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Topic

Assessing the Impact of the Post-Financial Crisis on Banks Profitability: Empirical Evidence in the Eurozone

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INDEX

ABSTRACT

This research study aims at assessing the impact of the post-financial crisis on banks profitability in the Eurozone. A selected number of 12 countries have been use to represent the Eurozone. This includes: Germany, Belgium, the Netherlands, Luxembourg, France, Austria, Italy, Ireland, Finland, Spain, Portugal and Greece. A country level aggregated bank industry and macroeconomic data was collected for the period 2002-2021 for each of the 12 representative countries. These are cumulative balance sheet data of all the regional banks in each of the 12 countries which gives a total of 240 observations in the whole sample period. The data constitute bank specific variables such as; bank loans, bank size, book value per share, bank debt securities and macroeconomic variables which includes; real GDP, inflation and net exports. Referencing from the research paper of Ali, M. (2016), a balanced panel regression model of Brook (2008) is use on the panel data of the dependent and independent variables. I conducted three separate analysis which captures the pre-crisis period (2002-2007), the crisis years (2008-2013) and the post-financial crisis period (2014-2021) to assess the impact on banks profitability. As reveal from the study results and findings, none of the null hypotheses were rejected which brings us to the conclusion that the post-financial crisis does not have any positive significant impact on banks profitability in the Eurozone. As compare to the pre-crisis period and crisis years, the regression results of the post-crisis shows that two of the explanatory variables (log of bank debt securities and log of net exports) are statistically significant at 5% and 10% level. However, they both have negative coefficients which implies they have negative significant effects on banks profitability in the Eurozone. We therefore also do not reject the null hypotheses of these variables and draw the conclusion that the post-financial crisis does not have any positive significant impact on banks profitability in the Eurozone.

1. INTRODUCTION

It is now more than a decade since the world was hit by the global financial crisis which started in the financial sector and rapidly unfold into a global recession in economies around the globe. This was as well followed by an unprecedented effect on the non-financial sectors. The preceding period of the financial crisis has great impact in the banking sector of most advanced economies around the world. Prior to the crisis, the assets, credit and profit of the banking system was growing at a faster rate. This led to negligence of risk which was often compensated by other incentives such as short-term gains over long-term sustainable returns and also poor assessment of banking strategies. There was also relaxation of credit standards and the reliance of banks on short-term wholesale markets to fund their activities. The banking system in some countries operated with a relatively small capital and liquidity buffers. The financial crisis started around mid of 2007 which was triggered by the deflation of US housing boom that led to significant losses on US mortgages credit and also uncertainty of institutions exposure to these assets. Banks and other financial intermediaries were face with liquidity constraints which triggered the central banks to expand significantly on their liquidity facilities. The banking sector also suffer due to the closure of the funding market after the failure of the Lehman Brothers in 2008. This pushes the government to guarantee the funding of banks in most economies around the globe. However, many banks within Europe and America failed to receive government funding and support and were therefore nationalized. Most of the large banking system across the world were affected by the crisis even though there were variation on the impact level due to different cyclical conditions and structural vulnerabilities. It is also good to note that banks in the Eurozone, the United Kingdom, and United States suffered huge losses during the height of the crisis as compare to those in Canada, Australia and Sweden which didn't need government capital support. Also banks in the emerging market economies (EMEs) were more protected from the financial crisis turmoil due to their domestic focus, high regulating buffers and also relatively low use of market funding.

As already mention above, the banking sector is one of the sectors that was mostly hit by the 2008-2010 financial crisis. The crisis exposes a pattern of excessive risk taking and inadequate capital and liquidity buffers within the banking sector couple with short-comings in the micro and macro prudential framework. As of presence, there have been a lot of regulatory amendment and frameworks put in place especially in the banking sector to address the post financial crisis. Some of these regulatory measures can be captured under the Basel I, II, III and IV regulatory framework couple with other regulatory framework formulated by the Basel

Committee on Banking Supervision (BCBS). These regulatory measures have gone a long way to address the aftermath of the 2008-2010 global financial crisis which didn't only hamper the banking sector but also contagion effect which went further to inflict severe losses of economic activities in many countries around the globe (Ball, 2014). By examining the nature and magnitude of these effects, there is variation on country-by-country basis and also the adverse impact on European economies have been highly visible, thus affecting countries both within and outside the Eurozone (European Union, 2013).

This research study gives an added value and contribution to previous studies that are related to my research question. The study has also gone further to address the problem of uncertainty and speculation of whether the post-financial crisis has made any positive significant effects on banks profitability in the Eurozone. A research study by Dietrich, A., and Wanzenried, G. (2011) on "Determinants of bank profitability before and during the crisis: Evidence from Switzerland" is one of the research papers that inspire me to conduct this research. Their study made use of data from the Swiss banking market whereby they examine bank profitability as a measure of how a bank should operate. They use profitability to assess whether a good judgement can be made for banks that operate in a similar environment concerning the success of their competitive strategies and other determined factors. A GMM estimator technique was use to analyze the profitability of 372 commercial banks in Switzerland over the period from 1999 to 2009. To evaluate the impact on profitability, they separated their analysis between the pre-crisis period and the crisis years. Another interesting paper that motivated my interest in this research is a study by Bouzgarrou, H. et al. (2017) who conducted research on "Bank profitability during and before the financial crisis: Domestic versus foreign banks". In their analysis, they collected data on bank specific variables from the financial statement of 170 commercial banks (105 domestic banks and 65 foreign banks) from the Bankscope database of Bureau van Dijk over the period 2000-2012. To analyze the effects of the financial crisis, they investigate the pre-crisis period (2000-2006) and the crisis years (2007-2012) separately. They use the GMM technique in their methodology to examine the profitability of domestic and foreign banks before and during the financial crisis. Another related paper by Sufian, F., and Chong, R. (2008) "Determinants of bank profitability in a developing economy: Empirical evidence from the Philippines". They use the OLS multivariate regression technique to analyze the determinants of Philippines banks profitability during the period 1990-2005. The empirical findings suggest that all the bank-specific determinant variable have a statistically significant impact on bank profitability. This can also be link with the research study of Muhammad, A.

(2016) in his research paper title "Bank profitability and it's determinants in Pakistan: A panel data analysis after the financial crisis". His study investigates the internal and external determinants of the Pakistan banking sector particularly after the financial crisis. The study sample constitute 26 banks which include 17 conventional, 5 Islamic and 4 public banks with a five-year sample period (from 2009 to 2013). The methodology used in the study consist of a balance panel data regression model whereby return on assets (ROA) and return on equity (ROE) has been use as an alternative for banks profitability. A summary of the research findings reveals that Pakistan banking industry succeed in avoiding significant impact of external factors like inflation and GDP over profitability whereas efficient management is required to improve internal factors in order to be more profitable.

From the above previous studies, my research paper has address some of the limitations in the assessment of the impact of the financial crisis on bank's profitability. Firstly, this research paper assesses the impact of the post-financial crisis on bank's profitability in the Eurozone region which hasn't been address in the previous studies. That is the study captures a comparative analysis by also examining the pre-crisis period and the crisis years to determine if there is any significant increase on banks profitability as compare to these previous periods. It is good to know that instead of using a financial crisis dummy as one of the independent variables, the researcher has instead conducted a separate analysis of the crisis years which also covers the Eurozone debt crisis (2008-2013). My research study has also upgrade and expand on the previous studies by extending the sample period data to include more recent years (2002 to 2021). This study also stretches further to expand on the area of study by using country level data of the banking industry of 12 countries in the Eurozone whereas the previous studies has focussed their analysis in a single country. This therefore gives more relevance and contribution of my research. This implies the results and findings of this study gives relevance and reliability for economy policies and decision making within the Eurozone and other economies across the globe. This research study will also be of importance to both current and future researchers, policy makers, the banking sector and firms across the globe and the society at large.

The main objective of this research is to assess the impact of the post-financial crisis on banks profitability in the Eurozone. The researcher is interested to find out if there is a positive significant effect (significant increase) in banks profitability during the post-financial crisis period in the Eurozone. After the global financial crisis that hit economies across the globe including the Eurozone, there have been amendment in the financial sector including regulatory

laws and measures put in place to stabilize the financial sector especially in the European Union and more specifically the Eurozone. Some of these laws and measure can be seen under the regulatory framework of the Basel I, II, III and IV formulated by the Basel Committee on Banking Supervision (BCBS) of the European Union. This has gone a long way to boost the supervisory activities of the banking sector and also improve the stability of their operations. Having this in mind, I'm therefore curious to investigate whether with these new policies and regulatory measures put in place after the financial crisis to govern the smooth operations of the banking industry, there is any positive significant effect (increase) in banks profitability in the post-financial crisis period in the Eurozone. This therefore gives rise to the main hypothesis of this study. Null hypothesis (H_0): The post-financial crisis does not have any positive significant effect on banks profitability in the Eurozone. Alternative hypothesis (H_a): The post-financial crisis has a positive significant effect on banks profitability in the Eurozone.

In my analysis I have use a selection of twelve (12) countries in the Eurozone. With the help of FactSet and Eikon, I went further to collect country level aggregated bank industry from the European Central Bank (ECB) and macroeconomic data of each of the 12 countries (Germany, Belgium, Netherlands, Luxembourg, Austria, Ireland, France, Finland, Italy, Spain, Portugal and Greece) use in my sample. I have collected data from both bank specific and macroeconomic variables for the period 2002 to 2021, whereby I have applied the balance panel regression model of Brooks (2008) on the panel data of each of the selected variables of the various countries use in my analysis.

To summarize the introduction of this research study, the remaining section of the study will unfold as follows: Section II will cover the literature review, section III will present the data and methods of the study, section IV captures the empirical results and finally section V covers the conclusion. In the next section, I'm going review existing and related literatures that support and backup this research study.

2. LITERATURE REVIEW

This section of my research study elaborates on existing literatures that are related to my research question.

Gulati, R. and Kumar, S. (2016) did a research study on "Assessing the impact of the global financial crisis on the profit efficiency of Indian banks". Their study focuses on the evolution of profit efficiency before, during and after the crisis. In their analysis, they use a DEA-based meta profit frontier framework that account to evaluate and compare the risk adjusted alternative profit efficiency of different ownership groups in the Indian banking industry. Their results shows that profit efficiency of banks decline mildly during the global financial crisis, but later recovered rapidly after the crisis. Their findings also reveal that technology gap ratio provides that foreign banks employed best practice production technology and were observed to be the technology leader of the Indian banking industry. The summary of their results shows that there are no long-lasting adverse effects of the global financial crisis on the profit efficiency of the Indian banking sector due to the adoption of accommodative macro policies which aim at injecting sufficient liquidity in the system. Linking this to my research study, there are limitations in this literature that I have address in my study. The above paper focuses their analysis within Indian banks which didn't play any great role in addressing the global financial crisis. However, my research study focuses on countries within the Eurozone which has a more stable banking system and policies and also were amongst the keys players in addressing the global financial crisis. This therefore gives the findings and results of my research an upper hand for a better policy decision making in relation to the financial crisis than the ones in this literature.

Dietrich, A. and Wanzenried, G. (2011) in their research study "Determinants of bank profitability before and during the crisis: Evidence from Switzerland". Their study uses the GMM estimator technique described by Arellano and Bover (1995) to analyze the profitability of 372 commercial banks in Switzerland over the period from 1999 to 2009. In their analysis, they consider the pre-crisis period 1999-2006 and the crisis period of 2007-2009. They also employ various determinants of bank's profitability. The results of the finding shows that operationally efficient banks are more profitable than banks that are less operationally efficient. Also, they discover that above average growth in loan volume affects bank profitability positively, while higher funding cost result in a lower profitability. The result further shows that interest income share has a significant impact on profitability. This implies banks that are

highly dependent on interest income are less profitable than banks whose income are more diversified. In relation to my current study, I have gone a step further to assess the impact of the post-financial crisis on banks profitability which hasn't been address in this literature. My study has assessed the pre-crisis period, the crisis years and post-crisis period to see if there is a significant increase on banks profitability in the different periods. Also, the scope of the analysis in this literature is limited on banks within Switzerland, whereas my research has gone beyond to include aggregated bank industry data of 12 countries in the Eurozone region. This therefore gives more visibility and added value to my research than the previous literature.

Bouzgarrou, H. et al (2018) in their research paper "Bank profitability during and before the financial crisis: Domestic versus foreign banks". Their research paper covers a sample of 170 commercial banks operating in France for the period 2000-2012. Their findings shows that foreign banks are more profitable than domestic banks most especially during the financial crisis. In their analysis, a robustness test was done, especially for foreign banks from advanced economies compared to banks from emerging economies. Concerning banks profitability, they find that during the financial crisis lagged profitability has a negative effect for domestic banks and a positive effect for foreign banks. Also, there is a limited gap in this literature in terms of their analysis in assessing the impact of the financial crisis on banks profitability which has been address in my study. They limited their findings and assessment on banks profitability before and during the financial crisis, meanwhile my research study has gone further to assess the post-crisis impact on banks profitability. I have also extended the sample periods to include recent years in the post-crisis period which is very important in the banking sector and economy as whole due to new regulatory measures that governs the banking and financial sector.

Teixeira, J. Et al (2014) conduct a research study on "Banks capital regulation and the financial crisis". They investigate whether regulatory capital requirements play an important role in determining bank's equity capital. In their analysis, they use panel data of a sample of 560 banks from 2004-2010 to estimate equity capital regression. They also document in their findings the differences on the effect of most factors on bank's share of equity according to the type and the region where it is located. They conclude their findings by showing that the determinants of this share are sensitive to recent international financial crisis and to other set of regulatory factors. My research paper has expanded on this literature by addressing different dimensions of the financial crisis and the impact on banks profitability. This can be seen by not only focussing on bank regulatory capital but also the inclusion of more bank's specific and macroeconomics variables in my model in order to assess the impact on banks profitability.

Furthermore, a research study by Erfani, G., & Vasigh, B. (2018) "The impact of the global financial crisis on profitability of the banking industry". They do a comparative study on the impact of the global financial crisis on the performance of Islamic and commercial banks. They evaluate the efficiency of profitability of the banking sector by using a sample of eight Islamic banks and eleven commercial banks with a study period from 2006 to 2013. The methodology for the findings and results involves the Altman Z-score model, ratio analysis and data envelopment analysis (DEA) method and a regression model. The study results show that Islamic banks has maintain their efficiency whereas most commercial banks have lost their efficiency. The overall findings show that financial crisis did not have a significant impact on the profitability of Islamic banks. Connecting this literature to my research study, I have gone ahead to cover some gaps that I have identified in this literature. The use of Islamic banks in their comparative analysis poses a limitation to their paper since their principles of operation is been govern by Islamic tradition and laws called Sharia which is not globally applied in the banking sector. Looking further on the research paper of Muhammad, A. (2016) on "Bank profitability and its determinants in Pakistan: A panel data analysis after the financial crisis". The paper looks forward to investigate the internal and external determinants of the Pakistan banking sector specifically after the financial crisis. In the research methodology, the author uses a balanced panel data regression technique whereby he uses return on assets (ROA) and return on equity (ROE) as a measure of bank profitability. The research sample comprises of 26 banks amongst which 17 are conventional, 5 Islamic and 4 public banks which covers a 5 years sample period (2009-2013). The results of the study show that bank profitability is significantly affected by internal determinants while external determinants are insignificant. My research study focuses in the Eurozone region where the operations and functionality of the banking sector is been govern by globally recognized banking laws and principles. I have also incorporated in my study different determinant variables in my methodology to assess the impact of the crisis on bank's profitability which has not been captured in this literature. Also, the author of the second literature has limited his analysis and findings by addressing only the post- financial crisis period with a sample period of only 5 years (2009 to 2013) while my research study has gone beyond to close this gap by assessing the pre-crisis period and the crisis years and also expanding the sample period beyond 2013.

Before moving to the next section of this research, I will like to state a number of hypotheses which I have use to answer my research question. To formulate the hypotheses, I have selected some key bank specific and macroeconomic variables from my model with a reference guide

from previous studies and literatures. As already mention in the introductory chapter, the objective of this study is to assess the impact of the post-financial crisis on banks profitability in the Eurozone. The main hypothesis that addresses the research question as previously stated include: H_0: The post-financial crisis does not have any positive significant effect on banks profitability in the Eurozone. H_a: The post-financial crisis has a positive significant effect on banks profitability in the Eurozone. Other hypotheses include;

H_0: Bank size does not have any positive significant effect on banks profitability in the post-financial crisis in the Eurozone. H_a: Bank size have a positive significant effect on banks profitability in the post-financial crisis in the Eurozone.

H_0: Bank debt securities does not have any positive significant effect on banks profitability in the post-financial crisis in the Eurozone. H_a: Bank debt securities have a positive significant effect on banks profitability in the post-financial crisis in the Eurozone.

H_0: The real GDP does not have any positive significant effect on banks profitability in the post-financial in the Eurozone. H_a: The real GDP have a positive significant effect on banks profitability in the post-financial crisis in the Eurozone.

H_0: Net exports does not have any positive significant effect on banks profitability in the post-financial crisis in the Eurozone. H_a: Net exports have a positive significant effect on banks profitability in the post-financial in the Eurozone.

Drawing from the references of the above literature reviews, I have selected some key bank specific and macroeconomic variables to come up with additional hypotheses in support of the main hypothesis so as to better address the research question. Amongst the four selected variables, the variable bank size (which represent the total assets of a bank) and real GDP are consistent with those use in the research papers of Dietrich, A; & Wanzenried, G. (2011), Bouzgarrou, H. et al (2018) and Erfani, G; & Vasigh, B. (2018). The variable Net Export is also consistent with the study conducted by Khan, M; & Yeniceri, T. (2016) on "Impact of Import and Export on the Profitability of Pakistani Banks. Their study highlights that both export and import are key factors in a country financial system which also go a long way to boost employment, economic growth and prosperity to the economy. The results obtained from their findings shows that Net Export (Export minus Import) have negative significant impact on banks profitability while the individual variable export have positive significant impact on banks profitability. The variable bank debt securities is a new variable added by the researcher. I have considered debt securities issued by banks as an important variable that determines

banks profitability because banks can make profit by borrowing money from depositors and issue them securities in the form of treasury bonds, municipal bond or corporate bonds and then compensate them with a certain interest rate. The bank can then lend the money to borrowers and charge them a higher interest rate thereby making own profit from the interest rate spread. I'm therefore interested to see the effect of this variable on banks profitability in the post-financial crisis period as compare to the pre-crisis and crisis years periods.

3. DATA AND METHODS

Data

The data use in this research study comprises of aggregated country level data for the banking industry of each of the selected countries in the Eurozone. After exploring FactSet and Eikon database, I manage to gather aggregated industry balance sheet bank data for twelve (12) countries to represent the Eurozone area in my study sample. The selected countries include; Germany, Belgium, The Netherlands, Luxembourg, Austria, Ireland France, Spain, Italy, Finland, Portugal and Greece. The data collection covers a twenty (20) year period (from 2002 to 2021). This comprises of the pre-crisis period (2002 to 2007), the crisis years (2008 to 2013) and the post-crisis period (from 2014 to 2021). Drawing from the research framework model of Bouzgarrou, H., et al. (2018), Dietrich, A., & Wanzenried, G. (2010), Sufian, F., & Chong, R. (2008) and Muhammad, A. (2016), I have collected data from a selected number of dependent and independent variables which constitute both bank specific and macroeconomic variables. I have use return on asset (ROA) as a representative dependent variable to measure banks profitability. The bank specific variables constitute aggregated industry level bank data. They include; bank loans, bank book value per share, bank debt securities and bank size. The macroeconomic variables include; real GDP, Inflation and Net Exports. I have exploited FactSet and Eikon database in gathering the relevant data use in this research study.

Methodology

This section of the study presents the research model and methodology use in analysing my findings and results. After the gathering and cleaning of the relevant data for all variables of the twelve (12) Eurozone countries use in my sample size, with the use of STATA software I then apply the balanced panel regression technique use by (Muhammad A., 2016) on the panel data of all the countries and the different explanatory variables use in my analysis. I have conducted three separate regression analysis which involves the pre-crisis period (2002-2007), the crisis years (2008-2013) and the post-crisis period (2014-2021 to determine if there is any

positive significant effect (significant increase) in banks profitability as a result of the post-financial crisis in the Eurozone. The model and methodology use in this research is consistent with the regression model of Brooks (2008).

The regression model can be stated below;

$$Y_{nt} = \alpha + \beta X_{nt} + \varepsilon_{nt}$$

Where;

Y = dependent variable

X = Independent or explanatory variables

α = Intercept or constant term

ε = Error term

n = Number of cross sections (1, ……..N)

t = time period (1, ……..T)

Drawing from the above regression model of Brooks (2008), the model for this study can also be stated;

$$ROA_{nt} = \alpha + \beta_1 logBL_{nt} + \beta_2 logBVS_{nt} + \beta_3 logBDS_{nt} + \beta_4 logBS_t + \beta_5 logGDP_{nt} + \beta_6 logINF_{nt} +$$

$$\beta_7 logNXP_{nt} + \varepsilon_{nt}$$

Table1: Description of variables use in the research study

Variable	Model Notation of Variable	Variable Type	Variable Description
Return on Assets	ROA	Dependent	Return on Assets
Bank Loans	logBL	Independent	Log of Bank Loans
Book value per share	logBVS	Independent	Log of Bank Book Value per Share
Bank Debt Securities	logBDS	Independent	Log of Bank Debt Securities
Bank Size	logBS	Independent	Log of Bank Size

Real GDP	logGDP	Independent	Log of Real Gross Domestic Product
Inflation	logINF	Independent	Log of Inflation
Net Export	logNXP	Independent	Log of Net Exports (Total Exports-total Imports)

4. EMPIRICAL ANALYSIS

This section of the study presents an empirical analysis of my research findings and also gives an interpretation and discussion of the main results. To properly address and answer the research question, I have presented three separate analysis which captures the pre-crisis period (2002-2007), the crisis years (2008-2013) and the post-crisis period (2014-2021). This will enable us to have a clear picture in addressing the research question and the hypotheses so as to determine whether the post-financial crisis has led to any significant increase in banks profitability in the Eurozone.

4.1 Summary Statistics and Correlation of the whole Sample Period (2002-2021)

Table 2: Summary Statistics of the whole sample period (2002-2021)

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	240	0.8887522	2.434407	-3.757737	25.54023
logBL	240	2.899554	0.4687398	2.006624	3.85938
logBVS	240	1.591382	1.073633	-5.77	2.930253
logBDS	240	2.095943	0.7535409	-0.3685562	3.214209
logBS	240	3.158134	0.4512436	2.232437	4.04382
logGDP	240	2.723021	0.8751339	1.398131	5.309321
logINF	240	1.974481	0.0412586	1.866902	2.048108
logNXP	240	-11.75048	20.53285	-99	31.5338

Source: Computed by Author with Stata

Table 2 above present summary statistics for the entire sample period of the study. The table therefore represent the pre-crisis period, the crisis years and the post-crisis with a total of 240 observations. We can see from the table that the dependent variable return on assets has a mean value of 0.88875 percent with a standard deviation of 2.434407 percent. By observing the values of the different independent variables, we see that log of bank size has the highest mean value of 3.158134 percent followed by log of bank loans (2.899554), log of real GDP (2.723021) and log of bank debt securities (2.095943). The variable log of Net Export has the lowest mean value of -11.75048 percent but however has the highest standard deviation of 20.53285 percent followed by return on assets (2.434407), log of book value per share (1.073633) and log of real GDP (0.8751339). It is also worth noting that amongst all the variables, the log of Net Export has both the lowest minimum value of -99 and the highest maximum value of 31.5338 percent.

Table 3: Pairwise correlation matrix for the whole sample period (2002-2021)

	ROA	logBL	logBVS	logBDS	logBS	logGDP	logINF	logNXP
ROA	1.0000							
logBL	0.1087	1.0000						
logBVS	0.0731	0.2326	1.0000					
logBDS	0.1021	0.8610	0.3960	1.0000				
logBS	0.1573	0.9755	0.2159	0.8649	1.0000			
logGDP	-0.1025	0.0000	-0.0628	0.0447	-0.0638	1.0000		
logINF	0.1102	0.1198	-0.1057	0.0801	0.1639	0.0346	1.0000	
logNXP	-0.1211	-0.2553	0.0302	-0.0501	-0.2117	-0.0974	-0.0417	1.0000

Source: Computed by Author with Stata

Table 3 shows an interactive correlation of all the variables in the whole sample period use in the study. The matrix shows less than few numbers of interactive variables with a strong positive correlation coefficient that exceeds 0.8. The most positive correlation pair can be seen from the correlation between log of bank size (logBS) and log of bank loans (logBL) with a correlation coefficient of 0.9755. This is also justifiable in real world because bank size represents the total assets of a bank, which implies the more assets a bank possesses, the more capacity it has to issue out loans to borrowers. Other strong positive correlations include

correlation between log of bank debt securities (logBDS) and log of bank size (logBS) with a correlation coefficient of 0.8649. This is followed by correlation log of bank loans (logBL) and log of bank debt securities (logBDS) with a correlation coefficient of 0.8610. It can also be seen from the table that no correlation exists between log of real GDP and log of bank loans.

4.2 Empirical Analysis of the Pre-financial Crisis (2002-2007)

Table 4: Summary Statistics of the Pre-financial Crisis

Variables	Obs	Mean	Std Dev.	Min	Max
ROA	72	0.8374217	0.6968949	0	3.882783
logBL	72	2.816737	0.4717173	2.006624	3.654414
logBVS	72	1.692388	0.5401732	0	2.691712
logBDS	72	1.996448	0.8488576	-0.3685562	3.214209
logBS	72	3.07313	0.4699911	2.232437	3.880379
logGDP	72	2.718454	0.8639472	1.749798	5.285184
logINF	72	1.929564	0.0329107	1.866902	2.021293
logNXP	72	-11.14175	22.19899	-99	31.5338

Source: Computed by Author with Stata

The above table illustrate the summary statistics of all the variables in the pre-financial crisis period (2002-2007). The average value of return on assets is 0.8374217 percent and a standard deviation of 0.6968949. Amongst the independent variables, bank size still maintains the highest mean value of 3.07313 percent as that of the whole sample period. However, the values of the pre-crisis period are a bit lower as compare to those of the whole sample period. Also, the variable Net Export still has the lowest average value of -11.14175 percent and highest standard deviation of 22.19899 percent as in the whole sample period. We can also notice from the table that there are variables that have higher mean values but lower standard deviation while others have higher standard deviation but lower mean values.

Table 5: Pairwise Correlation Matrix of the Pre-financial Crisis

	ROA	logBL	logBVS	logBDS	logBS	logGDP	logINF	logNXP
ROA	1.0000							
logBL	0.4431	1.0000						
logBVS	0.0381	-0.1831	1.0000					
logBDS	0.3373	0.8446	-0.0854	1.0000				
logBS	0.4285	0.9839	-0.1537	0.8520	1.0000			
logGDP	0.1626	-0.0070	-0.2559	0.0093	-0.0430	1.0000		
logINF	0.0533	0.3393	0.2364	0.3109	0.4215	0.1127	1.0000	
logNXP	0.0145	-0.1364	-0.0357	0.0556	-0.0628	0.0260	0.0190	1.0000

Source: Computed by Author with Stata

Table 5 above present the correlation matrix of the variables during the pre-crisis period. There are also few numbers of variables with strong positive correlation with a correlation coefficient above 0.8 as in the whole sample period. The correlation between log of bank size and log of bank loans still maintains the highest the highest correlation coefficient of 0.9839 follow by the correlation between log of bank size and log of bank debt securities (0.8520) and correlation between log of bank debt securities and log of bank loans with a correlation coefficient of 0.8446. There are also a number of interactive variables that have weak negative correlations as can be seen in the table.

Results of the pre-financial crisis (2002-2007)

Table 6: Balanced panel regression results of the pre-crisis period

Fixed-effects regression		Number of obs. =	72
Group variable: Code		Number of groups =	12
R-sq:		Obs per group:	
within = 0.1419		min =	6
between = 0.0382		avg =	6.0
overall = 0.0175		max =	6
		$F_{(7, 11)}$ =	8.09
		Prob > F =	0.0013

ROA	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
logBL	2.465378	1.524018	1.62	0.134	-.8889633	5.81972
logBVS	0.3320836	0.13354	2.49	0.030	.0381639	.6260032
logBDS	0.3037802	0.6189772	0.49	0.633	-1.058579	1.66614
logBS	-2.165228	1.897054	-1.14	0.278	-6.340616	2.01016
logGDP	-6.925002	3.530354	-1.96	0.076	-14.69526	.8452547
logINF	2.287145	3.486422	0.66	0.525	-5.386418	9.960708
logNXP	0.0061379	0.00803	0.76	0.461	-.0115359	.0238118
_cons	13.85912	7.516299	1.84	0.092	-2.684138	30.40239

Source: Computed by Author with Stata

Table 6 above present the regression results of the pre-financial crisis as shown in the regression model in the previous chapter of this study. Before diving into the interpretation and discussion of the results, I will like to draw our attention that the main interest of this study which addresses the research question and hypotheses is on the effect of the post-financial crisis on banks profitability in the Eurozone. However, in order to assess whether the post-financial crisis has led to any significant increase in banks profitability, I decide to also conduct separate analysis in the pre-crisis period and the crisis years. It is worth to know that, during the estimation process, in order to determine which estimation method to employ between fixed effect and random effect on the panel data, a Hausman test was perform in the three different sample periods (pre-crisis period, crisis years and post-crisis period). The number of groups represent the twelve (12) countries use in the sample which gives a total of 72 observations in the pre-crisis period (2002-2007).

After running a panel regression analysis on the country level data of the bank specific and macroeconomic variables for the twelve (12) representative countries in the Eurozone, I then arrive at the above results. The results are also robust at different significant test level. The aggregated bank industry use in the study represents all the regional banks of each of the twelve countries use in my study sample. The above result shows that the constant coefficient has a positive intercept value of 13.859 which is also statistically significant at 10% two tail test (absolute t-value of 1.84 > t-critical value of 1.67). However, this does not have any relevant influence on the independent variables. Using the t-statistics and p-value at both 5% and 10% two tail test, we can see that the variables log of bank loans, log of bank debt securities, log of

bank size, log of inflation and log of net export are statistically insignificant at 5% and 10% level. This is because their respective absolute t-values are less than their t-critical values from the t-distribution table. Looking at their intercept coefficient values, the variable log of bank loans, log of bank debt securities, log of inflation and of net export have positive intercepts which implies these variables have a positive relationship with banks profitability (return on assets), while the variable log of bank size has a negative relationship with banks profitability. However, these relationships are not significantly strong enough for any statistical inference in the real world. On the other hand, the variable log of book value per share is statistically significant at 5% and 10% significant level (absolute t-value of 2.49 > t-critical value of 1.99 and 1.67), while the variable log of real GDP is statistically significant at 10% significant level (absolute t-value of 1.96 > t-critical value of 1.67). The coefficient of log of book value per share has a positive intercept value of 0.33208. This shows a positive relationship between log of book value per share and banks profitability (ROA) in the pre-crisis period. This implies a percentage point increase in log of book value per share will increase banks profitability by 0.33208 ceteris paribus (holding everything else constant). The coefficient of the log of real GDP has a negative intercept value of -6.925. This shows a negative relationship between log of real GDP and banks profitability. This also implies a percentage point increase in log of real GDP will decrease banks profitability by 6.925 ceteris paribus (holding everything else constant). This is significantly strong for any statistical inference in the real world. We can go further to conduct an F-test in order to test the overall significance of the independent variables on banks profitability. From the above regression results, the p-value of the F-test is less than 5% (0.0013 < 0.05) which implies it is statistically significant at 5% level. This means the independent variables fit and satisfy the regression model and therefore the results are reliable.

4.3. Empirical Analysis of the Crisis Years (2008-2013)

Table 7: Summary Statistics of the Crisis Years

Variables	Obs	Mean	Std Dev.	Min	Max
ROA	72	0.3614107	0.9828691	-3.757737	3.810871
logBL	72	2.940874	0.4470727	2.278212	3.677335
logBVS	72	1.762911	1.08781	-5.77	2.901968
logBDS	72	2.202487	0.7400259	0.1655411	3.206809
logBS	72	3.215856	0.4287603	2.597956	3.924214
logGDP	72	2.719436	0.874757	1.627394	5.286568
logINF	72	1.978642	0.0178544	1.943919	2.014605
logNXP	72	-14.50759	21.95898	-94.1	2.309204

Source: Computed by Author with Stata

The summary statistics of the crisis years is been captured in table 7 above. As shown from the table, the mean value of return on assets is 0.3614 percent with a standard deviation of 0.9828691. As compare to the pre-crisis period, the mean value of return on assets is lower while the standard deviation is higher. Looking at the independent variables, the log of bank size still maintains the highest mean value of 3.215856 percent same as in the whole sample period and the pre-crisis period. However, the mean value of the crisis years is a little higher than that of the pre-crisis period. The log of net export also maintains the lowest the mean value and the highest standard deviation of -14.50759 percent and 21.95898 percent respectively. Also, the log of net export has the lowest minimum value of -94.1 percent, while the log of real GDP has the highest maximum value of 5.286568 percent. This is different as compare to the whole sample period and the pre-crisis period.

Table 8: Pairwise Correlation Matrix of the Crisis Years

	ROA	logBL	logBVS	logBDS	logBS	logGDP	logINF	logNXP
ROA	1.0000							
logBL	0.3318	1.0000						
logBVS	0.4887	0.1263	1.0000					
logBDS	0.3710	0.8405	0.3306	1.0000				
logBS	0.3305	0.9832	0.1163	0.8473	1.0000			
logGDP	0.0642	-0.0031	-0.0027	0.1332	-0.0757	1.0000		
logINF	-0.4128	0.0308	-0.3338	-0.1773	0.0192	0.0069	1.0000	
logNXP	-0.2918	-0.3413	-0.0183	-0.0879	-0.2861	-0.1082	-0.1031	1.0000

Source: Computed by Author with Stata

The above table 8 display the correlation matrix of the interaction amongst all the variables during the crisis years. We can see from the table that, there are few pairs of correlations with a correlation coefficient greater than 0.8. Comparing with the correlation matrix of the whole sample period and that of the pre-crisis period, we can also see a strong positive correlation between log of bank size and log of bank loans with a correlation coefficient of 0.9832. We can also see strong positive correlation between log of bank size and log of bank debt securities with a correlation coefficient of 0.8473. This is followed by the correlation between log of bank loans and log of bank debt securities with a correlation coefficient of 0.8405. We can also see from the table that five (5) of the independent variables have a positive correlation with the dependent variable return on assets (ROA) though not strong while two (2) of the independent variables have weak negative correlation with the dependent variable (ROA).

Results of the crisis years (2008-20013)

Table 9: Balanced panel regression results of the crisis years

Random-effect GLS regression				Number of obs. =		72	
Group variable: Code				Number of groups =		12	
R-sq:				Obs per group:			
within = 0.2832					min =	6	
between = 0.7154					avg =	6.0	
overall = 0.4603					max =	6	
				Wald chi2(7) =		375.70	
				Prob > chi2 =		0.0000	
ROA	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]		
logBL	-0.021743	1.799251	-0.01	0.990	-3.548242	3.504693	
logBVS	0.3459719	0.0551747	6.27	0.000	.2378315	.4541123	
logBDS	-0.2295709	0.2817769	-0.81	0.415	-.7818434	.3227017	
logBS	0.9348901	2.060477	0.45	0.650	-3.103571	4.973351	
logGDP	0.111002	0.1399526	0.79	0.428	-.1633	.3853041	
logINF	-16.61641	8.088902	-2.05	0.040	-32.47037	-.7624534	
logNXP	-0.0077959	0.0037145	-2.10	0.036	-.0150761	-.0005156	
_cons	29.77764	14.41093	2.07	0.039	1.532731	58.02256	

Source: Computed by Author with Stata

I will further proceed to analyze the results of the crisis years as presented in table 9 above. After conducting a Hausman test, a random-effect GSL regression technique was use over fixed-effect. As indicated in the above table, the same number of groups applies as in the pre-crisis period which signifies the twelve Eurozone countries use in the sample and a total of 72 observations. The constant coefficient from the regression results is positive, with an intercept value of 29.77764. The intercept is also statistically significant at 5% and 10% level. This can be seen as the p-value of 0.039 is less than 0.05 and 0.1 respectively. However, this doesn't have any meaningful influence on the independent variables. By examining the other coefficients of the independent variables, the log of book value per share, log of bank size and log of real GDP have positive coefficients. This implies there is a positive relationship between these variables and banks profitability (ROA) during the crisis years in the Eurozone. On the

other hand, the log of bank loans, log of bank debt securities, log of inflation and log of net exports have a negative relationship with banks profitability during the crisis years in the Eurozone. Their level of significance can be tested by comparing their p-value with the critical value at 5% and 10% respectively. The result shows that, the log of bank loans, log of bank debt securities, log of bank size and log of real GDP are statistically insignificant at 5% and 10%. This can be seen from their p-values which is greater than 0.05 and 0.1 respectively. Considering the other variables, the log of book value per share, log of inflation and log of net exports are statistically significant at 5% and 10% level. This is also reflected from their p-values which are less than 0.05 and 0.1 respectively. Considering the variable log of book value per share, we can say that, a percentage point increase in log of book value per share will increase banks profitability (ROA) by 0.34597 percent. On the other hand, a percentage point increase in log of inflation will decrease banks profitability by 16.616 percent. Furthermore, a percentage point increase in log of net exports will decrease banks profitability by 0.0077959. Comparing these results with those of the pre-crisis period, we can identify some changes in the number of significant variables. There were two significant variables (logBVS and logGDP) in the pre-crisis period while the crisis years shows three significant variables (logBVS, logINF, logNXP). The log of book value per share shows positive significance on banks profitability both in the pre-crisis period and the crisis years, whereas the log of real GDP shows negative statistical significance on banks profitability in the pre-crisis period but insignificance in the crisis years. The findings further shows that log of net exports has a negative statistical significance on banks profitability in the crisis year whereas the pre-crisis period shows insignificance of net exports on banks profitability in the Eurozone. These variables can therefore be use by policy makers for statistical inferences in the real world. We can further test the overall significance of the independent variables of the crisis years on banks profitability using the chi square (chi^2) test from the regression results. Using the p-critical value at 5% and 10% significant level, we can see from the table that the p-value of the chi square test is 0.0000 which is less than 0.05 and 0.1 respectively. This therefore implies the overall result of the crisis years is statistically significant at 5% and 10% level. This also implies the independent variables fit and satisfies the regression model and can be reliable upon.

4.4 Empirical Analysis of the Post-financial Crisis (2014-2021)

Table 10: Summary statistics of the post-financial crisis

Variables	Obs	Mean	Std Dev.	Min	Max
ROA	96	1.322756	3.663518	-2.383781	25.54023
logBL	96	2.930677	0.4791754	2.230408	3.85938
logBVS	96	1.386982	1.313474	-3.043832	2.930253
logBDS	96	2.090657	0.6816013	0.2787536	3.045635
logBS	96	3.178596	0.4487342	2.466267	4.04382
logGDP	96	2.729136	0.8927216	1.398131	5.309321
logINF	96	2.005049	0.0273565	1.891677	2.048108
logNXP	96	-10.13919	17.98075	-85.00997	2.40671

Source: Computed by Author with Stata

We can move further with the empirical analysis of the post-financial crisis in the Eurozone. Similar to the analysis of the pre-crisis period and crisis years, table 10 above present the summary statistics of the post-financial crisis. The mean value of return on assets is 1.322756 percent and a standard deviation of 3.663518 percent. Comparing these values with those of the pre-crisis and crisis years periods, we can see that post-crisis period has a higher mean value and standard deviation. For the independent variables, the log of bank size has the highest mean value of 3.178596 percent which is also consistent with those of the pre-crisis and crisis years. The log of net exports shows the lowest mean value of -10.13919 percent and highest standard deviation of 17.98075 percent which is also consistent with those of the pre-crisis and crisis years. The table further shows that the log of net exports has the lowest minimum value of -85.00997 percent while return on assets has the highest maximum value of 25.54023 percent. We can further see from the table that, there are variables with high mean values and lower standard deviation while others have higher standard deviation but smaller mean values.

Table 11: Pairwise correlation matrix of the post-financial crisis

	ROA	logBL	logBVS	logBDS	logBS	logGDP	logINF	logNXP
ROA	1.0000							
logBL	0.0535	1.0000						
logBVS	0.0502	0.4620	1.0000					
logBDS	0.0646	0.9036	0.7026	1.0000				
logBS	0.1439	0.9647	0.4326	0.8956	1.0000			
logGDP	-0.2043	0.0063	-0.0470	0.0077	-0.0734	1.0000		
logINF	0.1881	-0.1679	-0.0239	-0.1092	-0.0827	0.0137	1.0000	
logNXP	-0.1893	-0.2944	0.1256	-0.1133	-0.2857	-0.2016	-0.1819	1.0000

Source: Computed by Author with Stata

The correlation matrix presented in table 11 above shows the interactive correlation amongst the variables in the post-financial crisis in the Eurozone. As compare to the pre-crisis and crisis years, there is more than one variable in the post-financial crisis with a strong positive correlation coefficient greater than 0.9. This can be seen from the correlation between log of bank size and log of bank loans with a correlation coefficient of 0.9647. This is followed by the correlation between log of bank loans and log of bank debt securities with a correlation coefficient of 0.9036. There is also strong positive correlation between log of bank debt securities and log of bank size with a correlation coefficient of 0.8956. This is consistent with that of pre-crisis and crisis years. We can notice a change in the correlation between log of book value per share and log of bank debt securities in the post-financial crisis which is not consistent with that of pre-crisis and crisis years. We can see a strong positive correlation between log of book value per share and log of bank debt securities with a correlation coefficient of 0.7026 in the post-financial crisis. However, the pre-crisis period shows a weak negative correlation (-0.0854) between these variables while the crisis years shows a weak positive correlation between them (0.3306). Looking at the correlation between the dependent variable return on assets (ROA) and the independent variables, five of the independent variables (logBL, logBVS, logBDS, logBS and logINF) shows positive correlation with return on assets while the independent variables logGDP and logNXP shows negative correlation with return on assets in the post-financial crisis period.

Results of the Post-financial Crisis (2014-2021)

Table 12: Balanced panel regression results of the post-financial crisis

Fixed-effects regression				Number of obs. =		96
Group variable: Code				Number of groups =		12
R-sq:				Obs per group:		
within = 0.1218					min =	8
between = 0.0947					avg =	8.0
overall = 0.0478					max =	8
				F (7, 11) =		5.78
				Prob > F =		0.0053

ROA	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
logBL	-6.258522	8.094513	-0.77	0.456	-24.07442	11.55738
logBVS	-0.4998216	1.215202	-0.41	0.689	-3.174464	2.17482
logBDS	-3.19517	1.192449	-2.68	0.021	-5.819733	-.5706081
logBS	5.137443	4.406814	1.17	0.268	-4.561888	14.83677
logGDP	-13.64827	12.03204	-1.13	0.281	-40.13062	12.83408
logINF	42.73135	36.527114	1.17	0.267	-37.66434	123.127
logNXP	-0.0275546	0.0159936	1.72	0.113	-.0627562	.007647
_cons	-38.00202	54.40192	-0.70	0.499	-157.7398	81.7358

Source: Computed by Author with Stata

Furthermore, we can analyze the results and findings of the post-financial crisis in the Eurozone. This sub-section of the analysis will address and answer the research question including the different hypotheses that have been stated. The results and findings will also show clearly whether the post-financial crisis have any positive significant impact on banks profitability in the Eurozone.

An in-depth interpretation and discussion of this sub-section is base on the regression results presented in table 12 above. The regression data for the above results covers the period from 2014 to 2021 for each of the twelve (12) Eurozone countries which gives a total of 96 observations. The constant coefficient from the regression table shows a negative intercept value of -38.00202 which is statistically insignificant at both 5% and 10% two tail t-test. This doesn't have any true meaning or influence on the results of the independent variables.

Comparing this with the other sample periods, we see that both the pre-crisis and crisis years have positive intercepts values of 13.85912 and 29.77764 and also statistically significant at 5% and 10% level. Looking at the coefficients of the independent variables, the results show that 5 of the independent variables (logBL, logBVS, logBDS, logGDP and logNXP) have negative coefficient values of -6.2585, -0.4998, -3.195, -13.648 and -0.02755 respectively. This implies there is a negative relationship between these variables and banks profitability (ROA). On the other hand, the log of bank size and log of inflation have positive coefficient values of 5.13744 and 42.73 respectively, which shows a positive relationship with banks profitability (ROA). Comparing this with the pre-crisis and crisis years periods, it shows that there are more variables that have negative relationship with banks profitability in the post-financial crisis as compare to the pre-crisis and crisis years periods in the Eurozone.

We can further proceed in testing the different hypotheses stated in chapter two. I have used both the two-tail t-test and p-value at 5% and 10% significant level in testing the hypotheses of the study. To begin with the first hypothesis, the variable log of bank size is statistically insignificant at 5% and 10% level. This is shown from the t-value of 1.17 which is less than the t-critical value of 1.987 and 1.662 at 5% and 10% respectively. We therefore do not reject the null hypothesis that bank size does not have any positive significant effect on banks profitability in the post-financial crisis in the Eurozone. Even though it has a positive relationship with banks profitability, the relationship is not strong enough to be use for any statistical inferences by policy makers. The second hypothesis relates to the variable log of bank debt securities. The result shows a negative statistical significance at both 5% and 10% two tail test. This is confirmed from the absolute t-value of 2.68 which is greater than the t-critical value of 1.987 and 1.662 at 5% and 10% respectively. Even though the log of bank debt securities is statistically significant, it has a negative effect on banks profitability in the post-financial crisis in the Eurozone. This implies a percentage point increase in log of bank debt securities will decrease banks profitability by 3.195 percent ceteris paribus (holding everything else constant). We do not therefore reject the null hypothesis that bank debt securities do not have any positive significant effect on banks profitability in the post-financial crisis in the Eurozone. Further, we can test the third hypothesis which relates to log of real GDP. The result is statistically insignificant at 5% and 10% two-tail t-test (absolute t-value of 1.13 is less than 1.987 and 1.662 at 5% and 10% respectively). We do not also reject the null hypothesis that real GDP does not have any positive significant effect on banks profitability in the post-financial crisis in the Eurozone. The next hypothesis concerns the log of net exports (logNXP).

As seen from the results table, it has a negative coefficient of -0.02755 and also statistically significant at 10% two-tail test (t-value of 1.72 is greater than t-critical value of 1.662). This implies a percentage point increase in log of net exports will decrease banks profitability by 0.02755 percent ceteris paribus (holding all other factors constant). Also, we do not reject the null hypothesis that net exports does not have any positive significant impact on banks profitability in the post-financial crisis in the Eurozone. The log of net export should therefore be a variable to be considered for any statistical inference by policy makers in the post-financial crisis in the Eurozone. Furthermore, we can test the overall level of significance of the above regression results for the post-financial crisis by conducting an F-test. Using 5% and 10% significance level, we can see from the above table that the p-value of the F-test is 0.0053 which is less than 0.05 and 0.1 at both 5% and 10% respectively. This implies the overall results of the regression model is statistically significant in the post-financial crisis period. This also means the independent variables fits and satisfy the regression model and the results are therefore reliable. We can further relate these analysis and findings with the main hypothesis and research question of this study. By examining the above four (4) hypotheses that have been tested, it shows that we didn't reject any of the null hypotheses. Also, amongst the 4 hypotheses, two of them were statistically significant but with a negative effect on banks profitability in the Eurozone, while two were statistically insignificance. Base on these, we therefore do not reject the null hypothesis that the post-financial crisis does not have any positive significant effect on banks profitability in the Eurozone. I can therefore conclude my research findings that the post-financial crisis does not have any positive significant impact on banks profitability in the Eurozone. Some of the result findings and analysis is consistent with the research paper of Erfani, G., & Vasigh, B. (2018), Sufani, F., & Chong, R. (2008), Ali, M. (2016) and Dietrich, A., & Wanzenried, G. (2010).

5. CONCLUSION

This research study focuses in the assessment of the impact of the post-financial crisis on banks profitability in the Eurozone. I have chosen a selected number of 12 countries (Germany, Belgium, The Netherlands, Luxembourg, Austria, Ireland, Italy, Spain, Finland, Portugal and Greece) to represent the Eurozone. Using FactSet and Eikon database I have collected aggregated country level data from the banking industry from the Monetary and Financial Institution (MFI) of the European Central Bank (ECB) of each of the countries use in my study sample from the period 2002 to 2021. The aggregated bank industry data constitute the accumulated data of all the regional banks of each of the 12 selected countries in the Eurozone.

In addition to the banking data. I have also collected macroeconomic data for each to the selected countries. The bank industry data involves bank specific variables such as log of bank loans, log of book value per share, log of bank debt securities and log of bank size. While the macroeconomic data includes; log of real GDP, log of inflation and log of net exports.

Borrowing from the paper of Ali, M. (2016), I apply the regression model of Brooks (2008) on the balanced panel data of the respective variables to analyze my results and findings. To answer the research question, I conducted three separate regression analysis which covers the pre-crisis period (2002-2007), the crisis years (2008-2013) and the post-crisis period (2014-2021). The results of the pre-crisis shows that two from the seven explanatory variables (log of book value per share and log of real GDP) where statistically significant at both 5% and 10% two-tail test. The log of book value per share has a positive coefficient which implies it has a positive significant effect on banks profitability in the pre-financial crisis in the Eurozone. The log of real GDP has a negative coefficient which indicate a negative significant effect on banks profitability in the pre-financial crisis in the Eurozone. The overall test for the pre-crisis period was also statisticlly significant which shows reliability and trustworthiness of the regression results. Furthermore, the result findings for the crisis years indicates that three of the independent variables (log of book value per share, log of inflation and log of net exports) are statistically significant at 5% and 10% level. The log of book value per share has a positive significant effect on banks profitability in the crisis years in the Eurozone. This is consistent with the result of the pre-crisis period. Meanwhile, the log of inflation and log of net export both have negative significant effects on banks profitability in the crisis years. Again an overall test of the crisis years shows statistically significant result. Therefore, the regression results of the crisis years are reliable and trustworthy for any real world policy decision making. The research study proceed further to analyze the results and findings of the post-financial crisis which also address and answer the research question. From the findings, it shows that two of the independent variables (log of bank debt securities and log of net exports) were statistically significant at 5% and 10% two-tail test. The findings also reveals that, non of the null hypotheses were rejected from the different hypotheses test conducted. Eventhough we have 2 significant variables amongst the hypotheses, their effects on banks profitability are negative. We therefore conclude our findings that the post-financial crisis does not have any positive significant impact on banks profitability in the Eurozone.

The results of this study have some real world implications to policymakers both in the banking sector and the economy as a whole. This can be address by considering the significant variables from the different estimation periods (pre-crisis period, crisis years and post-crisis period). The log of book value per share has a positive significant effect on banks profitability in the pre-crisis period and crisis years. This implies an increase in book value per share leads to increase in banks profitability during these periods. This therfore can influence bank decision in the issuance of shares to share holders and investors in the banking sector. The macro variable log of real GDP has a negative significant effect on banks profitability in the pre-crisis period, but no statistical significance in the crisis years and post-crisis period. This can inform policymakers to know that the real GDP has a negative effect on banks profitability during the pre-crisis period but however, it doesn't have any significant effect on banks profitbility in the crisis years and post-crisis period. The variable log of inflation can also be of interest to policymakers in their decision making process especially in crisis years where it has a negative significant effect on banks profitability in the Eurozone. This clearly shows that inflation is one of the factors that was triggerd as a result of the global financial crisis which also has negative consequences on banks profitability in the Eurozone. The post-crisis result shows that policymakers have put in efforts to stabilize the inflation in the economy which therefore doesn't have any significant effect on banks profitability in the post-financial crisis in the Eurozone. Furthermore, the estimated result of log of net exports show negative significant effect on banks profitability in the crisis years and post-crisis period. This implies an increase in net exports will decrease banks profitability in the respective periods. Policymakers can therefore adjust their macroeconomic strategies to keep net exports lower so as to maintain a higher level of banks profitability and a more stable financial system in the Eurozone. Example of such strategy can be the adjustment on the trade balance in international trade that will be favorable to the financial sector. The log of bank debt securities also have negative significant effect on banks profitability in the post-financial crisis in the Eurozone. This shows that an increase in bank debts securities will lead to a proportionate decrease in banks profitability in the post-financial crisis in the Eurozone. This can also be of interest to policy and decision makers in the sense that they can reduce the level of bank debt securities by issuing less corporate, municipal and treasury bonds to depositors so as to boost banks profitability.

To conclude, the results of this study provides some new knowledge and interesting contributions in the assessment of the impact of the post-financial crisis on banks profitability

in the Eurozone. Firstly, the results of some of the explanatory variables use in this study is consistent with some of the literatures mention above. Secondly, most of the literatures that have been reviewed in this study, have limited their findings on the pre-financial crisis and the crisis years period. However, this study has gone further to extend the previous literatures by assessing the post-financial crisis and the impact on banks profitability. Thirdly, I have also introduce new bank specific and macroeconomic variables that have significant impact on banks profitability in the Eurozone which have not been investigated in the previous literatures. Fourthly, most of the previous literatures have limited their research findings on a single country, whereas this study has expand the scope by using country level bank industry data and macroeconomic data for 12 selected countries in the Eurozone. Fifthly, my result findings provide evidence of more recent data which gives validity and trustworthiness to rely on. Sixthly, a good number of bank regulatory rules and mesures have been put in place in the post-financial crisis era which makes this study more relevant to policy makers. Finally, the panel regression results is also robust which eliminate the level of biasness and boast the reliability of the findings. In addition a Hausman test was conducted to determine the applicability between fixed-effect and random-effect estimations in the different sample periods.

Although this study considers a broad range of bank specific and macroeconomic varaiables in assessing the impact of the post-financial crisis on banks profitability in the Eurozone, I can't wrap-up without pointing out some of the limitations of the study. The results can be more appreciated if the sample data is extended to cover more countries in the Eurozone, such as all 19 Eurozone member states. This is due to difficulty in accessing available data by the researcher. I therefore leave this open for further research. Also due to difficulty in acquiring data, the researcher has limited the pre-crisis to begin from 2002 to 2007. The pre-crisis results could be better assess if the data is taken further backward to begin from 1990 upward for example. Finally a different methodology and econometric technique can be employ than the one use in this study such as generalized method of moment (GMM). The researcher therefore leave this open for future research.

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APPENDIX 1

Original Stata output results of the pre-financial crisis period (2002-2007)

```
Fixed-effects (within) regression          Number of obs    =        72
Group variable: Code                       Number of groups =        12

R-sq:                                      Obs per group:
    within  = 0.1419                                      min =         6
    between = 0.0382                                      avg =       6.0
    overall = 0.0175                                      max =         6

                                           F(7,11)          =      8.09
corr(u_i, Xb)  = -0.9963                   Prob > F         =    0.0013

                              (Std. Err. adjusted for 12 clusters in Code)
```

ROA	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
logBL	2.465378	1.524018	1.62	0.134	-.8889633	5.81972
logBVS	.3320836	.13354	2.49	0.030	.0381639	.6260032
logBDS	.3037802	.6189772	0.49	0.633	-1.058579	1.66614
logBS	-2.165228	1.897054	-1.14	0.278	-6.340616	2.01016
logGDP	-6.925002	3.530354	-1.96	0.076	-14.69526	.8452547
logINF	2.287145	3.486422	0.66	0.525	-5.386418	9.960708
logNXP	.0061379	.00803	0.76	0.461	-.0115359	.0238118
_cons	13.85912	7.516299	1.84	0.092	-2.684138	30.40239

sigma_u	6.3378677					
sigma_e	.51978563					
rho	.99331886	(fraction of variance due to u_i)				

APPENDIX 2

Original Stata output results of the crisis years (2008-2013)

```
Random-effects GLS regression              Number of obs      =        72
Group variable: Code                       Number of groups   =        12

R-sq:                                      Obs per group:
    within  = 0.2832                                     min =         6
    between = 0.7154                                     avg =       6.0
    overall = 0.4603                                     max =         6

                                           Wald chi2(7)       =    375.70
corr(u_i, X)    = 0 (assumed)              Prob > chi2        =    0.0000

                                (Std. Err. adjusted for 12 clusters in Code)

                           Robust
       ROA      Coef.    Std. Err.      z     P>|z|     [95% Conf. Interval]

     logBL    -.0217743   1.799251    -0.01    0.990   -3.548242    3.504693
    logBVS     .3459719   .0551747     6.27    0.000    .2378315    .4541123
    logBDS    -.2295709   .2817769    -0.81    0.415   -.7818434    .3227017
     logBS     .9348901   2.060477     0.45    0.650   -3.103571    4.973351
    logGDP      .111002   .1399526     0.79    0.428      -.1633    .3853041
    logINF    -16.61641   8.088902    -2.05    0.040   -32.47037   -.7624534
    logNXP    -.0077959   .0037145    -2.10    0.036   -.0150761   -.0005156
     _cons    29.77764    14.41093     2.07    0.039    1.532731    58.02256

   sigma_u    .32722435
   sigma_e     .7011298
       rho    .17885944   (fraction of variance due to u_i)
```

APPENDIX 3

Original Stata output results of the post-financial crisis period (2014-2021)

```
Fixed-effects (within) regression          Number of obs      =         96
Group variable: Code                       Number of groups   =         12

R-sq:                                      Obs per group:
    within  = 0.1218                                       min =          8
    between = 0.0947                                       avg =        8.0
    overall = 0.0478                                       max =          8

                                           F(7,11)            =       5.78
corr(u_i, Xb)  = -0.9801                    Prob > F           =     0.0053

                             (Std. Err. adjusted for 12 clusters in Code)
```

ROA	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
logBL	-6.258522	8.094513	-0.77	0.456	-24.07442	11.55738
logBVS	-.4998216	1.215202	-0.41	0.689	-3.174464	2.17482
logBDS	-3.19517	1.192449	-2.68	0.021	-5.819733	-.5706081
logBS	5.137443	4.406814	1.17	0.268	-4.561888	14.83677
logGDP	-13.64827	12.03204	-1.13	0.281	-40.13062	12.83408
logINF	42.73135	36.52714	1.17	0.267	-37.66434	123.127
logNXP	-.0275546	.0159936	-1.72	0.113	-.0627562	.007647
_cons	-38.00202	54.40192	-0.70	0.499	-157.7398	81.7358
sigma_u	12.731318					
sigma_e	2.9102231					
rho	.95034237	(fraction of variance due to u_i)				