



Programme:

MSc in Banking & Finance

Module:

Dissertation Project

Dissertation Title:

***EUROPEAN BANKING PERFORMANCE DURING THE 2007-2010
FINANCIAL CRISIS***

Student Names:

Petros Tsachouridis & Anestis Tsinaslanidis

Supervisor:

Professor Stergios Leventis

Hand in Date:

15-10-2010

Economics and Business Administration

Acknowledgements

We wish to thank our dissertation supervisor Prof. Stergios Leventis for his very helpful comments and his research assistance. We gratefully acknowledge the hospitality of all the personnel of the International Hellenic University during the writing of this dissertation. Finally we sincerely thank our families and friends for their support and patience, without them our mission would be much harder.

Abstract

The financial crisis of 2007 to the present is a crisis triggered by a liquidity shortfall in the United States banking system. It has resulted in the collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets around the world. The crisis rapidly developed and spread into a global economic shock, resulting in a number of European bank failures, declines in various stock indexes, and large reductions in the market value of equities and commodities

This paper examines the performance of 137 banks in 26 European economies, all members of the EU-27, for the years 2005 – 2009 based on their public financial accounts. We examine some bank specific variables to determine whether these banks exhibit behavior and profitability associated with each financial year and thereafter with macroeconomic factors and finally we adhere all these data. Findings of the study confirm what is more or less known to everyone. We observe a negative relationship (negative correlation) between bank profitability and the two latest fiscal years, the Tier 1 capital, the loan loss reserves to gross loans ratio, and the GDP. At the same time there is a positive relationship (positive correlation) among bank profitability and logarithmic total assets, net loans to total assets ratio and the personnel expenses to total assets ratio. The results indicate that an appropriate policy and regulatory framework may be a necessary condition for significant progress to be made in order to avoid.

CONTENTS

I.	Introduction.....	page 6
II.	Background.....	page 8
III.	Literature review.....	page 9
IV.	Data and methodology.....	page 20
V.	Empirical results.....	page 26
VI.	Conclusion.....	page 33
VII.	References.....	page 36

TABLES

Table 1: Variable list.....page 23

Table 2: Descriptive statistics of the 137 EU banks..... page 24

Table 3: Descriptive statistic of the main financial features of bank
performance.....page 26

Table 4: Alternative Regression Specification for ROE.....page 27

I. Introduction

The financial crisis which started on 2007 caused the need for the re-evaluation of many economic theories in which global markets were based on. The crisis of 2007, one of the worst since Great Depression of 1930, affected deeply many countries worldwide and is still has an impact to many European countries. All the above, created the need for new researches on how economy behaves during big shocks.

Banks being the most important part of the economy chain was one of the main causes that triggered the smash of the financial markets. The degree of leveraging on capital was increasing continuously creating higher profits and credit supplies. The higher level of risk was requiring higher returns in order shareholders and their employees to be satisfied. This also led to high wages and huge bonuses for bank managers. However, this high risk seemed manageable through securitization which appeared to help the securitizing bank to sell on the risk and at the same time to replenish its capital. As soon as the housing market bubble came into light in the USA among other bubbles in UK, Spain and Ireland the weakness of the banking system was totally exposed. The lost of trust towards several banks created a domino effect to the whole banking system and unexpectedly to the world financial and economic system. By the end of 2008, the need for stabilization was necessary and both central banks and countries started planning the actions that will lead the economy out of the recession. Recently, crisis moved to the problem of sovereign default as many countries including Greece, Hungary and Ukraine were struggled to refinance their foreign loans.

It goes without saying that banks have the leading role throughout this crisis and there is a great need to examine the features that consist and affect the prosperity of a bank. Furthermore, the financial system in Europe where this study is focusing, is heavily reliant on banks and therefore important milestones in the banking system have a direct and great effect on the European economies. The real problem is that the EU's banking system is so weakly capitalized that it cannot absorb any losses. Moreover, it is so interconnected that problems in one country quickly put the entire system at risk. Until the banks' balance-sheet problems are dealt with decisively, financial markets will remain on edge.

Focus of the study

The current study tries to investigate the key elements of bank performance and also find new aspects that affect the banking profitability. We particularly focus on the performance of an identical number of commercial banks operating in the area of Europe 27. Commercial banks have a direct effect on households and at the same time on everyone's life and focusing explicitly to them added an extra motive.

Importance of the study

The efficiency of the banking system has been one of the major issues in the new monetary and financial environment. The general performance and efficiency of financial institutions cannot easily be measured, since their products and services are of an intangible nature. In the current study bank performance is examined based on the profitability of EU banks.

The profitability of banks is of interest to bank management, financial markets, bank supervisors and academics. This interest is driven by increasing consolidation in the banking sector, changes in production technology and regulation, and dissolving geographical borders in relation to financial products and industries. As a result, explaining the changes in profitability of banks is the implicit subject of much of the banking literature.

Furthermore, profitability can be used to assess the impact of major economic events such as economic crisis or financial liberalization on the performance of banking firms (e.g. Fukuyama, 1995; Humphrey and Pulley, 1997; Isik and Hassan, 2003; Kumbhakar *et al.*, 2001, and Leightner and Lovell, 1998). The record number of bank failures worldwide in recent years has attracted a great deal of attention from researchers, bank managers, regulators, and international organizations. As in virtually all-emerging financial markets, banks are the dominant financial institution in Europe. Thus, their health is very critical to the health of the whole general economy, as demonstrated in recent financial distresses experienced by the country. Concluding, another important issue of the study is that lies on the very recent period which characterized by the worst financial crisis since 1930. Despite its deep influence on both the real and financial

sectors, the 2007 crisis has not been studied yet in terms of its impact on the efficiency, and profitability of the financial industry.

Objective of study

The purpose of this paper is twofold, first we investigate how those banks we used in our sample were operating before the crisis and second how they are operating in the middle of the crisis. In effect, the paper targets to report important issues relating to the profitability of the European banking sector. Econometric analysis is used to achieve to investigate the various features of banking performance.

Structure

The remainder of this study is organized as follows. Section II gives an overview of the European banking system. Section III provides a brief review of the related literature. Section IV refers to data and methodology. Section V presents the empirical results. Section VII concludes and discusses the results of the study and Section VII includes the related references and sources we used.

II. Background

Over the last quarter of the twentieth century, both developed and developing countries have experienced severe banking crisis (Chile, Argentina, and Mexico, 1980s; Sweden, 1990s; Thailand, Malaysia, Korea, Philippines and Indonesia, 1997; Paraguay, 1995-1998; Russia, 1998; Turkey, 1994, 2000, and 2001; Argentina, 2001). The main causes of the crisis began on 2007 are poor banking practices and lack of revenue diversification, inadequate capital, shortcomings in the assessment of credit risk, lending to connected enterprises, excessive maturity or currency mismatches, and rapid rise of non-performing loans.

Moreover, the crisis was unprecedented in its global scale and severity, hindering credit access to businesses, households and banks, and harsh economic activity.

Banks, in particular, faced unparalleled liquidity stress hurting their ability to lend. Libor-OIS spreads, a conventional measure of liquidity stress and confidence between

banks, hit an all time high of 366 basis points (in U.S. dollar rates) in October 2008, soon after Lehman Brothers bankruptcy on September 15, 2008.

III. Literature Review

Economic crises have always been a matter of great concern among economists in the past. In particular, many authors tried to report, explain and formulate new theories concerning the banking system, strongly motivated from the financial crisis started on 2007. The analysis and explanation of banking system requires a very a good understanding of how banking performance is affected and that's why bank performance has for many years been a topic of major concern all over the world. Internationally bibliography includes many articles and books that concentrate to banking performance in specific countries and areas and general applications of banking performance as well. We considered useful to refer to references including models for measuring bank performance in specific countries while we thing that they consist a part of a general framework in banking performance. Moreover, we stated as well articles and books which deal with aspects of bank performance regardless the fact that it is not their major objective. Finally, we tried to compare the analysis of our study to previous findings of studies with similar objectives.

According to theory, bank performance can be measured with various ways. Profitability, efficiency, competitively and productivity consist some of the measures. This study deals with bank performance as it measured from profitability factors. Profitability is a management concept with the objective of assessment bank's results from efficiency point of view both for entirely activity and for differently management compounds. From conceptual point of view, profitability represents the modality to achieve the major goal of bank's activity, respectively the maximization of profit in minimization risk conditions. In addition, profitability analyses are achieved on a set of indicators to measure the banking performances. The indicators arise from the accounting dates, which illustrate the reference periods in the most synthetic expressions of balance sheet and the profit and loss account. On the basis of balance

sheet and the profit and loss account, we determined the necessary elements in order to express the profit indicators based as well to past literature.

The profitability of a bank represents its capacity to make sufficient profits from its operations to enable it to continue and develop its activity durably. The most popular indicator at the present time, return on equity (ROE), measures the return on shareholder investment. One shortcoming of this indicator is that the numerator it uses is net profit, which includes non recurrent and heterogeneous items that may well conceal the real structure of profitability. A second shortcoming is that according to this indicator, high profitability can go hand-in-hand with the structural under-capitalization of a bank, because high ROE can result from a low level of equity. The limitations of ROE are exclusively cover to section VI. The opposing view of banks, taking an interest in the whole financial structure, favors the return on assets (ROA), which is the ratio of net income to total assets. The problem with ROA is that it places all assets on the same level, even when they have different risks, and it does not take into account off-balance-sheet activities, which have grown strongly over the last few years.

Profitability is a bank's first line of defense against unexpected losses, as it strengthens its capital position and improves future profitability through the investment of retained earnings. An institution that persistently makes a loss will ultimately deplete its capital base, which in turn puts equity and debt holders at risk.

Return On Equity (ROE) is one of the most commonly used bank financial performance measure. It can be found in the most researches surrounding bank performance, in analyst reports and in company financial results (Lindblom and Von Koch, 2002: 52,56). It is also considered as a simple method to calculate and measure past performance while giving a fairly good indicator of future ROE (Wilcox, 1984). Hopkins et al. (1997: 642) states that the ultimate measure of the strength of any financial institution is the ROE. It also helps to compare banks differing in size and structure. Use of ROE as a measure is primarily based on the assumption that "customer value creation is positively correlated to the financial performance [measured as ROE] of the bank" (Lindblom et al., 2002: 48).

It is crucial to identify the scope of performance measurement analysis. In this respect, bank analysts tend to consider efficiency, asset quality and capital adequacy indicators as key elements of banks' performance measures. Hence, explicit indicators of credit risk and shock absorption capacity are considered essential in assessing the performance of a bank and encompassing risk in the analysis. Their analyses also rely upon detailed revenue and cost indicators (e.g. the structure, sustainability and rate of change of revenue and cost items), as well as market-based indicators of profitability and valuation (e.g. P/E, P/BV). On the other hand, in assessing banks' performance, bank analysts tend not to use liquidity indicators, market-based indicators of credit risk, the systemic significance of the bank and efficiency indicators related to capital, primarily because these indicators provide less reliable information. With efficiency indicators, for example, it is often difficult to gauge the actual amount of capital allocated to each line of business, whereas with market-based indicators, the problem is more that they mirror other indicators and are already reflected in the bank's valuation.

Bank consultants seem to adopt a narrow definition of performance measures. They place efficiency indicators – both traditional and capital-adjusted – at the core of their performance analysis and consider revenue, asset quality and capital adequacy as secondary measures. Interestingly though, they consider market-based indicators, including bond spreads and CDS, to be useful. As with the bank analysts, consultants also consider liquidity indicators and the systemic significance of the bank to be less informative, although they acknowledge that these indicators could have been helpful around the time of the crisis.

Rating agencies follow a more holistic approach, in line with their objective of assigning grades for the overall assessment of the banks. They consider all types of prudential returns (e.g. capital, asset quality, liquidity) to be integral in measuring the performance of a bank. They also assign equal weight to efficiency indicators and revenue/cost composition.

Also, they take a more dynamic approach, paying attention to changes in the level and composition of revenue and cost elements, as well as trying to incorporate market-based indicators into their analysis.

All banking incomes generated by banking activity, including service and off-balance-sheet activities, constitute the first determinant factor of profitability. The share of each

of these incomes in total income and the way they evolve can explain variations in profitability, because the profitability of banks oriented towards retail banking activities is a decreasing function of the fall in interest rates, whereas the profitability of banks whose structure of activity is dominated by market activities decreases in the event of a fall in financial markets. Thus, all the banks in the Euro zone were affected by the fall in interest rates, but faced with this reduction in their profit margins, they responded by developing commissions on the services

Dimitris N. Chorafas (2009) reported the causes the recent financial crisis. High leverage, high risk financial products like derivatives, wrong management of mortgage loans and finally the wrong belief that market would correct bank excesses were the main causes for losing the control of credit risk management.

Bikker A.J, Bos W.B Jaap (2008) on their book provide a comprehensive analysis of bank performance based on competition and efficiency. The interesting part of their study is that incorporate a collection of empirical results coming from different methods that often yield different results. Market power models¹ and efficiency based models are used.

Due to quite different approached of each method authors concluded to the need of focusing to a set of variables instead of using a single dependent variable to each approach. Our study incorporates regression analysis of two dependent variables Return on assets and Return on equity.

Goddard, J., Molyneux, P., Wilson, J.O.S., (2004) investigate the profitability of European Banks during 1990s using cross-sectional, pooled cross sectional time-series and dynamic panel models. Except dynamic effects they use size, diversification, and risk and ownership type as determinants of profitability. They concluded to weak size profitability relationship, different results to each region for off-balance-sheet items – profitability relationship and positive relationship between capital assets ratio and profitability. Although , our study found a positive relationship between size and profitability, no significant correlation found between capital assets ratio and profit-

¹ The research includes six market power models: Iwata model, Bresnahan, Pazar-Rosse, Structure-Conduct-Performance, Cournot model and the Stigler approach.

ability. Finally, CAR presented a positive relationship with profitability which is consisted to what Berger (1995) found as well.

Athanasoglou, et al. (2006) apply a dynamic panel data model, as our study, to investigate the performance of Greek banks over the period 1985–2001, and find some profit persistence, a result that signals that the market structure is not perfectly competitive. The results also show that the profitability of Greek banks is shaped by bank-specific factors and macroeconomic control variables, which are not under the direct control of bank management. Industry structure does not seem to significantly affect profitability.

More recently , Yun-Fang Chuo, Steven W. Lamp, William C. Minnis, Jeffrey S. Harper (2009) attempts to develop a methodology that any commercial bank may use to determine the factors which influence its net profit fluctuations.

A research for measurement of bank performance of commercial and cooperative banks in Greece deducted from Kosmidou, K., Zopounidis C (2008). They used the Promethee method to evaluate the performance of banks based on particular financial ratios. They conclude that commercial banks tend to increase their accounts and hedge the financial risk in order to attract more customers and become more complete among European banks. In other words, the size of a bank tends to play an important role to its performance.

Altunbas et.al (2007) analyzed the relationship between capital, risk and efficiency for a large sample of European banks between 1992 and 2000. European banks with weak bank performance appear to hold more capital and take on less risk. Empirical evidence is found showing the positive relationship between risk on the level of capital (and liquidity), possibly indicating regulators' preference for capital as a mean of restricting risk-taking activities. They also find evidence that the financial performance strength of the corporate sector has a positive influence in reducing bank risk-taking and capital levels.

Bert Scholten (2000) analyses competition, growth, and performance in the banking industry. He finds that profitability is inversely related to the amount of bank assets and is positively related to the amount of tier 1 bank capital.

Meyer, David G., Lohrey, Peter L (2006) explored the limits of banking performance by modeling the relationship between Return on Equity and Return on Assets, which both represent profitability, and variables such as non-performing loan percentage, net interest margin and leverage. Maximizing performance, they concluded, requires reduction of non-performing loans and net interest margin should target at one standard deviation higher than the mean of all banks.

A very interesting research about financial performance of commercial banks was written by Medhat Tarawneh (2006). He concentrated his research on Omani banks and tried to classify the banks based on characteristics derived from financial ratios. A simple regression analysis of the impact of asset management, efficiency and bank size revealed that higher capital, deposits and credits don't always mean better performance.

Yongil, J., Stephen M. M. (2005) reported a research analysis of how financial crisis in Asia affected the profitability of banking sector. The analysis splits banks to foreign and domestic and shows that foreign banks achieves higher efficiency and rely more heavily on fee-for-service income rather than loan revenue. The same subject bothered the authors on year later basing their research on Korea nationwide banks before and after economic crisis of 1998 and proved that many factors have strong correlation with bank performance. Equity to assets ratio and non-interest income to interest income correlates positively with bank performance while loan losses provisions correlates negatively.

Chantapong , S. (2005) studied also on banking performance after the east Asian financial crisis based on banking sector of Thailand. The study uses micro bank-level panel data by pooling cross-bank time series data derived from financial ratios of income statements and balance sheets. One of findings was that credit exposure was reduced during crisis years as our research found as well. Depending on the fact that Loan to Total assets ratio is an indication of risk exposure, in table 2 we can see that on 2007 the ratio was 86,50, on 2006 goes to 73,62 and on 2006 is decreased to 58,13. Beyond the use of descriptive statistics, the author finds in his study a significantly positive relationship between Loans to Total assets and bank profitability by applying fixed effects methodology in his regression. The same result finds also the current with the difference that the methodology used was random effects in cross periods.

The need of testing the vulnerability of European banks lead to the stressing tests which were carried out by the Financial Services Authority (FSA) on behalf of the EU on July 2010. Affected from these tests, Shar A.H, Munner a.S, Jamali H. (2010), tried to apply a little different performance evaluation measure on their country using a new model called “Bankometer”. The study focuses on Pakistan but gives a general idea for using of their model in more developed regions like Europe. The parameters ² that this studies uses is Capital adequacy ratio, Capital to assets ratio, Equity to total assets, NPL to loans and cost to income ratio and loan to assets ratio. Although, the methods applied to our study was different, there several common variables that used to measure the soundness of a bank which is also affected from profitability.

Bank performance analysis might hold various motives such as Shu (2002) conducted studies in Hong Kong to see affiliation between macroeconomic condition and average asset quality of banks. Gerlach and Peng (2003) study concentrated on lending opportunities, economic performance and regulatory measures in their bank sector performance analysis. Other studies examined competition and its impact on profit margins (Johnston and Buttle, 2001), the growth of non-interest income (Mansur et al, 1993), capital management (Mansur et al, 1993), cost efficiency (Kwan, 2002; Jiang et al, 2003; Bonin and Leven, 1996, Gunay, 2004), industry consolidation (Jackson, 1975), banking regulation (Kumbhakar and Sarkar, 2003).

Government regulation exerted approximately as an intermediate against profitability and productivity of banking sector in numerous countries. Many of the developed economies undertook massive deregulation effort to liberalize the banking sector since 1980s’ (Kumbhakar and Sarkar, 2003). The relaxation of stringent regulation thereafter began to contribute in overall economic development, productivity, employment generation. In recent years, specific performance related issues such as profitability has been widely covered in numerous studies. Among others, the Return on Asset, Return on Equity, Interest Margin and Net Profit Margin were considered in analyzing the cause-and-effect of banks’ success (Seiford and Zhu, 1999; Tatje and Lovell, 1999; Soteriou and Zenios, 1999).

² The parameters included in this study by Shar A.H, Munner a.S, Jamali H. derived following International Monetary Funding (2000) recommendations.

Various other sets of performance analysis highlighted the successful structural or allocation presence of banks in specific territory. Number of employees, branch coverage, population coverage of branch, per employee expense, credit and deposit ratio and number of deposit and credit accounts have been the focal point of study (Athanasopoulos, 1998; Harker and Zenios, 1999; Berger and Humphrey, 1997; Seiford and Zhu, 1999, Huda et al, 2007).

Studies went beyond operational and allocative performance. Seiford and Zhu (1999), Gunay (2004), Johnston and Buttle (2001) studied the impact of bank's financial ratios on its stock market performance. Generally, the financial performance of banks and other financial institutions has been measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget or a mix of these methodologies (Avkiran, 1995).

Simply stated, much of the current bank performance literature describes the objective of financial organizations as that of earning acceptable returns and minimizing the risks taken to earn this return (Hempel G. Coleman, 1986). There is a generally accepted relationship between risk and return, that is, the higher the risk the higher the expected return. Therefore, traditional measures of bank performance have measured both risks and returns.

The increasing competition in the national and international banking markets, the change over towards monetary unions and the new technological innovations herald major changes in banking environment, and challenge all banks to make timely preparations in order to enter into new competitive financial environment. (Spathis, and Doumpos, 2002) investigated the effectiveness of Greek banks based on their assets size. They used in their study a multi criteria methodology to classify Greek banks according to the return and operation factors, and to show the differences of the bank's profitability and efficiency between small and large banks.

(Chien Ho, and Song Zhu, 2004) showed in their study that most previous studies concerning company performance evaluation focus merely on operational efficiency and operational effectiveness which might directly influence the survival of a company. By using an innovative two-stage data envelopment analysis model in their study, the

empirical result of this study is that a company with better efficiency does not always mean that it has better effectiveness. A paper in the title of efficiency, customer service and financing performance among Australian financial institutions (Duncan E., and Elliott, 2004) showed that all financial performance measures as interest margin, return on assets, and capital adequacy are positively correlated with customer service quality scores.

Generally, the concept of efficiency can be regarded as the relationship between outputs of a system and the corresponding inputs used in their production. Within the financial efficiency literature, efficiency is treated as a relative measure which reflects the deviations from maximum attainable output for a given level of input (English M. and Warnig, 1992). However, there have been numerous studies analyzed the efficiency of financial institutions. Among these, (Rangan N. and Grabowski, 1988) use data envelopment analysis to analyze technical efficiency in US banking into pure technical and scale efficiency. (Aly H., and Rangan 1990) extend this analysis to contain analysis of allocative efficiency, and (Field, 1990), (Dark, 1992), (Chu-Meiliu, 2001), (Tser- Yieth Chen, and Tasi Yeh, 1998), and (Leigh D.,and Howcroft, B., 2002) have conducted some studies into banking efficiency.

Ali Abdula (1994) is using two accounting measures of banks performance (return on assets and return on equity) in Bahrain commercial banks. He found out that the gulf crisis, loan to deposit ratio, operating costs, and bank size are inversely related to the two measures of performance, whereas a two bank concentration ratio, loan to total assets ratio, individual deposits to total deposits ratio and government ownership in bank's stocks are directly related to banks profitability. Similar variables were included in a simple correlation analysis used by Agu (1992).

Another interesting study was conducted from Bourke (1989) who attempted to appreciate the factors that are likely to influence the performance of the commercial banks in Europe, North America and Australia. Using a sample of 90 banks from 1972 to 1981, he controlled for differences in accounting standards and reporting in those countries by introducing the concept of value added. Two measures were used as proxies of this concept: 1) Pre-tax income plus staff expenses and 2) Pre-tax income

plus staff expense plus loan losses. His results show that liquidity ratio (cash and bank deposit plus investment securities as percentage of total assets), concentration ratio (largest three banks of either total deposits or assets) and growth of money supply in each country are significant in determining commercial banks profitability.

Sinkey (1975) used multiple discriminate analyses to empirically identify the features of problem banks. He postulated that there are several factors, both financial and operational, that might be used to diagnose possible problems in a bank's performance. The factors are assets composition, loan characteristics, capital adequacy, sources and uses of revenues, efficiency and profitability.

Bashir (2000) examines the determinants of Islamic bank's performance across eight Middle Eastern countries for 1993-1998 period. A number of internal and external factor were used to predict profitability and efficiency. Controlling for macroeconomic environment, financial market situation and taxation, the results show that higher leverage and large loans to asset ratios, lead to higher profitability.

Bank expenses are also a very important determinant of profitability, closely related to the notion of efficient management. There has been an extensive literature based on the idea that an expenses-related variable should be included in the cost part of a standard microeconomic profit function. For example, Bourke (1989) and Molyneux and Thornton (1992) find a positive relationship between better-quality management and profitability.

Macroeconomic variables have been used very often by several studies. The variables normally used are the inflation rate, the long-term interest rate and/or the growth rate of money supply. Revell (1979) introduces the issue of the relationship between bank profitability and inflation. He notes that the effect of inflation on bank profitability depends on whether banks' wages and other operating expenses increase at a faster rate than inflation. The question is how mature an economy is so that future inflation can be accurately forecasted and thus banks can accordingly manage their operating costs. In this vein, Perry (1992) states that the extent to which inflation affects bank profitability depends on whether inflation expectations are fully anticipated.

An inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust interest rates in order to increase their revenues faster than their costs and thus acquire higher economic profits. Most studies (including those by Bourke (1989) and Molyneux and Thornton (1992) have shown a positive relationship between either inflation or long-term interest rate and profitability.

In a study conducted in Kuwait (Edris, 1997) to determine the importance of selection factors used by Kuwait business consumers in choosing domestic and foreign banks. Findings of this study show that the highest – ranking determinant factors of selection a bank in Kuwait by business firms were size of bank assets, personnel efficiency, banking experience, friendliness of staff, reputation, and availability of branches abroad.

European Banks are subject to extensive and increasing regulation, accounting standards and interpretations thereof, and legislation in the various countries in which each Bank operates. From time to time, new laws are introduced, including tax, consumer protection, privacy and other legislation, which affect the operating environment in which the banking system operates. As a result of the recent interventions by governments in response to global economic conditions, for instance, it is widely expected that there will be a significant review of government regulation such as the imposition of higher capital requirements and restrictions on certain types of transaction structure to engender stronger but effective supervision of the financial services industry.

If enacted, such new regulations might compel Banks to inject fresh capital into its operations and those of its subsidiaries and affiliates. The development might require the Banks to enter into business transactions that are not otherwise part of their strategy, prevent them from continuing current lines of operations, restrict the type or volume of transactions they may enter into, limit their subsidiaries' and affiliates' ability to declare dividends, or set limits on or require the modification of rates or fees that the Banks are charging on certain loans or other products. Banks may also face increased compliance costs and limitations on its ability to pursue business opportunities. Separately, the Basel II Accord's requirement for financial institutions to increase their capital in response to deteriorating market conditions may have secondary effects on lending, which could exacerbate the current market downturn. These measures, alone or in combination, could have an adverse effect on its operations.

Banks are currently subject to tax-related risks in the foreign countries where they operate, which could have an adverse effect on their operating results.

A number of double taxation agreements entered into between countries also affect the taxation of the Banks. Tax risk is the risk associated with changes in tax law or in the interpretation of tax law. It also includes the risk of changes in tax rates and the risk of consequences arising from the failure to comply with procedures required by tax authorities. Failure to manage tax risks could lead to increased tax charges, including financial or operating penalties, for non-compliance as required by the law.

Synopsis

In an effort to connect the findings that we derive running our regression model with what was mentioned above in previous researches we must conclude with the following: As we obtain from our results the fact that European banks performance were not affected by high risk financial products like derivatives (Chorafas,2009) proves the small exposure of European banks in such products. In opposition to what Bert Scholten (2000) analyzes, Tier 1 capital ratio has slightly negative coefficient in our regression, showing in that way that is not positively related to a bank's profitability. Shu (2002) have noticed the affiliation between macroeconomic factors and bank performance which is something that we have also have to admit based on the probability that we found regarding the inflation variable in our model. As regards personnel efficiency which is normally related to high personnel wages, we found a positive statistically significant relationship with bank performance as Edris, (1997) found as well. Summarizing, bank-specific variables of size, efficiency and risk taking both with macroeconomic factors are the key elements for investigating how the performance of a bank in terms of profitability is affected.

IV. Data and Methodology

Bank data sample

This research uses detailed data obtained from Bankscope database. The initial data set covers 3,952 commercial banks of the 27 members of European Union with standardized reporting annual data that facilitate comparison across different accounting systems. The panel data set, prior to any apply of selection criteria is covering 592,800 observations in years 2005-2009. The data set was unbalanced as for various reasons not all banks are included throughout the entire period. We remove all observations from other types of financial institutions like mortgage banks, securities houses, credit banks and any governmental credit institutions. The reason from excluding this type of banks is to make our sample as homogeneous as possible while the reaction of performance of these banks may be different from pure commercial banks. In order to have as fair and safe data as possible we include only banks that were listed during the period we examine. This reduced drastically the sample by 94, 3% to 224 banks.

Continuing with selection rules, we eliminate banks that don't present data on Bankscope for all the five years in order to balance our bank sample throughout the sample period. This criteria reduced the sample by 29,9% or 67 banks less. This number consisted by 40 dissolved banks, 3 bankrupt banks, 6 banks that change name and 17 banks with no available data. Finally, we tried to balance our sample regarding the number of banks from each country. Therefore we exclude some banks and we come up to 137 banks and 8905 observations with 598 missing values (6,7%). The limitations of this research are the lack of data of some banks from particular countries such as Estonia which make the sample of countries slightly unbalanced.

The data included in the sample derived for the balance sheet and income statement data of each bank. In addition, macroeconomic data such as GDP and inflation collected from the website of EUROSTAT. Inclusion of these variables introduces the macroeconomic factor.

Econometric analysis

Everything in this study was estimated using E-Views 5.0, 6.0 and 7.0. We utilize a panel data set of 137 EU commercial banks as mentioned before to empirically investigate which bank-specific and macroeconomic characteristics are the main determinants of banking performance. The econometric analysis estimates an equation for return on equity which represents bank performance. Four sets of regressions are produced to include separately and all together the three different types of individual bank explanatory variables. Our aim was to start from a model and show how it is improved by adding each time different types of variables. The forth and last model would be most improved one. The methodologies followed in some earlier studies (CHANTAPONG, 2006; GODDARD et al., 2004) are applied. The explanatory banking variables both with a set of dummy variables such as year dummies constitute the equation for which a reduced form is illustrated below:

$$I_{it} = \alpha_0 + \beta_i B_{it} + e_{it} \quad (1)$$

Where I_{it} is the endogenous variable (ROE) for bank I at time t; B_{it} is bank specific variables for banks i at time t and dummy variables; α_0 is a constant and β_i are coefficient while e_{it} is an error term.

Ordinary least squares method (OLS)³ is used for the estimation of the equation (1). Moreover, after checking the Hausman test⁴, which is presented in detail in the appendix, a random effects model⁵ is applied to cross-sections.

³ **Ordinary least squares (OLS)** or linear least squares is a method for estimating the unknown parameters in a linear regression model. OLS rule asserts that we should fit a line to the data values so that the sum of the squares of the vertical distances from each point to the line is as small as possible.

Source : *Andreas G.Merikas,A.Merika (2006) Basic Econometrics for financial analysis with E-Views applications page 70.*

⁴ Hausman helps to evaluate if a statistical model corresponds to the data. Given a model and data in which fixed effects estimation would be appropriate, a Hausman test tests whether random effects estimation would be a better solution. Source : *E-Views 6 help*

⁵ A central assumption in random effects estimation is the assumption that the random effects are uncorrelated with the explanatory variables. One common method for testing this assumption is to employ a Hausman test (1978) Source : *E-Views 6 help*

Variable list

We now briefly introduce the variables used in our empirical econometric analysis. Table illustrated the variable list. All the variables used in this study are chosen carefully based on past literature. As for the dependent variable that used as a measure of bank performance is ROE which is considered as the most important measure for bank profitability as many previous studies suggest. A detail presentation of these studies are stated in section V.

As regards the bank specific variables, we used the natural logarithm of total assets (LOG_TOTAL_ASSETS) as an indication of bank size. Tier 1 Capital (TIER_1_CAP) which is the regulatory capital. Furthermore, the Loan Loss Reserve to Gross loans (LOAN_LOSS_RES_GROSS_LOAN) is used as an indication of banking risk. Overall financial soundness is captured by CAR which includes except Tier I capital the Tier II. The variable of Net Loans to Total Assets (NET_LOANS_TOTAL_AS) used because rapid loan growth may increase risk and effect adversely on capital and bank efficiency. Personnel expenses to total assets (PERSONNEL_EXP_TA), Loan to Customer Deposits (LOAN_CUST_DEP) , Overheads (OVERHEADS) and Off-balance Sheet items (OFF_BALANCE) are used that to trace the effect of the financial structure to bank profitability. Also, Net Interest Revenue (NET_INTER_REVENUE) is used as an indication of efficiency. In order to capture the macroeconomic effect we include annual average rate of Inflation (INFLATION) change and real GDP (GDP) growth. Finally, four dummies are included, each for every year of the sample period, excluding the year 2007 as we assumed that including the before-crisis years of 2005, 2006 and the during crisis years 2008, 2009 would help comparing the before crisis and during crisis effect.

Table 1: Variable list

Dependent Variable	Independent variables	
Return on Equity (ROE)	NET_LOANS_TOTAL_AS	Net Loans-to-Total assets
	LOAN_LOSS_RES_GROSS_LOAN	Loan loss reserves-to-Gross loans
	TIER_1_CAP	Tier-1-capital
	CAR	Capital Adequacy ratio
	PERSONNEL_EXP_TA	Personnel expenses-to-Total Assets
	LOG_TOTAL_ASSETS	Logarithm of banks total assets
	LOAN_CUST_DEP	Loans-to-Customer deposits
	INFLATION	Inflation
	GDP	Gross domestic product
	DUMMY_05	Dummy of year 2005
	DUMMY_06	Dummy of year 2006
	DUMMY_07	Dummy of year 2007
	DUMMY_08	Dummy of year 2008
DUMMY_09	Dummy of year 2009	

After analyzing the output of the correlation matrix (see APPENDIX) between the variables presented on table 1, we exclude three specific variables due to correlation problems. Below are the final forms of the four models:

$$ROE = C(1)*DUMMY_06 + C(2)*DUMMY_07 + C(3)*DUMMY_08 + C(4)*DUMMY_09 + C(5)$$

$$ROE = C(1)*NET_LOANS_TOTAL_AS + C(2)*LOAN_LOSS_RES_GROSS_LOAN + C(3)*TIER_1_CAP + C(4)*CAR + C(5)*PERSONNEL_EXP_TA + C(6)*LOG_TOTAL_ASSETS + C(7)*LOAN_CUST_DEP + C(8) + [CX=R]$$

$$ROE = C(1)*NET_LOANS_TOTAL_AS + C(2)*LOAN_LOSS_RES_GROSS_LOAN + C(3)*TIER_1_CAP + C(4)*CAR + C(5)*PERSONNEL_EXP_TA + C(6)*GDP + C(7)*INFLATION + C(8)*LOG_TOTAL_ASSETS + C(9)*LOAN_CUST_DEP + C(10) + [CX=R]$$

$$ROE = C(1)*NET_LOANS_TOTAL_AS + C(2)*LOAN_LOSS_RES_GROSS_LOAN + C(3)*TIER_1_CAP + C(4)*CAR + C(5)*PERSONNEL_EXP_TA + C(6)*DUMMY_06 + C(7)*DUMMY_07 + C(8)*DUMMY_08 + C(9)*DUMMY_09 + C(10)*GDP + C(11)*INFLATION + C(12)*LOG_TOTAL_ASSETS + C(13)*LOAN_CUST_DEP + C(14) + [CX=R]$$

The first model is consisted from the four dummies of 2005, 2006, 2008 and 2009. The second model comprises the bank specific variables and in the third model macroeconomic variables are added. The final forth model is a synthesis of all the previous three models by including all the independent variables.

Descriptive Statistics

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures.

Table 2: Descriptive statistics of the 137 EU banks

Variables	Mean	Median	Max	Min	Observations
RETURN ON EQUITY(ROE) (%)	11.47	12.97	111.40	-245.13	611
NET LOANS TO TOTAL ASSETS (%)	55.90	61.25	92,90	-0.92	638
LOAN LOSS RESERVES TO GROSS LOAN (%)	3,323099	2,47	4410000	0.010000	597
TIER 1 CAPITAL RATIO (mil. €)	4231,63	785,00	62910,00	-116,0000	535
CAPITAL ADEQUACY RATIO (%)	10,69099	9,00	166,00	0.000000	466
PERSONNEL EXPENSES TO TOTAL ASSETS (%)	1,866258	1,05628	185,7143	0.000000	676
TOTAL ASSETS	9,281769	9,06033	14,60507	3,044522	683
LOANS TO CUSTOMER DEPOSITS (%)	131,2396	122,2	947,90	2,20	663
INFLATION (%)	2,647883	2,20	15,30	-1,70	685
GROSS DOMESTIC PRODUCT (GDP) (%)	1,80146	2,20	12,20	-18,00	685

The above table contains the descriptive statistics for all the variables that we use in our attempt to investigate in the performance of the European Banks that we choose in our sample. It contains means, medians, maximums, minimums and standard deviations for all the variables. The sample consists of (as the following table describes) 137 banks all belonging in the EU-27, for a period of five years (2005-2009).

What we can generally conclude based on the table is the relatively good performance of the banks which is clarified by the average percentage of ROE and is almost 11.5% during the period we examined, but the fact of the existence of high standard deviation indicates that the data is spread out over a large range of values meaning that at the same time that some banks are performing well, some others don't. Moreover it is worth saying that throughout those five years the mean of the inflation which is 2.647% gives explanation in the rise in the general level of prices of goods and services in the European economy over this certain period of time. At the same time the GDP mean is 1.8% in the EU-27 country which is acceptable in addition to the small standard deviation (4.11), as it represents the market value of all final goods and services made within the borders of EU-27 during those 5 years. Loans to customer deposits ratio mean percentage (131%) seems to be slightly high. The Tier 1 capital ratio standard deviation proves the fact that not all banks are equally measured from the regulators regarding their financial strength and that every bank holds a different amount of capital provide protection against unexpected losses depending always on the size. On the other hand the Capital Adequacy Ratio (10.69%) mean is close to the minimum requirements that each bank must have, however the number of observations is the smallest among all other variables (466). Furthermore the net loans to total assets ratio which mean is 55.90% is quite satisfactory since a bank should aim to the target of 70% to 80%.⁶ The same satisfactory is the average amount of the total assets (9.28 mil. €) as the benchmark suppose to be: $> \text{Inflation} + 10\%$.⁷

⁶ <http://www.woccu.org/bestpractices/pearls/pearlratios>

⁷ <http://www.woccu.org/bestpractices/pearls/pearlratios>

Table 3: Descriptive statistic of the main financial features of bank performance

VARIABLES	2005	2006	2007	2008	2009
INFLATION %	2,71	2,48	2,55	4,23	1,17
GDP %	2,99	4,42	4,02	1,40	-3,76
Net Interest Revenue (mil. €)	897,73	1010,04	1143,18	1409,18	1566,45
Total Assets (mil. €)	79734,91	98994,39	111109,80	118069,42	109469,91
Equity (mil. €)	3550,02	4268,21	4786,41	4606,42	5406,69
Equity / Total Assets (%)	9,33	9,13	8,96	8,16	8,71
Return on Average Equity (ROAE) (%)	57,51	68,79	19509,15	54,89	-0,76
Return on Average Assets (ROAA) (%)	4,07	4,22	4,69	2,56	0,23
Loan Loss Reserve / Gross Loans(%)	3,79	3,38	2,56	2,98	3,94
Net Loans / Total Assets (%)	80,80	77,74	86,50	73,62	58,13
Off Balance Sheet Items (mil. €)	14353,93	18072,54	22308,23	18993,77	17115,13
Off Balance Sheet Items/ta (mil. €)	0,26	0,21	0,20	0,17	0,16
Loan Loss Provisions (mil. €)	106,57	152,50	172,22	370,24	779,05
Loan Loss Provisions/ta (%)	0,25	0,17	0,19	0,53	1,18
Tier 1 Ratio (mil. €)	19,16	31,05	35,91	21,98	11,51
Loans/ Customer Deposits (%)	118,90	129,48	129,08	135,87	129,54
Overheads	1061,15	1364,27	1439,01	1445,21	1519,59
Overheads/ta	3,03	2,82	2,49	2,52	2,53
Personnel Expenses	519,61	757,28	801,57	759,54	821,55
Personnel Expenses/total assets	1,50	1,40	1,27	1,21	1,21
Tier 1 Capital	3497,00	3903,44	4248,22	4259,76	5066,19
capital adequacy ratio	11,36	12,23	9,83	11,60	11,03

VI. Empirical Results

Table 3 illustrates the regression results for each model we applied. We examined our results based on F-Statistic, Adjusted R-Square for the whole regression and t-student for each coefficient. F-statistic determines if the whole regression is statistically significant and thus the explanatory variables have an impact on the dependent variable. A closing to zero probability value of F-Statistics means that we can reject the null hypotheses that all slopes coefficients, excluding the constant, are zero with 1% significance level. As table 3 depicts the F-statistic of the four models is statistically significant with 1% significance level. The R-square measures the usefulness of the regression model but presents problems when the numbers of repressors are too high. Thus, we use adjusted R-Square which is an alternant of R-square that takes into

account the number of repressors in the model. The adjusted R-Square adjusts for the number of explanatory variables in the model by taking into account the number of control variables. This is facilitating the comparison between different models. Table 3 shows that the adjusted R-square is improving by moving from model 1 to model 4 which was one of the objectives of our analysis.

Table 4 : Alternative Regression Specification for ROE

Dependent Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4
Intercept	7,5101*** (5,381)	-2,8119*** (2,8219)	-3,9927*** (-3,9145)	-3,4987*** (-3,4186)
Bank specific variables				
Net Loans-to-Assets ratio		0,2106*** (3,1643)	0,1817** (2,8140)	0,1765*** (2,8165)
Loan loss reserves-to-Gross loans		-8,6918*** (-3,0212)	-5,6239** (-1,9732)	-5,2316** (-1,8911)
Tier-1-Capital		-0,0058*** (-2,7549)	-0,0054*** (-2,6042)	-0,0051** (-2,5354)
Capital Adequacy Ratio (CAR)		-0,6391 (-0,8403)	-0,5621 (-0,74994)	-0,7145 (-0,9838)
Personnel expenses-to-Total Assets		4,3530** (1,9160)	4,6273** (2,0775)	3,6448* (1,6816)
Log_total assets		3,3998*** (3,6734)	4,0846*** (4,3828)	4,1809*** (4,6145)
Loan-to-Customer Deposits		0,1256 (0,8442)	0,1680 (1,1397)	0,1366 (0,9528)
Macroeconomic Variables				
Inflation			0,9364** (2,0992)	1,1321** (2,0601)
GDP			0,7286*** (3,9620)	-2,1466 (-0,8138)
Year Dummy Variables				
Dummy 2005	-5,4667 (-0,2850)			-1,3868 (-0,5865)
Dummy 2006	2,1699 (1,1251)			0,4512** (2,0249)
Dummy 2007				
Dummy 2008	-1,9396 (-0,9977)			-0,5236** (-2,1165)
Dummy 2009	-0,7563*** (-4,0149)			-1,9801*** (-3,4509)
F-Statistic	8,0513 (Prob. 0,00003)	6,0833 (Prob. 0,000001)	8,0870 (Prob. 0,00000)	8,2240 (Prob. 0,00000)
Adjusted R-Squared	0,044195	0,091572	0,153037	0,210136
Sample size	137	137	137	137

Note : t-statistics are in parenthesis. By two-tailed test*** indicates statistically significant at 1% level;**indicates statistically significant at 5% level;*indicates statistically significant at 10% level,

Model 1

This model includes only the year dummy variables. As mentioned in the Variable list section we exclude the 2007 year dummy in order to split our sample period to before crisis and during crisis years. The dummy variables of 2008 and 2009 could be defined as crisis dummies as well. Proceeding with the results which are presented in table 3 presents, the probability of F-statistic is almost zero which means that we can reject the null hypothesis that all slope coefficients, excluding the constant, are zero with 1% significance level. Therefore, we can consider that there is a linear relationship of ROE to the explanatory variables. However, the data don't fit well to the regression as we have a very low adjusted R-squared of 4,44%. This was a totally expected result as ROE cannot be explained by only year dummy variables. In order to proceed to the statistical analysis of the control variables included in this model, t-statistics should be examined. The only statistically significant, with 1% level of significance, is the variable dummy of 2009. The sign of the coefficient is negative which means that there is negative relationship between ROE and year 2009. This is an expected outcome as we assumed that the financial crisis of 2007-2009 would depress the banking industry profitability. In particular, when the DUMMY_09 increases by one unit ROE decreases by -0,7563. Although it's statistical insignificance, the coefficient of 2008 presents also an expected negative sign. The dummy of year 2006, one year before crisis start, has a positive sign while the dummy of year 2005 present a negative sign which is an unexpected outcome.

Model 2

In the second model, all bank specific variables of the study are included. The probability value of F-statistic is almost zero implying that there is a liner relationship between the bank-specific variables and ROE. The adjusted R-squared is increased to the previous model to 9,15%. Despite its low value, this model explains better how the dependent variable is affected compared to model 1. Five out of seven explanatory variables are found statistically significant. With regard to 1% confidence interval, there are four statistically significant variables: NET_LOANS_TOTAL_AS, LOAN_LOSS_RES_GROSS_LOAN, TIER_1_CAP and LOG_TOTAL_ASSETS. The p-value of NET_LOANS_TOTAL_AS is 0.0051 and its t-statistic is 3, 1643. The positive sign of

the coefficient reveals a positive relationship with the depended variable. As for LOAN_LOSS_RES_GROSS_LOAN the p-value is 0,027 and its t-statistics -3,021. Also, there is a negative relationship with ROE. The TIER_1_CAP variable has a p-value of 0, 0062 with a t-statistic of -2,754 and has a negative sign. Finally, the variable of LOG_TOTAL_ASSETS has a p-value of 0,0003 with a t-statistic of 3,673 and has a positive impact on ROE. With regard to 5% confidence interval, there is the variable of PERSONNEL_EXP_TA with p-value 0,0562, t-statistic 1,916 and a positive impact on ROE. The high probability values of CAR and LOAN_CUST_DEP leads us to the conclusion that are statistically insignificant.

Model 3

The only difference from model 2 is the addition of the macroeconomic variables. The model has a F-statistic value of 8,0870 with a p-value of zero meaning that the regression is statistically significant in 1% significance level. The adjusted R-squared is 15,30% clearly improved from the previous model. This can be interpreted from the fact that both INFLATION and GDP are statistically significant, the first with 5% and the second with 1% level of significance. Both the macroeconomic variables have a positive coefficient leading us to the conclusion that they have a positive impact on ROE. Regarding the specific variables, there no important changes from model 2 but we have to mention that despite that NET_LOANS_TOTAL_AS and LOAN_LOSS_RES_GROSS_LOAN are still statistical significant, the confidence level is now 5% instead from 1%.

Model 4

The last model is a synthesis of the all previous models and the most appropriate to comments on its results. As table shows the regression is statistical significant with 1% level of confidence with F-statistic to be 8,2240 and its p-value zero. Despite the still low adjusted R-Squared with a value of 21,01%, it's the higher value among the previous models which means that explains even better the movements of ROE. We now briefly present the results for each variable: NET_LOANS_TOTAL_AS has a

positive impact on ROE with a 1% level of significance, LOAN_LOSS_RES_GROSS_LOAN is statistically significant with 5% level of significance and has a negative impact on ROE, TIER_1_CAP is statistical significant as well having a negative impact on ROE but with a very low coefficient, PERSONNEL_EXP_TA and LOG_TOTAL_ASSETS are both significant, the first with 10% and 1% level of confidence accordingly. Their positive coefficient implying that they have a positive impact on ROE. CAR and LOAN_CUST_DEP are statistically insignificant showing no relationship to the depended variable. As for the macroeconomic variables, only INFLATION is still statistically significant with 5% confidence level. Finally, dummy variables are all statistically significant except DUMMY_05. The coefficient sign of the statistical significant dummies are negative revealing their negative relationship with ROE.

Overall findings

In this section, we summarize the main finding of this study. The main model to be discussed is Model 4 as it presents a synthesis of the other three models. Beginning with the bank specific variables, our regression model showed that banking risk indicators (Loan loans reserves to Gross loans), have a significantly negative correlation with ROE which is consistent with the study of Jeon Y. and Miller M. (2005) which states that loan loss indicators are negatively correlated to bank performance. Higher loan loss reserves to the gross loans of the bank implying higher risk for the bank. These reserves are a prudent measure against potential losses inherent in the portfolio. The retaining of capital for reserves purposes leads to a reduced amount of funds for investment and thus, higher profits. Also, Chantapong S. (2006) presents data that shows that bank profitability increased whereas provisioning and reserve expenses declined in many European countries.

Continuing, we found that the variable of Net Loans-to-Assets ratio is statistically significant and have a positive correlation with the return on equity ratio in contrast with the study of Jeon Y. and Miller M. (2005) which stated a statistically insignificant result. However, the study refers to the Asian Financial crisis of 1997 and we can conclude that there is a different approach between Asian and European bank performance. The

positive relationship with ROE was an expected outcome as the more loans banks provide the customers, the more profits the bank gets.

Our study also found that there is no impact of Loan-to-Customer deposits to ROE. The coefficient of the variable is still positive which is consisted with past literature. However the examination of this variable is quite ambiguous. The same ratio may imply significantly different levels of credit risk across European countries. On one hand more loans means higher interest and commission gains but on the other hand loans provoke higher risk. Deposits generate interest expenses but of course increase the bank's capital and it's upon an efficient asset management in order to exploit positively the capital from deposits. Moreover, as Table depicts, in year 2009 there ratio of loan to customer deposits decreases by -4,66% implying that during periods of crisis banks limit their lending and focus mainly on gathering deposits, therefore the gap between loans and deposits is expected to be narrowed .Summarizing, there is further investigation of other factors in order to be able to attribute a clear definition to this ratio.

Tier 1 Capital is one of the ingredients of the Capital adequacy ratio. However, our study found that Tier 1 Capital is statistically significant while Capital Adequacy ratio is not. Both of them have negative signs, which might be explaining but the fact that banks in their try to retain higher capital in order to withstand future financial crisis, they satisfy financial leverage which possibly lead to lower margins and ROE. Dabla-Norris E.,Floerkemeir H. (2007) in their research found as well a negative relationship between CAR and ROE. Different outcome had the study of Jeon Y. and Miller M. (2005) that stated that ROE is correlated positively with bank performance.

With the regard the relationship of Personnel Expenses to bank performance, our study showed a statistically positive relationship with returns on equity. There are not many studies in the past literature that examined this kind of variable. Only Bikker A. and Bos W.B (2008) on their book included this variable and found an average positively correlation among banks worldwide. The same result estimated from our study particularly for European countries. We can conclude that the increase in personnel expenses or labor costs including of course wages affect positively to profitability. Higher wages means, more executive and quality staff working more efficient and producing higher profits. Regarding the bank size, there are quite many past studies which tried to explain this relationship. The majority of these studies referred to a positive impact of capital on profitability (Altunbas Y. et al, 2007, Goddard J. et al,

2004) .Other studies support that there is a diverse relationship (Flamini V.et al. 2009). The findings of our study come to an agreement to the studies that found a positive correlation of the ratio with ROE. This result can be explained by the fact that big banks benefit from scale or scope economies. Also, the well-know phrase “too big to fail” is an indication of the protection large banks receive from regulation. Finally, large banks by holding less capital they can also be more diversified and have other size advantages.

Bank performance is expected to be sensitive to macroeconomic variables. The results of our study confirm this expectation as regards inflation rate which is statistically significant with a positive impact on ROE. Although GDP was also significant on model 3, in our last model is statistically insignificant even with 10% level of confidence which is an unexpectatable outcome. Flamini V.et al. (2009) reports a positive influence of GDP in bank profitability and a positive influence of inflation in case that is fully anticipated. In other case the result can be reversed. Generally, when banks can forecast the movement of inflation, they can adjust their interest rates targeting to increased profits.

Finally, in order to trace time effect on bank performance we examined the yearly dummy variables. As we mentioned earlier in the study, we exclude the dummy of year 2007 to have a better comparison between before-crisis and during crisis results. Both years 2008 and 2009 have a negative sign underperforming year 2006 which has a negative sign. This can be interpreted by the fact that in year 2006 the financials of banking industry was at its pick and after 2007 the first signals of the upcoming crisis started to appear. Also, the dummy of year 2005 has a negative and underperforms year 2006 but it was expected to be positive as well. No past literature found to use this kind of variables to investigate the time effects during periods of crisis. However, in a recent study Papanikolaou E. and Patsi M. (2010) include this kind of dummies finding a negative relationship for all the years between 2004 and 2008.

VII. CONCLUSION

During the recent financial crisis, the European banking sector has undergone a dramatic transformation. Many financial institutions have been forced to take restructuring and consolidation actions in order to avoid collapsing. While European banks have calmed fears of a funding crisis, most of them still need to reposition themselves for recovery. Their priorities include regaining trust by increasing transparency and governance, as well as managing risk and identifying strategies to return to higher levels of profitability.

This study derived data from a sample of European commercial banks and reported and dynamic panel estimations of four models designed to identify selected determinants of profitability. The results of the empirical research suggest that size variables are positively associated with the bank's profitability. Despite the fact that past literature presents a non-clear relationship of bank size to its performance, in the aftermath of credit crisis big banks proved to be more reliable than smaller banks which lost consumer's trust. Of course, regulatory framework and state protection to larger banks, in the fear of a domino effect, enhanced the vulnerability of large banks against smaller ones. Results also indicated an expected strong negative correlation between banking risk and bank performance. This negative impact is driven mainly by factors concerned with the recent credit crunch. The fact that Loan loss accounts increased in the last two years, as table 3 depicts, supports the previous results. An interesting finding is also the significant positive relationship of personnel expenses to Return on Equity. Regardless, the difficult financial situation of banks, top management seems to support and reward the quality personnel which prove to have major impact to the bank's profitability. Last but not least, the recently modified regulatory framework proves to have a negative impact on a bank's short term performance. Despite the fact that regulatory capital can be used as lifeboat during big shocks, it poses serious limitations to the use of capital for investing purposes.

Contribution of the study and research agenda

The study presents the most recent data including the effect of the credit crisis. Indicates the importance of bank performance in the middle of great recessions and underlines the major factors that drive the profitability of a commercial bank.

Further research should be concentrated to other bank performance measures than just profitability. Particularly, it is essential to take into consideration the quality of assets, the funding capacity and the risk related with the production value. Finally, financial instruments such as derivatives which are considered as off-balance sheet items could be an interesting feature than needs further investigation as they poses an they played an important role in recent financial crisis.

Limitations

Below, there is a brief presentation of the limitations of this study. There are four obvious limitations : the limited number of periods that the research is based on, the characteristics of the bank's sample, the dependent variable used both with the selection of the variables among a vast variety of the independent variables and finally the lack of data for specific observations.

Concerning the time period of the data used in this study, we focus on the last five years trying to compare the years before the crisis burst and during the crisis. The sample was limited to the EU-27 countries excluding Estonia as we haven't access to related Estonian banks. Furthermore the search criteria used, resulted to an unbalanced sample. As an example, Great Britain, one of the strongest economies among the EU-27 countries, is only represented from three banks. Continuing, we state the limitation referred to the measure of bank's profitability selected. The choice of ROE as a key determinant of bank profitability instead of the return on assets (ROA) was made mainly because ROE is more stable than ROA, presenting a more accurate income picture from period to period as we thought. But according to a recent publication of

the European Central Bank, issued in September 2010, “*the recent crisis has shown how ROE failed to discriminate between the best performing banks and the others (in the sense of banks being able to generate sustainable profits) since, a quarter before the crisis, figures pointed to a great homogeneity in terms of banks’ profitability (a high level of ROEs). In some cases, the banks with the highest ROE were those worst hit by the crisis. Thus, ROE did not make it possible to indentify the best performing banks in terms of sustainability of their results. ROE is a short-term indicator and must be interpreted as a snapshot of the current shape of institutions. It does not take into account either the institution’s long –term strategy or long-term damages caused by the crisis.*”

VIII. References

- Altunbas, Yener, Carbo, Santiago, Gardener, Edward P.M. P.M. and Molyneux, Phil, Examining the Relationships Between Capital, Risk and Efficiency in European Banking. *European Financial Management*, Vol. 13, No. 1, pp. 49-70, January 2007.
- Bert Scholtens, 2000. Competition, Growth and Performance in the banking Industry.
- Bikker A.J, Bos W.B Jaap, 2008. Bank Performance. A theoretical and empirical framework for the analysis of profitability, competition and efficiency.
- Bikker, J., Bos. J., (2005) Trends in Competition and profitability in the Banking Industry: A Basic Framework, *The European Money and Finance Forum*.
- Capon Noel, Farley John U.. and Hoenig Scott (1990), “determinants of financial performance: A meta-analysis, *Management Science*, Vol.36, No. 10,
- Caruntu, Alexandru, G., Romanescu, G., (2008) The Assessment of Banking Performances- Indicators of Performance in Bank Area, *MPRA Paper No. 11600*.
- Chantapong , S., 2005. Comparative Study of Domestic and Foreign Bank Performance in Thailand: The regression Analysis. *Economic Change and Restructuring*, 38, 63-83.
- Chuo, Y.F., Lamb, S.W., Minnis, W.C., 2009. The Determinates of Profitability of a Specific Community Bank. Allied Academies International Conference *Proceedings of the Academy of Banking Studies*, pp.1-3.
- Delfino, M., (2007), Control Changes and Firm Performance in banking, *International Journal of the Economics of Business*, Vol. 14, No.2, pp. 261-281.
- European Central Bank (2010) Beyond ROE-How to measure Bank Performance.
- Goddard, J., Molyneux, P., Wilson, J.O.S., 2004. The Profitability of European Banks: Across-Sectional and Dynamic Panel Analysis. *The Manchester School*, 72 (3), pp. 363-381.
- Jeon, Y., Miller S.M., 2004. The effect of the Asian financial crisis on the performance of Korean nationwide banks. *Applied Financial Economics*, 14, 351-360.
- Kosmidou, K., 2008. Measurement of Bank Performance in Greece. *South-Eastern Europe Journal of Economics*, 1, pp. 79-95.
- Kosmidou, K., Zopounidis, C., (2008) Measurement of Bank Performance in Greece. *South-Eastern Europe Journal of Economics 1*, pp 79-95.
- Medhat, T., 2006. A Comparison of Financial Performance in the Banking Sector: Some Evidence from Omani Commercial Banks. *International Research Journal of Finance and Economics*, 3 , p.

- Merikas, A., Merika, A.,(2006), Basic Econometrics for financial Analysis with E-views Applications, *Papazisis Publications*, pp. 70-75.
- Meyer,David G.,Lohrey,Peter L ,2006. Exploring Banking Performance : Where are the Limits? *Credit Research Fountation Third Quarter 2006*
- Rachev, S., Mittnik, S., Fabozzi, F., Focardi, S., Jasic, T., (2007). Financial Econometrics, Wiley Finance.
- Rey, N., (2007) The need to reconstruct performance indicators, *The new Banking economics*.
- Scholtens, B., 2000. *Competition, Growth, and Performance in the Banking Industry*. Ph. D. University of Groningen.
- Shar A.H,Munner a.S,Jamali H. ,2010. Performance Evaluation of banking Sector in Pakistan : An application of Bankometer. *International Journal of Bussines and Management Vol.5 No 8 August 2010*
- Sufian, F., (2007) Financial Crisis and Banks Performance: A Comparative Analysis of Domestic and Foreign Banks in Malaysia, *MFA 9TH Conference*.
- Yongil, J., Stephen M. M., 2005. Performance of Domestic and Foreign Banks: The Case of Korea and the Asian Financial Crisis, *Global Economic Review*,34 (2), pp. 145-65.
- Yun-Fang Chuo,Steven W.Lamp,William C. Minnis,Jeffrey S.Harper, (2009). The determinants of profitability of a specific community bank.*Proceedings of the Academy of Banking Studies,Volume 9, Number 2*.

Websites

- Available:<http://www.financierworldwide.com/article.php?id=7067&page=1> [20 September 2010]
- Available:http://www.firstbanknigeria.com/investor_relations/annualreport_dec_2009/business/performance/kpi-financial.html [14 August 2010]

APPENDICES

Table A1 : Variable Definitions

ROE	Return over total equity
Total Assets	Total Assets = Total Earning Assets + Cash and Due From Banks + Foreclosed Real Estate + Fixed Assets + Goodwill + Other Intangibles + Deferred Tax Assets + Discontinued Operations + Other Assets + Current Tax Assets
Tier 1 Capital	Regulatory Total Capital
Loan Loss Reserve / Gross Loan	Loan loss reserve -to- Net Loans less Reserves for Impaired Loans/ NPLs
Net Loans / Total Assets	(Residential Mortgage Loans + Other Mortgage Loans + Other Consumer Retail Loans + Corporate & Commercial Loans + Other Loans - Less: Reserves for Impaired Loans/ NPLs) -to- Total Assets
Capital Adequacy Ratio (CAR)	Capital to Risk Weighted Assets Ratio (CRAR)
Personel expenses / total assets	Salaries to Total Assets
Loan / Customer deposits	Loans/ Customer Deposits (a / b) a) Gross Loans - Reverse repurchase agreements included in loans b) Total Customer Deposits- Repurchase agreements included in customer deposits
Overheads	Overhead (or Total Non-Interest Expenses expenses) are all costs on the income statement except for direct labor, direct materials & direct expenses. Overhead expenses include accounting fees, advertising, depreciation, insurance, interest, legal fees, rent, repairs, supplies, taxes, telephone bills, travel and utilities costs.
Off Balance Sheet Items	Off Balance Sheet Items = Managed Securitized Assets Reported Off-Balance Sheet + Other Off-Balance Sheet exposure to securitizations + Guarantees + Acceptances and documentary credits Reported Off-Balance Sheet + Committed Credit Lines + Other Contingent Liabilities
Net interest Revenue	Net interest revenue = interest income - interest expense. Net interest revenue may also be called net interest income
Inflation	Annual average rate of change in Harmonized Indices of Consumer Prices (HICPs)
Real GDP growth	Percentage change of Gross Domestic Product on previous year.

Table A4: Sample statistics

COUNTRY	CODES	NUMBER OF BANKS	OBSERVATIONS
AUSTRIA	<i>AT</i>	4	260
BELGIUM	<i>BE</i>	1	65
BULGARY	<i>BG</i>	3	195
CYPRUS	<i>CY</i>	3	195
CZECH REPUBLIC	<i>CZ</i>	2	130
DENMARK	<i>DK</i>	15	975
GERMANY	<i>DE</i>	12	780
FINLAND	<i>FI</i>	2	130
FRANCE	<i>FR</i>	9	585
GREAT BRITAIN	<i>GB</i>	3	195
GREECE	<i>GR</i>	11	715
HUNGARY	<i>HU</i>	1	65
IRELAND	<i>IR</i>	4	260
ITALY	<i>IT</i>	18	1170
LATVIA	<i>LT</i>	2	130
LITHUANIA	<i>LT</i>	4	260
LUXEMBURG	<i>LU</i>	1	65
MALTA	<i>MA</i>	4	260
NETHERLANDS	<i>NE</i>	2	130
POLAND	<i>PO</i>	12	780
PORTUGAL	<i>PR</i>	2	130
ROMANIA	<i>RO</i>	2	130
SLOVAKIA	<i>SK</i>	5	325
SLOVENIA	<i>SL</i>	5	325
SPAIN	<i>SP</i>	8	520
SWEDEN	<i>SW</i>	2	130
SUM	EU-27 (exl. Estonia)	137	8905

Table A2: Correlation Matrix

Variables	ROE	NET_LOANS_TOTAL_A	LOAN_LOSS_RES_OUR	TIER_1_CAP	CAR	PERSONNEL_EXP_TA	LOG_TOTAL_ASSETS	INFLATION	GDP	OVERHEADS	OFF_BALANCE	NET_INTER_REVENUE	DUMMY_5	DUMMY_6	DUMMY_7	DUMMY_8	DUMMY_9	
ROE	1.000.000																	
NET_LOANS_TOTAL_AS	0.140164	1.000.000																
LOAN_LOSS_RES_GROSS_LOAN	-0.221468	-0.081014	1.000.000															
TIER_1_CAP	0.084573	0.038944	-0.096868	1.000.000														
CAR	-0.076881	-0.083488	0.068134	0.033414	1.000.000													
PERSONNEL_EXP_TA	-0.172068	-0.140489	0.363258	-0.278607	0.106267	1.000.000												
LOG_TOTAL_ASSETS	0.308745	0.188789	-0.228261	0.652463	-0.018838	-0.511809	1.000.000											
LOAN_COST_DEP	0.174585	0.136380	-0.142577	0.215187	-0.083515	-0.388071	0.271305	1.000.000										
INFLATION	0.062002	-0.018810	-0.081277	-0.242788	-0.004987	0.088887	-0.300137	-0.071814	1.000.000									
GDP	0.178282	0.084027	-0.101818	-0.188774	-0.032725	8.78E-05	-0.157848	-0.093460	0.322227	1.000.000								
OVERHEADS	0.087638	0.080182	-0.102712	0.834687	-0.080637	-0.211488	0.638722	0.143887	-0.218883	-0.178338	1.000.000							
OFF_BALANCE	0.073488	0.076080	-0.111184	0.823808	0.032887	-0.278848	0.828100	0.310561	-0.212162	-0.186822	0.882046	1.000.000						
NET_INTER_REVENUE	0.072845	0.048131	-0.078814	0.847472	-0.041683	-0.222205	0.891333	0.166811	-0.223000	-0.172187	0.880134	0.878570	1.000.000					
DUMMY_5	0.048838	-0.087045	-0.024810	-0.023805	-0.018377	0.017788	-0.038129	-0.082421	0.033352	0.112513	-0.042345	-0.028844	-0.038027	1.000.000				
DUMMY_6	0.287283	0.085178	-0.053248	-0.084381	0.038713	-0.019404	-0.022883	0.027130	-0.018787	0.328778	-0.082513	-0.042132	-0.065884	-0.182524	1.000.000			
DUMMY_7	-0.004888	0.107813	-0.073515	-0.112227	-0.034803	0.048888	-0.108887	-0.050368	0.018163	0.333340	-0.081511	-0.088884	-0.088883	-0.182587	-0.218788	1.000.000		
DUMMY_8	-0.031047	0.010088	-0.014882	-0.085563	0.034881	-0.008817	-0.028844	0.007886	0.488431	0.042728	-0.081268	-0.082073	-0.084464	-0.221878	-0.288181	-0.248810	1.000.000	
DUMMY_9	-0.258880	-0.082147	0.142044	0.258887	-0.020763	-0.034823	0.187883	0.080023	-0.481812	-0.887884	0.223318	0.228888	0.238884	-0.245722	-0.281730	-0.278888	-0.336802	1.000.000

Table : Correlation Matrix

Table A3: List of sample countries and codes

No.	Bank Name	Code	No.	Bank Name	Code
1	AB DnB NORD Bankas	LT	42	Bankas Snoras	LT
2	AB Ukio Bankas	LT	43	Bankinter SA	ES
3	Abanka Vipaa dd	SI	44	Bankverein Werther AG	DE
4	Agricultural Bank of Greece	GR	45	Banque Paribas	FR
5	Allied Irish Banks plc	IE	46	Bank of America	US
6	Alpha Bank AE	GR	47	BKS Bank AG	AT
7	Amagerbanken, Aktieselskab	DK	48	BNP Paribas	FR
8	Anglo Irish Bank Corporation Limited	IE	49	Bradford & Bingley Plc	GB
9	AS DnB NORD Banka	LV	50	BRD-Groupe Societe Generale SA	RO
10	Baader Bank AG	DE	51	BRE Bank SA	PL
11	Banca Carige SpA	IT	52	BTV (3 Banken Gruppe)- Bank für Tirol und Vorarlberg AG	AT
12	Banca Fideuram SpA	IT	53	Bulgarian-American Credit Bank	BG
13	Banca Finnat Euramerica SpA	IT	54	Ceska Sporitelna a.s.	CZ
14	Banca Ifis SpA	IT	55	Cofitem - Cofimur	FR
15	Banca Popolare Commercio e Industria SpA	IT	56	Comdirect Bank AG	DE
16	Banca Popolare di Cremona SpA	IT	57	Commerzbank AG	DE
17	Banca Popolare di Spoleto SpA	IT	58	Corporate Commercial Bank AD	BG
18	Banca Profilo SpA	IT	59	CREDEM-Credito Emiliano SpA	IT
19	Banca Transilvania SA-Transilvania Bank	RO	60	Crédit Industriel et Commercial - CIC	FR
20	Banco Bilbao Vizcaya Argentaria SA	ES	61	Credito Artigiano	IT
21	Banco de Sabadell SA	ES	62	Credito Bergamasco	IT
22	Banco Desio - Banco di Desio e della Brianza SpA	IT	63	DAB Bank AG	DE
23	Banco di Sardegna SpA	IT	64	Danske Bank A/S	DK
24	Banco Espanol de Crédito SA, BANESTO	ES	65	Depfa Bank Plc	IE
25	Banco Espirito Santo SA	PT	66	Deutsche Bank AG	DE
26	Banco Guipuzcoano SA	ES	67	Deutsche Postbank AG	DE
27	Banco Pastor SA	ES	68	Dexia banka Slovensko a.s.	SK
28	Banco Popular Espanol SA	ES	69	DF Deutsche Forfait Aktiengesellschaft	DE
29	Banco Santander SA	ES	70	DiBa Bank A/S	DK
30	Bank Austria-UniCredit Bank Austria AG	AT	71	DVB Bank SE	DE
31	Bank BPH SA	PL	72	DZ Bank Polska SA	PL
32	Bank Handlowy w Warszawie S.A.	PL	73	EFG Eurobank Ergasias SA	GR
33	Bank Millennium	PL	74	Emporiki Bank of Greece SA	GR
34	Bank Ochrony Srodowiska Capital Group-	PL	75	FB Bank Copenhagen A/S- Forstaedernes Bank A/S	DK
35	Bank of Aland Plc-Alandsbanken Abp	FI	76	FIMBank Plc	MT
36	Bank of Attica SA-Attica Bank SA	GR	77	First Investment Bank	BG
37	Bank of Cyprus Group-	CY	78	General Bank of Greece SA	GR
38	Bank of Valletta Plc	MT	79	Generbanca-Banca Generali SpA	IT
39	Bank Pekao SA-Bank Polska Kasa Opieki SA	PL	80	Getin Noble Bank SA	PL
40	Bank Zachodni WBK S.A.	PL	81	Gruppo Monte dei Paschi di Siena-	IT
41	Banka Koper d.d.	SI	82	Hellenic Bank Public Company Limited	CY

No.	Bank Name	Ctry	No.	Bank Name	Ctry
83	HSBC Bank Malta Plc	MT	124	Société financière pour le financement de bureaux et d'usines SOFIBUS	FR
84	HSBC France	FR	125	Société Générale	FR
85	HSBC Trinkaus & Burkhardt AG	DE	126	Spar Nord Bank	DK
86	ING Bank Slaski S.A. - Capital Group	PL	127	Sparbank A/S	DK
87	Intesa Sanpaolo	IT	128	Sparekassen Faaborg A/S	DK
88	Irish Life & Permanent Plc	IE	129	Svenska Handelsbanken	SE
89	IW Bank SpA	IT	130	Sydbank A/S	DK
90	Jyske Bank A/S (Group)	DK	131	T Bank S.A	GR
91	KBL European Private Bankers SA	LU	132	Tatra Banka a.s.	SK
92	Keytrade Bank SA/NV	BE	133	UniCredit Bank AG	DE
93	Komerčni Banka	CZ	134	UniCredit SpA	IT
94	Kredyt Bank SA	PL	135	Vestjysk Bank A/S	DK
95	Laan & Spar Bank A/S	DK	136	VOLKSBANK Slovensko, as	SK
96	Latvian Savings Bank	LV	137	Vseobecna Uverova Banka a.s.	SK
97	LBB Holding AG- Landesbank Berlin Holding AG	DE			
98	Le Crédit Lyonnais (LCL)	FR			
99	Lombard Bank (Malta) Plc	MT			
100	Marfin Egnatia Bank SA	GR			
101	Marfin Popular Bank Public Co Ltd	CY			
102	Max Bank A/S	DK			
103	Millennium bcp- Banco Comercial Português, SA	PT			
104	National Bank of Greece SA	GR			
105	National Westminster Bank Plc	GB			
106	Natixis	FR			
107	Noerresundby Bank A/S	DK			
108	Nordea Bank Polska SA	PL			
109	Nordjyske Bank A/S	DK			
110	Northern Rock (Asset Management) Plc	GB			
111	Nova Kreditna Banka Maribor d.d.	SI			
112	Oberbank AG	AT			
113	OTP Bank Plc	HU			
114	OTP Banka Slovensko, as	SK			
115	Piraeus Bank SA	GR			
116	Pohjola Pankki Oyj-Pohjola Bank plc	FI			
117	Probanka d.d. Maribor	SI			
118	Proton Bank S.A.	GR			
119	RBS Holdings NV	NL			
120	Ringkjøbing Landbobank	DK			
121	Siauliu Bankas	LT			
122	Skandinaviska Enskilda Banken AB	SE			
123	SKB Banka DD	SI			

