ECB (2004)). Corvoisier and Gropp (2009) agree, showing that banking markets in Europe are not perfectly contestable and suggesting that physical bank presence continues to matter, especially for loan markets. Heikensten (2004) argues that since cross-border expansion often involves a merger or acquisition, further entry costs apply, such as re-organizations, abiding to new regulations and political deliberations.

Many papers in the area of banking integration also discuss various cultural and linguistic factors that might limit integration. The standard argument is that banking is a relationship business, where a large part of a bank's value lies in its customer relationships (Heikensten (2004)). It is from these relationships the banks add value by using their expert knowledge about the financial needs and risks of its customers and the local economy. As a foreign bank, the sources of value are less obvious, since the natural expert knowledge is lost. There is also some support for the existence of a reluctance of consumers to switch to foreign banks. Reputation is crucial in banking, and lack of name recognition or lack of confidence can deter consumers from switching to foreign banks (Cabral et al (2002)). Evidence suggests that this mentality is present even in large multinational corporations, further limiting the prospects of global banking integration (Berger et al (2002)).

A final factor limiting cross-border retail banking integration is the strategic behavior on the part of incumbent banks to deter market entry. The idea is that comfortable margins in less competitive segments allow incumbents to compete intensively in other segments, deliberately incurring temporary losses (Cabral et al (2002)). Strategic behavior may also include limiting access to payment systems for new entrants, if the payment systems are established by the banks themselves. In a perfect world, however, effective EU competition rules should deter such behavior.

2.2. Measuring retail banking integration

2.2.1. Traditional metrics

When trying to quantify retail banking integration, a number of different measures can be used. Common measures in the literature are (a) the fulfillment of the law of one price in banking services, (b) cross-border deposits and loans, (c) the market share of foreign banks, and (d) cross-border bank M&A.

When looking at the fulfillment of the law of one price, a researcher would examine for instance fees for cross-border transfers or interest rates in different countries. Convergence in price would suggest market integration. Adam et al (2002) is a good example of a paper using this metric. The authors examine the convergence in interest rates on commercial and mortgage loans in Europe and find low convergence after 1999. Thus, they conclude that retail banking markets are lacking integration. Martin-Oliver et al (2005) perform a similar study, and find support for convergence in Spanish interest rates to long-term values. Examining cross-border banking business, the second traditional metric,

would involve tracking and measuring lending or depositing between countries or regions. Dermine (2005) uses this measure and is able to determine that the levels of cross-border deposits and lending in Europe are low but increasing. The market share of foreign banks, the third common metric, is also quite easily observable in data provided by financial authorities and therefore a simple metric to use in studies. Linked to this metric are cross-border M&A in banking, which some authors choose to focus on, for instance Buch and DeLong (2004). The idea behind these three final metrics is that increased cross-border activity is a sign of market integration.

2.2.2. Integration studies on Nordic data

Some studies applying these traditional metrics have been made on Nordic data. When examining the average yearly cost of bank services for a family in the different Nordic countries, Juul (2006) finds significant discrepancies, suggesting lacking integration. In Denmark, the bundle of services is on average 40 percent cheaper than in Norway, Sweden, Iceland and Finland, where the prices are more similar. Juul also finds large price differences within each country. Regarding mortgage interest rates, the differences were smaller, but nevertheless present. As for cross-border banking, foreign banks have prominent positions in many Nordic and Baltic markets (Nordic Central Banks (2006)). Markets generally seem contestable in the region, for example during the period 1993 – 2006, 22 banks entered the retail banking market in Sweden, seven of which have since left the market through mergers or acquisitions (Nordic competition authorities (2006)). Regarding cross-border M&A, there has been significant consolidation in the Nordic and Baltic region over the past decade (Nordic Central Banks (2006)). We have not found any studies on cross-border deposits and loans in the Nordic countries and empirical studies on banking integration regarding the Baltic countries are also generally hard to come by.

2.3. A new metric for retail banking integration

2.3.1. The need for a new approach.

There are several arguments against using the traditional measures of retail banking integration presented above. First, Dermine (2005) presents several reasons why the law of one price for bank services would not be a suitable metric of market integration. One crucial assumption behind the law is that the products examined are totally homogenous. However, local bank knowledge, proximity, and national legal systems will create differentiated banking products. Also, the law of one price might be applicable only at a bundle of services level. Therefore, local differences in pricing do not say much about the level of integration. Conversely, equal treatment need not equate integrated markets, since prices might be set by an oligopoly (Dermine (2005)). Along the same lines, Affinito and Farabullini (2009) show that interest rates are less dispersed when controlling for domestic borrower characteristics. The authors conclude that euro area prices appear different because national banking products appear different or because they are differentiated by national factors. Hence, price differences would not

represent a failure of integration, rather high heterogeneity of the products exchanged (Kleimeier and Sander (2004)).

Second, cross-border retail flows of deposits and loans do not constitute a necessary condition for retail banking integration. One could argue that the threat of such flows could be enough to ensure perfect integration (Gropp and Kashyap (2009)).

Regarding the other two commonly used measures; market share of foreign banks and cross-border bank M&A, a similar argument applies. Neither is necessary, nor sufficient, for financial integration to take place. Köhler (2008) points out that this metric often is further blurred by political interventions to protect domestic target banks.

2.3.2. Focus on convergence in profitability

Gropp and Kashyap (2009) therefore present a novel approach to measuring retail banking integration, focusing on convergence in bank profitability. Stigler (1963) laid the foundations for this approach when providing evidence that market contestability and competition among American industrial companies result in convergence in profit margins. When markets are integrated, market entrants and the threat of takeover will lead to such a convergence. New entrants reduce industry profitability by competition, and the threat of takeover forces poorly performing banks to improve (Stigler (1963)). Integration is thus defined as the absence of barriers to entry and takeovers (Gropp & Kashyap (2009)). The persistence of large differences in profitability between countries' banking systems will spur banks to undertake cross-border expansion (Heikensten (2004)). The argument for forces of convergence from below is supported by Hernando et al (2008) who analyze the determinants of bank acquisitions both within and across the 25 members of the European Union during the period 1997 – 2004. Their results suggest that poorly managed banks, measured as a high cost-to-income ratio, are more likely to be acquired by other banks in the same country. In their empirical study, Gropp and Kashyap (2009) find that European listed banks' profitability appears to converge to a common level; competition eliminates high profits and underperforming banks tend to improve their profitability. However, unlisted European banks show no tendency to revert to any common target rate of profitability. Overall, the banking market in Europe appears far less integrated than in the U.S., the authors conclude.

To our knowledge, no work has yet been done on convergence in profitability for banks in the Nordic and Baltic region. However, the Nordic competition authorities examined the retail banking market in 2006, and found that Nordic banks appear to have been somewhat more profitable than the counterparties of five European countries (Germany, Austria, United Kingdom, Ireland and the Netherlands) during the period of 1994 – 2003 (Nordic Competition Authorities (2006)). One suggested reason for the higher profitability is the rationalization and restructuring of the industry which followed in the wake of the banking crisis in the early 1990's (Nordic Central Banks (2006)). We hope to add to the existing literature by examining in detail the convergence in profits and thus increased market integration in the Nordic and Baltic region.

3. The Nordic and Baltic retail banking market

In this section, we first define our market of interest, both in geographical and industry terms. Second, the similarities and common trends of the national markets are summarized and the notion of a common market is presented. We then describe some of the interesting differences persisting across the region. Finally, the major players in the Nordic and Baltic retail banking market are introduced.

3.1. The geographical and industry scope

In this thesis, we examine integration in the Nordic and Baltic retail banking market(s). We therefore include banks incorporated in Iceland, Denmark, Norway, Sweden, Finland, Estonia, Latvia and Lithuania. We include the Baltic countries since their banking markets are dominated by Nordic banking groups and the commercial and cultural ties linking these countries to the rest of the region are numerous.

We focus on the retail banking industry, which is different from wholesale or investment banking and often perceived as the traditional business of banks. The counterparties are mainly households or small firms and the products include various loan and deposit types and payment services. Asset management, in the form of investment advice, mutual funds, pension schemes and life insurance, are also increasingly common retail banking services (Cabral (2002)). Even after the advent of online banking, proximity to the generally immobile customers remains integral for retail banks (Corvoisier and Gropp (2009)). A number of different types of corporate structures are present on the Nordic and Baltic retail banking market, all performing retail banking services. These different bank types will be presented in section 4.7.

3.2. Common features of the Nordic and Baltic retail banking market

3.2.1. Similar structural changes

The national markets have undergone similar structural changes over the recent decades. Until the middle of the 1980's, the average Nordic banking market consisted of four types of institutions (Juul (2006)). First, securities brokerages acted as intermediaries in asset transfers. Second, insurance companies tended to life, non-life and pension scheme needs. Third, credit institutions offered financing against collateral. Fourth, banks provided loan/deposit services and payment solutions. The markets were regional or national, but seldom international. Since then, financial sector M&A activity has increased and financial conglomerates have emerged as the prominent corporate structure, partly erasing the traditional partition between different specialized service providers. Modern Nordic and Baltic banks not only provide loans and deposit solutions, but often also mortgage loans, mutual funds and even insurance. Personal financial advisors evaluate the complete financial situation of the customer (Juul (2006)).

Banking constitutes important sectors of all Nordic economies, and the growth of banks' total assets has been rapid over the past decade. Banking sector total assets exceed GDP in every Nordic country, and the ratio has been increasing. In the case of Iceland, and to a certain extent Sweden, the high asset-to-GDP ratio is explained by credit expansion abroad and foreign acquisitions (Nordic Central Banks (2006)). The growth has rendered Nordic banks more dependent on international capital markets for short term funding, as deposits have not sufficed. The introduction of market economy in the Baltic countries in the early 1990's swiftly integrated the Baltic banks into the Nordic market consolidation process (Financial and Capital Markets Commission of Latvia (2009)). A smaller ratio of banks assets to GDP in these countries enabled remarkable lending growth, mostly provided by Nordic banking groups (Estonian Central Bank (2009)).

While the assets of the banking sector have increased rapidly throughout the Nordic and Baltic region over the past decade, the total number of bank employees has decreased, suggesting growing productivity in the sector. Continuous technological development means more customers can be handled with a smaller labor force (Corvoisier & Gropp (2009)).

3.2.2. Regulatory harmonization

Regulatory harmonization and financial market deregulation at an international level have changed the rules governing the retail banking market (Juul (2006)). One explicit goal of the European Union is the creation of a common market. In the words of the European Commission; achieving an integrated market for banks and financial conglomerates is a core component of the European policy in the area of financial services (European Commission (2009)). Hence, the EU has since long been pushing for regulatory changes to increase integration and create a level playing field across national borders.

Denmark, Sweden, Finland, Estonia, Latvia and Lithuania are all full members of the European Union, although the Baltic countries did not join until 2004. However, in preparation for the accession these countries undertook major reforms to privatize and deregulate their banking systems (Roland (2005)). Since 1992, Norway and Iceland are part of the European Economic Area (EEA) and hence accept to abide to EU banking regulation (Dermine (2005)). Over the years, new EU decisions have lifted restrictions on interest rates, capital controls, stock exchange membership, foreign bank entry, credit ceilings, investment requirements, banking license, and exposure concentration (Dermine (2002)). In addition to EU rules, Nordic and Baltic banks are also affected by the international standards set by the Basel Committee on Banking Supervision. Established by the Bank for International Settlements, the Basel Committee develops frameworks for assessing banks' risks and capital adequacy (Basel Committee on Banking Supervision (2006)).

3.2.3. Akin business cycles

The correlated business cycles of the Nordic and Baltic countries mean banks across the region face similar challenges. The economic environment has been benign in the Nordic countries during the last ten years, mainly supported by growing domestic demand and favorable developments in the world

economy. Increasing exports and profits in the corporate sector have supported GDP growth in the area and retail banks have been able to reap significant profits (Nordic Central Banks (2006)). In the Baltic countries, the business cycle has been even more pronounced, and so has the lending growth. Similarly, the financial crisis of 2008 had severe repercussions throughout the region. As seen in section 3.3.2. Iceland and the Baltic countries were affected the most.

It is also important to bear in mind that the banking crisis in the Nordic countries in 1990-1991 played a significant part in shaping today's market and the banking business cycle. This crisis resulted in rationalization and restructuring of the industry, rendering the Nordic banking sector more cost effective and more profitable than other European banking sectors (Nordic Central Banks (2006)). For the major banks, profitability has also been underpinned by technological advances and economies of scale from expanding to other Nordic countries, as discussed above.

3.3. Persisting national differences

Numerous similarities exist between the countries in the region. However, since we are dealing with eight independent states, some important differences are bound to remain. These include market size, market concentration and foreign bank presence. The damage caused by the recent financial crisis has also varied across the region.

3.3.1. Retail banking market composition

The national markets are of varying size, based on population. The Swedish population is the largest (9.3 million), followed by the Danish (5.5 million), Finnish (5.3 million), Norwegian (4.8 million), Lithuanian (3.4 million), Latvian (2.3 million), Estonian (1.3 million) and Icelandic (0.3 million) respectively (Eurostat (2009)). The national markets are serviced by local and international commercial banks and local savings banks.

In Sweden, there are around ten commercial bank groups, of which five are more prominent, and around 80 local savings banks (Swedish Financial Supervisory Authority (2009)). In Denmark, the total number of banks is higher, primarily due to a much higher number of commercial banks (Danish Financial Supervisory Authority (2009)). In Finland, the total number of banks is higher still, but most of them are small, local savings banks or cooperative credit distributors (Federation of Finnish Financial Services (2009)). The Norwegian market is quite similar to the Swedish, in that a limited number of commercial banks dominate the market, while around a hundred savings banks have strong local footprints (Norwegian Financial Supervisory Authority (2009)). In the Baltic countries, the total number of banks is much lower, and most of them are commercial banks (Estonian Financial Supervisory Authority (2009)). Iceland is a special case since the quasi-totality of the banking system is under government control as a result of the financial crisis. In early 2008, on the other hand, there were four large commercial banks in Iceland; Kaupthing, Landsbanki, Glitnir and Sparisjóðabanki Íslands (Icebank). The latter served as a banking institution for 24 local savings banks (Icelandic Financial Supervisory Authority (2009)).

Lending growth has basically been inversely related to market size over the past decade. The Baltic and Icelandic markets have experienced high growth, whereas the central markets in the region are more mature and hence display lower growth (Nordic Central Banks (2006))

Banking sectors in the Nordic and Baltic countries are generally highly concentrated to a limited number of domestic groups (Nordic Competition Authorities (2006)). However, interesting differences in market concentration and foreign bank presence remain.

The Swedish market is dominated by four large banking groups. Domestic banks Nordea, SEB, Handelsbanken and Swedbank together account for about 75 percent of total lending to Swedish consumers (Swedish Financial Supervisory Authority (2009)). Danish Danske Bank is the largest foreign bank in Sweden, but only the fifth largest bank in the market.

The Danish market is dominated by Danske Bank and Nordea, holding a combined market share of around two thirds of all deposits (Juul (2006)). Lending to the public from foreign banks constituted 30 percent of total lending in 2005. Almost all of the foreign activity stems from other Nordic banks, Nordea being the largest (Nordic Central Banks (2006)).

In Finland, the main banking groups are Nordea, the OP alliance of cooperative banks and Sampo Bank (owned by Danske Bank). These three players account for more than 80 percent of the total market (Nordic Central Banks (2006)). Foreign banks are thus most present in the Finnish market, and their market share is expanding.

The Norwegian market is dominated by DnB NOR and Nordea, with market shares of a third and 10 percent of all bank assets respectively (Norwegian Financial Services Authority (2009)). Relatively high market shares are held by savings banks, making the Norwegian market less concentrated. Foreign bank presence is lower in Norway than in most other countries in the region, but increasing. In addition to Nordea, Danske Bank the Icelandic banks Íslandsbanki and Glitnir have entered the market (Nordic Central Banks (2006)).

In the Baltic countries, a small number of foreign banks dominate the landscape. In Estonia, Swedish Swedbank held a 50 percent share of total bank assets at year-end 2008. Another Swedish bank, SEB, controlled another 20 percent of total assets (Estonian Banking Association (2009)). In Latvia, Swedbank's and SEB's shares of total bank assets were 23 and 13 percent respectively at year-end 2008 (Association of Latvian Commercial Banks (2009)). In Lithuania, the same two banks held a combined market share of 56 percent of all loans in 2007 (Lithuanian Central Bank (2008)). In aggregation, dependency on foreign banks is high in the Baltic countries. Swedbank, SEB and Nordea have a combined market share of approximately 70 percent in the region (Nordic Central Banks (2006)).

In the case of Iceland, the four large commercial banks seem to saturate the domestic demand, as foreign bank activity is low (Icelandic Financial Services Authority (2009)).

The Baltic countries and Finland are more dependent on foreign banks than other countries in the region. At the same time, Swedish and Icelandic commercial banks have expanded internationally to

a higher extent than banks of other countries. At year-end 2007, about half of the lending of the four major Swedish banking groups went to non-residents, mostly in other Nordic and Baltic countries (Swedish Central Bank (2008)). Icelandic banks also expanded rapidly in other Nordic countries, but they also entered the UK market (Icelandic Financial Supervisory Authority (2009)). In early 2008, more than two thirds of deposits of Icelandic banks were from non-residents.

3.3.2. The financial crisis of 2008

Logically, the financial crisis of 2008 had major implications for the integration process in retail banking (Financial Times (4/29 2009)). Most Nordic and Baltic governments have been forced to step in to shore up the banking system. So far (September 2009), Iceland and the Baltic states have been hardest hit. The Icelandic government nationalized most of the banking system in October 2008 (Icelandic Financial Supervisory Authority (2009)). New Kaupthing was created, comprising of the remains of Kaupthing, Landsbanki, Glitnir and Sparisjóðabanki Íslands (Icebank), as well as investment bank Straumur-Burdaras (Financial Times 3/9 2009)). In the Baltic countries the economic pain is felt more through a severe recession and brutally reversed credit streams than outright bank failures. Nevertheless, bank failures have happened, the most prominent example being the Latvian government's take-over of Parex Banka, a major independent national bank, in late 2008.

The main reason for the relative absence of a bank failure in the Baltic region could be that all remaining major banks are foreign. Swedish banks Swedbank and SEB are exposed as bad loans and delinquencies are on the rise, but so far they seem to weather the storm (Affärsvärlden (5/13 2009), Financial Times (4/23 2009), Swedbank and SEB). The Danish banking sector also feels the crisis, even though the broader economy is holding up much better than in Iceland and the Baltic states. Roskilde bank, with SEK 48 billion in assets (€4.8 billion), and Forstaedernes Bank, with SEK 42 billion in assets (€4.2 billion), are the most prominent casualties so far (Danish Financial Supervisory Authority (2009)). The size of these banks can be put in relation to the SEK 5311 billion in assets (€477 billion) of Danish market leader Danske Bank.

3.4. The major retail banking groups in the Nordic and Baltic region

We have outlined how bank M&A over the past 20 years has created several financial conglomerates in the Nordic region which have outgrown their respective domestic markets. As these groups operate all over the region and to a large extent shape the market, it seems appropriate to present them in some more detail. In Table I (Appendix A), we show how these groups emerged as market leaders. Nordea is the most diversified across the region, holding 40 percent of bank assets in Finland, 25 percent in Denmark, 20 percent in Sweden, and 15 percent in Norway (Dermine (2005)). Market leader contender Danske Bank is more dependent on Denmark and Sweden in terms of lending (Danske Bank (2009)).

Figure I: Chart comparing the largest Nordic retail banking conglomerates in terms of size, measured in total book value of assets.

4. Methodology

In this section we first define integration and introduce our hypotheses. We then proceed by presenting the partial adjustment model and specifying the model we employ in this thesis. We continue by describing the construction of our variables, data set and bank categorization, before presenting some descriptive statistics of our sample.

4.1. Defining integration

The purpose of this thesis is to quantify to what extent the Nordic and Baltic retail banking market is integrated. We define market integration along the lines of Stigler (1963) and Gropp and Kashyap (2009) as the absence of barriers to entry and takeovers. This definition is based on two critical assumptions. The first assumption is that excessive profits will attract market entrants and that this increased competition will reduce profits. Note that this concerns both geographical and product markets. The second assumption is that the market for corporate control forces banks with low profitability to improve. If they do not, they will be acquired by someone who will. It is important to stress that actual market entry or M&A activity need not occur, merely the threat is enough. This implies that if the threats of new market entrants and takeovers are present, profitability in the market will converge over time. We can therefore use convergence in profitability as a proxy for market integration.

4.2. Hypotheses

We expect our tests to indicate that there is integration in the Nordic and Baltic retail banking market. The regulatory harmonization process taking place over the last decade is evidence of decreasing barriers to entry, while the frequent M&A activity across the region suggests that there is a functioning market for corporate control. Furthermore, finding support for integration would also be in congruence with the general findings in section 2, despite the fact that these studies use other definitions of integration than us.

Hypothesis 1: All Nordic and Baltic banks converge towards a common profitability level.

We further expect some differences in profitability convergence to remain across the banks in our sample. Country and bank characteristics, as well as a bank's relative profitability, are likely to influence the rate of convergence. To achieve a clear and explicit statistical result, we use the opposite view as our second hypothesis.

Hypothesis 2: The rate of convergence is identical across banks, regardless of country origin, bank type and profitability.

To empirically test these hypotheses we follow the methodology developed by Gropp and Kashyap (2009) and use the partial adjustment model (PAM) to measure the rate of convergence in return on assets among Nordic and Baltic retail banks towards a set of proxies for the equilibrium profitability rates, henceforth called benchmark ROA, during the period 2001 – 2008.

4.3. Partial adjustment model

A PAM consists of two parts; a static part (1), which assumes that the equilibrium value of the dependent variable depends on some explanatory variable(s), and a dynamic part (2), which is introduced since the equilibrium level is rarely known. In the dynamic part it is assumed that, each period, the true change of the dependent variable is a portion, λ , of the desired change. The desired change is the difference between the current equilibrium level and the dependent variable's value in the previous time period, implying that economic agents have an expectation of the future. Over time, if the desired change has explanatory power over the actual change, the actual level of profitability will converge towards the benchmark and λ will be high.

$$y_t^* = \beta_1 + \beta_2 x_t \quad (1)$$

$$y_t - y_{t-1} = \lambda(y_t^* - y_{t-1}) + u_t \quad (2)$$

Expression (2), also known as the partial adjustment hypothesis, can be rewritten as (3), which clearly shows that the current value y_t is a weighted average of the desired value and the previous actual value. λ measures the speed of adjustment where a low value would indicate a very sluggish adjustment each period towards the equilibrium level (Gujarati (2003)).

$$y_t = \lambda y_t^* + (1 - \lambda)y_{t-1} + u_t \quad (3)$$

Since the equilibrium level y_t^* is rarely known, equation (3.1) is often used to estimate the speed of adjustment λ , by assuming that the two coefficients in (3) add up to unity.

$$y_t = (1 - \lambda)y_{t-1} + e_t \quad \text{where } e_t = \lambda y_t^* + u_t \quad (3.1)$$

However, when adjustments in the lagged dependent variable are infrequent and lumpy, $(1-\lambda)$ will be biased towards zero and indicate an instantaneous adjustment of y_t to the equilibrium level (Caballero and Engel (2003)). This is relevant in our case, since the threats of market entry and takeover are continuous, constantly adjusting the benchmark and the rate of return for each market participant. The observed adjustments, on the other hand, are yearly events. The rate of return appears unchanged between observations, which is hardly the case. Once the rate of return is observed, it includes the continuous adjustments between observations. This leads to an exaggeration of the true adjustment and thus the bias in the rate of convergence estimation. Accordingly, this bias is aggravated by increasing the time period between observations.

Therefore, we have to estimate λ by using a proxy for the equilibrium level and dropping the restriction that the two coefficients should add up to one. In expression (3.2) the rate of convergence can be directly estimated and β is expected to be close to 0.

$$y_t = \lambda y_t^* + \beta y_{t-1} + u_t \quad \text{where } \beta \neq (1 - \lambda) \quad (3.2)$$

Once the speed of convergence is calculated, the full PAM continues by inserting expression (1) instead of y_t^* in (3) to obtain a model for y_t with only observable variables. This model can then be used to compute the true equilibrium level y_t^* . However, for our purpose we make no assumptions as to what drives the equilibrium level. Instead we focus on our variable's speed of convergence, λ , towards a calculated proxy for the equilibrium level y_t^* . Under the rational expectations assumption such calculations are possible by using historical realized returns, as they are then the best proxy for agents' expectations (Kennan (1979)).

4.4. Our model specifications

We formally use expression (4) in our regressions, which we obtain by substituting y in expression (3.2) for measures of return on assets for each bank-year and rewrite it to the differenced form. The differenced form addresses the first order serial correlation problem potentially present when using time series, making our variables consistent for OLS estimations.

Taking the first difference would naturally remove the intercept. However, we choose to keep the intercept for all tests since forcing the regressions through the origin could influence our coefficients. Keeping the intercept also allows us to meaningfully compare λ coefficients (rates of convergence) across the different sub-samples of banks (Gropp and Kashyap (2009)).

$$\Delta ROA_{it} = \alpha + \lambda \Delta ROA_t^* + \beta \Delta ROA_{it-1} + w_{it} \quad (4)$$

We test our hypotheses by running OLS regressions on different sub-samples of banks towards proxies for equilibrium levels. The flexibility of the model enables us to test the overall level of convergence as well as the convergence of over-performing and under-performing banks in isolation. Hopefully, this will deepen our understanding of the integration process, as low convergence from above would indicate poor market contestability, while low convergence from below would indicate limited takeover threat.

4.5. Variables

We construct our measure of return on assets by dividing pre-tax profit by the book value of assets in the preceding year. All three variables in our model are based on ROA; we use the first difference in ROA, the lagged first difference in ROA and the first difference in ROA*. ROA*, our proxy for the long-term equilibrium profit level, is calculated as the equally weighted average ROA for a certain group of banks. For example, when we examine the convergence of ROA of all banks to the listed bank average ROA, we use the listed banks' average ROA as ROA*.

Many considerations are taken into account when we construct our performance measure. First of all, we use pre-tax earnings to increase comparability across countries with different tax rates. Secondly, we use book values rather than market values when we calculate ROA to be able to include unlisted banks as well as listed ones. The drawback of using book values is that differences in accounting rules and practices impair comparability. One illustrative example is the possibility for Swedish banks to move parts of their pre-tax profit between calendar years, decreasing comparability of actual operating performance over time. However, we choose to use book values since a larger number of banks means a more complete picture of the market.

An alternative approach to using ROA would be to use return on equity (ROE) as the profitability measure. One argument against ROA is that the assets of a company can be affected by off-balance sheet operations, whereas equity is not. On the other hand, differences in tax regulations across jurisdictions can influence bank leverage ratios and thereby affect ROE. Neither measure is therefore perfect without adjusting for these tax and/or off-balance sheet effects. We choose to use ROA in our primary tests, but repeat some tests using ROE to verify the robustness of our results.

4.6. Data

We use Bureau van Dijk's ORBIS database of corporate information to compile pre-tax profits and book values of assets for all banks in Sweden, Norway, Finland, Denmark, Iceland, Estonia, Latvia and Lithuania, excluding Investment Banks, Securities Houses, Islamic Banks, Central Banks, Multilateral Governmental Banks and Micro-Financing Institutions, for the period 1999 – 2008. These search criteria return 667 banks for which we then compute ROA.

We reduce our sample stepwise by a number of procedures. First, we remove all banks with fewer than four ROA observations, leaving us with 339 banks. Second, we eliminate all banks that are part of the consolidated balance sheet of another entity to avoid using figures that may have been affected by intra-group transfers. This reduces our sample by another 77 banks, leaving us with 262 independent retail banks and 1,929 bank-year observations. We lose further observations when we calculate the first difference, ending up with 1,667 bank-year observations. In addition, for each test we remove the top and bottom two percent of the observations each year to control for outliers.

We keep observations for banks that have been acquired by other banks in our sample during the period, if the number of target bank observations before acquisition is four or more. After acquisition, only the acquirer's figures are used, since the balance sheets hereafter are consolidated. The same line of reasoning applies for banks taken over by governments in 2008. Also worth mentioning is the case when banks have been liquidated during the period. We keep the observations before liquidation in our sample.

4.7. Categories

We proceed by grouping all banks in our sample into different categories to be able to compare the level of integration across market segments. We classify the banks based on three criteria; country of incorporation, whether they are listed or not and bank type. The bank types we use are commercial banks, savings banks and government sponsored credit institutions. When bank characteristics are not obvious, we use bank web sites, annual reports or national financial supervisory authorities' web sites to verify our classification.

Country of origin is interesting for obvious reasons when studying regional integration. Due to the limited number of retail banks in the Baltic countries, we group them as belonging to one Baltic country/region.

The separation of listed and unlisted banks is a simple procedure based on stock exchange information, yet important since the assumptions underlying our integration measure are likely to hold stronger for listed banks. There is likely a better functioning market for corporate control for listed banks and shareholder returns should be the primary management objective.

We define commercial banks as profit maximizing banks operating on a national or international level. These are often listed companies. We also include bank holding companies, medium and long term credit banks and mortgage and real estate banks in our commercial bank category.

Savings banks operate on a local level, tending to the financial services needs of a well defined geographical area. These banks are often controlled by a trust-like structure aiming at reinvesting parts of the profit in the local community by donating funds to cultural, recreational or charitable causes. Savings banks are often organized on a national level to provide a package of services similar to a commercial bank, including for instance mortgages and mutual funds. Consequently, on a local level, the commercial bank and the savings bank are in direct competition. In especially Finland and the Baltic region, co-operative banks and so-called credit unions keep fractions of the market. These are customer-owned organizations channeling funds between members and we include them in the savings bank group. The threat of takeover should be weaker for savings bank than for commercial banks, especially listed ones. It is also unclear to what extent savings banks always want to maximize profits.

A final type of credit institution present on the Nordic and Baltic retail banking market is the government sponsored credit institution. These entities are set up to promote competition in well defined market segments or subsidize financing for certain sectors of the economy. In their chosen segments, these entities enter into direct competition with commercial and savings banks. An illustrative example is Swedish SBAB, explicitly set up to reduce mortgage rates. Like savings banks, government sponsored credit institutions are less exposed to the takeover threat than commercial banks and can sometimes have ambiguous management objectives.

4.8. Sample descriptives

Table II: Our sample of Nordic and Baltic retail banks during the years 2008-1999.

Figure II: The composition of our sample in terms of country of incorporation.

Figure III: The composition of our sample in terms of bank type.

Table II and Figures II-III present our bank sample. Danish, Swedish and Norwegian banks dominate, both in terms of number of banks and bank-year observations. In Sweden and Norway, savings banks are the dominant bank type, whereas commercial banks are more common in Denmark. The Baltic countries, Iceland and Finland have a combined share of bank-year observations of merely 12 percent. Of the 262 banks in our sample savings banks constitute 52 percent and commercial banks 43 percent. Table III describes the composition of the group of banks excluded via the procedures outlined in section 4.6.

Table III: The group of Nordic and Baltic retail banks excluded from our sample.

Figure IV: The development of average ROA for all banks 2000 – 2008.

Figure V: The development of average ROA for all listed banks 2000 – 2008.

Figure VI: The development of average ROA for all savings banks 2000 – 2008.

Figure IV shows the average rate of returns for all banks in our sample. It is clear that the different national markets have similar profit levels. The exception is Iceland, where the banks clearly outperformed during the period 2005 – 2007. Figure II tells us that Sweden, Denmark and Norway contribute with 88 percent of all bank-year observations, so it is no surprise that the average ROA is highly influenced by these three countries.

The basic assumptions underpinning our method are likely to hold stronger for listed banks. Looking at Figure V, Danish banks seem to outperform the average, whereas the Norwegian banks underperform. Since 2002, listed banks are more profitable than other banks. A mere visual examination of the chart suggests that Danish banks have a strong influence over the average listed ROA. Our data confirms this; 58 percent of all listed banks in the Nordic and Baltic region are Danish. Due to lack of observations we were unable to include more countries than Sweden, Denmark and Norway in Figure V.

Looking finally at Figure VI, we see that the average profitability is lower for savings banks than for listed banks. Only the Danish savings banks seem to match the average profit level for listed banks. Again, due to insufficient observations, we were unable to include the other countries in this graph.

Table IV: Our sample ROA and Δ ROA.

On an aggregated level ROA has a mean of 0.0157 and a median value of 0.0148, suggesting more extreme values on the positive side. Gropp and Kashyap (2009) find an average ROA in Germany, Spain, France, United Kingdom, Italy and United States of 0.0062. Our findings are reasonable since Nordic and Baltic banks have been more profitable than their European peers since the early 1990's (Nordic Central Banks (2006)). Our ROA sample has a standard deviation is 0.00299. The first difference of ROA, which we will use in our model estimations, has a mean of -0.0006. The standard deviation is 0.0268. This is expected given the stable level of profitability seen in Figure IV.

5. Results

In this section we present our results from testing for convergence in bank profitability in the Nordic and Baltic region. First, we quantify the rates of convergence for all banks as well as particular bank types and countries. Second, we test if bank performance matters for convergence. Third, we study how the recent financial crisis impacts the rates of convergence. To enable a quick overview, all our results are also presented in Tables V through VII, and summarized in the final part of this section. All coefficients are statistically significant at all reasonable levels, unless stated otherwise. Differences between coefficients (rates of convergence) are statistically verified using t-tests and the least number of degrees of freedom of the two regressions in the comparison. Under the null hypothesis that two coefficients are equal, we test for statistically significant difference at the 5 and 10 percent levels.

5.1. Convergence in retail bank profitability

Our assumptions underpinning the convergence in profitability are likely to hold stronger for listed banks than unlisted, since listed banks have unambiguous management targets and are more exposed to takeovers. We therefore primarily use average ROA for listed banks in the region as our profitability benchmark.

First of all, we find that all banks converge to the common listed mean profitability benchmark, indicated by a λ coefficient equal to 0.754. Such a rate of convergence means that, on average, 75 percent of the difference between a bank's profitability and the benchmark profitability disappears each year. Further tests shed more light on this figure. Listed banks converge faster ($\lambda = 0.888$) than savings and government sponsored banks to the benchmark, which is in line with the reasoning that the latter groups are less exposed to takeover pressure. The difference is quite small, but statistically significant at the 5 percent level. Surprisingly, unlisted commercial banks display a higher rate of convergence than listed banks, but the difference between the two groups' rate of convergence is not significant even at the 10 percent level.

To test for country specific effects we first examine how Danish banks bias our results for listed banks, given that they compose 60 percent of the listed bank sample and thus influence the benchmark heavily. Repeating our tests after excluding the Danish listed banks from our benchmark, from our sample, or both, indicates lower convergence among non-Danish listed banks. Danish listed banks, however, converge rapidly to the listed benchmark, even if they have been excluded from it. The rate of convergence of Danish banks is statistically different from that of the whole sample at the 5 percent level.

As for other country specific effects we test if the profit levels of all banks in each country converge to the regional listed bank average. We find that they do, but at quite different rates.

Convergence is poor among Swedish and most notably Norwegian banks, while Danish, Baltic and Icelandic banks converge at a rate close to, or higher than, one. These differences in convergence are all statistically significant at the 5 percent level.

To learn more about country and bank type specific effects we break our sample down according to both bank type and country. We find that Swedish savings banks converge faster to the listed mean than Swedish commercial banks, which is not in line with the overall results (however, the difference is not statistically significant at 10% level). In addition, the commercial banks' rate of convergence is also only significant at the 10 percent level. We find a similar effect in Denmark; savings banks converge faster than commercial banks, though the difference is again not significant. In Norway, the results are more in line with our overall results, as commercial banks converge more rapidly than savings banks. However, the difference again appears not to be statistically significant.

5.2. Convergence from above and from below

We proceed by investigating if convergence in profitability depends on relative performance. Specifically, we test if underperforming banks raise their profitability and/or if abnormally high profits are driven down. First, we test for convergence of listed banks with an above listed average ROA and for convergence of listed banks with a below listed average ROA, respectively. Convergence from below is significantly faster (at the 5 percent level) than from above for listed banks. Excluding the Danish listed banks from our sample yields quite different results, with considerably lower coefficients, especially for convergence from below. We can again reject the null hypothesis that the rate of convergence for underperforming banks is equal to that of over-performing banks at the 5 percent level, as well as again reject the hypothesis that Danish origin does not matter. Poor convergence from below thus seems to be the reason for the weaker convergence among non-Danish listed banks. This effect is further accentuated when we exclude observation from 2008, with significant differences between the two coefficients and previous ones.

Further tests show that for savings banks and government sponsored entities, convergence is weaker from below than from above. Importantly, unlisted commercial banks also converge better from above than below, which strengthens the basic assumption that unlisted banks are less exposed to the takeover threat. The differences between these coefficients are significant at 5 percent level.

5.3. Effects of the financial crisis of 2008

We exclude all 2008 observations to isolate the impact of the sudden drop in profitability that year, as seen in Figure IV. Our results show that the general market downturn had no impact on our listed banks' convergence rate; the null hypothesis of equal rates of convergence cannot be rejected at the 5 percent level. However, the financial crisis clearly influenced convergence for savings banks and government sponsored credit institutions. Most notably, the coefficient of convergence from below drops significantly (at the 5 percent level) from 0.592 to 0.376. This suggests that in 2008, savings

banks and government sponsored entities converged towards the benchmark at a much higher rate than during the rest of the period, especially from below.

Excluding all 2008 observations also impacts our estimated coefficients for the country samples of banks. Convergence for Swedish commercial banks improves somewhat from 0.359 to 0.458 (although the difference is not significant at the 10 percent level), whereas convergence for Swedish savings banks drops significantly from 0.527 to 0.142 (difference significant at the 5 percent level). It should be noted that the commercial banks coefficient is not significant and that the savings bank coefficient is significant only at the 10 percent level, when excluding 2008 observations.

Excluding 2008 observations from the Danish sample tells a similar picture. During the period 2002 – 2007, commercial banks converged faster than savings banks, but if we include 2008 the relationship is the opposite. In the case of Denmark the differences are smaller than in Sweden and not statistically significant.

For the Norwegian coefficients we cannot reject the null hypothesis that they are equal when excluding 2008 observations.

5.4. Summary of results

All banks converge to a common profitability benchmark, but there are differences across bank types, countries and time periods. As expected, convergence is generally higher for listed banks than for unlisted ones. Removing 2008's observations accentuates this difference as the financial crisis seems to overestimate the rate of converge for savings banks and government sponsored banks, especially from below. Unexpectedly, unlisted commercial banks show higher converge rate towards a listed mean than listed banks themselves. This seems mainly due to very high convergence from above.

Danish banks' increase the estimated convergence rates, while Swedish and Norwegian banks influence the estimations negatively. Poor convergence is especially observed for Swedish commercial banks and Norwegian savings banks. Icelandic banks exhibit a convergence rate higher than unity.

Our results also clearly show that no banks are able to sustain abnormal profitability for long, while underperforming banks tend to raise their profitability slowly. Convergence from below is relatively low for both listed and all unlisted banks.

6. Robustness tests

In this section we present several robustness tests to verify the functionality of our model, before discussing the validity of our results, both in their own right, in relation to each other and compared to previous research. In the final part of this section we further verify our results by repeating some of the tests using return on equity as profitability measure.

6.1. Model functionality

To verify that there are no fundamental problems with our model we perform tests using our original model and randomizing the ROA benchmark to which we test for convergence. We let the yearly average vary randomly between 0.01 and -0.01. As expected, this leads to insignificant and close to zero estimates of convergence, in other word nonsense. We also do a similar test where we keep the actual yearly averages, but randomize them across the period. Low and weakly significant rates of convergence result from this test.

Table VIII: Results table for the randomized convergence test.

We also test if the estimation bias for the lagged Δ ROA coefficient β affects our estimated rate of convergence λ , as shown by Phillips and Sul (2003). For this reason use the second lag of our dependent variable as an instrumental variable for the lagged Δ ROA to re-estimate our equations (Gropp and Kashyap (2009)). Our tests show that this change has no impact on our estimated coefficients of convergence, while the coefficients of the instrumental variable approach zero and statistical insignificance.

Table IX: Results table for regression using the second lag of the dependent variable as an instrument for the lagged dependent variable.

These tests signal that there are no major methodological flaws to our approach which could repeatedly exaggerate the rates of convergence and bias our results.

6.2. The validity of our results

6.2.1. Interpreting the results

We therefore continue by interpreting our results. They clearly show that the rate of convergence is lower for unlisted banks and banks with vague management objectives than for listed banks and commercial banks, suggesting that the model responds as expected to different sample compositions. That additional tests generally find lower convergence from below than from above for unlisted banks, strengthens the conclusion that the model seems to be working correctly.

However, we obtain some questionable results where the adjustment coefficients exceed one. A lambda of one suggests that the whole gap between the proxy benchmark level and last year's profitability is closed in one year, while a higher coefficient would mean that the benchmark level is

overshot each year. Such results could be due to high fluctuation one year which strongly influences the coefficient for the whole period. Our short time period might contribute to such exaggerating effects. We have a limited number of observations for the bank groups displaying very high rates of convergence, which hinders us to investigate the issue deeper.

6.2.2. Further validation of country specific effects

To further test for country fixed effects on convergence we add country specific dummy variables to our original model, resulting in the following model:

$$\Delta ROA_{it} = \alpha + \lambda \Delta ROA_t^* + D_{DK} \lambda \Delta ROA_t^* + D_{NO} \lambda \Delta ROA_t^* + D_{FI} \lambda \Delta ROA_t^* + D_{IS} \lambda \Delta ROA_t^* + D_B \lambda \Delta ROA_t^* + \beta \Delta ROA_{it-1} + w_{it} \quad (5)$$

We have added dummy variables for all countries except Sweden, which constitutes our base case. When estimating the above model we include our complete sample of observations and the listed bank average ROA as benchmark.

Table X: Results table for dummy variable regression with country fixed effects.

As seen in Table X, we get rates of convergence that are similar to those in the tests with one country sample at the time and the listed benchmark. Differences could be due to the restriction that the intercept and the β coefficient are the same for all country groups. We also risk getting slightly biased estimates due to potential correlation between the dummies and the lagged dependent variable because of the limited number of years (Nickel (1981)).

In addition to confirming previous results, this dummy model tells us that all country fixed effects are significant at a five percent level, except for Finland. The F-statistic also rejects the null hypothesis that all country effects are equal to zero at all reasonable levels of significance.

6.2.3. Comparing our results to previous research

When comparing our results to those of Gropp and Kashyap (2009), which employed the same methodology on the U.S. retail banking market over the period 1994 – 2006, we find that our coefficients are of similar magnitude and significance.

However, our results differ from theirs in that we get markedly higher R^2 values, around 0.4 compared to 0.04. This could be due to several reasons. First of all, our sample of banks could be more homogenous. A mere visual inspection of Figures IV-VI shows that the banks seem to co-vary with the benchmark. The benchmark ROA is also less stable in our study, meaning it can explain more of the changes in ROA given a good model. There is also more variance to explain in our data; 0.027 compared to 0.0027. Finally, if there is autocorrelation in the error term, despite us taking the first difference of our variables, then our OLS estimators might be inefficient. This means that they are still unbiased, consistent and asymptotically normally distributed, but no longer have the least variance. This would in turn mean that we underestimate the true residual variance and thus overestimate the R^2 . For a further discussion on this topic, please see section 8.1.

6.3. Return on equity as profitability measure

Finally, to further verify the robustness of our results, we repeat a number of tests using average ROE as benchmark instead of average ROA. Please see section 4.5. for an introduction to this topic. The results are similar regardless of profitability measure. The results of the ROE benchmark tests change when excluding 2008 observations in similar ways as when the ROA benchmark is used.

Table XI: Results table for convergence in ROE robustness test.

All in all, there seems to be no major econometric or methodological flaws to our approach, and our results seem robust.

7. Analysis

In our framework convergence in profitability is a proxy for market integration, based on the assumptions of market contestability and takeover threat. High convergence means that the forces eliminating profits in excess of the group average and the forces pushing underperformers to improve are strong.

7.1. Overall integration

Our study indicates that there is a high level of retail banking integration in the Nordic and Baltic region, even though observations from 2008 seem to exaggerate the speed. Thus, we find support for our first hypothesis presented in section 4.2. Convergence remains high regardless of the relative performance of the banks included in the study.

Although we find high overall convergence for Nordic and Baltic retail banks, several aspects need closer investigation before we can make a similar conclusion regarding the level of integration between different sub-samples of banks. Our results indicate that the forces for convergence are present to a varying extent across market segments.

7.2. Convergence in profitability across bank types, countries and profitability

Our second hypothesis does not seem to hold; as we find differences in the rate of convergence depending on bank type, geographical market and relative performance. The interesting question that arises is therefore why such differences exist and how these affect banks and policy makers in the region.

We start by analyzing our results for listed banks and then for unlisted banks. The unlisted banks can be separated into unlisted commercial banks and savings and government sponsored banks. When analyzing differences in coefficients of convergence across groups of banks it is important to bear in mind that these can be due to country sample composition (commercial, savings or government sponsored banks) as well as country specific factors. This makes the interpretation of some of our coefficients quite complex. We try to overcome this by sorting banks based on both bank type and country of origin.

7.2.1. Integration among listed banks

Our tests show that the listed banks' convergence rate is high, but significantly affected by the many Danish banks in the listed bank sample and benchmark. Excluding Danish banks from the sample lowers the convergence from below, thus influencing the overall convergence. We reject the null hypothesis that the two coefficients are equal at the 5 percent level. Excluding the Danish banks from both the sample and the benchmark further increases the convergence from above, while convergence from below remains low, although the differences are not statistically significant at the 5 percent level.

This signals that Nordic and Baltic listed banks outside of Denmark face a low threat of takeover while at the same time being exposed to high levels of market contestability. The non-Danish listed bank sample is dominated by large banking groups like Nordea, Handelsbanken, SEB and DnB Nor. Our results could be an indication that the costs of takeover and restructuring are too great for an efficient market for corporate control to exist for these banks.

The listed Danish banks converge at a high rate regardless of benchmark, both from above and from below. This difference compared to the non-Danish listed could be due to the fact that Danish listed banks generally are smaller than their Nordic and Baltic peers and therefore more exposed to the market forces. Underperformers could be cheaper to restructure and over-performers not strong enough to deter new market entrants.

From this analysis we conclude that the listed banks operate on an integrated market, with a high level of overall market contestability and an efficient market for corporate control, at least for smaller banks.

7.2.2. Integration among unlisted commercial banks

To determine if the unlisted commercial banks are integrated with the listed ones we analyze how well unlisted commercial banks converge to the listed bank average. Unfortunately, we are unable to test for individual country effects due to the limited sample size.

The unlisted commercial banks' convergence rates may seem odd at first, as the assumptions should hold less for this category than for listed banks. However, further analysis shows that the overall convergence is highly driven by convergence from above, while convergence from below is lower (the difference is significant at the 10 percent level). This effect is stronger when accounting for the change in convergence due to the drop of the benchmark in 2008 (again, the difference is significant at the 10 percent level). The high coefficient for convergence from above is hard to explain, but one reason could be that unlisted commercial banks often are smaller niche players, lacking the resources to maintain profitability in their particular market segments if larger banks enter. One third of our unlisted commercial bank sample is composed of Baltic banks which have faced increased competition from Swedish behemoths Swedbank and SEB over the period in question. We are cautious about interpreting too much into our results for the unlisted commercial banks since they are a heterogeneous group.

In summary, the unlisted commercial banks' market seems truly contestable while the threat of takeover is low, but positive and significantly different from zero. Unlisted commercial banks are thus clearly an integrated part of the Nordic and Baltic retail banking market.

7.2.3. Integration among savings banks and government sponsored credit institutions

As expected, we find that savings and government sponsored banks' converge at the lowest rate of all bank types (statistically different at the 5 percent level). This is primarily due to low convergence from below, especially when excluding 2008. This broadly confirms the notion that these banks have

unclear profit maximization objectives, as they may prefer to benefit customers or exist solely to promote competition in a certain market segment.

However, their high convergence from above has to be evaluated in relation to the country specific effects. The convergence rates differ dramatically between the Norwegian, Swedish and Danish groups of savings and government sponsored banks.

7.2.4. Country effects

Our tests show that Swedish and Norwegian banks converge at a slower pace than other banks, and that these differences are significant at the 5 percent level. At first glance, it seems like the commercial banks drag the Swedish average down. However, excluding all 2008 observations increases their rate of convergence, while it lowers that of Swedish savings bank, showing that these rates are unstable. The generally low convergence of Swedish banks to the listed benchmark is intriguing. The Swedish retail banking market is dominated by the four large banking groups Nordea, Swedbank, SEB and Handelsbanken. These banks are some of the largest and most internationally oriented in the region, and thereby separate themselves from other banks. Perhaps this type of banks is less integrated with the broader market. In the case of Sweden, this bank type is to a large extent able to dictate the market conditions, which might explain the overall low rates of convergence for Swedish banks to the rest of the market.

In the case of Norway, it seems like it is the savings banks that drag the country average down. Unlike their Swedish and Danish peers, convergence of Norwegian savings banks is not improved by the developments in 2008. Norwegian savings banks display stable profitability during the whole period 2002 – 2008 (see Figure VI), virtually unaffected by the general business cycle. The group underperforms compared to listed banks for most of the period, but in 2008 the roles are reversed. In fact, given our definitions, one can question whether the Norwegian savings bank segment is integrated with the rest of the Nordic and Baltic retail banking market.

We have chosen to include the Baltic countries in our study, and based on our results this seems like a correct decision. The Baltic banks clearly converge to the listed bank mean in the region, even though they outperform the region average, especially in 2005 – 2007 (see Figure IV). 9 of the 13 banks in our Baltic sample are unlisted commercial banks, which we have seen converges rapidly (see Table II and Table V). Thus, we reach a situation where both the country group (Baltic countries) and the dominant bank type in that group (unlisted commercial banks) converge strongly to the listed mean. If the country effect or the bank type effect is stronger is hard to tell.

Icelandic banks also merit further analysis. Like the Baltic banks, the Icelandic banks clearly outperformed the overall market during the period (see Figure IV). At the same time, Icelandic banks display the highest rate of convergence of all groups included in our study. The Icelandic banking system was severely hit by the financial crisis of 2008, so much that none of the major banks survived

as independent entities. Therefore, there are no observations from the financial year 2008 in our Icelandic sample. Instead, we see that Icelandic banks converge rapidly to the benchmark in 2007.

7.2.5. Relative performance effects

We find differences between the rates of convergence from above and below in all groups of banks, indicating that market contestability and takeover threat are not equally strong forces. The rate of convergence from above is high for all bank types, which we interpret as market contestability being high and real. This also serves as an alternative indication that there is indeed a high level of integration in the region.

However, we find less proof of a well functioning takeover market for Nordic and Baltic retail banks. One possible explanation is that there are very few banks still available for acquisition after the last two decades of frequent M&A activity in the region. Today, markets are dominated by a few large and strong financial conglomerates, followed by a large number of small unlisted banks. The unlisted banks are often controlled through trusts, cooperative ownership structures or governmental agencies, which can make the takeover process more cumbersome for the acquirer.

7.3. General impacts of 2008: Is integration dependent on the business cycle?

We have expressed concern about how the financial crisis of 2008 impacts our study. Our tests show that the crisis had a small impact on the convergence coefficient for listed banks. However, it enhances the rate of convergence for savings banks markedly. Without the 2008 observations, convergence is clearly lower for this group. The difference in convergence between over- and underperformers is also more accentuated if 2008 is disregarded. Convergence from below accounts for most of this difference. In 2008, as the benchmark profitability dropped significantly, the savings banks with profitability below benchmark rapidly closed the gap to the benchmark. The same is true for listed banks and unlisted commercial banks; convergence from below drops significantly when 2008 observations are excluded.

These results indicate that convergence from below in 2008 is strong for all bank types. This profitability behavior could be due to government support and rescue packages put in place in response to the financial crisis. By limiting the downside risk in banking, government measures resulted in many banks performing badly, but not catastrophically. In our data, this translates into many banks gathering at very low profit rates, dragging the average profit towards them. Very high rates of convergence from below ensue. Since the overall rate of convergence for listed banks was unaffected by the financial crisis and convergence from below was strong, convergence from above must have been low in 2008. Apparently, some well-run banks were able to exploit opportunities arising in the crisis, thus distancing themselves from the ailing listed bank average. The natural extension of this line of reasoning is of course that the rate of convergence of profits in retail banking is highly dependent on the boom/bust cycle. Unfortunately, our sample period is too short to explore this further.

Given that the tests excluding all 2008 observations alter our initial results, one could ask which way integration will go from here. The integration process is likely to continue, but probably along the pre-2008 trend rather than the faster 2008 trend. In the wake of the crisis, many banks will have to focus entirely on staying afloat and managing existing loan portfolios, which might limit market contestability and M&A activity in the near term. The high rate of convergence in 2008 was also likely an effect of the financial crisis rather than actual integration.

7.4. Wrapping up: Implications for bank strategy and public policy

The high level of integration between the Nordic and Baltic countries and market segments indicate that all banks operate on a single market. We thus find support for our first hypothesis stated earlier.

However, our results show no support for our second hypothesis, as we identify many significant differences in the rate of convergence between countries, bank types and banks with high and low relative performance. Generally speaking, it seems like barriers to market entry have been reduced to a high extent, while barriers to takeovers remain. Possible reasons for this include the trust-based and/or cooperative ownership structures of many savings banks, the sheer size of some listed banks, and possible political resistance. Our main findings from our quantitative study are thus in congruence with our qualitative investigation of the region's retail banking market.

The implications of our findings on banks' corporate strategy are numerous and of great importance. The larger banking groups in the region already claim to have adjusted to the new integrated reality (Nordea (2009), Danske Bank (2009) among others).

Considering the Nordic and Baltic region as one retail banking market also has implications for risk assessment. Thinking about financial stability in one country in isolation becomes virtually impossible, since the interplay between different national markets is so intricate. The measures taken over the past year to shore up the financial system confirm this, in that many of them have been internationally coordinated and harmonized.

7.5. The ambiguous effects of high integration in banking

The European Union is a solid supporter of banking integration since it increases competition. Competition in turn increases efficiency and benefit of consumers in the form of lower prices and better services (European Commission (2009)). However, given the systemic importance of the banking system, bank competition might not be an altogether positive phenomenon. There is a debate going on in the literature regarding the soundness of always promoting fierce competition among banks (Cihak and Shaeck (2008)).

On the one hand, there is strong support for a positive impact of competition on bank soundness. The main argument is a familiar one. Increases in competition precipitate increases in profit efficiency. Efficient banks (i.e. those with superior management and production technologies, that

translate into higher profits) will increase in size and market share. Thus, if banks were strengthened by the gymnastics of competition, the banking system would be stronger and more resilient to shocks (Padoa-Schioppa (2001)).

On the other hand, there are arguments for the existence of a treacherous trade-off between the two. Higher competition is likely to lead to less loyal consumers, amplifying the information asymmetries and thus banking risks (Boot and Schmeits (2005)). Competition can also mean a less thorough screening of loan applicants. According to Vives (2008), the key question to answer is therefore: what is the optimal degree of competition? The author suggests that quite a bit of competition is preferable as long as it is regulated appropriately.

The current situation in the Nordic and Baltic region could offer valuable input in these discussions. Our results show signs of high retail banking integration, especially in terms of market contestability. It seems like excessive profits have been systematically competed away. Banks in the region have been forced to search for new, often risky, means of preserving their profit margins. One example is the expansion to lucrative markets abroad, like the Baltic countries. As the financial crisis hit in 2008, many banks were already stretched and lacked precautionary funds. The high level of integration has also rendered banks more exposed to contagion effects, meaning that a breeze in Riga, Latvia could cause a hurricane in Copenhagen, Denmark. With less integration and competition, perhaps the crisis would have been less severe. But then again, retail banking integration is likely to have spurred GDP growth during several decades coming up to 2008.

8. Discussion of limitations

In this section we first acknowledge some of the difficulties in handling unbalanced panel data, before discussing our limited sample size and problems in data comparability. Finally, we revisit our assumptions and proxy to discuss their validity.

8.1. Difficulties with unbalanced panel data

Along the lines of Gropp and Kashyap (2009), we use OLS regressions in this thesis. Our data set is fundamentally a panel data set, in that we track a large number of banks over a period of time. It is also unbalanced, since we do not have observations for all banks during the whole period (Gujarati (2003)). The traditional approach to robustness testing would be to check the validity of the basic assumptions underlying the OLS regression. However, most of these relate to the properties of the error terms. In our setting, we have 262 error terms per year and seven error terms per bank. Any error term in our sample is therefore comparable to a maximum of six other residuals. Traditional tests for autocorrelation, heteroscedasticity and normality of the error term are therefore difficult to perform. Using the differenced form, as in equation (4), addresses any AR(1) processes. However, we cannot completely determine whether we have made our variables consistent or efficient for OLS estimations.

8.2. Sample size and data comparability

The sizes of our various bank sub-samples are restricted by the very nature of the Nordic and Baltic retail banking market and the fact that the ORBIS database does not have observations for all banks. Limited sample size is a serious problem when we want to perform tests focusing on narrowly defined bank samples. Sometimes we are therefore forced to address an interesting issue indirectly via excluding certain banks from a wider sample rather than testing the banks separately. It is a blunter tool, but the main tendencies should still be visible.

Another problem regarding our sample is data comparability. As previously mentioned, differences in accounting rules can influence pre-tax profits and the use of legal reserves. In a more detailed study, data should be fully adjusted for these discrepancies to be completely comparable.

8.3. The validity of our assumptions and proxy

It is tempting to use our study to draw conclusions about the level of competition in Nordic and Baltic retail banking. However, although our integration measure is based on assumptions about competitive pressure, it can sometimes be deceitful to equate high integration and perfect competition. In our setting, integration means convergence in ROA. This process could take place without perfect competition. An intuitive example is the case of an oligopoly/cartel setting a target profitability to which several member banks converge. Our model would classify such a market as integrated, but it is not

very competitive. In other words, finding a high rate of convergence does not necessarily mean that there are no barriers to entry and takeovers. We can therefore not use our results to validate our assumptions.

Our results show that convergence increased in 2008. We use convergence as a proxy for integration, and we define integration as the absence of barriers to entry and takeovers. However, convergence might not be a completely bullet-proof proxy for integration. The convergence in 2008 is more likely due to a systemic shock (financial crisis) than the reduction of the above-mentioned barriers. Given that 2008 in many aspects was an extraordinary year, we have confidence in our proxy over a longer period of time.

We also presume throughout the analysis that all banks can be meaningfully compared, which is a simplification. In the real world, banks specialize to fill different niches of the market. The Stigler (1963) line of reasoning is thus somewhat impaired, since some banks avoid facing direct competition. We think, however, that our method is reasonable, especially at high levels of aggregation.

8.4. Difficulties in testing the difference between estimated coefficients

We want to determine if the rate of convergence depends on country of origin, bank type and profitability. Each bank in our sample has its own combination of characteristics, making our sub-samples overlapping. When we want to test the statistical significance of differences across our sub-samples, this over-lapping nature prevents us from using the preferable dummy variable approach. A dummy variable regression with a dummy for each bank characteristic would allow us to compare coefficients directly, just as in section 6.2.2. Instead, we employ a t-test to test the null hypothesis that two estimated coefficients are equal. If the difference between two estimated coefficients is large enough and sum of the coefficients' estimated variances are small enough, the observed t-value will exceed the critical t-value and we will be able to reject the null hypothesis. This test is only second best to the dummy variable technique as other variables in the regression can influence the estimated standard error and thus also the t-test.

9. Conclusions and further research

This thesis aim to quantify the level of integration on the Nordic and Baltic retail banking market. In a brief review of the current literature, we present the traditional metrics of market integration, such as the fulfillment of the law of one price in banking services, cross-border deposits and loans, the market share of foreign banks, and cross-border bank M&A. A review of the extensive criticism faced by these metrics leads us to choose convergence in profitability as our proxy for market integration. We base this proxy on assumptions regarding market contestability and takeover threat.

After an introduction to the similarities and differences across the Nordic and Baltic retail banking market, we employ a partial adjustment model to quantify the level of market integration. Our results clearly show that the overall level of integration is high, but that there are differences depending on country origin, bank type, relative profitability and time period. Convergence is generally higher for listed banks than unlisted banks like savings banks and government sponsored banks. Removing all observations from 2008 accentuates this difference as the financial crisis seems to exaggerate the rate of converge for savings banks and government sponsored banks, especially from below. Geographical and product markets seem to have few barriers to entry, while many impediments remain for there to be a fully efficient takeover market for retail banks in the region.

The high level of integration indicates that the Nordic and Baltic countries are in fact a single retail banking market, which has major implications for bank strategy and public policy. Given the importance of banking integration and the flexibility of our model, our study could easily be expanded to evaluate the level of integration between the Nordic and Baltic retail banking market and the European. Given the explicit ambitions of the European Union to create a single market for financial services across the continent, convergence should be expected. However, the rate should be lower than in our study since the internal differences throughout Europe remain more pronounced than in the region we focus on.

Another proposition for further research would be to categorize the bank sample by bank size, measured in terms of assets, as universal definitions of commercial and savings banks are hard to develop since their characteristics can differ across countries. A more accurate description of the different market segments could perhaps be achieved by using groups like large banks, medium sized banks and small banks. An alternative approach would be to compute the benchmark profitability levels as a value weighted average rather than equal weighted, to see if banks converge to a benchmark set by the dominant banks.

Finally, it would also be interesting to repeat our study over a longer period of time, to determine if our findings are part of, or an exception to, a more general long-term trend. With a longer time period one could also explore further the implications of the business cycle on retail banking integration.

References

- Adam, Klaus, Tullio Jappelli, Annamaria Menichini, Mario Padula, and Marco Pagano, 2002, *Analyse, compare, and apply alternative indicators and monitoring methodologies to measure the evolution of capital market integration in the European Union*, Centre for studies in economics and finance, University of Salerno, Italy.
- Affinito, Massimiliano and Fabio Farabullini, 2009, *Does the law of one price hold in euro-area retail banking? An empirical analysis of interest rate differentials across the monetary union*, International journal of central banking, volume 5 no. 1, 1-33.
- Basel Committee on banking supervision, 2006, *Core principles for effective banking supervision*, Bank for International Settlements, Basel, Switzerland.
- Berger, Allen N., Qinglei Dai, Steven Ongena and David C. Smith, 2002, *To what extent will the banking industry be globalized? A study of bank nationality and reach in 20 European nations*, Federal Reserve international finance discussion paper no. 725.
- Berger, Allen N., David C. Smith, and Jennifer Judge, 2003, *Global integration in the banking industry*, Federal Reserve Bulletin November 2003, 451-453.
- Boot, Arnoud W. A., and Anjolein Schmeits, 2005, *The competitive challenge in banking*, Amsterdam center for law and economics working paper no. 2005-08.
- Buch, Claudia M., and Gayle DeLong, 2004, *Cross-border bank mergers: what lures the rare animal?*, Journal of banking and finance, volume 28, issue 9, 2077-2102.
- Caballero, Ricardo J. and Eduardo M. Engel, 2003, *Adjustment is much slower than you think*, Cowles Foundation Yale University discussion paper no. 1430
- Cabral, Inês, Frank Dierick, and Jukka Vesala, 2002, *Banking integration in the Euro area*, European central bank occasional paper series no. 6, Frankfurt am Main, Germany.
- Cihak, Martin, and Klaus Schaeck, 2008, *How does competition affect efficiency and soundness in banking: new empirical evidence*, ECB working paper no. 932.
- Corvoisier, Sandrine, and Reint Gropp, 2009, *Contestability, technology and banking*, Centre for European economic research working paper no. 09-007.
- Dermine, Jean, 2002, *European banking, past, present and future*, INSEAD, Fontainebleau, France.
- Dermine, Jean, 2005, *European banking integration: don't put the cart before the horse*, INSEAD, Fontainebleau, France.
- European Central Bank, 2004, *Research network on capital markets and financial integration in Europe: results and experience after two years*, Frankfurt am Main, Germany.
- Estonian Banking Association, 2009, *Estonian economy and financial sector 2008*, Tallinn, Estonia.
- Gropp, Reint, and Anil Kashyap, 2009, *A new metric for banking integration in Europe*, National bureau of economic research working paper no. 14735.
- Gujarati, Damodar N., 2003, *Basic econometrics*, McGraw-Hill/Irwin, New York, United States of America
- Heikensten, Lars, 2004, *The integration of European banking: some regulatory challenges*, speech at seminar on the integration of financial markets in Europe at the Swedish parliament, Stockholm.

- Hernando, Ignacio, María J. Nieto, and Larry D. Wall, 2008, *Determinants of domestic and cross-border bank acquisitions in the European Union*, Federal reserve bank of Atlanta working paper 2008-26, Atlanta, Georgia.
- Juul, Henrik, 2006, *Mobiliteten i den nordiske finansielle sektor*, Tema Nord 2006:507, Nordic council of ministers, Copenhagen, Denmark.
- Kaas, Leo, 2004, *Financial market integration and loan competition: when is entry deregulation socially beneficial?*, ECB working paper no. 403.
- Kennan, John, 1979, *The estimation of partial adjustment models with rational expectations*, *Econometrica*, volume 47, issue 6, 1441-1455, The Econometric Society
- Kleimeier, Stefanie and Harald Sander, 2002, *European financial market integration: evidence on the emergence of a single eurozone retail banking market*, Maastricht University, the Netherlands.
- Köhler, Mattias, 2008, *Transparency of regulation and cross-border bank mergers*, Centre for European economic research working paper no. 08-009, Mannheim, Germany.
- Köhler, Mattias, 2007, *Merger control as barrier to EU banking market integration*, Centre for European economic research working paper no. 07-082, Mannheim, Germany.
- Lithuanian central bank, 2008, *Financial stability review 2008*, Vilnius, Lithuania.
- Martin-Oliver, Alfredo, Vicente Salas-Fumas, and Jesus Saurina, 2005, *A test of the law of one price in retail banking*, Bank of Spain working paper no. 530.
- McGuire, Patrick and Nikola Tarashev, 2008, *Global monitoring with the BIS international banking statistics*, Bank for international settlements working paper no. 244.
- Nordic Central Banks (Danmarks Nationalbank, Suomen Pankki, Sedlabanki Islands, Norges Bank, Sveriges Riksbank), 2006, *Nordic banking structure – Report*.
- Nordic Competition Authorities, 2006, *Competition in Nordic retail banking*, report no. 1/2006, Stockholm, Sweden.
- Padoa-Schioppa, T., 2001, *Competition and supervision in the banking industry: a changing paradigm?*, *European finance review*, Volume 5, 1–5.
- Perez, Daniel, Vicente Salas-Fumás, and Jesús Saurina, 2005, *Banking integration in Europe*, Bank of Spain working paper no. 519, Madrid, Spain.
- Phillips, Peter C.B. and Donggyu Sul, 2007, *Bias in dynamic panel estimations with fixed effects, incidental trends and cross section dependence*, *Journal of Econometrics*, volume 137, 162-188
- Roland, Gerard, 2005, *After enlargement: institutional achievements and prospects in the new member states*, presented at the ECB conference The New EU Member States: Convergence and Stability.
- Stigler, George J., 1963, *Capital and rates of return in manufacturing industries*, Princeton University Press, Princeton, NJ.
- Swedish Central Bank (2008), presented by Stefan Viotti in *"The Financial System - Markets and Intermediaries"*, lecture at SSE, April 2009.
- Vives, Xavier, 2002, *Industrial organization of banking, bank competition and bank market integration*, ECB workshop on capital market s and financial integration in Europe.

Non-Academic Sources – Newspaper and Magazine Articles

Högberg, Johan in Affärsvärlden, May 13 2009, *Baltisk kreditfrossa*.

Plender, John in Financial Times, April 29 2009, *Banks head back to their home markets*.

Anderson, Robert in Financial Times, May 12 2009, *Economic downturn deepens in Baltics*.

Anderson, Robert in Financial Times, April 23 2009, *Baltic storms threaten to undermine Swedish lenders*.

Ibison, David in Financial Times, March 9 2009, *Iceland nationalises Straumur-Burdaras*.

Electronic and Other Sources: All electronic sources last accessed 15 September 2009.

Association of Latvian Commercial Banks: <http://eng.bankasoc.lv/Association/gi/tasks/index2.php>

Danish Financial Supervisory Authority: <http://www.finanstilsynet.dk/sw1267.asp>

Danske Bank: www.danskebank.com

DnB NOR: www.dnbnor.com

Estonian Financial Supervisory Authority:

<http://www.fi.ee/?id=593&PHPSESSID=036f69e0413fa9cf5eb537c7ad4cb7df>

European Commission: http://ec.europa.eu/internal_market/top_layer/index_24_en.htm

Eurostat: <http://epp.eurostat.ec.europa.eu/guip/introAction.do?profile=cpro&theme=eurind&lang=en>

Federation of Finnish Financial Services:

<http://www.fkl.fi/asp/system/empty.asp?P=2989&VID=default&SID=757011513840730&S=1&C=26116>

Financial and Capital Markets Commission of Latvia:

http://www.fktk.lv/en/market/credit_institutions/banks/

Handelsbanken: www.handelsbanken.com

Icelandic Financial Supervisory Authority: <http://www.fme.is/?PageID=150>

Lithuanian Central Bank: <http://www.lb.lt/eng/statistic/index.html>

Nordea: www.nordea.com

Norwegian Financial Supervisory Authority: <http://register.kredittilsynet.no/default.aspx>

Bureau van Dijk's ORBIS database:

<http://0-orbis.bvdep.com.inn.hhs.se/version-200998/cgi/template.dll>

SEB: www.seb.com

Swedbank: www.swedbank.com

Swedish Financial Supervisory Authority:

http://www.fi.se/Templates/InstitutGridPage_2757.aspx?la=sv&typ='FILB++'%2c'BANK++'%2c'MBANK++'%2c'SPAR++'

Appendix A – Tables

Table I: M&A activity 1997-2007 forging the large retail banking groups in the Nordic and Baltic region.

Bank group	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Danske Bank (DK)	Buys Östgöta Enskilda Bank (SE)		Buys Fokus Bank (NO)		Buys BG Bank (DK) and Realkredit (DK)				Buys National Irish Bank (IR) and Northern Bank(UK)		Buys Sampo Bank (FI)
Nordea (FI)	Merita Bank (FI) and Nordbanken (SE) merge to create Nordea		Buys Bank Komunalny (PL)	Merges with Uni-Danmark (DK), buys Christiania Bank (NO) and Kreditkasse (NO)	Buys postgirot Bank (SE) and BWP Unibank (PL)	Buys LG Petrobank (PL)		Buys Kredyt Bank (LT)	Buys Sampo Insurance (FI)	Buys Orgresbank (RU)	
SEB (SE)	Buys Trygg-Hansa Insurance (SE)		Buys Codan Bank (DK)	Buys Eesti Ühispank (ES), Latvijas Unibank (LV) and Vilnius Bankas (LT)					Buys Bank Agio (UR)	Buys PetroEnergo Bank (RU)	Buys Factorial Bank (UR)
Swedbank (SE)	Föreningsbanken (SE) and Sparbanken (SE) merge to create Swedbank							Buys Hansbank (LT)			Buys TAS-Kommerzbank (UR)
Handelsbanken (SE)	Buys parts of Skopbank (FI)		Buys Bergensbanken (NO)		Merges with Midtbank (DK) and insurer SPP (SE)						SPP (SE) divested
DnB NOR (NO)			DnB merges with Postbanken (NO). Gjensidige and Sparebanken NOR merge.				DnB buys Nordlands-banken (NO). DnB and Gjensidige NOR merge to create DnB NOR		Buys Monchebank (RU)	DnB NORD is set up in DK, FI, PL, ES, LV, LT.	

Country codes: SE = Sweden, DK = Denmark, NO = Norway, FI = Finland, ES = Estonia, LV = Latvia, LT = Lithuania, PL = Poland, UR = Ukraine, RU = Russia.

Sources: www.danskebank.com, www.nordea.com, www.seb.com, www.swedbank.se, www.handelsbanken.com, www.dnbnor.com.

Table II: Our sample of Nordic and Baltic retail banks during the years 2008-1999.

Country	Bank type	Number of Banks	Firm/year observations	Share of bank-year observations
Baltics (EE, LT, LV)	Commercial Bank	12	100	5,2%
	Government sponsored	1	9	0,5%
Denmark (DK)	Commercial Bank	53	459	23,8%
	Government sponsored	2	15	0,8%
	Savings Bank	25	204	10,6%
Finland (FI)	Commercial Bank	4	35	1,8%
	Government sponsored	1	8	0,4%
	Savings Bank	1	9	0,5%
Iceland (IS)	Commercial Bank	4	29	1,5%
	Savings Bank	8	40	2,1%
Norway (NO)	Commercial Bank	18	141	7,3%
	Government sponsored	3	25	1,3%
	Savings Bank	37	249	12,9%
Sweden (SE)	Commercial Bank	8	65	3,4%
	Government sponsored	4	33	1,7%
	Savings Bank	81	508	26,3%
Total		262	1929	100,0%

Table III: The group of Nordic and Baltic retail banks excluded from our sample.

Country	Bank type	Number of Banks	Share of bank-year observations
Baltics (EE, LT, LV)	Commercial Bank	52	12,8%
	Government Sponsored	1	0,2%
Denmark (DK)	Commercial Bank	52	12,8%
	Government Sponsored	2	0,5%
	Savings Bank	83	20,5%
Finland (FI)	Commercial Bank	19	4,7%
	Government Sponsored	2	0,5%
	Savings Bank	3	0,7%
Iceland (IS)	Commercial Bank	4	1,0%
	Savings Bank	24	5,9%
Norway (NO)	Commercial Bank	34	8,4%
	Government Sponsored	2	0,5%
	Savings Bank	74	18,3%
Sweden (SE)	Commercial Bank	42	10,4%
	Government Sponsored	2	0,5%
	Savings Bank	9	2,2%
Total retail banks.		405	100,0%

Table IV: Our sample ROA and Δ ROA.

	Mean	Median	Standard deviation	Observations
ROA	0,0167	0,0148	0,0299	1929
Δ ROA	-0,0006	-0,0004	0,0268	1667

Table V: Results table for type specific convergence tests both including and excluding 2008 observations.

<i>Proxy</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks ex DK Mean</i>	<i>All Nordic and Baltic Listed Banks ex DK Mean</i>
<i>Region</i>	<i>All Listed Banks</i>	<i>All Nordic and Baltic Savings Bank</i>	<i>All Nordic and Baltic Savings and Government Banks</i>	<i>All Nordic and Baltic Commercial Banks</i>	<i>All Nordic and Baltic Unlisted Commercial Banks</i>	<i>All Nordic and Baltic Listed excl DK</i>	<i>DK Listed</i>	<i>All Listed Banks</i>
ΔROA^*	0.888***	0.643***	0.592***	0.937***	1.200***	0.464***	1.258***	0.991***
Standard deviation ΔROA^*	0.050	0.036	0.034	0.052	0.359	0.067	0.094	0.071
ΔROA_{t-1}	0.104***	0.023	0.001	0.064*	-0.158	0.134***	0.056	0.133***
Standard deviation ΔROA_{t-1}	0.026	0.042	0.040	0.037	0.167	0.024	0.071	0.028
Constant	-0.01	0.000	0.00006	-0.001	0.003	0.000	-0.004***	-0.003***
Standard deviation Constant	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.000
R sq	0.448	0.352	0.303	0.369	0.076	0.341	0.439	0.585
N	458	657	752	587	149	179	256	458
Number of Banks	75	152	163	99	29	33	42	75

<i>Proxy</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks ex DK Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	
<i>Region</i>	<i>All Listed Banks ex 2008</i>	<i>All Nordic and Baltic Savings Bank ex 2008</i>	<i>All Nordic and Baltic Savings and Government Banks ex 2008</i>	<i>All Nordic and Baltic Commercial Banks ex 2008</i>	<i>All Nordic and Baltic Unlisted Commercial Banks ex 2008</i>	<i>All Nordic and Baltic Listed excl DK</i>	<i>DK Listed</i>	
ΔROA^*	0.901***	0.421***	0.376***	0.897***	1.296**	0.593***	1.184***	
Standard deviation ΔROA^*	0.072	0.049	0.046	0.077	0.587	0.089	0.058	
ΔROA_{t-1}	0.090***	-0.121***	-0.125***	0.017	-0.183	0.142***	-0.058	
Standard deviation ΔROA_{t-1}	0.023	0.040	0.038	0.035	0.179	0.024	0.058	
Constant	-0.001**	0.001***	0.001**	0.000	0.003	0.001***	-0.001**	
Standard deviation Constant	0.000	0.000	0.000	0.000	0.003	0.001	0.000	
R sq	0.552	0.371	0.348	0.460	0.214	0.574	0.798	
N	400	582	643	513	133	179	256	
Number of Banks	75	152	163	99	29	33	42	

Table VI: Results table for country specific convergence tests and both country and type specific convergence tests, including and excluding 2008 observations.

<i>Proxy</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>
<i>Region</i>	<i>All Nordic and Baltic Banks</i>	<i>All Baltic Banks (EE, LV, LT)</i>	<i>All Danish Banks (DK)</i>	<i>All Finnish Banks (FI)</i>	<i>All Icelandic Banks (IS)</i>	<i>All Norwegian Banks (NO)</i>	<i>All Swedish Banks (SE)</i>
ΔROA^*	0.754***	0.918***	1.111***	0.700**	3.346***	0.345***	0.511***
Standard deviation ΔROA^*	0.030	0.158	0.054	0.242	1.076	0.034	0.049
ΔROA_{t-1}	0.010	-0.135	-0.008	-0.205	-0.058	-0.198***	0.089***
Standard deviation ΔROA_{t-1}	0.030	0.120	0.050	0.377	0.355	0.045	0.023
Constant	0.000	-0.001	-0.001***	-0.002	0.001	0.000	0.000
Standard deviation Constant	0.000	0.001	0.000	0.001	0.006	0.000	0.000
R sq	0.335	0.371	0.493	0.509	0.353	0.318	0.262
N	1304	61	477	21	26	279	382
Number of Banks	262	13	80	6	12	58	93

<i>Proxy</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>
<i>Region</i>	<i>Norwegian Commercial Banks</i>	<i>Norwegian Savings Banks</i>	<i>Norwegian Savings and Government Sponsored Banks</i>	<i>Sweden Commercial Banks</i>	<i>Sweden Savings Banks</i>	<i>Sweden Savings Banks and Government Sponsored Banks</i>	<i>Denmark Commercial Banks</i>	<i>Denmark Savings Banks</i>	<i>Denmark Savings Banks and Government Sponsored Banks</i>
ΔROA^*	0.412***	0.322***	0.294***	0.359*	0.527***	0.495***	1.113***	1.201***	1.117***
Standard deviation ΔROA^*	0.085	0.031	0.029	0.208	0.050	0.047	0.067	0.103	0.100
ΔROA_{t-1}	-0.249***	-0.006	-0.013	0.082	-0.172***	-0.147***	0.011	-0.110	-0.107
Standard deviation ΔROA_{t-1}	0.074	0.064	0.063	0.181	0.059	0.061	0.059	0.090	0.090
Constant	0.00009	0.000	0.000	-0.001	0.000	0.000	-0.001	-0.001	-0.001*
Standard deviation Constant	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.001	0.001
R sq	0.320	0.418	0.375	0.150	0.278	0.260	0.479	0.537	0.490
N	87	155	174	26	317	337	330	129	141
Number of Banks	18	37	40	8	81	85	53	25	27

<i>Proxy</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>	<i>All Nordic and Baltic Listed Banks' Mean ex 2008</i>
<i>Region</i>	<i>Norwegian Commercial Banks ex 2008</i>	<i>Norwegian Savings Banks ex 2008</i>	<i>Norwegian Savings and Government Sponsored Banks ex 2008</i>	<i>Sweden Commercial Banks ex 2008</i>	<i>Sweden Savings Banks ex 2008</i>	<i>Sweden Savings Banks and Government Sponsored Banks ex 2008</i>	<i>Denmark Commercial Banks ex 2008</i>	<i>Denmark Savings Banks ex 2008</i>	<i>Denmark Savings Banks and Government Sponsored Banks ex 2008</i>
ΔROA^*	0.398***	0.277***	0.243***	0.458	0.142**	0.126**	1.072***	0.920***	0.809***
Standard deviation ΔROA^*	0.150	0.053	0.048	0.356	0.057	0.055	0.088	0.094	0.142
ΔROA_{t-1}	-0.258***	-0.030	-0.038	0.038	-0.282***	-0.299***	-0.113**	-0.228**	-0.240***
Standard deviation ΔROA_{t-1}	0.080	0.067	0.065	0.204	0.049	0.051	0.054	0.094	0.092
Constant	0.000	0.000	0.000	-0.001	0.001***	0.001	-0.001	0.000	0.000
Standard deviation Constant	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.001	0.001
R sq	0.233	0.187	0.161	0.080	0.132	0.128	0.357	0.306	0.258
N	76	128	146	22	291	310	287	114	125
Number of Banks	18	37	40	8	81	85	53	25	27

Table VII: Results table for convergence tests for banks with below and above average ROA, including and excluding 2008 observations.

<i>Proxy</i> <i>Region</i> <i>Direction</i>	Listed Mean All Listed From Below	Listed Mean All Listed From Above	Listed Mean All Unlisted Commercial From Below	Listed Mean All Unlisted Commercial From Above	Listed Mean All Savings and Government From Below	Listed Mean All Savings and Government From Above
ΔROA^*	1.031***	0.821***	0.595***	2.200**	0.601***	0.751***
Standard deviation ΔROA^*	0.073	0.067	0.127	0.882	0.040	0.067
ΔROA_{t-1}	0.092	0.093***	-0.126	-0.168	-0.068	0.039
Standard deviation ΔROA_{t-1}	0.073	0.028	0.111	0.288	0.044	0.079
Constant	-0.002***	0.001	-0.002*	0.012*	-0.001***	0.003***
Standard deviation Constant	0.000	0.001	0.001	0.007	0.000	0.001
R sq	0.495	0.447	0.196	0.116	0.297	0.426
N	227	230	94	55	544	177

<i>Proxy</i> <i>Region</i> <i>Direction</i>	Listed Mean ex 2008 Listed excl 2008 From Below	Listed Mean ex 2008 Listed excl 2008 From Above	Listed Mean ex 2008 All Unlisted Commercial ex 2008 From Below	Listed Mean ex 2008 All Unlisted Commercial ex 2008 From Above	Listed Mean ex 2008 All Savings and Government ex 2008 From Below	Listed Mean ex 2008 All Savings and Government ex 2008 From Above
ΔROA^*	0.557***	1.321***	0.375**	3.327*	0.259***	0.826***
Standard deviation ΔROA^*	0.076	0.120	0.152	1.658	0.041	0.131
ΔROA_{t-1}	-0.069	0.094***	-0.277***	-0.122	-0.277***	0.041
Standard deviation ΔROA_{t-1}	0.061	0.027	0.100	0.320	0.039	0.083
Constant	-0.001***	-0.001	-0.001	0.010	0.00003	0.003***
Standard deviation Constant	0.000	0.001	0.001	0.008	0.000	0.001
R sq	0.212	0.419	0.126	0.096	0.170	0.243
N	208	192	86	47	518	126

<i>Proxy</i> <i>Region</i> <i>Direction</i>	Listed Mean Listed excl DK From Below	Listed Mean Listed excl DK From Above	Listed excl DK Mean Listed excl DK From Below	Listed excl DK Mean Listed excl DK From Above	DK Listed DK Listed From Below	DK Listed DK Listed From Above
ΔROA^*	0.338***	0.522***	0.360***	0.860***	1.096***	0.910***
Standard deviation ΔROA^*	0.082	0.166	0.077	0.188	0.074	0.067
ΔROA_{t-1}	-0.026	0.143***	0.059	0.140***	-0.058	-0.140*
Standard deviation ΔROA_{t-1}	0.063	0.041	0.061	0.36	0.074	0.081
Constant	0.00002	0.000	-0.001	-0.001	-0.002***	0.002***
Standard deviation Constant	0.000	0.002	0.000	0.001	0.001	0.001
R sq	0.120	0.420	0.169	0.412	0.637	0.563
N	128	50	116	63	132	149

<i>Proxy</i> <i>Region</i> <i>Direction</i>	Listed Mean ex 08 Listed excl DK ex 08 From Below	Listed Mean ex 08 Listed excl DK ex 08 From Above	Listed excl DK Mean ex 08 Listed excl DK ex 08 From Below	Listed excl DK Mean ex 08 Listed excl DK ex 08 From Above		
ΔROA^*	0.290***	0.752	0.187**	0.816***		
Standard deviation ΔROA^*	0.086	0.511	0.094	0.298		
ΔROA_{t-1}	-0.025	0.137	0.048	0.141***		
Standard deviation ΔROA_{t-1}	0.062	0.050**	0.060	0.037		
Constant	0.000	0.000	0.000	-0.001		
Standard deviation Constant	0.000	0.002	0.000	0.002		
R sq	0.086	0.381	0.041	0.342		
N	126	28	107	49		

Table VIII: Results table for the randomized convergence test.

<i>Proxy Region</i>	<i>Random ROA All Nordic and Baltic Listed Banks</i>	<i>All Nordic and Baltic Listed mean Random ROA listed</i>
ΔROA^*	-0.059	-0.115*
Standard deviation ΔROA^*	0.115	0.061
ΔROA_{t-1}	0.181***	0.182***
Standard deviation ΔROA_{t-1}	0.033	0.033
Constant	-0.002***	-0.002*
Standard deviation Constant	0.000	0.000
R sqr	0.249	0.262
N	458	458
Number of Banks	75	75

Table IX: Results table for regression using the second lag of the dependent variable as an instrument for the lagged dependent variable.

<i>Proxy Region</i>	<i>All Nordic and Baltic Listed mean All Nordic and Baltic Listed banks</i>
ΔROA^*	0.978***
Standard deviation ΔROA^*	0.063
ΔROA_{t-2}	0.000
Standard deviation ΔROA_{t-2}	0.001
Constant	0.000
Standard deviation Constant	0.000
R sqr	0.635
N	356
Number of Banks	75

Table X: Results table for dummy variable regression with country fixed effects.

<i>Proxy Region</i>	<i>All Nordic and Baltic Listed mean All Nordic and Baltic Banks</i>	
Coefficient	Estimation	Standard error
ΔROA^* SE Base	0.574***	0.056
ΔROA^* DK	0.526***	0.071
ΔROA^* NO	-0.231***	0.078
ΔROA^* IS	1.188***	0.277
ΔROA^* FI	-0.021	0.178
ΔROA^* Baltics	0.309**	0.127
ΔROA_{t-1}	-0.034	0.029
Constant	0.000	0.000
R sqr	0.631	
N	1307	
Number of Banks	262	

Table XI: Results table for convergence in ROE robustness test.

<i>Proxy</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>
<i>Region</i>	<i>All Nordic and Baltic Banks</i>	<i>All Nordic and Baltic Listed Banks</i>	<i>All Nordic and Baltic Savings and Government Banks</i>	<i>All Nordic and Baltic Unlisted Commercial Banks</i>
ΔROE*	0.701***	0.952***	0.449***	1.029***
Standard deviation ΔROE*	0.028	0.052	0.025	0.150
ΔROE_{t-1}	-0.069**	-0.061	-0.114***	-0.025
Standard deviation ΔROE_{t-1}	0.029	0.047	0.036	0.079
Constant	0.001	-0.001	0.001	0.007
Standard deviation Constant	0.002	0.004	0.002	0.010
R sqr	0.575	0.658	0.557	0.495
N	1309	453	720	150
Number of Banks	262	75	163	29

<i>Proxy</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>	<i>All Nordic and Baltic Listed Banks' Mean</i>
<i>Region</i>	<i>All Baltic Banks (EE, LV, LT)</i>	<i>All Danish Banks (DK)</i>	<i>All Finnish Banks (FI)</i>	<i>All Icelandic Banks (IS)</i>	<i>All Norwegian Banks (NO)</i>	<i>All Swedish Banks (SE)</i>
ΔROE*	1.109***	0.846***	0.682**	4.516***	0.454***	0.428***
Standard deviation ΔROE*	0.146	0.043	0.266	1.276	0.041	0.036
ΔROE_{t-1}	-0.143	-0.142***	-0.434	0.128	-0.057	-0.016
Standard deviation ΔROE_{t-1}	0.120	0.051	0.332	0.395	0.057	0.035
Constant	0.001	-0.005	-0.006	-0.017	0.002	0.000
Standard deviation Constant	0.010	0.003	0.019	0.075	0.003	0.002
R sqr	0.717	0.677	0.699	0.620	0.558	0.528
N	58	476	19	23	277	382
Number of Banks	13	80	6	12	58	93

Appendix B – Figures

Figure I: Chart comparing the largest Nordic retail banking conglomerates in terms of size, measured in total book value of assets.

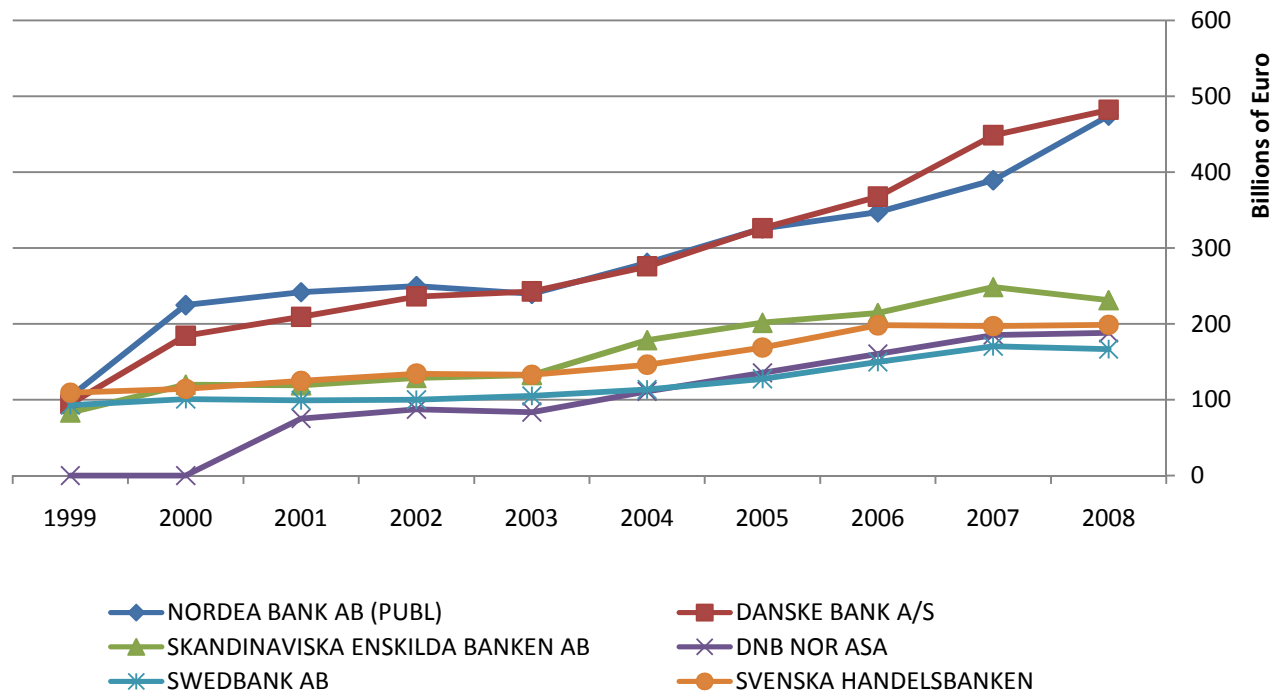


Figure II: The composition of our sample in terms of country of incorporation.

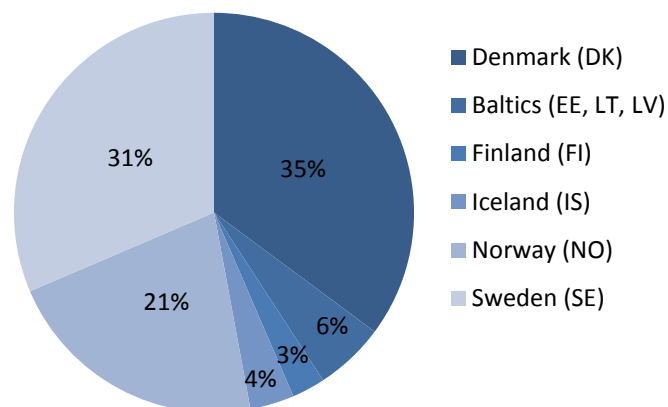


Figure III: The composition of our sample in terms of bank type.

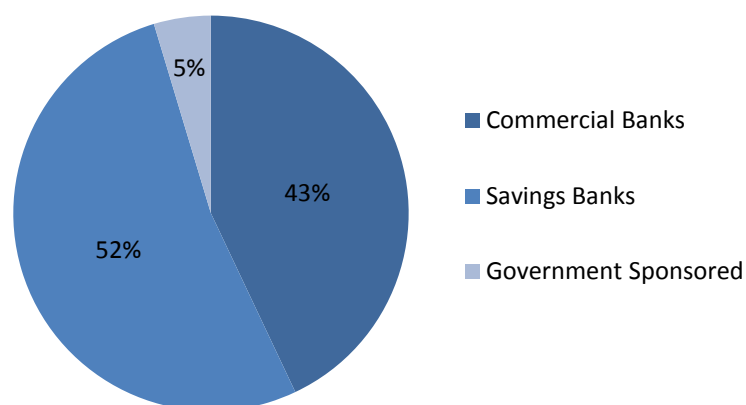


Figure IV: The development of average ROA for all banks 2000 – 2008.

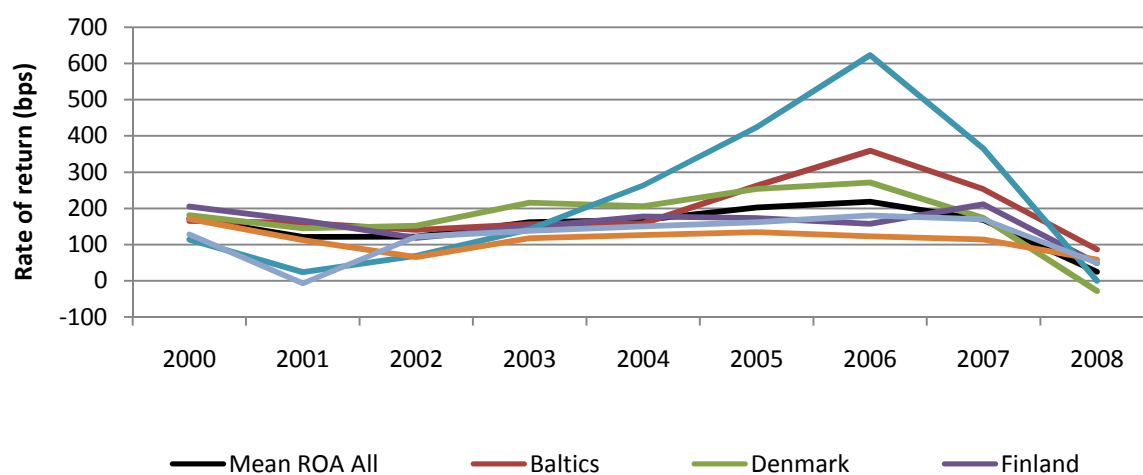


Figure V: The development of average ROA for all listed banks 2000 – 2008.

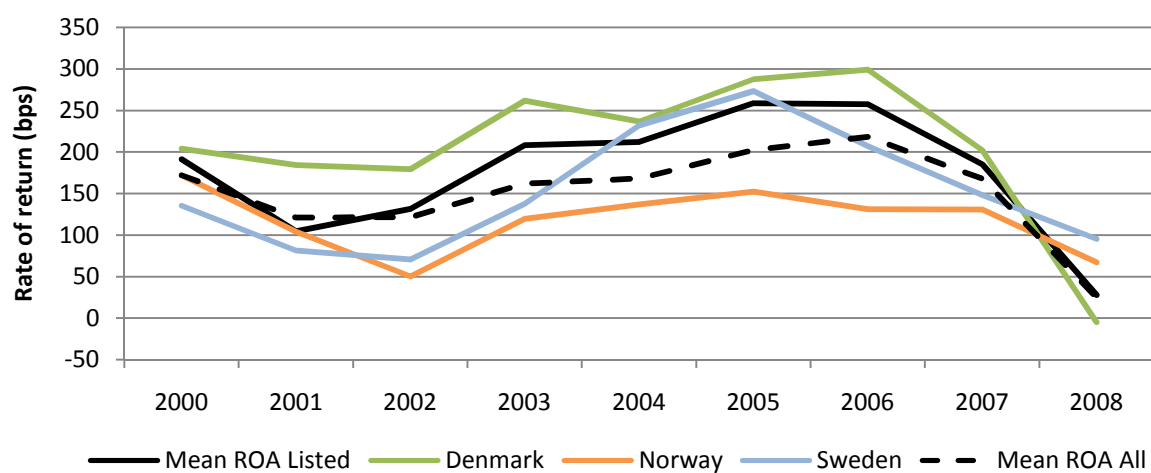


Figure VI: The development of average ROA for all savings banks 2000 – 2008.

