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North-South Divide in the European Banking Sector:
*Comparison between the Performance, Strength and Stability of Northern
European Banks and Southern European Banks before and during the
European Sovereign Debt Crisis*

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Abstract

In the midst of the European sovereign debt crisis, the East-West divide of the continent became obsolete. The European Union now exhibits a new divide that is more economic than political – the North-South divide. Since the economies and the banking sectors of the Eurozone countries are very integrated, this paper explores whether there is a similar North-South divide in the European banking sector as well and whether the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis. To answer this question, we run seven panel data regression analyses of northern European and southern European banks for the years 2005 to 2014. To run the regression analyses, we use seven financial ratios in four categories - capital, asset quality, profitability, and liquidity – as the dependent variables. Our expectations, formed by existing literature and general economic opinions are that North was doing better than South even before the crisis, and that all banks did more poorly after the onset of the European Sovereign Debt Crisis. Consequently, we put forward our hypothesis that this divide between how well banks are doing became wider during the crisis years. The results of our study are mostly in line with our expectations and, therefore, our hypothesis is proven: Northern banks emerged relatively stronger and more profitable than Southern banks after the crisis. However, a surprising discovery was that before the onset of the crisis, southern banks were actually the ones that seemed to do better, at least in regards to the financial ratios we are examining.

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Keywords: European sovereign debt crisis, North-South divide, Eurozone, European banking crisis, bank performance.

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1 Introduction

The European continent has never been as unified as it is today throughout its entire recorded history and the European Union is widely considered to be one of the biggest political feats in the history of mankind. Unfortunately, while the path of convergence of its members seemed imminent during the pre-crisis years, the reality, nowadays, is considerably different. The global Great Recession and the European sovereign debt crisis became the catalysts of a new, emerging economic divide in the Eurozone. This economic divide is referred to as the North-South Divide. In addition, it is evident that the European banking crisis is one of the catalysts of the European sovereign debt crisis. As Shambaugh (2012) argues, since there is an interconnection between the European sovereign debt crisis and the European banking crisis, we wanted to explore whether there is a similar divide in the European banking sector as well.

During the pre-2007 period, markets were ecstatic with the introduction of the common currency – the euro; following the adoption of the common currency, southern European countries, such as Greece and Italy, suddenly started borrowing at much lower rates than they used to before. Markets seemed to disregard the reasons behind the old prices and assumed that just by becoming Eurozone members, the southern countries' riskiness substantially diminished. Unfortunately, the readily available funds were not used to the full extent in the southern European countries. Instead of investing and improving competitiveness, lavish social programs were introduced. Consequently, when the world economy took a turn for the worst, this became unsustainable, resulting in the increase of the deficits and debt levels.

The European sovereign debt crisis did not occur on its own. Europe was hit by three crises that fed off from and perpetuated each other. These were the sovereign debt crisis, the banking crisis, and the growth and competitiveness crisis. Higher debt levels and austerity measures meant that growth levels were decreasing, while in the same time unemployment was increasing. The aforementioned changes were especially true in the southern European countries. While the debt and growth performance indicators are easily contrasted between the northern European countries and the southern European countries, the banking crisis is not so clear cut. The European banking sector was hurt across the board after the downturn of the markets. One of the aims of this paper is to find out whether the northern European banks had an advantage before the onset of the crisis

and whether the southern European banks were hurt more during the crisis period, which might be expected from how the economies of their respective home countries were doing. A counter-argument is that the European banking sector is very integrated and most banks operate across country borders, meaning that, for example northern European banks might have various operations and business activities in the southern European countries as well; this means that during the crisis years the banks with exposures to the underperforming markets will perform worse and these are not necessarily banks from the same geographical regions.

Our thesis takes a holistic view of the banking sector. We want to investigate how banks are doing not only from an investor's perspective (profitability measures), but also from the perspective of the regulators, politicians, general public, which in turn reflect on the business side of things as well. Just as there are structurally important banks in the financial system, banking is a structurally important sector in the economy as a whole. Due to its interconnectedness and the “too big to fail” institutions, looking at more factors other than banks’ profitability measures, is crucially important when defining how 'well a bank is doing'.

Consequently, the main topic that this paper is seeking to explore is how northern and southern European banks were performing during the European sovereign debt crisis. The prevalent economic and political opinion in the press and in the market is that north is generally better than south and that the European banks were harshly hit during the period of financial instability on the continent. Drawing upon that, **our primary goal in conducting this study is to find out:**

- 1. Whether there is a similar North-South divide in the European banking sector as well.**
- 2. Whether the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis.**

To answer this question we took a large, representative sample of banks from northern European countries and southern European countries. Consequently, we run panel data regression analysis using bank-specific financial ratios as the dependent variables; one of the primary advantages of the financial ratios is that they disregard the differences in sizes and currencies. The period used in the Methodology is the years 2005 to 2014. We run seven regression analyses with

seven different performance indicators in four different performance categories – capital ratios, asset quality ratios, profitability ratios, and liquidity ratios. In addition, each regression analysis includes 16 dummy variables. Moreover, we have three control variables to control for macroeconomic indicators.

2 Literature Review

There have been many studies conducted to evaluate the performance metrics of the banks. We reviewed a variety of literature in the aforementioned topics in order to conduct our study regarding the banking sector in the Eurozone. In their study, Beltratti and Stulz (2009) argue that since there is empirical evidence by John, Litov, and Yeung (2008) risk-taking is affected by a country's institutions, there is expectation that "banks in countries with better institutions" would perform better. The results of the study show evidence that banks from countries with stronger capital supervision also had better performance. Consequently, if there is a so-called North-South divide in the Eurozone, we expect a similar divide in the banking sector of the Eurozone countries as well. In addition, as Shambaugh (2012) states, since there is an interconnection between the European sovereign-debt crisis and the European banking crisis, in the periods of distressed economies, banks' portfolios get damaged. This leads to another expectation that the aforementioned divide grows with the crisis. Consequently, having done thorough research and analyses and observed the North-South divide in the European economies, our primary goal in conducting this study is to find out whether there is a similar North-South divide in the European banking sector and whether the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis.

Since we are mainly conducting a study to find out whether there is a North-South divide in the European banking sector, of particular importance was to find a study with a similar analytic approach. Due to the topic being relatively new, we focused on studies that analyze bank performance. This is something that has been in the center of attention in the academia for decades. Of particular importance for us were the studies using econometric models which utilize financial ratios showing banks' performance as dependent variables; the main reason behind this is the fact that using financial ratios disregards the size differences between banks.

There has been previous studies researching the banks' performance using econometric models which utilize financial ratios showing banks' performance as dependent variables. The study conducted by Bordeleau and Graham (2010), which uses a methodology in which return on assets (ROA) is the dependent variable, is one such example. By using ROA as the dependent variable, the authors analyze the banks' profitability performance. To conduct the study, the

authors use liquid asset holdings and dummy variable for time as independent variables, and GDP and short-term fund reliance as control variables. The results suggest that a non-linear relationship exists, whereby profitability is improved for banks that hold some liquid assets but, all else equal, there is a point beyond which holding further liquid assets diminishes a banks' profitability. Nevertheless, the study finds some variations in the finding depending on the type of the business model of the financial institution under study. The banks that use more traditional method of business model such as deposit and loan based model are able to optimize profits with less liquidity in the balance sheet. In addition, the study provides a policy advice, in which the authors suggest to keep optimal amount of liquidity by considering the trade-off between profitability and liquidity. Even though more than optimal amount of liquidity can translate into more resilient financial sector in economic downturn, in general it will result in low yield not only for the banks but also for the GDP of the countries involved since it's the banks that extend credit to the real economy.

Another paper that has analyzed the banks' performance is the study conducted by Athanasoglou et al. (2005), which explores the effects of bank-specific, industry-specific and macroeconomic determinants on the profitability of a panel of Greek commercial banks spanning the period of 1985-2001. To explore the banks' performance the paper uses an econometric model with two profitability ratios – return on assets (ROA) and return on equity (ROE) – as the dependent variables. The independent variables of the model for the bank-specific profitability determinants include equity to assets ratio as a capital variable, loan-loss provisions to loans ratio as a credit risk variable, the rate of change in labor productivity (real gross total revenue over the number of employees) as a productivity variable, operating expenses to total assets as an expenses management variable, and banks' real assets (logarithm) and their square as a size variable. In addition, the study uses inflation, cyclical output, dummy variable equal to one for privately-owned banks, Herfindahl-Hirschman index, 10-year bond yield, and many other control variables. The empirical results of the study prove that bank-specific factors, resulting from bank-level management, and macroeconomic, control variables shape the profitability of the Greek banks. This study is of particular importance for our paper since it analyzes the commercial banks in Greece, which is an essential country in our Methodology as well.

Another study evaluating bank performance is the study conducted by Beltratti and Stulz (2009) explore possible determinants if bank performance during the crisis. The performance is

measured by stock returns. The sample of banks used is large banks, with Assets in excess of 50 billion USD, at the end of 2006, across the world. The paper specifies the crisis period as the period from the beginning of 2007 to the end of December 2008. The results find that banks which have more shareholder-friendly boards had worse performance while banks with more Tier 1 capital, more deposits, and more loans had better performance during the crisis period. In addition, the results find that banks from countries with stronger capital supervision also had better performance. An interesting finding is that banks with higher Tier 1 ratios and situated in countries with stronger capital supervision had better returns for their shareholders during the crisis. This finding leads to the conclusion that regulators' and shareholders' interests are more often aligned than not. This, in fact, is one of the reasons why we include Tier 1 capital ratio as one of the performance indicators in our Methodology.

Another paper analyzing bank performance is the study by Olson and Zoubi (2011). The paper analyzes cost efficiency and profitability of the MENA banks. Even though there exists similar studies, this one goes far deeper “by covering more banks, using a longer time period, and by examining more variables believed to affect efficiency and bank profitability.” The study involves both accounting based and economics based methods. The methodology covers 527 banks, including Islamic Banks, GCC conventional banks and non-GCC conventional banks, across a study period of 8 years. The authors use return on assets (ROA), return on equity (ROE), total cost and net operating profit as dependent variables, natural log of total assets, total net loans to total assets, other interest bearing assets (non-loans) to total assets, total deposits to total liabilities, operating expenses to gross income, ratio of overhead (depreciation plus other expenses) to total assets, ratio of non-interest bearing assets including cash, fixed assets, and amount due (to total assets), personnel expenses to gross income, loan loss provisions to net loans, total equity to total assets as independent variables. The study finds evidence that MENA banks are somewhat smaller than optimal size. Moreover, the study finds out that even though cost efficiency of average MENA bank is lower than average North American bank, it's in line with the performance of the European banks. Nevertheless, the profit efficiency numbers suggest that even though the Islamic banks earn higher ROA and ROE, they could do even better relative to conventional banks if they were equally profit efficient. Another finding from the study is that MENA banks are nearly as cost efficient as European banks, but the difference between cost and profit efficiency is generally less than for North American or European, banks. That is, MENA banks have performed relative

well in terms of profit efficiency compared to banks in other parts of the world. Thus, the implication is that even though inefficiencies exist on the revenue side, MENA banks are doing relatively well by world standards in generating profit from existing resources and the current operating environment.

Having done through research and analyzed the aforementioned studies, we got inspired to conduct further research regarding bank performance in order to find out whether there is a North-South divide in the European banking sector and whether the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis. To further develop the analytic approach, we added a panel data regression analysis in order to statistically compare the banking sectors in the northern European countries and the southern European countries. Overall, we observed seven performance indicators – financial ratios – in four different categories and, consequently, run seven regressions analyses. Each regression analysis includes the chosen ratio as the dependent variable. Our Methodology includes sixteen dummy variables and three control variables as the independent variables. We have provided more information about the analytical approach and the Methodology, used in this paper, in Chapter 4.

3 Background

In 1988, the European Commission introduced a plan of establishing a European central bank and a single currency. Later, in 1999, EMU, which stands for Economic and Monetary Union but is also called European Monetary Union was initiated and “formalized in the provision of Maastricht Treaty” that “established the conditions, or convergence criteria, that countries are required to meet before they join EMU” (R. J. Ahearn et al., 2012). EMU “is the agreement among participating countries of the European Union to adopt a single currency, the euro, and a common monetary policy set by a common central bank, the ECB” (R.J. Ahearn et al., 2012). Although the member countries have a common monetary policy, they make their own fiscal policy decisions independently of the other participating countries

However, the implementation of EMU was not without problems. For instance, many scholars argue that the European sovereign debt crisis can be traced back to the establishment of the EMU. After the single currency was adopted in 1999, the member countries agreed to let the European Central Bank control the monetary policy in the EMU; as Harari (2014) states “one-size-fits-all monetary policy” was adopted. Consequently, ECB was wholly in charge of setting the interest rates for the Eurozone and the set interest rates would become applicable for each member state. This would become a problem since not all Eurozone countries had same economies and applying one monetary policy for all of them would lead to various imbalances in addition to being one of the primary causes of the European sovereign debt crisis.

With the development of the European sovereign debt crisis, the European continent started suffering from a divide, referred to as the North-South divide – the divide between the northern European countries, which possess stronger economies, and the southern European countries, which have weaker and highly-indebted economies. In his article, Yiannos Papantoniou (2013), who has served as Greece’s Economy and Finance Minister from 1994 to 2001, argues that “while the eurozone’s northern members enjoy low borrowing costs and stable growth, its southern members face high borrowing costs, recession, and deep cuts in incomes and social spending”. Y. Papantoniou (2013) claims that with the initiation of the European sovereign debt crisis, Europe has been economically divided. He continues his argument by claiming that the southern European countries have higher unemployment rates and lower aggregate per capita income levels.

3.1 The European banks' susceptibility to crises

According to the model published by Diamond and Dybvig (1983), since banks issue deposits which are more liquid than their assets and, therefore, banks possess illiquid assets and liquid liabilities, they are susceptible to bank runs. Shambaugh (2012) argues that the “problems in a banking sector can either be those of liquidity – where solvent banks cannot get funds – or of solvency – where banks simply do not have assets of enough value to pay off creditors”. Shambaugh (2012) continues his argument claiming that if a liquidity crisis occurs, “a central bank can stand in as a lender of last resort” supply the essential financial support. Therefore, although the banks are global in essence, “bank supervision and resolution of banking activity is still primarily a national activity” (Shambaugh, 2012); this applied to EMU as well.

However, national supervision has specific hardships in the Eurozone. To show evidence for this argument Shambaugh (2012) compares the banking system in Europe with the one in the USA and states that in the euro area “the total assets of the banking system as a share of the overall economy were over 300%” while this number was below 100% in the USA. This leads to the following implication: “the euro area relies more on the banking system for financing than American firms” (Shambaugh, 2012) and, therefore, the euro area needs a better-functioning banking system. In addition, when comparing the largest banks in the Eurozone and in the USA, we can observe that they “are roughly the same size”. Therefore, it can be inferred that the “largest euro area banks are a much larger share of any individual national economy in the euro area”. Shambaugh (2012) uses Netherland’s ING bank as an illustration and, consequently, states that despite ING bank’s similar size to the US banks, “Netherlands economy is roughly 5% the size of the U.S. economy”. Therefore, “ING has more assets than the entire GDP of its host country” while “no U.S. bank has more than 1/8th” (Shambaugh, 2012) and this makes the national supervision very difficult, which can be a significant issue during the periods of economic crises.

According to the Bush, Knott, and Peacock (2014), although there is evidence “that banking system size was not a good predictor of the crisis”, “larger banking systems may impose higher direct fiscal costs on governments in crises”. Therefore, the main difficulty arising from the interconnectedness between banks and sovereigns is that saving banks becomes costly for the sovereigns if the asset sizes are large relative to GDP. Table 1 illustrates the data for the bank

assets as a percentage of GDP for the years 2008 to 2012. The data is taken from Heigi Library and solely the countries used in our Methodology are compiled. Analyzing the data, we can see that in fact northern European countries tend to have higher bank assets to GDP ratios than the southern European countries. According to the aforementioned argument of Bush, Knott, and Peacock (2014), by analyzing Table 1, it can be inferred that saving banks becomes costlier for the northern European countries compared to the southern European countries. Since our main research motive is to find out whether there is a North-South divide in the Eurozone countries' banking sector, the aforementioned expectation is enriching.

Table 1: Bank Assets as a percentage of GDP

Bank Assets (As % of GDP)					
	2008	2009	2010	2011	2012
Austria	366%	360%	333%	329%	310%
Belgium	350%	323%	310%	316%	280%
Finland	193%	210%	222%	274%	249%
France	318%	340%	357%	368%	375%
Germany	309%	303%	322%	311%	299%
Luxembourg	2477%	2196%	1936%	1872%	1677%
Netherlands	471%	429%	430%	441%	420%
Portugal	267%	291%	296%	291%	292%
Spain	277%	289%	289%	295%	295%
Greece	191%	207%	227%	229%	227%
Italy	210%	219%	213%	208%	216%

3.2 The Interconnectedness between the Two Crises in Europe

According to Shambaugh (2012), one of the main risks in the EMU is the fact that the sovereign debt crisis and the banking crisis are interlocked. Shambaugh (2012) defines the banking crisis as the undercapitalization of the banks, which, consequently, faced “liquidity problems”. Subsequently, Shambaugh (2012) describes the sovereign debt crisis as a situation in which “a number of countries have faced rising bond yields and challenges funding themselves”. There is a huge interconnection between the sovereign debt crisis and the banking crisis in Europe. For

instance, the member states in the Eurozone got into sovereign debt crises, partially, due to the bank bailouts they had to commit to. On the other side, banks had portfolios relying on the sovereign bonds which were at risk of defaulting.

A. Popov and N. V. Horen (2013) argue that “European banks tend to hold a large amount of government debt securities on their balance sheet”. European banks are particularly inclined to holding “sizable amounts of debt issued by foreign (mostly Eurozone) sovereigns, including debt issued by the GIIPS countries, i.e. Greece, Italy, Ireland, Portugal and Spain”. This was the case during the onset of the European sovereign debt crisis and resulted in huge concerns regarding the European banking system’s solvency. Moreover, the fragility in the banking system resulted in concerns in the health of the sovereign governments as well. Consequently, European banks started failing due to the bad debts they were holding and following the failures of the banks, the sovereign governments had to bail out their banks and, therefore, were put into hardships themselves.

3.3 North-South Divide in the European Banking Sector

Shambaugh (2012) argues that “weak banks slow growth through reduced lending” and this, consequently, leads to the growth and competitiveness crisis. Subsequently, the economies become weaker and “falling asset prices damage banks’ balance sheets” (Shambaugh, 2012). Shambaugh (2012) refers to the aforementioned interlinkage as the interconnectedness between the banking crisis and the growth and competitiveness crisis. This means that if the banks in Eurozone become weaker and stop lending, the Eurozone economies will not improve since the “rapid cut in the availability of credit will reduce both consumption and investment” (Shambaugh, 2012). Moreover, in the periods of distressed economies, banks incur huge losses since household and firms cannot “repay their loans” and, furthermore, “asset prices typically decline” and, thus, damage banks’ portfolios (Shambaugh, 2012)

As Harari (2014) argues, several Eurozone member states, particularly the southern European countries got into the European sovereign debt crisis due to their declining banking sectors. Therefore, the poor-performing banks contributed to the expansion of the North-South divide among the European economies. Having observed that the weaker performance of the

southern European banks resulted in the slower growth levels of the southern European countries' economies and, consequently, observing the North-South divide among the European economies, further in this paper, we want to explore whether there is a similar North-South divide in the European banking sector as well and whether the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis.

4 Methodology

To observe whether there is a similar North-South divide in the European banking sector and whether the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis, we run a panel data regression analysis, using financial ratios as the dependent variables, on a large sample of European banks, separated into two categories – northern European banks and southern European banks. Since market observers no longer look solely at the profitability performance of a bank, but also analyze a bank's safety and long-run predictive ratios, we decided to focus our study on four performance categories: capital performance, asset quality performance, profitability performance, and liquidity performance. The categorization was taken from the Orbis database. The main purpose of the study is to find out whether the geographical location of a bank (either northern Europe or southern Europe) affects its performance and whether the European sovereign debt crisis, affects the performance of banks.

Financial ratios are the key indicators of a certain company's financial statements, mainly balance sheets, income statements, and cash flow statements, and are used to evaluate the company's performance in various times. One of the primary advantages of analyzing financial ratio analysis is the fact that by using them, we are removing the imbalances between the banks which are not equal in size. We drew inspiration for the use of financial ratios from the studies conducted by Bordeleau and Graham (2010), Athanasoglou et al. (2005), Beltratti and Stulz (2009), and Olson and Zoubi (2011). The aforementioned studies analyze bank performance using econometric models in which financial ratios of the banks are the dependent variables; their finding are described in more detail in Chapter 2 of this paper.

What is particularly interesting to us is the effect that pre-crisis and crisis periods and geographical locations have on banks' performance indicators and key financial ratios. We define the pre-crisis period as the years 2005 to 2008 and the crisis period as the years 2009 to 2014.

4.1 Performance Indicators

We have categorized the financial ratios into four groups: capital ratios, asset quality ratios, profitability ratios, and liquidity ratios. The categorization was taken from the Orbis database.

4.1.1 Capital Ratios

We start our observation with the capital ratios. In this category, we analyze one ratio – Tier 1 capital ratio. It is important to observe this category because it shows how much a company relies on its own capital in comparison to borrowed funds. Usually, companies that are more leveraged, meaning that they use more borrowed funds and in turn have lower capital ratios are considered riskier. Capital insures companies against unexpected losses. When the business cycle goes down, companies still have to service their debt and this is the reason why more leveraged companies tend to take bigger hits in a situation of an economic downturn. This is evident in Beltratti and Stulz (2009), where higher Tier 1 capital ratio is shown to correlate with better financial performance. Due to this and the increasing stake of politicians and regulators in the financial industry in the recent years, we believe that it is crucial to include Tier 1 capital ratio in the Methodology of this paper.

Tier 1 capital ratio basically compares a bank's core equity capital, which is its permanent shareholder's equity plus its disclosed reserves, to its risk-weighted total assets. We chose this ratio for several reasons. Firstly, it is a very popular ratio among financial regulators. The ratio is often used to measure the capital adequacy of a bank and is of a particular importance to banks since it has to be high enough for a bank to function in today's regulatory frame. Secondly, Tier 1 capital ratio uses total risk-weight assets in its formula, which offers a great advantage in comparison to simply using total assets. By taking into account how risky assets are, the aforementioned ratio can bring a distinction between the banks, whose holdings are more prone to losses. Moreover, it is a crucial indicator in pointing out which banks are riskier.

$$\text{Tier 1 capital ratio} = \frac{\text{Core equity capital}}{\text{Total risk weighted assets}} \quad (1)$$

4.1.2 Asset Quality Ratios

Furthermore, we delve into the asset quality performance indicators in order to assess the quality of the banks' holdings. It can be said that lower quality of assets leads to lower lending by

banks, as shown by Hou (2008) and Tracey (2011). High levels of non-performing and impaired loans lead to lower levels of lending by the banks; this can, in turn, slow down the economy. In addition, since the banks' major income-generating assets are loans, the quality of the loan portfolio is very crucial and as Ongore and Kusa (2013) argue the quality of loan portfolio determines the profitability of banks. Ongore and Kusa (2013) conduct a study by using a linear multiple regression model and Generalized Least Square on panel data of commercial banks in Kenya. The results of the study shows evidence that "asset quality which is expressed as non-performing loans to total loans is negatively related to all the three bank performance indicators" – return on assets (ROA), return on equity (ROE), and net interest margin (NIM). As the study's evidence proves, poor asset quality performance leads to poor profitability performance for the commercial banks in Kenya.

This is why from a macroeconomic perspective, banks with higher asset quality performance, tend to have higher profitability performance, which in turn will lead to a more stable and positive outlook for the economy as a whole. It is particularly interesting whether there is a divide in the European banking sector in terms of asset quality performance. In addition, we are interested to find out whether there are differences between the pre-crisis and crisis levels of non-performing loans and impaired loans when comparing northern European banks to southern European banks. Our expectation is that non-performing loans and impaired loans would increase with the onset of the European sovereign debt crisis. Moreover, due to the economic and political climate in the peripheral economies, we expect the banks in the northern European (core) countries to have significantly lower levels of loans that are non-performing or impaired compared to the banks in the southern European countries. In order to examine this issue further, we chose two ratios – non-performing loans to gross loans and impaired loans to equity.

Non-performing loans to gross loans is calculated by dividing the total value of non-performing loans, not just the part that is overdue, to the total amount of loans. We chose to use this ratio as it commonly used for judging the relative quality of a bank's portfolio. As Ongore and Kusa (2013) state, according to Dang (2011) "the highest risk facing a bank is the losses derived from delinquent loans" and, therefore, nonperforming loan ratios are the best proxies for asset quality. Besides that, this indicator is commonly aggregated on a country level and is widely used

by the regulators and politicians who take macroeconomic decisions. As with the Tier 1 capital ratio, we prefer to use such ratios, which are commonly in use and are widely available.

$$\text{Non – perf. to Gross Loans} = \frac{\text{Non – Performing Loans (total amount)}}{\text{Total (gross) Loans}} \quad (2)$$

The other ratio that we use to assess bank's asset quality performance is the impaired loans to equity. As Moody's states: "Under IFRS, impaired loans are considered to be the best measure of problem loans." In addition, as Ekpu and Paloni (2015) state "higher values of this ratio are a sign of lower quality of the loan portfolio". An impaired loan is basically the one for which the lender is not likely to collect the full value owed to him or her, due to a fall of creditworthiness of the borrower. This is a very important metric for us since we want to thoroughly analyze the banks' loan portfolio qualities and, thus, asset quality performance. Consequently, we compare this to the shareholder's equity for each bank that we have and expect impaired loans to go up during the crisis. In addition, we have expectations that the values will be higher for the southern European banks.

$$\text{Impaired Loans to Equity} = \frac{\text{Impaired Loans (total amount)}}{\text{Shareholder's Equity}} \quad (3)$$

4.1.3 Profitability Ratios

Furthermore, we observed profitability ratios – financial metrics used to evaluate a particular company's capability to generate earnings relative to its expenses and other costs in a specific period of time – to assess the banks' profitability performance. For most profitability ratios, the higher the value, the better is the profitability performance of a company. In this study, we used two profitability ratios – profit margin and the return on equity (ROE), which are two of the most widely utilized profitability ratios. Both of the ratios might have different benchmark levels for various industries and, they are mostly used to assess the performance of a particular industry, in our case the European banking industry.

The first ratio that we used is the profit margin, which is calculated by dividing the net income of a company to its revenue. It is a very common profitability ratio and is particularly used a lot when companies are in the process of setting internal goals. It measures how effectively a company can turn its sales into profits.

$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{Total Revenue}} \quad (4)$$

The other ratio we chose is the return on equity (ROE), which shows the return for common stock owners of a particular company. In other words, it measures the company's profitability by assessing how much profit the company generates by utilizing the funds invested by the shareholders. The higher the ratio, the better is a particular bank's profitability performance. The following is the formula to calculate ROE:

$$\text{ROE} = \frac{\text{Net Profit attributable to the Group}}{\text{Equity attributable to the Group}} \quad (5)$$

As already mentioned, these ratios should be used for comparing relatively similar companies. In our case all companies are from the same industry – the banking sector, and similar geography – Europe.

4.1.4 Liquidity Ratios

“Liquidity refers to the ability of the bank to fulfill its obligations, mainly of depositors” (Ongore and Kusa, 2013). Since the crisis, there have been several instances of bank runs on illiquid banks, with the most notable example of Northern Rock in the UK. Therefore, both the policymakers and the public greatly value liquidity in the current economic climate. There is generally positive relationship between liquidity and profitability. For instance, as Ongore and Kusa (2013) state that “according to Dang (2011) adequate level of liquidity is positively related with bank profitability.” In addition, the study conducted by Bordeleau and Graham (2010) also showed evidence that profitability is improved for banks that hold some liquid assets although

there is a point beyond which holding further liquid assets diminishes a banks' profitability. This is an important indicator in bank performance and we wanted to see whether there is divide in the European banking sector in terms of liquidity performance. In addition, we wanted to analyze the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis.

To evaluate the banks' liquidity performance indicators, we utilized liquidity ratios – financial metrics used to evaluate a particular company's capability to pay its short-term debt obligations. For most liquidity ratios, the higher the value, the better is the liquidity performance of a company. In this study, we used two liquidity ratios – net loans to total assets (NetLTA) and liquid assets to deposit and short-term funding (LdASF).

NetLTA shows what percentage of the total assets is linked to the net loans and, thus, designates to what extent a bank is loaned up. The higher the ratio, the more loaned up, the less liquid and, thus, the more susceptible to defaults the bank is. The following is the formula to calculate NetLTA:

$$\text{NetLTA} = \frac{\text{Net Loans}}{\text{Total Assets}} \quad (6)$$

LdASF shows what percentage of the customer deposit and short-term funds is accessible for the unexpected withdrawals. The higher the ratio, the more liquid is the bank. In addition, the higher the ratio, the less susceptible is the bank to the bank runs. The following is the formula to calculate LdASF:

$$\text{LdASF} = \frac{\text{Liquid Assets}}{\text{Customer Deposit} + \text{Short-term Funds}} \quad (7)$$

4.2 Additional Variables

In order to run the regression analyses on the banks' financial ratios, we have included additional independent variables. In our Methodology, we have used sixteen dummy variables and three control variables.

4.2.1 Dummy Variables

Our independent variables include 16 dummy variables. Table 2 illustrates the dummy variables with their respective conditions to be equal to one, used for the purposes of this study. First, we introduce a dummy variable, called D_{North} which equals to one if a bank is in a northern European country. Thus, southern European banks will lie in the Intercept. We add this variable in order to be able to differentiate the banks in two different geographies, namely northern Europe and southern Europe, which is essentially important for the purposes of this study. Therefore, if D_{North} is equal to one, then the bank is in a northern European country and if D_{North} is equal to zero, then the bank is in a southern European country.

In addition, in order to see the development of the variables on a year-to-year basis, we utilize a separate dummy variable for each year in the period from 2006 to 2014. Therefore, year 2005 – the first year in this study – will lie in the Intercept. Consequently, for instance if D_{2006} is equal to one, then the year analyzed is 2006; however, if D_{2006} is equal to zero, then the year analyzed is any other year from the period 2005 to 2014 but 2006. We choose this method instead of averaging the pre-crisis and the crisis periods since it provides a greater insight of the development of banks' performance indicators in all four categories which we examine.

Finally, we add dummy variables for the banks that are in the North during the crisis years, namely 2009 and onwards. For instance, if $D_{\text{North and 2009}}$ is equal to one, then the analysis is based on the bank which is located in a northern European country and the year of analysis is 2009, which is a crisis period. If the year is any other year but 2009, then $D_{\text{North and 2009}}$ will be equal to zero. In addition, if the bank is located in a southern European country, then $D_{\text{North and 2009}}$ again

will be equal to zero. This is done in order to differentiate between the North and the South during the crisis and to be able to test our main hypothesis.

Table 2: List of dummy variables

Dummy	Condition to be equal to 1
D_{North}	<i>if a bank is in North</i>
D_{2006}	<i>if year is 2006</i>
D_{2007}	<i>if year is 2007</i>
D_{2008}	<i>if year is 2008</i>
D_{2009}	<i>if year is 2009</i>
D_{2010}	<i>if year is 2010</i>
D_{2011}	<i>if year is 2011</i>
D_{2012}	<i>if year is 2012</i>
D_{2013}	<i>if year is 2013</i>
D_{2014}	<i>if year is 2014</i>
$D_{\text{North and 2009}}$	<i>if a bank is in North and year is 2009</i>
$D_{\text{North and 2010}}$	<i>if a bank is in North and year is 2010</i>
$D_{\text{North and 2011}}$	<i>if a bank is in North and year is 2011</i>
$D_{\text{North and 2012}}$	<i>if a bank is in North and year is 2012</i>
$D_{\text{North and 2013}}$	<i>if a bank is in North and year is 2013</i>
$D_{\text{North and 2014}}$	<i>if a bank is in North and year is 2014</i>

4.2.2 Control Variables

Our independent variables include three control variables. The control variables used in the Methodology are listed below:

1. **GDP growth rate of the home country** – the control variable for the macroeconomic fluctuations arising from the country of origin. The change in a country's GDP is the main indicator of how a country's economy is performing. GDP growth is estimated to have a positive and statistically significant impact on bank profitability, while the level of unemployment, through a higher probability of default on loans, has a

negative impact. (Bordeleau and Graham. 2010). There's another relationship with bank profitability and GDP growth since bank profits are extended to real economy as credits (Bordeleau and Graham. 2010) which will eventually have positive effect on country's GDP. In their study Kelly et al. (2013) claim that it has long been shown that there is an empirical link between GDP and credit growth. Additionally, there is evidence that banks' lending mistakes are more prevalent in economic booms (when GDP is increasing) than in recessions. Thus, wealth of literature now links rapid credit growth with financial crises. (Kelly et al., 2013)

2. **The growth level in the most prominent stock market index in each respective country** – the control variable for the general financial mood. Stock market indices show the general economic consensus about the current state of an economy. According to the efficient markets hypothesis, it's believed that all the available information up today are reflected in the stock prices, thus stock market index (Fabozzi, 2008). In addition, it outlines how market participants gauge the general financial stability prospects of the economy. It should be noted that stock price variability is fundamentally linked to the changes in macroeconomic variables (Acikalin et al., 2008). In their study Acikalin et al. (2008) found that, the co-integration test and the vector error correction model illustrate that stock price index is co-integrated with a set of macroeconomic variables – that is, production, exchange rate, interest rate and current account balance – which provides a direct long-run equilibrium relationship. In another study Maysami et al. (2004) concluded that the Singapore stock market and the SES All-S Equities Property Index formed significant relationships with all macroeconomic variables identified. The stock market indices, together with their respective home countries, utilized in the Methodology of this paper is outlined in Table 3.

Table 3: List of Stock Market Indices with their respective home countries

Country	Stock Market Index
Germany	<i>DAX</i>
Greece	<i>FTSE/ATHEX LARGE CA</i>
Belgium	<i>EURONEXT BEL-20</i>
Austria	<i>ATX</i>
Finland	<i>OMX HELSINKI 25</i>
France	<i>CAC 40</i>
Italy	<i>FTSE MIB</i>
Luxembourg	<i>LuxX Index</i>
Netherlands	<i>AEX</i>
Portugal	<i>PSI 20</i>
Spain	<i>IBEX 35</i>

3. **Government Gross Debt as a percentage of GDP** – the control variable to assess the effects of government debt on the banking crisis. As we have mentioned in Chapter 3, there is an interconnection between the European sovereign debt crisis and the European banking crisis. The interconnections is evidently illustrated in the study by Shambaugh (2012), who argues that “bailouts of banks have contributed to the sovereign debt problems, but banks are also at risk due to their holdings of sovereign bonds that may face default”. This means poor performance of the banks can cause budgetary problems and mutually budgetary problems can result in poor performance of banks. Consequently, we believe this ratio is a crucial explanatory factor for our topic and, thus, the variable is essential for our Methodology.

4.3 Regression Equation

Having gathered all the variables essential for the purposes of the Methodology of this paper, we constructed an equation for the regression analysis. Consequently, we used the constructed

equation to run seven different regression analyses – one regression analysis for each ratio observed. The equation used for each regression analysis is below:

$$\begin{aligned}
 Y = & \text{Intercept} + b_1 * D_{\text{North}} + b_2 * D_{2006} + b_3 * D_{2007} + b_4 * D_{2008} + b_5 * D_{2009} + b_6 \\
 & * D_{2010} + b_7 * D_{2011} + b_8 * D_{2012} + b_9 * D_{2013} + b_{10} * D_{2014} + b_{11} \\
 & * D_{\text{North and 2009}} + b_{12} * D_{\text{North and 2010}} + b_{13} * D_{\text{North and 2011}} + b_{14} \\
 & * D_{\text{North and 2012}} + b_{15} * D_{\text{North and 2013}} + b_{16} * D_{\text{North and 2014}} + b_{17} \\
 & * CV_{\text{GDP Growth}} + b_{18} * CV_{\text{Stock Market Indices Growth}} + b_{19} \\
 & * CV_{\text{Government Gross Debt as a Percentage of GDP}} \quad (8)
 \end{aligned}$$

After running the regression analyses with the formula above, we observe the changes between the performance indicators of the northern European banks and the southern European banks during the pre-crisis and the crisis years. To explore the aforementioned changes, we need to calculate the following four:

1. **North Crisis**, which represents northern European banks during the crisis years. To calculate this, we add the coefficients of $D_{\text{North and 2009}}$, $D_{\text{North and 2010}}$, $D_{\text{North and 2011}}$, $D_{\text{North and 2012}}$, $D_{\text{North and 2013}}$, and $D_{\text{North and 2014}}$, and, consequently divide the resulting number by six.

$$\text{North Crisis} = \frac{b_{11} + b_{12} + b_{13} + b_{14} + b_{15} + b_{16}}{6} \quad (9)$$

2. **South Crisis**, which represents southern European banks during the crisis years. To calculate this, we add the coefficients of Intercept, D_{2009} , D_{2010} , D_{2011} , D_{2012} , D_{2013} , and D_{2014} .

$$\text{South Crisis} = b_0 + b_5 + b_6 + b_7 + b_8 + b_9 + b_{10} \quad (10)$$

3. **North Pre-Crisis**, which represents northern European banks during the pre-crisis years. To calculate we add the coefficients of Intercept, D_{North} , D_{2006} , D_{2007} , and D_{2008} .

$$\text{North PreCrisis} = b_0 + b_1 + b_2 + b_3 + b_4 \quad (11)$$

4. **South Pre-Crisis**, which represents southern European banks during the pre-crisis years. To calculate we add the coefficients of Intercept, D_{2006} , D_{2007} , and D_{2008} .

$$\text{South PreCrisis} = b_0 + b_2 + b_3 + b_4 \text{ (12)}$$

Consequently, we explore and analyze at the following differences:

1. Difference between **North Crisis** and **South Crisis**
2. Difference between **North Pre-Crisis** and **South Pre-Crisis**

4.4 Data

To conduct this study we used the data from various banks. We selected the banks from 7 northern European countries and 4 southern European countries. We used Austria, Belgium, Germany, Finland, France, Luxemburg and the Netherlands as the northern European countries. On the other hand, we used Greece, Italy, Spain, and Portugal as the southern European countries. Table 3 illustrates the list of countries, with their respective geographies (Northern Europe vs. Southern Europe), used for the purposes of this study. We chose these countries because we are looking at Eurozone countries only. According to R. M. Nelson et al. (2012), “During the crisis, it has become convention among some policymakers and analysts on both sides of the Atlantic to refer to a group of mostly southern European countries—**Greece, Ireland, Italy, Portugal, and Spain**—as the Eurozone “periphery,” in contrast to a group of mostly northern European countries, including **Austria, Belgium, Germany, Finland, France, Luxembourg, and the Netherlands**, referred to as the Eurozone “core.” In this context, periphery countries are those that have been under the most market pressure due to some combination of high public debt levels, large public deficits, and persistent trade imbalances, and core countries are those with generally stronger economies, which tend to have some combination of lower public debt levels, smaller fiscal deficits or surpluses, and trade surpluses. Although these terms mask important differences among countries in the periphery and the core, they are used in this memo to reflect current discussions.”

We chose to include all the countries discussed above besides Ireland. We do not think it is that crucial to add it to our study for a couple of reasons. Firstly, Ireland is not a “Southern” country, not only geographically, but also economically and politically. It was put into the GIIPS grouping due to its bad financial performance. However, when one thinks of countries in the southern Europe, Ireland does not come to mind and, as the title of our thesis suggests, we are more interested in differences between banks from different geographical regions. Moreover, Ireland has put major efforts after the onset of the European sovereign debt crisis in order to alleviate the damage to its economy; the country has also had certain successful reforms. At the end of the time period we chose, Ireland can no longer be put in the same category as Portugal or Greece, as it performs much better than them.

Table 4: List of countries with their respective geographies (Northern Europe vs. Southern Europe)

Northern European countries	Southern European countries
<i>Country</i>	<i>Country</i>
Austria	Spain
Belgium	Italy
Germany	Greece
Finland	Portugal
France	
Luxemburg	
Netherlands	

The data used in this study was extracted from Orbis since it is a reliable and comprehensive database. More specifically, all banks were taken from the aforementioned database. The years we observe are the years 2005 to 2014. We wanted to focus on the European sovereign debt crisis period and the years just before and after the aforementioned crisis. In total, we have 2777 banks that we included in our study. However, number of banks varies for each ratio after filtration (due to non-available data since some ratios are more common and, thus, easier to find than the others.

Table 5 illustrates the number of observations in the matrix form *Country to Ratio*. In addition, Appendix 1 illustrates the further breakdown of the observations in the matrix form *Country to Year* for each respective ratio used for the purposes of this study.

Table 5: Number of observations in the matrix form - *Country to Ratio*

<i>Country/ Ratio</i>	Tier 1 Capital Ratio	Profit Margin	ROE	Non- perf. Loans to Gross Loans	Impaired Loans to Equity	Liquid Assets to D&ST Funding	Net Loans to Total Assets
Austria	247	1141	1169	78	78	1166	1169
Belgium	127	261	275	86	86	276	270
Germany	3310	11443	11505	2137	2140	11512	11493
Finland	123	157	158	61	69	158	158
France	293	2406	2477	1356	1460	2479	2467
Luxembourg	31	87	90	21	21	91	87
Netherlands	240	353	367	198	202	365	365
Spain	229	934	982	387	402	991	991
Italy	3671	3852	3932	3373	3395	3929	3922
Greece	84	100	109	79	74	114	114
Portugal	145	253	267	218	218	271	271
All	8500	20987	21331	7994	8145	21352	21307

Tables 6 to 12 illustrate means, standard deviations, and medians (on a yearly basis) for every ratio used in the Methodology of this paper. The data in each table is separated into two groups – northern European banks and southern European banks.

Table 6: Mean, Standard Deviation, and Median on annual basis for Tier 1 Capital Ratio

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
North	<i>Mean</i>	11,49	11,27	10,74	11,67	11,96	12,04	12,22	12,80	14,00	15,05
	<i>Standard Deviation</i>	9,01	8,43	8,00	9,35	8,20	5,50	7,73	5,95	7,18	9,86
	<i>Median</i>	8,70	8,84	8,68	9,60	10,43	10,83	10,98	11,68	12,73	13,36
South	<i>Mean</i>	13,64	14,45	13,24	12,96	13,16	13,93	14,94	15,61	16,23	17,04
	<i>Standard Deviation</i>	7,50	13,24	9,35	9,16	8,48	8,81	8,37	8,57	8,67	9,36
	<i>Median</i>	12,34	12,03	11,92	11,12	11,80	11,96	13,08	13,37	14,00	14,77

The numbers in Table 6 show that both before and after the crisis, means and medians are constantly higher in the South. This is surprising for us, as it shows that southern banks are better capitalized than their northern counterparts, contrary to our expectations. Standard deviation varies, but not substantially, meaning that there are no huge differences in the distribution of the observations.

Table 7: Mean, Standard Deviation, and Median on annual basis for Profit Margin

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
North	Mean	19,80	20,70	19,41	15,94	14,09	18,98	19,31	19,06	18,30	18,99
	Standard Deviation	17,01	16,86	16,87	17,23	18,53	16,17	16,23	16,98	18,54	16,87
	Median	16,96	17,00	15,53	13,38	11,93	16,42	16,47	17,02	17,06	17,03
South	Mean	28,63	31,50	32,41	27,97	21,82	17,10	13,08	12,58	11,31	10,95
	Standard Deviation	16,20	15,36	16,77	16,70	20,09	19,97	23,12	25,12	27,09	28,12
	Median	27,86	30,96	32,45	27,78	20,76	16,67	14,63	12,41	11,11	10,81

Table 8: Mean, Standard Deviation, and Median on annual basis for ROE

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
North	Mean	6,15	6,63	6,45	4,03	2,82	4,74	3,86	3,96	3,58	3,33
	Standard Deviation	11,87	11,59	9,06	18,18	21,50	14,00	15,16	12,39	12,42	10,40
	Median	4,85	4,83	4,58	3,54	3,14	3,97	3,88	3,44	3,23	2,97
South	Mean	8,78	9,54	9,61	7,13	5,22	3,58	0,62	-0,92	0,17	-2,00
	Standard Deviation	9,20	7,99	7,78	12,24	15,48	12,01	29,40	39,48	21,34	41,41
	Median	7,35	8,15	8,88	7,35	5,30	3,45	3,11	2,89	2,52	2,35

For profitability indicators, a major trend reversal seems to occur after the year 2010. As observed in Tables 7 and 8, on average, profitability ratios seemed to be higher for southern European banks in the pre-crisis period. However, that changed in the turnaround year. In addition, variance in the above two ratios spiked greatly in the southern European banks after the onset of the European sovereign debt crisis.

Table 9: Mean, Standard Deviation, and Median on annual basis for Non-performing Loans to Gross Loans

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
North	Mean	4,15	3,81	3,52	4,36	4,92	4,95	5,13	5,06	4,41	4,23
	Standard Deviation	6,67	5,90	4,37	6,43	4,41	4,32	4,61	6,30	5,10	5,38
	Median	3,19	2,86	2,67	2,96	3,98	3,99	3,95	3,81	3,33	3,08
South	Mean	2,55	4,04	4,80	5,02	6,16	7,16	8,96	10,56	12,67	15,47
	Standard Deviation	2,55	3,04	3,73	3,30	4,87	5,76	6,86	7,43	8,14	9,91
	Median	1,49	3,57	4,07	4,60	5,48	6,54	8,07	9,66	11,76	14,19

Table 10: Mean, Standard Deviation, and Median on annual basis for Impaired Loans to Equity

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
North	Mean	39,75	36,45	34,02	42,90	58,12	54,43	50,09	45,70	35,91	33,56
	Standard Deviation	52,33	46,54	35,35	81,05	88,03	76,25	99,66	65,74	47,59	46,94
	Median	20,77	24,24	23,54	28,21	36,84	36,25	34,83	29,79	24,20	22,21
South	Mean	23,02	31,33	35,12	40,23	50,02	59,73	77,90	83,92	101,84	117,79
	Standard Deviation	23,60	25,36	25,97	28,93	48,00	55,54	81,62	86,84	93,44	113,12
	Median	14,09	26,36	30,03	34,81	42,68	49,64	61,59	69,47	79,77	91,40

Observing Tables 9 and 10, we can explore a trend similar to the profitability indicators in the asset quality dataset as well. The northern European banks seemed to have more bad assets than the southern European banks. However, this quickly changed during the crisis, and it can be observed that in the year 2014, there is a stark contrast between the holdings of the two groups of banks.

Observing Tables 11 and 12, we can see that for the liquidity ratios, the pattern is not that discernable. Even though southern European banks seemed to hold more liquid assets in the pre-crisis years, they were also more loaned up. For both ratios, means and medians became very close for the two groups by the year 2014.

Table 11: Mean, Standard Deviation, and Median on annual basis for Liquid Assets to Deposits and Short-term Funding

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
North	Mean	23,85	23,83	24,14	27,20	25,92	24,05	24,63	25,91	24,21	22,18
	Standard Deviation	42,61	38,42	40,11	49,45	38,10	39,52	48,11	57,18	53,73	46,54
	Median	14,45	14,64	15,83	17,99	18,18	15,78	15,47	15,46	13,73	12,51
South	Mean	33,18	29,92	27,14	28,57	27,61	22,55	22,22	19,58	21,44	21,92
	Standard Deviation	30,62	40,17	35,49	59,25	53,59	44,47	57,59	30,25	40,78	46,51
	Median	25,23	18,74	16,28	15,51	14,44	12,61	11,67	11,66	11,45	11,04

Table 12: Mean, Standard Deviation, and Median on annual basis for Net Loans to Total Assets

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
North	Mean	58,63	58,37	58,21	57,56	56,70	56,28	56,74	57,06	57,93	58,62
	Standard Deviation	18,97	18,75	19,36	19,51	19,21	19,37	19,18	19,58	19,76	19,24
	Median	61,32	61,07	60,59	59,47	57,98	58,16	58,46	59,16	60,25	61,05
South	Mean	66,92	68,11	69,47	70,39	69,60	69,88	67,87	63,13	58,79	56,04
	Standard Deviation	20,58	20,55	20,73	19,92	20,20	19,99	19,80	20,16	20,30	20,00
	Median	71,54	73,56	74,70	75,35	74,20	74,66	72,87	66,65	61,46	57,45

5 Results

In this Chapter, we will discuss the results we get after running the regression analysis on the seven aforementioned ratios – Tier 1 capital ratio, profit margin, return on equity (ROE), non-performing loans to gross loans, impaired loans to equity, liquid assets to debt and short-term funding, and net loans to total Assets. Our expectations were that there is a North-South divide in the European banking sector and the so-called North-South divide in the European banking sector grew wider with the European sovereign debt crisis

We chose to use a 95% confidence interval. Therefore, for statistically significant results, we need t-statistics outside the -1.962 to 1.962 range and a p-value of less than 0.05. Moreover, we also analyze the F statistics and its significance level with a 95% confidence level. With $df_1 = 6$ and df_2 more than 120, for statistically significant results, we need F more than 2.0986 and its significance less than 5%.

In our analysis we are adding a goodness of fit measure – R-squared. We are also using adjusted R-squared. The reason we need it is that the normal R-squared goes up for every predictor added to the model. Therefore, it can be artificially high in models with more variables. Adjusted R-squared “adjusts” for that by going up for independent variables correlated to the dependent variable and going down for uncorrelated variables. However, having in mind the large data samples have and the fact that we have only a few variables, even low R-squared should not be a cause of concern, as it might be expected.

Table 13 illustrates a summary of the results for the northern European banks and the southern European banks and the differences during the pre-crisis and crisis periods. Tables illustrating the detailed regression results for every regression analysis conducted can be found in Appendix 2.

Table 13: Summary of the Results

	North Crisis	South Crisis	North Pre- Crisis	South Pre- Crisis	Difference between N and S in Crisis	Difference between N and S in Pre-Crisis
Tier 1 Capital	0.15	22.78	13.13	15.58	-22.63	-2.45
Profit Margin	15.12	-56.05	30.11	42.58	71.18	-12.47
Return on Equity	5.09	-32.83	3.19	6.77	37.92	-3.57
Non- Performing Loans to Gross Loans	-4.2	26.44	2.84	1.26	-30.64	1.58
Impaired Loans to Equity	-34.25	208.33	19.82	-1.1	-242.58	20.92
Liquid Assets to Deposits and Short- Term Funding	7.07	-4.9	36.96	42.66	11.98	-5.69
Net Loans to Total Assets	5.37	11.66	54.38	62.04	-6.29	-7.66

5.1 Capital Ratios

To compare the banks' capital performance indicators, we analyzed the Tier 1 capital ratio. The results for the independent variables for this ratio do not have high significance levels; 7 out of the 19 independent Variables are significant. The F-statistics is strong since it is higher than

2.0986 and its significance is less than 5%. In addition, the difference between the R-squared and the Adjusted R-squared is less than 5%. Therefore, all in all our results have explanatory power.

D_{North} explains the difference between the ratios of northern European banks and southern European banks during the pre-crisis period. It is assumed to be constant. A surprising result, contrary to our expectations that the north is generally doing better is exhibited by it. Its value is -2.45, meaning that northern European banks have lower Tier 1 capital ratio before 2009. The t-statistic is over 4, making the result significant. Possible explanation for this might be the fact that, in general, banks are not trying to build capital, especially during boom times, as they are missing on profits. Therefore if the notion that northern banks are generally better, they will be more efficient and will optimize their capital holdings level, leading to the observed difference.

When examining what happens during the development of the crisis, the same pattern is evident - southern European banks hold more Tier 1 capital than northern European banks. With the exception of 2009, banks tend to keep more and more capital with every year passing, with the coefficient going from 0.6760 in 2010 to 3.5909 in 2014. This is due to new regulatory requirements, regulators became more stringent after the onset of the crisis, and the underperforming banks in the southern European countries had to build their capital. Results for these years are mostly significant. When we look at the development in northern banks, we can see that the negative gap actually became wider. There is no observable pattern that can be seen in the results, as the coefficients for different years are negative for some and positive for other years. Results for these years are also insignificant. Even though a discernable movement on a year-to-year basis cannot be found, the building of capital in the southern European banks and lack of such in the northern European banks leads to even higher Tier 1 capital levels for southern European banks during the crisis.

A recent development is that the European Commission has been considering an investigation into the way southern banks treat deferred tax assets. Depending on jurisdiction, some banks are allowed to include those in their capital. This might be the reason why southern banks can have artificially high Tier 1 ratios. In certain countries like Greece, these assets might be up to 4-5% of the core capital of banks. Even though this issue is out of the scope of this paper, it might be one of the main reasons behind the results shown above.

As our paper shows further on, northern banks are more profitable during crisis years. This seems to be in contradiction with Beltratti and Stulz (2009), which stated that banks with higher

Tier 1 ratios and situated in countries with stronger capital supervision had better returns for their shareholders during the crisis. Our results show that Tier 1 capital itself is not indicative of a bank's performance. The finding in the above paper seems to hold true only for banks in countries that have stronger capital supervision, and the difference between countries' regulatory frameworks seems to be more important than simply having a higher Tier 1 ratio.

5.2 Asset Quality Ratios

To compare the banks' asset quality ratios, we analyzed two ratios – non-performing loans to gross loans and impaired loans to equity.

5.2.1 Non-performing Loans to Gross Loans

The results for the non-performing loans to gross loans are as follows: independent variables are mostly significant. 15 out of 19 independent variables are significant. F-statistics is very high and its significance level is less than 5%. In addition, the difference between the R-squared and the Adjusted R-squared is less than 5%.

Contrary to our expectations looking at the D_{North} , the North seems to be performing worse. It is positive 1.5792, which in this case means that southern banks had smaller percentage of non-performing loans before the crisis. However, with the worsening of the southern European countries' economies, a sharp and significant rise can be seen between 2010 and 2014 in the south. This observation is in line with what we expected - business and people are faring worse in these years and cannot repay their loans, which in turn leads to an increase in the non-performing loans on southern banks' portfolios.

If we look at the same ratio of the northern European banks, using $D_{\text{North and 2009}}$ through $D_{\text{North and 2014}}$, after 2009, which is again insignificant, there is a sharp decline on a year-to-year basis in comparison to the southern European banks. The reversal of the pattern signifies that northern economies in general and northern banks in particular fared better during these times of financial turmoil in regards to loans that could not be repaid.

An interesting observation is that there is a positive relationship between banks being in countries with more indebted governments and higher levels of non-performing loans.

5.2.2 Impaired Loans to Equity

The results for the impaired loans to equity are as follows: independent variables are mostly significant. 11 out of the 19 independent variables are significant. The F-statistics is again very high and its significance is less than 5%. In addition, the difference between the R-squared and the Adjusted R-squared is less than 5%.

Again surprisingly, the southern European banks have a lower percentage of bad loans in comparison to equity. The coefficient is 20.9157. Similar to the ratio above, a positive number once again means that the ratio is higher. Southern banks exhibit a pattern of rising numbers for that ratio. The pre-crisis results are not changing by that much, the delta is about positive 4 for the 4 years, and they are not significant. However, starting in 2010, the ratio jumps up at an alarming rate, signifying that either equity is going down or impaired loans are skyrocketing. In this case, the second option must be the reality.

Again, a similar pattern is observed in the North. After a positive and insignificant 2009 and an insignificant 2010, the pattern reverses and the northern banks start having a smaller percentage of non-performing loans, which in turn proves our hypothesis that there is a widening gap between the two groups during the crisis years.

There is a similar relationship between banks being in countries with more indebted government and higher levels of bad loans, as aforementioned.

5.3 Profitability Ratios

To compare the banks' profitability performance indicators, we analyzed two ratios – profit margin and return on equity (ROE).

5.3.1 Profit Margin

The results for the profit margin are as follows: independent variables are mostly significant. All but two independent variables. F statistics is strong since F is higher than 2.0986 and its significance is less than 5%. In addition, the difference between the R-squared and the Adjusted R-squared is less than 5%.

D_{North} is negative: -12.4721. Southern banks are more profitable during the pre-crisis period. There is no straightforward linear pattern for this ratio. The profit margin is going down in the southern European banks in the years 2005 to 2009. After that, during the crisis period, it is constantly negative, with the coefficient varying between -11.1470 and -16.4764. Southern European banks' profitability was greatly diminished during the crisis. This development is in line with our expectations and corresponds to the rise in bad loans observed in the ratio above.

What happens with the profit margin in the north during crisis years is that, again there is no constant growth, however after the onset of the European sovereign debt crisis, northern European banks exhibit higher profitability than southern European banks. Overall, it grows, even though there is a 2 point correction in the years 2013 and 2014 in comparison to the years 2011 and 2012.

There is a negative relationship between a bank's profitability and the government debt of its country of domicile. This is expected since the economies which owe more, tend to fare worse during the times of financial uncertainties. Interestingly enough, there seems to be a negative relationship between GDP growth and banks' profitability.

5.3.2 Return on Equity (ROE)

The results for the return on equity (ROE) are as follows: independent variables are mostly significant although less than for the other profitability performance indicator. 13 out of the 19 independent variables are significant. F-statistics is strong since it is higher than 2.0986 and its significance is less than 5%. In addition, the difference between the R-squared and the Adjusted R-squared is less than 5%.

Again, southern European banks exhibit better profitability performance during the pre-crisis period. This can be observed by looking at the D_{North} variable that is -3.5708. However, even during that period the southern European banks are performing worse every year. A bigger negative jump can be observed in the year 2010. After a slowdown in the years 2011 and 2012, and a slight improvement in the year 2013, southern European banks continue performing even worse in 2014. Once again, this is in line with our expectations.

Return on equity in the northern European banks is improving in comparison to the southern European banks, surpassing it in 2010. This development is mostly due to the lower ROE for southern European banks rather than higher ROE for northern banks.

For this profitability ratio, however, GDP growth seems to be positively correlated.

5.4 Liquidity Ratios

To compare the banks' liquidity Ratios, we analyzed two ratios – liquid assets to deposits and short-term funding and net loans to total assets.

5.4.1 Liquid Assets to Deposits and Short-term Funding

The results for liquid assets to deposits and short-term funding are as follows: independent variables are mostly significant. 12 out of the 19 independent variables are significant. F-statistics is strong since it is higher than 2.0986 and its significance is less than 5%. In addition, the difference between the R-squared and the Adjusted R-squared is less than 5%.

For this liquidity ratio, D_{North} is -5.6925. Southern European banks are yet again doing better before the crisis and are holding more liquid assets as a percentage of deposits and short-term funding. This liquidity ratios is going down for every year before the crisis. In 2009 it is -8.2546 and then it spikes again in 2012 when it is -11.7054. It is negative in every year during the crisis as well. It is apparent that liquidity dries up fast when there are shocks in the economy. This is why in contrast to the ratios discussed above, where the reversal usually happens in the year 2010; it occurred faster for this ratio.

When adding the dummy variables for the northern European banks during the crisis years, as per our expectations the northern European banks begin performing better and holding more liquid assets than their southern counterparts. The gap widens up until the year 2012; however, it becomes smaller in the year 2013 and even smaller in the year 2014. This is contrary to our hypothesis. The driving factor behind this might be similar to the Tier 1 discussion above; the fact that southern European banks might need to face more stringent regulations or might want to appear safer can be among the reasons why the gap stopped widening.

5.4.2 Net Loans to Total Assets

The results for the net loans to total assets are as follows: independent variables are mostly significant. 13 out of the 19 independent variables are significant. F-statistics is strong since it is higher than 2.0986 and its significance is less than 5%. In addition, the difference between the R-squared and the Adjusted R-squared is less than 5%.

D_{North} is -7.6596. Northern European banks seem to underperform before the crisis once again. Looking at the other variables, the South does progressively worse throughout the years in question. For this ratio, it takes a bit longer to reverse the pre-crisis trend – it happens after 2011, when the gap starts widening, in line with our hypothesis, and the North starts performing better.

5.5 Interpretation

Most of the Results are significant and in line with our hypothesis. F-statistics figures are significant for all regression analyses. The difference between the R-squared and the Adjusted R-squared figures are less than 5% for all regressions. In addition, t-statistics figures are significant for most of the regressions. Asset quality, profitability, and liquidity indicators show better performance levels for the Northern European banks following the onset of the European sovereign debt crisis. In addition, the differences between the northern European banks and the southern European banks became mostly higher following the onset of the crisis compared to the pre-crisis period. The exception is Tier 1 capital ratio. However, we have to take into account that most of

the results for this Ratio had insignificant t-statistics figures, and several other factors, like reporting in the south and banks' incentives to hold more capital.

For profitability and asset Quality, the expected pattern reversal for the northern European banks to do better than the southern European banks occurs in the year 2010, rather than in the year 2009. This shows the fact that, at the onset of the crisis, every bank on the street was not doing well. However, northern European banks managed to recoup faster and to be on top of the recovery game, in stark comparison to the southern European banks.

The interesting finding that the South seemed to do better in everything before the crisis can be explained by the fact that banks there had the option to take higher risks due to less strict regulations and sometimes more reckless spending by the borrowers. While this can be profitable during the boom times, it is disastrous during the bust periods. Moreover, the question whether there has been any creative accounting there can also be used to explain some of the unexpected good performance.

6 Conclusion

The results seem to partially prove our initial expectations. The comprehensive dataset that we acquired supports the hypothesis that the banking sector in the northern European countries performs much better than the banking sector in the southern European countries, in most categories during the crisis years, and that gap is becoming wider. An interesting observation that can be drawn from our data, however, is that the southern European banks actually seemed to perform better in the pre-crisis years.

Chances are high that the most important performance indicators from an investor's point of view is profitability performance and it is, therefore, worth noting the results from our study in that particular category. In that regard, northern European banks came on top during the crisis years. It is interesting to note that the southern European banks' ratios seem to worsen after the year 2010, which as mentioned above seems to be a pattern reversal year in our dataset. A reason behind this might be that there are higher levels of "creative" accounting in the southern European economies. This becomes harder to hide in a full-blown economic crisis. In turn, southern European banks can suddenly end up with more toxic assets and non-performing loans.

A surprising result was the level of capitalization of the European southern banks, namely the Tier 1 capital ratio. Differences in reporting might be the main reason behind this or it may be explained again with the use of creative accounting. Also, the significance levels of our results for this ratio were low and, thus, might be lacking explanatory power.

Finally, the results of this study show that the northern European countries and the southern European countries are not only economically divided, but also exhibit a divide in their banking sectors. The econometric model utilizing financial ratios yields the result that on average northern European banks outperformed the southern European banks during the European sovereign debt crisis. The results may not exhibit our hypotheses as prominently as we expected since we have one interesting insignificant result, which is contrary to our expectations. The main reasons behind this might be the interconnectedness of the European financial sector and the European banking sector's international exposure, which is much more than the international exposures of their respective economies. Overall, the general banking crisis in Europe made the North-South economic chasm bigger, even though it was non-existent before the crisis itself.

Further research might aim to include more banks from newer members of the European Union. A larger sample of banks might yield more significant results. The current study focused on larger economies, however it might be interesting to examine the divide in the newer members and smaller economies like Estonia, Latvia, Croatia and Bulgaria.

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Appendix 1

Table 14: Number of observations in the matrix form - *Country to Year for Tier 1 Capital Ratio*

<i>Country/Year</i>	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	8	10	12	18	29	28	33	32	35	42
Belgium	8	10	12	11	14	17	14	13	15	13
Germany	29	29	40	82	172	223	307	589	950	889
Finland	7	8	9	10	11	12	13	14	19	20
France	27	31	29	28	29	28	31	32	33	25
Luxembourg	2	1	1	3	3	3	4	5	5	4
Netherlands	18	19	21	22	23	26	26	26	31	28
Spain	14	15	15	20	21	29	29	33	32	21
Italy	224	260	269	283	278	341	454	508	532	522
Greece	7	7	7	7	9	10	10	9	9	9
Portugal	8	8	10	9	13	16	18	21	21	21
All	352	398	425	493	602	733	939	1282	1682	1594

Table 15: Number of observations in the matrix form - *Country to Year for Profit Margin*

<i>Country/Year</i>	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	96	108	104	106	108	114	123	122	131	129
Belgium	24	23	28	23	25	29	26	27	27	29
Germany	1023	1098	1109	1110	1121	1160	1178	1213	1215	1216
Finland	10	12	12	13	14	17	17	19	20	23
France	204	210	231	246	249	251	257	264	267	227
Luxembourg	5	6	7	9	7	10	9	12	12	10
Netherlands	31	32	32	33	36	36	35	39	41	38
Spain	52	65	76	82	93	103	109	115	122	117
Italy	264	293	297	307	294	349	464	522	538	524
Greece	9	11	10	13	12	13	6	10	6	10
Portugal	19	20	24	22	26	28	30	29	28	27
All	1737	1878	1930	1964	1985	2110	2254	2372	2407	2350

Table 16: Number of observations in the matrix form - *Country to Year for Return on Equity*

<i>Country/Year</i>	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	99	109	104	109	110	118	127	126	135	132
Belgium	25	24	29	27	26	30	27	28	29	30
Germany	1027	1099	1113	1123	1127	1167	1190	1220	1219	1220
Finland	10	12	12	13	14	17	17	19	21	23
France	212	215	236	253	257	263	263	272	273	233
Luxembourg	5	6	7	9	8	10	11	12	12	10
Netherlands	31	33	33	35	37	38	37	41	42	40
Spain	54	68	78	84	96	105	113	129	135	120
Italy	265	294	297	309	297	357	472	529	558	554
Greece	9	11	10	13	12	13	10	9	11	11
Portugal	19	20	25	25	27	28	30	31	32	30
All	1756	1891	1944	2000	2011	2146	2297	2416	2467	2403

Table 17: Number of observations in the matrix form - *Country to Year for Non-performing Loans o Gross Loans*

<i>Country/Year</i>	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	4	4	5	5	6	8	11	12	12	11
Belgium	6	6	7	9	9	11	9	9	10	10
Germany	12	18	22	26	28	33	95	405	825	673
Finland	4	3	3	4	5	7	9	8	9	9
France	49	50	93	128	142	153	168	195	202	176
Luxembourg	1	1	1	1	2	2	4	3	3	3
Netherlands	7	11	14	17	21	24	25	27	27	25
Spain	17	20	26	28	33	41	47	59	66	50
Italy	99	173	259	268	272	334	433	497	523	515
Greece	3	6	6	7	8	9	10	10	10	10
Portugal	15	13	16	18	21	22	27	28	30	28
All	217	305	452	511	547	644	838	1253	1717	1510

Table 18: Number of observations in the matrix form - *Country to Year for Impaired Loans to Equity*

Country/Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	4	4	5	5	6	8	11	12	12	11
Belgium	6	6	7	9	9	11	9	9	10	10
Germany	12	19	23	26	28	33	96	405	825	673
Finland	6	5	4	5	6	8	9	8	9	9
France	60	63	103	143	154	161	179	207	209	181
Luxembourg	1	1	1	1	2	2	4	3	3	3
Netherlands	8	11	14	17	21	24	26	28	28	25
Spain	17	20	26	29	35	44	50	62	69	50
Italy	107	181	260	271	273	334	434	498	524	513
Greece	3	6	6	7	8	9	9	6	10	10
Portugal	15	13	16	18	21	22	27	28	30	28
All	239	329	465	531	563	656	854	1266	1729	1513

Table 19: Number of observations in the matrix form - *Country to Year for Liquid Assets to Deposits and Short-term Funding*

Country/Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	98	108	103	109	110	118	127	126	135	132
Belgium	25	24	29	27	26	30	28	28	29	30
Germany	1027	1099	1113	1124	1128	1169	1192	1221	1219	1220
Finland	10	12	12	13	14	17	17	19	21	23
France	212	214	237	253	257	263	264	272	274	233
Luxembourg	5	6	7	9	8	10	12	12	12	10
Netherlands	31	33	32	35	37	38	36	41	42	40
Spain	54	68	78	84	96	107	114	133	136	121
Italy	264	294	297	309	297	357	472	528	558	553
Greece	9	11	10	13	12	13	12	12	11	11
Portugal	19	20	25	26	28	29	31	31	32	30
All	1754	1889	1943	2002	2013	2151	2305	2423	2469	2403

Table 20: Number of observations in the matrix form - *Country to Year for Net Loans to Total Assets*

Country/Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	99	109	104	109	110	118	127	126	135	132
Belgium	24	23	28	26	25	29	28	28	29	30
Germany	1025	1097	1111	1121	1125	1165	1190	1220	1219	1220
Finland	10	12	12	13	14	17	17	19	21	23
France	211	213	236	253	254	260	264	271	273	232
Luxembourg	5	6	7	9	8	10	11	11	11	9
Netherlands	31	32	33	35	36	38	37	41	42	40
Spain	54	68	78	84	96	107	114	133	136	121
Italy	264	293	295	308	295	355	470	529	559	554
Greece	9	11	10	13	12	13	12	12	11	11
Portugal	19	20	25	26	28	29	31	31	32	30
All	1751	1884	1939	1997	2003	2141	2301	2421	2468	2402

Appendix 2

Table 21: Results for Tier 1 Capital Ratio

Y Variable	Tier 1			
	<i>b:</i>	<i>Standard Error:</i>		
Intercept	15,62* (15,66)	1,00		
D_{North}	-2,45* -(4,42)	0,55		
D₂₀₀₆	0,89 (1,38)	0,65	North - Crisis	0,15
D₂₀₀₇	-0,27 -(0,44)	0,63	South - Crisis	22,78
D₂₀₀₈	-0,66 -(1,04)	0,64	North - Pre-Crisis	13,13
D₂₀₀₉	-2,11* -(2,03)	1,04	South - Pre-Crisis	15,58
D₂₀₁₀	0,68 (1,03)	0,66	Difference between N and S in Crisis	-22,63
D₂₀₁₁	1,42* (2,28)	0,62	Difference between N and S in Pre-Crisis	-2,45
D₂₀₁₂	1,29 (1,68)	0,77		
D₂₀₁₃	2,30* (3,30)	0,70		
D₂₀₁₄	3,59* (5,44)	0,66		
D_{North and 2009}	0,71 (0,84)	0,85		
D_{North and 2010}	0,56 (0,71)	0,78		
D_{North and 2011}	-0,06 -(0,07)	0,75		
D_{North and 2012}	-0,20 -(0,28)	0,70		
D_{North and 2013}	-0,13 -(0,20)	0,64		
D_{North and 2014}	0,01 (0,02)	0,66		
CV_{GDP Growth}	-0,30* -(2,27)	0,13		
CV_{Stock Market Indices Growth}	0,20 (1,96)	0,10		
CV_{Government Gross Debt as a Percentage of GDP}	-1,75* (-2,03)	0,86		
F	15,41* (0,00)			

t-statistics are in brackets. Coefficients with asterix are significant.

Table 22: Results for Profit Margin

Y Variable	Profit Margin			
	<i>b:</i>	<i>Standard Error:</i>		
Intercept	40,08*	0,00		
	(33,32)			
D_{North}	-12,47*	0,60		
	-(20,87)			
D₂₀₀₆	3,98*	0,73	North - Crisis	15,12
	(5,43)			
D₂₀₀₇	2,47*	0,70	South - Crisis	-56,05
	(3,54)			
D₂₀₀₈	-3,94*	0,62	North - Pre-Crisis	30,11
	-(6,32)			
D₂₀₀₉	-14,68*	1,43	South - Pre-Crisis	42,58
	-(10,24)			
D₂₀₁₀	-11,15*	1,06	Difference between N and S in Crisis	71,18
	-(10,50)			
D₂₀₁₁	-15,98*	0,99	Difference between N and S in Pre-Crisis	-12,47
	-(16,17)			
D₂₀₁₂	-19,29*	1,10		
	-(17,57)			
D₂₀₁₃	-18,55*	1,03		
	-(17,96)			
D₂₀₁₄	-16,48*	1,02		
	-(16,15)			
D_{North and 2009}	2,15	1,16		
	(1,85)			
D_{North and 2010}	15,00*	1,12		
	(13,38)			
D_{North and 2011}	19,69*	1,09		
	(17,99)			
D_{North and 2012}	19,20*	1,07		
	(18,01)			
D_{North and 2013}	17,43*	1,02		
	(17,15)			
D_{North and 2014}	17,27*	1,03		
	(16,72)			
CV_{GDP Growth}	-1,27*	0,18		
	-(7,00)			
CV_{Stock Market Indices Growth}	-0,04	0,14		
	-(0,28)			
CV_{Government Gross Debt as a Percentage of GDP}	-9,98*	1,12		
	-(8,93)			
F	65,24*			
	(0,00)			

*t-statistics are in brackets. Coefficients with
asterix are significant.*

Table 23: Results for Return on Equity

Y Variable	Return on Equity			
	<i>b:</i>	<i>Standard Error:</i>		
Intercept	9,46*	1,13		
	(8,36)			
D_{North}	-3,57*	0,56		
	-(6,32)			
D₂₀₀₆	-0,47	0,69	North - Crisis	5,09
	-(0,68)			
D₂₀₀₇	-0,46	0,66	South - Crisis	-32,83
	-(0,70)			
D₂₀₀₈	-1,76*	0,59	North - Pre-Crisis	3,19
	-(2,97)			
D₂₀₀₉	-1,42	1,35	South - Pre-Crisis	6,77
	-(1,05)			
D₂₀₁₀	-5,78*	1,01	Difference between N and S in Crisis	37,92
	-(5,74)			
D₂₀₁₁	-8,21*	0,94	Difference between N and S in Pre-Crisis	-3,57
	-(8,76)			
D₂₀₁₂	-8,40*	1,03		
	-(8,13)			
D₂₀₁₃	-7,81*	0,97		
	-(8,05)			
D₂₀₁₄	-10,68*	0,96		
	-(11,12)			
D_{North and 2009}	1,08	1,10		
	(0,98)			
D_{North and 2010}	3,52*	1,06		
	(3,32)			
D_{North and 2011}	5,19*	1,04		
	(5,00)			
D_{North and 2012}	6,83*	1,01		
	(6,79)			
D_{North and 2013}	5,88*	0,96		
	(6,16)			
D_{North and 2014}	8,03*	0,97		
	(8,25)			
CV_{GDP Growth}	0,45*	0,17		
	(2,67)			
CV_{Stock Market Indices Growth}	0,11	0,12		
	(0,88)			
CV_{Government Gross Debt as a Percentage of GDP}	-0,61	1,05		
	(-0,58)			
F	21,99*			
	(0,00)			

*t-statistics are in brackets. Coefficients with
asterix are significant.*

Table 24: Results for Non-performing Loans to Gross Loans

Y Variable	Non-performing Loans to Gross Loans			
	<i>b:</i>	<i>Standard Error:</i>		
Intercept	-2,11* -(2,95)	0,71		
D_{North}	1,58* (4,24)	0,37		
D₂₀₀₆	0,93 (1,67)	0,56	North - Crisis	-4,20
D₂₀₀₇	1,36* (2,67)	0,51	South - Crisis	26,44
D₂₀₀₈	1,08* (2,05)	0,53	North - Pre-Crisis	2,84
D₂₀₀₉	0,68 (0,85)	0,81	South - Pre-Crisis	1,26
D₂₀₁₀	2,85* (5,27)	0,54	Difference between N and S in Crisis	-30,64
D₂₀₁₁	4,17* (7,96)	0,52	Difference between N and S in Pre-Crisis	1,58
D₂₀₁₂	4,65* (7,53)	0,62		
D₂₀₁₃	6,67* (11,77)	0,57		
D₂₀₁₄	9,52* (17,61)	0,54		
D_{North and 2009}	-0,64 -(1,00)	0,64		
D_{North and 2010}	-1,71* -(2,85)	0,60		
D_{North and 2011}	-2,85* -(5,06)	0,56		
D_{North and 2012}	-4,05* -(7,81)	0,52		
D_{North and 2013}	-6,60* -(14,19)	0,47		
D_{North and 2014}	-9,33* -(19,51)	0,48		
CV_{GDP Growth}	-0,22* -(2,23)	0,10		
CV_{Stock Market Indices Growth}	0,03 (0,63)	0,05		
CV_{Government Gross Debt as a Percentage of GDP}	6,14* (10,90)	0,56		
F	156,26* (0,00)			

*t-statistics are in brackets. Coefficients with
asterisk are significant.*

Table 25: Results for Impaired Loans to Equity

Y Variable	Impaired Loans to Equity			
	<i>b:</i>	<i>Standard Error:</i>		
Intercept	-19,87*	7,93		
	-(2,51)			
D_{North}	20,92*	4,11		
	(5,08)			
D₂₀₀₆	4,12	6,06	North - Crisis	-34,25
	(0,68)			
D₂₀₀₇	6,21	5,61	South - Crisis	208,33
	(1,11)			
D₂₀₀₈	8,45	5,79	North - Pre-Crisis	19,82
	(1,46)			
D₂₀₀₉	8,44	9,09	South - Pre-Crisis	-1,10
	(0,93)			
D₂₀₁₀	23,29*	5,98	Difference between N and S in Crisis	-242,58
	(3,89)			
D₂₀₁₁	38,23*	5,79	Difference between N and S in Pre-Crisis	20,92
	(6,61)			
D₂₀₁₂	37,03*	6,90		
	(5,37)			
D₂₀₁₃	52,97*	6,30		
	(8,41)			
D₂₀₁₄	68,24*	5,99		
	(11,40)			
D_{North and 2009}	4,68	7,06		
	(0,66)			
D_{North and 2010}	-9,10	6,71		
	-(1,36)			
D_{North and 2011}	-28,77*	6,29		
	-(4,57)			
D_{North and 2012}	-35,65*	5,81		
	-(6,14)			
D_{North and 2013}	-60,41*	5,19		
	-(11,64)			
D_{North and 2014}	-76,24*	5,34		
	-(14,27)			
CV_{GDP Growth}	-1,15	1,14		
	-(1,01)			
CV_{Stock Market Indices Growth}	0,29	0,58		
	(0,49)			
CV_{Government Gross Debt as a Percentage of GDP}	53,10*	6,31		
	(8,41)			
F	69,86*			
	(0,00)			

t-statistics are in brackets. Coefficients with asterix are significant.

Table 26: Results for Liquid Assets to Deposits and Short-term Funding

Y Variable	Liquid Assets to Deposits and Short-term Funding			
	<i>b:</i>	<i>Standard Error:</i>		
Intercept	38,27* (13,12)	2,92		
D_{North}	-5,69* -(3,90)	1,46		
D₂₀₀₆	2,20 (1,23)	1,79	North - Crisis	7,07
D₂₀₀₇	1,19 (0,70)	1,70	South - Crisis	-4,90
D₂₀₀₈	1,00 (0,65)	1,53	North - Pre-Crisis	36,96
D₂₀₀₉	-8,25* -(2,37)	3,48	South - Pre-Crisis	42,66
D₂₀₁₀	-4,68 -(1,80)	2,60	Difference between N and S in Crisis	11,98
D₂₀₁₁	-6,00* -(2,48)	2,42	Difference between N and S in Pre-Crisis	-5,69
D₂₀₁₂	-11,71* -(4,40)	2,66		
D₂₀₁₃	-7,78* -(3,11)	2,50		
D₂₀₁₄	-4,76* -(1,92)	2,48		
D_{North and 2009}	1,62 (0,57)	2,84		
D_{North and 2010}	8,19* (2,99)	2,74		
D_{North and 2011}	9,63* (3,59)	2,68		
D_{North and 2012}	12,85* (4,95)	2,59		
D_{North and 2013}	6,94* (2,81)	2,47		
D_{North and 2014}	3,21 (1,27)	2,51	<i>t-statistics are in brackets. Coefficients with asterix are significant.</i>	
CV_{GDP Growth}	-1,35* -(3,10)	0,43		
CV_{Stock Market Indices Growth}	0,02 (0,06)	0,32		
CV_{Government Gross Debt as a Percentage of GDP}	-9,15* -(3,39)	2,70		
F	3,46* (0,00)			

Table 27: Results for Net Loans to Total Assets

Y Variable	Net Loans to Total Assets		
	<i>b:</i>	<i>Standard Error:</i>	
Intercept	59,35* (47,72)	1,24	
D_{North}	-7,66* -(12,33)	0,62	
D₂₀₀₆	1,31 (1,72)	0,76	North - Crisis 5,37
D₂₀₀₇	1,59* (2,19)	0,73	South - Crisis 11,66
D₂₀₀₈	-0,21 -(0,32)	0,65	North - Pre-Crisis 54,38
D₂₀₀₉	-2,85* -(1,92)	1,48	South - Pre-Crisis 62,04
D₂₀₁₀	0,10 (0,09)	1,11	Difference between N and S in Crisis -6,29
D₂₀₁₁	-3,09* -(3,00)	1,03	Difference between N and S in Pre-Crisis -7,66
D₂₀₁₂	-10,23* -(9,03)	1,13	
D₂₀₁₃	-14,63* -(13,75)	1,06	
D₂₀₁₄	-16,98* -(16,09)	1,06	
D_{North and 2009}	-2,73* -(2,25)	1,21	
D_{North and 2010}	-2,23 -(1,91)	1,17	
D_{North and 2011}	1,41 (1,24)	1,14	
D_{North and 2012}	7,11* (6,44)	1,10	
D_{North and 2013}	12,44* (11,85)	1,05	
D_{North and 2014}	16,19* (15,14)	1,07	<i>t-statistics are in brackets. Coefficients with asterix are significant.</i>
CV_{GDP Growth}	-0,54* -(2,92)	0,19	
CV_{Stock Market Indices Growth}	-0,01 -(0,05)	0,13	
CV_{Government Gross Debt as a Percentage of GDP}	10,72* (9,30)	1,15	
F	57,04* (0,00)		