



Analysis of the investment activities of Spanish financial institutions in the real-estate market 2004 - 2015

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Abstract: *In this paper we analyse the investment activities and performance of several Spanish financial institutions in the real-estate sector. Before discussing our data analysis, we have conducted a literature review in which we shortly discuss the causes of the global financial crisis and the Spanish financial crisis. Given this context, we analyse the direct and indirect investment of 5 financial institutions (Santander, BBVA, Caixa Ontinyent, Bankia and Caixbank) before and after the financial crisis. We also look at the situation before the financial crisis of the saving banks merged into Bankia and Caixbank. We find huge differences in terms of the direct and indirect investment in the real-estate market among institutions. These differences also are present in performance, solvency and liquidity metrics. The institutions which went into trouble presented large disequilibrium way before they recognized they had them. So we believe that with a proper control part of the restructuring of the Spanish banking system could not have been avoided.*

Keywords: *Global financial crisis, Housing bubble, Spanish Financial crisis, Real-estate investments, banking industry*

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Introduction

In this paper we will investigate the investment tendencies in the Spanish housing market by Spanish banks. In order to properly identify and analyse these tendencies it is important to look at the past and the context in which these investments were made. The past allows us to identify and observe tendencies in the real-estate market. Also we hope to identify general characteristics that distinguish successful banks from unsuccessful ones. However, the real-estate market and investments are complex matters that are influenced by a multitude of factors. The same can be said for financial institutions such as banks. Consequently, this implies that we cannot focus on everything in this work and we will have to focus on certain specific events that have considerably affected the real-estate market and the investments in it. These events will serve to create a financial context in which the investments have occurred. Without the context it would be impossible to guess where the investment in the real-estate market is going. The events on which we focus are respectively the global financial crisis, the U.S. housing bubble, the Spanish financial crisis and the Spanish housing bubble. The financial crises are related, but after investigating clearly do not have the same root causes. However both events have significantly affected the real-estate markets and the investments in these markets.

Concerning the methodology of our research, we begin by explaining the events that have changed the financial markets. This will be done by a literature review. It is very important to first create the context before actually analysing the investments. We will start with the global financial crisis comparing it to the Spanish financial crisis. After that, we will analyse the operations of Spanish banks during the years of the crisis. Knowing the financial context will allow us to identify more accurately the investment tendencies of Spanish banks in the real-estate market. After this literature review we will elaborate on the results of our empirical research and discuss these results for each of the banks that we have chosen. The data of our empirical research is extracted from the financial reports of the institutions that we will analyse. These financial reports were obtained through the website of the CNMV (The Spanish Commission of Stock Markets). We have created a dataset with annual observations for each of the variables that we perceive as important for our research. The methodology of our data research will be explained in further detail in chapter 2. Finally we will conclude our research and discuss some of the probable future tendencies that are likely to occur in the investments of Spanish banks in the real-estate market, as well as answering the following question:

“What investment tendencies in the Spanish real-estate sector exist among Spanish Banks and how are these related to the Spanish Financial crisis?”

Chapter 1: Literature review: The financial context

The global financial crisis

Firstly it is important to mention that the global financial crisis was a complex phenomenon that without any doubts has been caused by a multitude of factors. According to José Antonio Alvarez (2008) the crisis has been caused by an overabundance of liquidity and several excesses. These excesses can be clearly observed in the United States real-estate market, in which an enormous housing bubble emerged which eventually burst and this had severe effects on the financial world. Various explanations exist on what factors have caused the overabundance of liquidity, excesses and the U.S. housing bubble and other bubbles all over the world.

According to Levitin and Wachter (2012) various explanations on what has caused the bubble exists and they state that in general there is little consensus on what has caused this bubble. Levitin and Wachter (2012) state the following: “Numerous explanations exist: misguided monetary policy; a global savings surplus; government policies encouraging affordable homeownership; irrational consumer expectations of rising housing prices; inelastic housing supply. None of these explanations, however, is capable of fully explaining the housing bubble.”

To analyse whether these factors mentioned by Levitin and Wachter (2012) are capable of explaining the housing bubble; we have conducted an extensive literature review. According to Greenspan (2009) there are two broad and competing explanations for the origins of the financial crisis. The first explanation argues that loose monetary policies have caused the bubble, while the second explanation argues that lower interest rates that have caused speculative optimism are the main cause. We will first analyse the role of monetary policy and after that the role of low interest rates in relation to the housing bubble and the global financial crisis.

According Dokko and others (2011) critics have blamed the Federal Reserve to be too loose with their monetary policy. Stanford professor John Taylor (2007) argues that if the monetary policy of the Federal Reserve would have followed the Taylor Rule instead of deviating from it the housing bubble would probably not have existed. According to Greenspan (2009) this

notion of Taylor has been cited so often that according to him it has taken the aura of conventional wisdom. Thus we can argue that monetary policy is one of the popular explanations of the housing bubble.

However after analysing the research of Dokko and others (2011), it is unlikely that monetary policy has contributed significantly to the financial crisis, developments in the real-estate market would have been only slightly different and the housing bubble would still have emerged. Furthermore, considering the fact that Dokko and others (2011) have investigated the correlation between monetary policy and housing booms and have found the correlation to be statistically insignificant. In figure 12 of the research of Dokko and others (2011) which can be found in the figure A1 of the appendix, some countries like Spain and Ireland which indeed deviated from the Taylor rule (blue line) experienced considerable increases in housing prices, this generally implies a housing boom, however other countries such as the U.K., Canada and Australia which deviated only slightly from the Taylor Rule, also had significant changes in housing prices. Thus, many countries with different monetary policies experienced considerable increases in housing prices. So it is empirically proven by Dokko and others (2011) that monetary policy has not contributed significantly to the global financial crisis. In addition to that other authors such as Bernanke (2010) and Greenspan (2009) also argue that the monetary policy is unlikely to have caused the housing bubble.

So what about the other widely believed explanation that argues that lower long-term interest rates and unrealistic optimism have caused the global financial crisis? Greenspan (2009) argues that it was not the federal fund rate that caused this optimism, but rather the rate on long-term fixed-rate mortgages. According to Greenspan (2009) in the past the federal fund rate and the long-term fixed rate have been heavily correlated between 1971 and 2002, however between 2002 and 2005 there was no longer a correlation between the two. According to Greenspan (2009) the lowering interest rates were caused by an excess of global savings which is another common explanation of the global financial crisis and the housing bubble. So these lower interest rates supposedly increased the demand for mortgages and thus houses, however Dokko and others (2011) argue that in several countries such as Germany, Japan and Switzerland interest rates were even lower and there were no significant increases in housing prices and some of these countries even experienced decreases in housing prices. So in this paper we argue that it is unlikely that both monetary policy and low fixed-rate mortgage interest rates were responsible for the crisis.

What other possible explanations are there? According to Farhi, Caballero and Gourinchas (2008) global asset scarcity led to large capital flows to the U.S. which according to them

have caused large asset bubbles such as the housing bubble in the real-estate market. Furthermore, they state that the bubble in the real-estate market was complex and that this bubble compromised the whole financial sector. Consequently, the financial sector and the real-estate market would be heavily interrelated with each other.

Although, it is true that many asset bubbles have been formed in the U.S. and that eventually the demand for mortgaged-back securities went up, global asset scarcity has been there for a longer amount of time as it is heavily related to global savings; because a lack of assets could mean a lack of possibilities to invest. So it is possible that demand pushed the financial structure to change and it is likely that global asset scarcity has contributed to the housing bubble, but it does not completely explain the formation of the housing bubble itself. Farhi, Caballero and Gourinchas (2008) believe that the world economy entered a global financial crisis due to a chronic excess demand for financial assets and that the subprime market development may simply have been a market that was trying to cope with the shortage of assets. This would explain why the U.S. housing bubble and the global financial crisis are related, because if investors/financial institutions from all over the world invest in the subprime market of the U.S. housing market then the financial world and the bubble become heavily interrelated.

Farhi, Caballero and Gourinchas (2008) argue that the problem that caused the financial crisis and the asset bubbles is macro-economic in nature. We however agree with Levitin and Wachter (2012) and argue that the approach of Farhi, Caballero and Gourinchas (2008) does not completely explain the formation of the housing bubble.

Levitin and Wachter (2012) demonstrate in their article that the formation of the housing bubble was a supply-side phenomenon that was largely caused by an excess of mispriced mortgages. According to them mortgage-finance spreads declined, the volume of mortgage backed securities increased even when the risk on those securities was increasing. A decline in financial spread means that the difference between the buying and selling price of mortgage backed securities decreased. Furthermore Levitin and Wachter (2012) attribute the formation of the bubble to the failure of markets to price risk correctly due to opacity, complexity and the heterogeneity of private label mortgage backed securities, which from now on will be referred to as PLS.

It is extremely important to note that PLS's were unregulated securities. Levitin and Wachter (2012) mention that until 2003 the increase in housing prices can be explained according to economic fundamentals, after 2003 they claim that the market shifted from financing mortgages with regulated securitization to using unregulated securitization in order to finance mortgages. The authors explain that the market of unregulated securitizations

featured products with serious information asymmetry between financial intermediaries and investors. Levitin and Wachter (2012) argue that investors undervalued the risk of these securities, and thus overvalued the securities and consequently oversupplied mortgage finance. Financial institutions that sold these securities made a lot of profit on each transaction, which gave them an incentive to supply more mortgage backed securities. For financial institutions to create more value, they needed to increase the volume of the mortgages for securitization and thus increase the pool of mortgage borrowers. To increase the amount of borrowers, non-traditional mortgage products were necessary to make mortgages more accessible. As a result many mortgages with initial low payments appeared and flooded the market which explains the rise in PLS's. This can be clearly seen in figure 5 of the article of Levitin and Wachter (2012) which can be found in section A2 of the appendix. Eventually the housing bubble collapsed because the pool of borrowers could not indefinitely have been expanded. Additionally, the increasing housing prices eventually discouraged potential home-owners from getting a mortgage. Furthermore, due to the fact that many mortgages were given to people who were unlikely to be able to pay the mortgages in the long-run more and more defaults appeared and this caused some investors to pull back their money and eventually the rest of the investors followed. So in a way the bubble has caused its own downfall.

Levitin and Wachter (2012) claim that the housing bubble would not have happened if the real-estate market, would not have shifted from a regulated to an unregulated financing market. Levitin and Wachter (2012) do admit that other factors such as irrational consumer demand and inelastic housing supply are partially to blame, but they the effects of for example irrational consumer demand was less than that the increase in supply of housing-finance.

So what caused this shift from a regulated to an unregulated mortgage-backed securities market? Before the 2000's there were hardly any PLS's. According to James Crotty (2008) this shift was made possible thanks to repeal the Glass-Steagall act which restricted affiliations between commercial banks and securities firms. In 1999 thanks to the Gramm-Leach-Bliley act these restrictions were repealed. As a result banks were absorbed into giant financial conglomerates and this clearly changed their structures. Crotty (2008) argues that in this new financial structure banks were self-regulatory for two reasons. First, regulatory agencies were controlled by people that were followers of the narrative that modern financial markets should be self-regulating as they believe that these markets are efficient. Second, these conglomerates are so large and complex that for outsiders it is impossible to effectively to monitor their risk and control their behaviour. According to Crotty (2009) this allowed them to monitor their own risk.

So we would argue that the housing bubble is largely caused by an excessive supply of unregulated mortgage-securities that has been made possible because of a change in legislation that has increased the complexity and opacity of the financial market which has caused information asymmetries and all this in an environment where investors were undervaluing risk and were overly optimistic. Now after discussing the global financial crisis and the housing bubble, we will discuss the crisis in Spain.

Spanish Financial crisis & housing bubble

So what caused the financial crisis in Spain?

According to Alvarez (2008) the Spanish financial crisis unlike many other countries was not caused by investing excessively in the U.S. subprime securities market which has caused financial problems in many other countries. As a matter of fact throughout the first years of the global financial crisis it looked like Spain was barely affected by the global financial crisis. However Alvarez (2008) does mention that the global financial crisis has affected Spain, especially in terms of restrictions in liquidity, changes in the perception of risk, intensifying drastic reformations in the real-estate market and the deceleration of the Spanish economy have severely affected the volume of business, the financing costs of credit entities and changes in the quality of its portfolio. So it is likely that the global financial crisis has affected the Spanish financial institutions and their investments in the real-estate market, but it has not been the fundamental cause of the Spanish financial crisis nor the Spanish housing bubble. We would argue that the global financial crisis mainly due to its liquidity restrictions accelerated the downfall of the Spanish housing market and can be seen more as an interactive variable rather than an independent variable that caused the Spanish financial crisis.

The Spanish economy seemed so successful and if the global financial crisis has not caused the Spanish crisis, then what caused it? According to Sebastián Royo (2009) Spain has had a remarkable period of growth but according to him this incredible economic success came with some considerable deficiencies. Royo (2009) argues that the Spanish crisis is caused mainly by two simultaneous disequilibria: unsustainable growth of the real-estate/construction sector and excess consumption. According to Royo (2009) both these disequilibria have been driven by low interest rates and thus borrowed money.

Accordingly Maudos (2011) argues that these weaknesses and disequilibria have started to show during the global financial crisis. Maudos (2011) proposes that the amount of defaults in the Spanish financial sector increased because of the global crisis which eventually led to

a drastic fall in housing prices and caused the bubble to burst. The fact that these weaknesses and disequilibria started to show after the global financial crisis supports our point of view that the global financial crisis had an interactive effect that accelerated the downfall of the Spanish housing market.

Another issue that the Spanish economy experienced, which was declining productivity; Royo (2009) states the following: “Spain has not addressed its fundamental challenge—its declining productivity—which has grown only an average of 0.3 per cent in the last ten years (0.7 per cent in 2006), one whole point below the EU average, placing Spain at the bottom of the European Union, and ahead only of Italy and Greece (the productivity of a Spanish worker is the equivalent of 75 per cent of a US one).”

It should be noted that in this study we mainly focus on the real-estate market and the investments of banks in this market and not so much on other factors such as the declining productivity of the Spanish economy, however we would like to state that the Spanish financial crisis like the global financial crisis is caused by a multitude of factors and we are merely discussing one of these in this paper. Furthermore, it should be made clear that the real-estate market can be seen merely as a segment of the construction sector as is argued by Ramón Ferez Duran (2006), so we are truly focusing on a very specific but influential causal factor of the Spanish financial crisis.

Now we would like to draw from the literature to discuss who the actors are that have most likely caused these unsustainable investments in the housing market. According to Duran (2006) this has been made largely possible with investment flows of the public sector (Private consumption) and credits of Spanish saving banks (Cajas de ahorro, who had a large degree of political autonomous power). However it is important to note that, Maudos (2011) argues that both groups; banks and cajas, have large individual differences. So it is like that not every caja can be hold responsible and there are probably also exceptions. We will extensively investigate the financial figures of both commercial banks and saving banks in order to describe the actions of the commercial banks and saving banks accurately.

To summarize these previous paragraphs: unsustainable growth of the real-estate / construction sector, excessive consumption, financing by credits and low productivity are some of the main contributing factors that have caused the Spanish financial crisis and when liquidity problems arose the whole system just collapsed. Our view is in line with the view of Jaime Zurita (2014) which we will now shortly discuss.

Zurita (2014) argues that the Spanish financial sector was not directly related to the subprime crisis, as the mark to market valuation losses of the Spanish banking sector were

not significant. Zurita (2014) argues that the problem lies in the excesses that occurred in the years of expansion: an abundance of liquidity that generated the perception that money was always available at low costs, low interest rates, economic expansion policies during excessively large periods, low risk premiums, low market volatility in capital markets, etc. According to Zurita (2014) these factors created an environment where the conditions for the concession of credits were exceptionally lax in nature, a negative real interest rate between 2002 and 2006, and a risk premium of the Spanish economy that was in negative territory during various periods throughout these years and was generally close to zero throughout this whole period.

Zurita (2014) states the following: that “*the construction/real-estate sector was the primary destination of financing by banks and the most important income generator of the credit institutions*”.

Furthermore Zurita (2014) mentions that the OSR (Other residential sectors) credit yearly grew around 16% between 2000 and 2008, finally it represented 172% of the Spanish gross domestic product (GDP). Furthermore, he argues that the components of the OSR were strongly related to the real-estate sector (Home credits, construction credit and real-estate promoting credit). The real-estate sector represented in 2008, 60% of the credit growth of the OSR and it represented 101% of the GDP. In 2000 it only represented 39% of the GDP) so the real-estate market is strongly related to the increase in financial credits of the Spanish financial system. A complete overview of these developments can be seen in part A3 of the Appendix.

According to Zurita (2014) large levels of family and company indebtedness have been generated, but that was apparently not the only problem. The credit accumulation of the real-estate sector, the banking system was partially caused by other problems in their balance sheets. Zurita (2014) argues that the most important contributing factor was the increase of the financing by wholesale banking markets which was a relatively new cheap and rapid way to finance the credit growth.

The growth of the wholesale financing showed a worrying indebtedness of banking entities on top of the indebtedness of family and companies says Zurita (2014). The payments of the debts of the banking entities were growing parallel to financing by the wholesale market. This wouldn't necessarily have been bad if the abundance of liquidity and the wholesale market would have maintained themselves over time, but because of the global financial crisis both the wholesale market as the abundance of liquidity were severely affected.

Zurita (2014) argues that excesses of banking entities which occurred, initially contributed to the growth of the sector, but they are also the base for the recession and lengthening of the crisis.

Our personal view and the view of Zurita (2014) this bring us to the following conclusion that the Spanish crisis just like the global crisis has been caused among other factors such as declining productivity by a series of excesses and risky forms of credit financing, which mainly manifested itself in the real-estate / construction market in Spain. Surely internal demand for houses by Spaniards and external demand by foreigners have been important contributing factors to both the housing bubble and the Spanish financial crisis, but the problem is largely related to an excess of credits and the sudden appearance of liquidity restrictions that were caused by the global financial crisis which accelerated the downfall of the Spanish real-estate / construction sector on which the Spanish economy was heavily dependent.

In the next chapter we will discuss the financial figures of commercial and saving banks and also discuss their actions in the real-estate/construction sector, to identify what makes financial institutions successful and what not, as well as to identify the investment tendencies in the real-estate market. This will also allow us to shed light on which institutions help fuelled the Spanish financial and real-estate crisis.

Chapter 2: Spanish commercial Banks and Saving Banks

In this chapter we analyse various financial figures of a representative group of commercial and saving banks. It is fair to say that there are many banks operating in Spain, so we have decided to only focus on the following financial institutions.

We analyse the following commercial banks:

- Santander
- BBVA

We analyse the following cajas or saving banks:

- Caixa Ontinyent
- CaixaBank
- Bankia

It should be noted that Caixabank and Bankia are the result of a merger of many other saving banks. Thus we have also analysed the financial statements of these saving banks before their merger.

So why have we chosen these specific commercial and saving banks? Santander and BBVA are the largest Spanish commercial banks and have performed relatively well during the financial crisis. We have chosen Caixa Ontinyent because it was the only *caja* that did not experience any mergers, interventions or any other drastic changes. CaixaBank and Bankia on the other hand did experience mergers and/or state interventions. With this varied sample of institutions we hope to be able to identify what made certain financial institutions successful and what caused other financial institutions to fail and experience financial difficulties. Also we hope to be able to identify the investment tendencies in the real-estate market. We are especially interested in the role of real-estate investment in the evolution of several financial figures. Therefore, a considerable part of our analysis will use measurements related to the activity of banks in the real-estate market. In the next section each one of these financial institutions will be shortly described, but first we will first introduce the ratios and financial figures that we want to use for our research.

The ratios and financial figures

To give the reader a clear overview down below we present a list of the variables that we have investigated. The variables and ratios that we have decided to use are the following:

- Mortgage loans
- Investments in the real-estate sector
- Credit investments/loans to customers
- Customer deposits
- Financial necessity ratio
- Total assets
- Net Equity
- EBIT
- Total Profit
- Real-estate investments / Total assets
- Real-estate investments / Net equity
- Return on Assets (ROA)
- Return on Equity (ROE)
- Solvency Ratio
- Liquidity Ratio (LTD-ratio)

All the information is built upon information that is publicly available in the annual financial reports of each entity. These financial reports were obtained through the website of the CNMV (The Spanish Commission of Stock Markets). We have created a dataset with annual observations for each of the variables from the list that we have previously mentioned from 2004 to 2015 for all the entities that we have previously mentioned in the introduction of this chapter.

The first figure that we will investigate is the amount of Mortgage Loans that have been given by the bank to its clients. We believe that this amount is strongly related to investments in the real-estate market, and also would give us a good perspective of the banks risk-perception in the housing market. Mortgage loans can be seen as indirect investments in the real-estate market.

The second figure that we will discuss is the amount of direct investments in the real-estate sector; this amount will be a good indicator of both the eagerness of a bank to grow as well as its confidence in the real-estate sector as an investment asset.

“Loans to customers” is another excellent indicator of the bank’s confidence in the overall economic situation. Furthermore, this variable is important to create the “Loan to deposit” ratio which is a commonly used statistic to assess a bank’s liquidity ratio. To calculate this variable we will also need the next variable that we will discuss which is “Client deposits”.

The financial necessity ratio where client deposits are divided by credit investments is a liquidity ratio that gives a good overview to measure the balance between these two variables and serves as an important indicator of possible liquidity problems

Another important variable that we will use in our research is “Total Assets”. Total assets on its own can be an important statistic to assess a bank’s financial situation. However, it is also essential to calculate other ratios such as ROA, Real-estate investments / Total assets and the solvency ratio. Likewise Net equity is also useful to assess a bank’s financial situation as well as to calculate ratios such as ROE, Real-estate investments / total equity and more.

Earnings before interest and Taxes usually referred to as EBIT, is always a good indicator of financial performance, as it is the operational profit. Like EBIT, total profit is also an excellent indicator of financial performance.

Real-estate investments divided by total assets give a good overview of how much the bank or saving bank is investing in the Real-estate sector compared to its assets. Real-estate investments divided by net equity give a proper overview of how much of an institution’s equity is invested in the real-estate market.

Return on assets (ROA) is a very important ratio that gives an idea of how efficient the bank or saving bank is at using its assets to generate profits. Banks with higher ROA's are likely to perform better than banks with lower ROA's. Return on equity (ROE) like ROA is a very important ratio and especially for the shareholders/investors in the bank or saving bank. Calculating the ROE allows us to measure the profitability of a bank by giving an indication of how much profit has been created with the investments of its shareholders. Higher ROE's are likely to attract more investors.

Solvency is essential for banks as it can be seen as the ability of a bank to meet its long-term financial obligations. A bank that is insolvent, which means that it is not solvent enough, is bound to become bankrupt. However, Solvency is not everything; even banks that are solvent and can thus meet their long-term obligations can get bankrupt if they can't meet their short-term obligations. The ability of meeting short-term obligations is called liquidity or liquidity to debt ratio and is also essential for banks and saving banks in order to stay in business and to be financially successful.

The banks and their performance throughout the years (Results + Discussion)

After having presented the ratios and variables we will now discuss the evolution of the variables of interest in each bank one by one. This part of the paper is basically a combination of the presentation and discussion of our data.

Santander

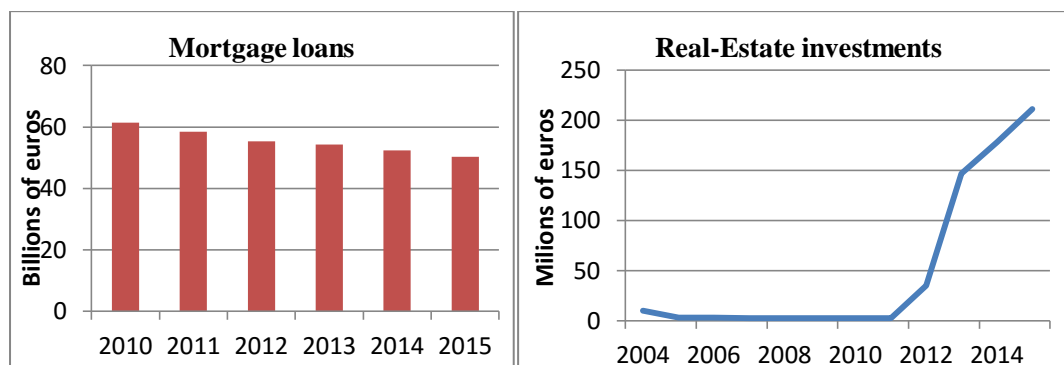
The first bank that we will discuss is Santander.

We will start by looking at the activities of the bank in the real-estate sector. The variables that we have chosen for this are mortgage loans and real-estate investments. We have decided to illustrate these graphs side by side to give a clearer overview. Concerning, the first variable mortgage loans, it should be mentioned that unfortunately we did not find any data on the total amount of mortgage loans issued by Santander before 2010. However, a clearly downward trend can be observed in figure 2.01.

It is possible that the bank perceives that issuing mortgages has become riskier in the recent years; it is also possible that the demand of mortgage loans has dropped over the years. However, in reality this decline is likely to be caused by a multitude of factors including the two previously mentioned causes. After witnessing the global financial crisis and considering the fact that loose mortgage policies of financial institutions has been described as one of the major causes of the crisis, it is likely that banks such as Santander have revised their

mortgage policies as well as their criteria to issue mortgage loans to its clients. This is typical supply side phenomenon; however it is likely that there are also factors on the demand side of mortgage loans that have caused this drop. For example, many Spanish families have experienced financial problems after not being able to pay their debts. Perhaps, not all the families have experienced these problems but it is likely that they have heard of other families experiencing these. So it is likely that Spanish citizens have become more cautious and risk-averse regarding taking on a mortgage loan.

Figure 2.01 – Evolution of mortgage loans and real investments for Santander SA



This figure represents the evolution of two indicators of banking activity in the real estate market. The left figure shows the total value of mortgage loans of Santander SA for the period 2010-2015. The y axis is expressed in billions of euros. The right figure shows the investment of the bank in real-estate asset expressed in millions of euros.

Contrary to the drop in mortgage loans, the direct real-estate investments of the bank have increased considerably in the recent years compared to the early 2000's. This incredible increase can perhaps be partially explained by looking at the house prices. After analysing the house prices by looking at the graph that we have extracted from the article of José Luis Carillo (2014) which can be found in section A4 of the appendix; we can observe that the house prices have dropped considerably starting in 2007-2008, where after the prices stabilised in 2009-2010 and finally they have dropped significantly again in the period of 2011-2013. In the years 2012 and 2013 the housing prices reached their lowest point which was also the year in which the line that depicts the real-estate investments of Santander was at its steepest. However, to confirm whether real-estate investments and housing prices are related a regression analysis should be conducted to measure the correlation between these two variables. This is not in the scope of this research, but we strongly recommend future researchers to investigate this correlation.

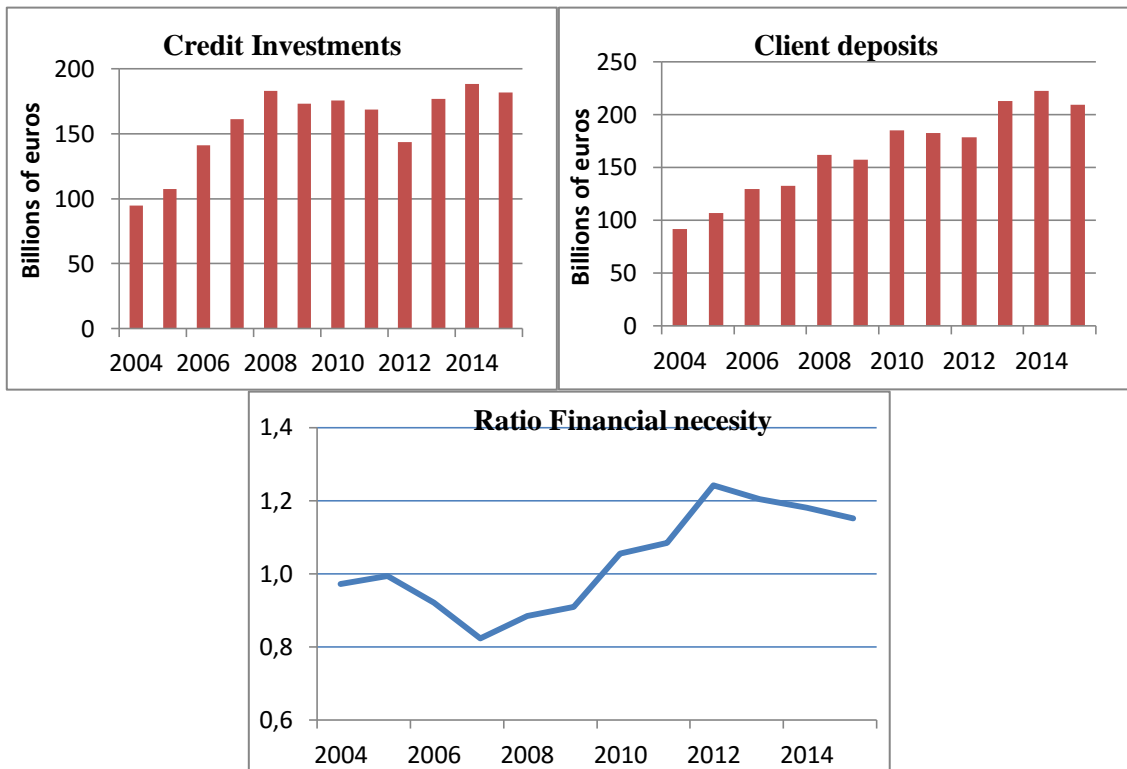
After having discussed the variables that can be specifically attributed to the real-estate market, we move on to the variables that are related to the liquidity of the bank. The

variables that we have chosen for this are credit investments (Loans to customers) and client deposits. Furthermore, we will introduce a liquidity ratio which is computed by dividing client deposits by credit investments. All of these three graphs will be illustrated down below in figure 2.02.

The total amount of credit investments or loans to customers has actually increased albeit in a wave-like pattern. This could be possibly explained by the fact that there is less demand and/or supply for mortgages, which would make people opt for different ways to finance the purchases of their houses. Another possibility is that due to the collapse of house prices, mortgages are no longer necessary, but smaller loans are possibly still required for consumers to purchase a house.

Another factor is the fact that due to the crisis many saving banks disappeared or lost their clients because of a lack of faith of the Spanish citizens in these institutions. Large commercial banks such as Santander and BBVA performed well throughout the crisis and this made these banks viable options for people who lost faith in their bank or if their bank simply had gone bankrupt. The total amount of bank accounts of Santander increased with 8.8% between 2008-2012 according to data of the AEB and CECA published in the article of Michaela Romani (2013). Furthermore, in 2012 Santander merged with Banesto, which resulted in 2.5 million new clients for Santander. This merger most likely explains the relatively large increase between 2012 and 2013. The other variable Client deposits also shows this steep increase between 2012 and 2013 which is in line with our assumption that client deposits and credit investments have increased partially because of an increase in clients. So it is clear that the total amount of both variables has increased, but it is important to put these changes into perspective by analysing the liquidity ratio that we have computed with these two variables. The liquidity ratio clearly shows that client deposits have been increasing faster than credit investments. Ratios below one could indicate liquidity problems and Santander's liquidity ratio has been excellent in the last years.

Figure 2.02 – Evolution of liquidity related variables for Santander SA



This figure represents the evolution of three indicators of banking liquidity. The top-left figure shows the total value of client credits of Santander SA for the period 2004-2015. The top-right figure shows the total value of client deposits of Santander SA for the period 2004-2015. The y axis for these two plots is expressed in thousands of millions of euros. The bottom figure exhibits the liquidity ratio expressed as the client deposits over the client credits.

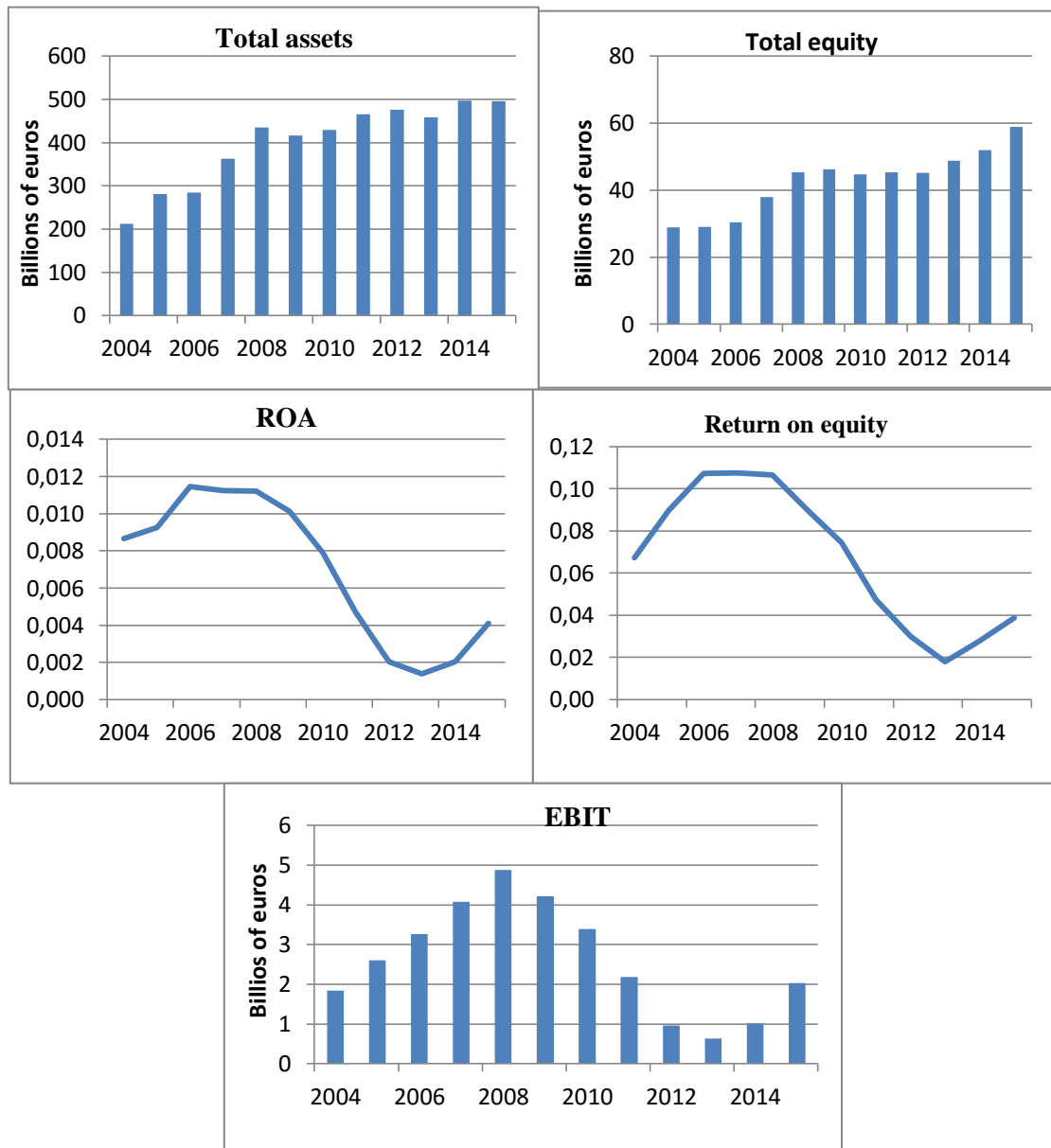
Now after having evaluated the liquidity of Santander, we will continue our analysis by evaluating the financial performance of the bank. The metrics that we have chosen for this as mentioned earlier are total assets, total equity, return on assets, return on equity and earnings before interest and taxes. It should be noted that we could also have used net profit, but EBIT which is the operational income would be sufficient to assess the financial performance of the bank. In figure 2.03 we have made a graphical representation of all the relevant variables that we have used to evaluate financial performance.

You can clearly see that both total assets and total equity have increased over time. An increase in total assets throughout the financial crisis is noteworthy and implies solid financial performance. The increase in total equity can perhaps be explained by an increase in retained earnings and/or an increase in investments.

However, it is important to put these totals into context by evaluating the development of the ROA and ROE ratios. The ROA ratio which shows how proficient Santander is at using its assets to generate profits has dropped significantly over the years. So this could indicate

that the bank has become less proficient at using its assets to generate profit, but it should be said that the ratio has been positive for the last 11 years and that during financially difficult times. It is always important to put the financial performance into context. Achieving a positive ROA ratio throughout the global financial crisis and the Spanish national crisis is very positive and implies exemplary financial performance of the bank. The developments of the ROE ratio are remarkably similar to those of the ROA ratio. The Ratio has dropped considerably, but it has also remained positive over time and that in a financially difficult context to operate because of the two crises. Finally when looking at the EBIT you can also clearly see that it has dropped but that it stayed positive. In 2012-2013 the EBIT was at its lowest, but this can probably be explained by the take-over of Banesto. It is likely that retained earnings have been used to purchase the take-over. This would partially explain the drop in EBIT and the increase in total equity. Thus, we could say the financial performance has been excellent throughout the years, now we will move on to the next set of variables.

Figure 2.03 – Evolution of performance related variables/metrics for Santander SA

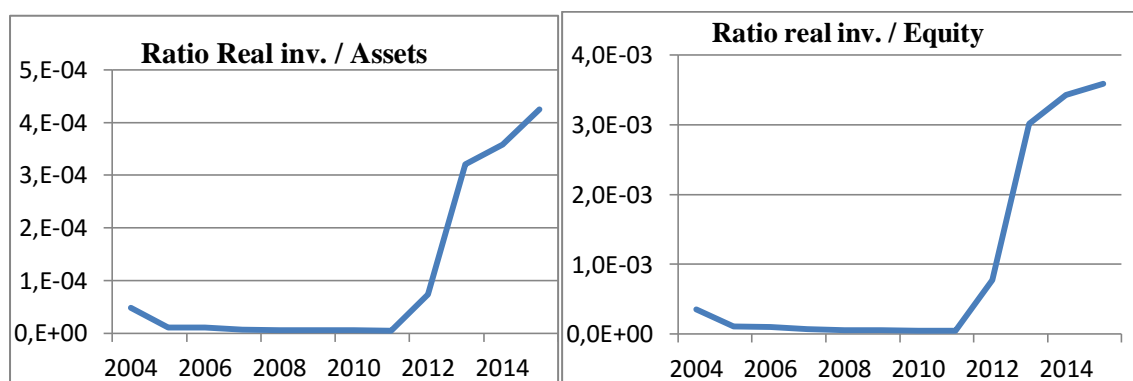


This figure represents the evolution of five indicators related to banking performance. The top-left figure shows the total value of assets. The top-right figure shows the total value of equity. The middle-left plot displays the return on assets of Santander while the middle-right figure is the return to equity ratio (computed as the EBIT over the total value of assets and the EBIT over the equity respectively). The bottom figure exhibits the evolution of the earnings before interest and taxes (EBIT).

The next ratios show the real-estate investments divided by total assets and real-estate investments divided by total equity. They show the evolution of the weight of Santander's investments in the real-estate sector. It is important to note that the denominators total assets and total equity have increased over the years as we have mentioned previously. The nominator of these fractions; real-estate investments has also increased. In figure 2.04 you

can clearly see that from 2011-2014 the nominator real-estate investment has increased dramatically more compared to the increase in total assets and total equity.

Figure 2.04 – Evolution of ratios measuring the weight on real estate investment in Santander

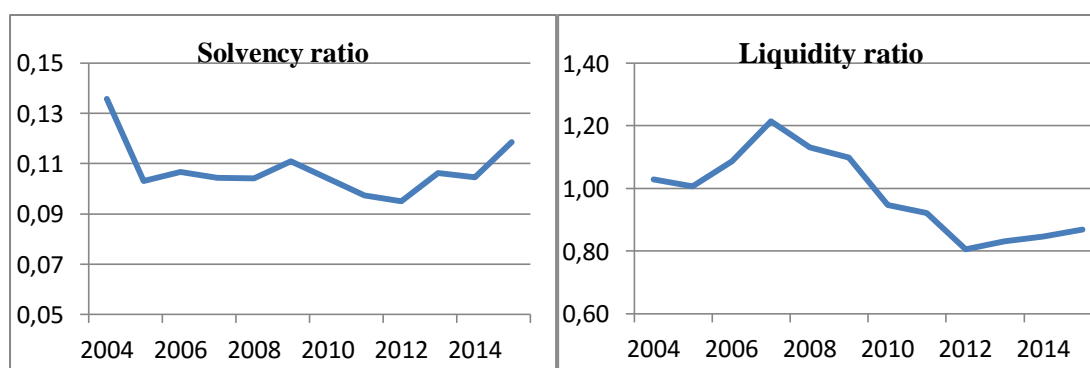


This figure represents the evolution of two ratios measuring the weight that real-estate investment has in the balance of Santander. The left figure shows the ratio between the real estate investments over the total value of assets. The right figure displays the ratio between the real estate investments over the value of equity.

Furthermore, it should be noted that the real-estate investments were very low compared to the total amounts of assets and equity from 2004-2011. It is likely that the housing bubble in Spain and the collapse of the house prices have made investments in the real-estate market more profitable, because with less capital more could be purchased. So from this data we can draw the conclusion that Santander did not invest a lot in the real-estate sector prior to the crisis and it would be extremely interesting to compare these ratios of Santander to the *cajas* that went bankrupt because of the housing bubble.

We would like to end our analysis of Santander by looking at its liquidity and solvency ratios to determine whether the bank is financially stable both in the short-term as well as the long-term. In figure 2.05 you can observe these ratios.

Figure 2.05 – Evolution of liquidity and solvency ratios



This figure represents the evolution of two ratios measuring the capacity of Santander to meet their long-term (solvency) and short-term (liquidity) financial obligations. These ratios are computed as the ratio assets over total equity and credits over deposits respectively.

Concerning, the solvency ratio of Santander you can observe that it is generally stable. When interpreting solvency ratios one should always compare it to the ratios of other companies or institutions that operate in the same sector. It is not necessary for us to calculate the ratios of the whole Spanish banking sector as we could simply analyse the guidelines of the Central European Bank. According to the Common Equity Tier 1 (CET1) Santander should maintain a minimum solvency ratio of 9.5%. In our data you can clearly see that Santander has maintained a solvency ratio of at least 9.5% and is currently well above that value. Also according to Santander (2015) both the bank and the group by far exceed the minimum requirements set by the Central European Bank. Thus, according to the standards of the Central European Bank we could say that Santander is a solvent institution.

Furthermore, it is also interesting to check the ratings given by large credit entities such as Standard & Poor, Moody and Fitch. Santander has received good or excellent ratings by all of these entities so it can be assumed that Santander is solvent and is thus likely to be able to meet its long-term obligations. For example Moody (2014) stated: "Madrid, March 04, 2014 -- Moody's Investors Service has today upgraded to Baa1 from Baa2 the debt and deposit ratings of Banco Santander S.A. (Spain) and maintained the stable outlook. At the same time, Moody's affirmed Banco Santander's standalone Bank Financial Strength Rating (BFSR) at C- and raised the equivalent baseline credit assessment (BCA) to baa1 from baa2. The outlook on the bank's BFSR remains stable and the bank's short-term ratings were affirmed at Prime-2."

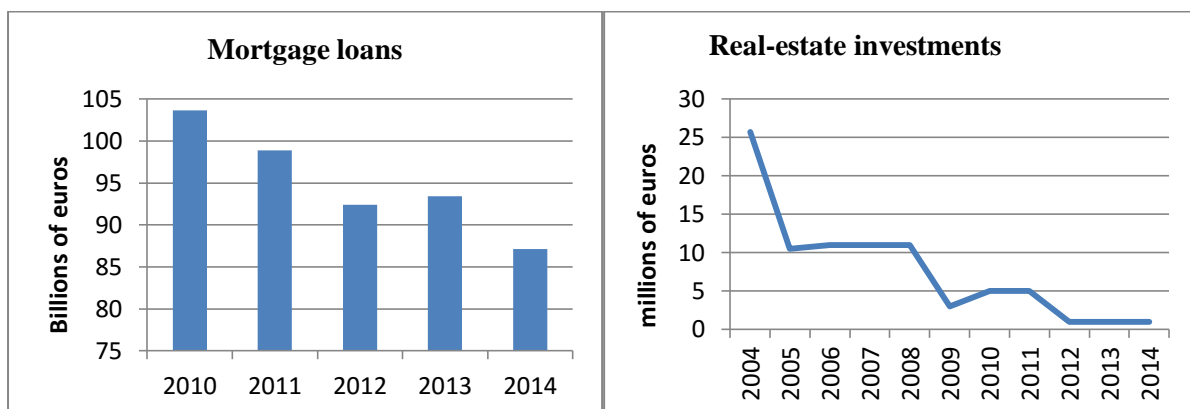
So what about its liquidity? As mentioned earlier, liquidity ratios are used to measure the company's ability to meet short term debts. Better liquidity ratios imply a larger safety margin of the company to meet its short-term debts. With this formula ratios below 1 are excellent and ratios above 1 could indicate a problem. We can clearly observe that Santander's liquidity ratio has declined considerably from 2004 to 2011, but it has been increasing slightly since 2012. So its liquidity ratio is excellent in the last years, but the bank did experience some small problems in the past. So in general we could conclude that Santander has been performing well throughout the crisis, it was not heavily depended on the real-estate sector, and as a matter of fact it did not invest a lot in it until after the housing bubble burst. Furthermore, the bank has been profitable for 11 years; it has excellent ratings and solvency. The only thing that could be troublesome is its liquidity ratio that has worsened a

little bit since 2012, but it still below 1 so there is no real indication that the bank will suffer from liquidity problems.

BBVA

For BBVA we will use the same approach as with Santander. We will analyse and discuss the financial data to assess the performance of the bank over the last years and its activity in the real-estate market. It should be noted that we did not find any data on the amount of mortgage loans issued by BBVA prior to 2010. In addition to that, the latest data we found is from 2014, as the data from 2015 is not yet published. Like Santander the total amount of mortgage loans has dropped significantly, this can be observed in figure 2.06. As we mentioned earlier this could be due to a multitude of factors such as revised criteria that make mortgage loans less accessible, less demand, etc. On the other hand the real-estate investments of BBVA have decreased dramatically over the last years. This is significantly different than the action of Santander. Probably BBVA perceives the real-estate sector as a very risky sector and prefers not to invest in it. As both its mortgage activities which are indirect investment in the real-estate market and its direct real-estate investments have declined.

Figure 2.06 – Evolution of mortgage loans and real investments for BBVA

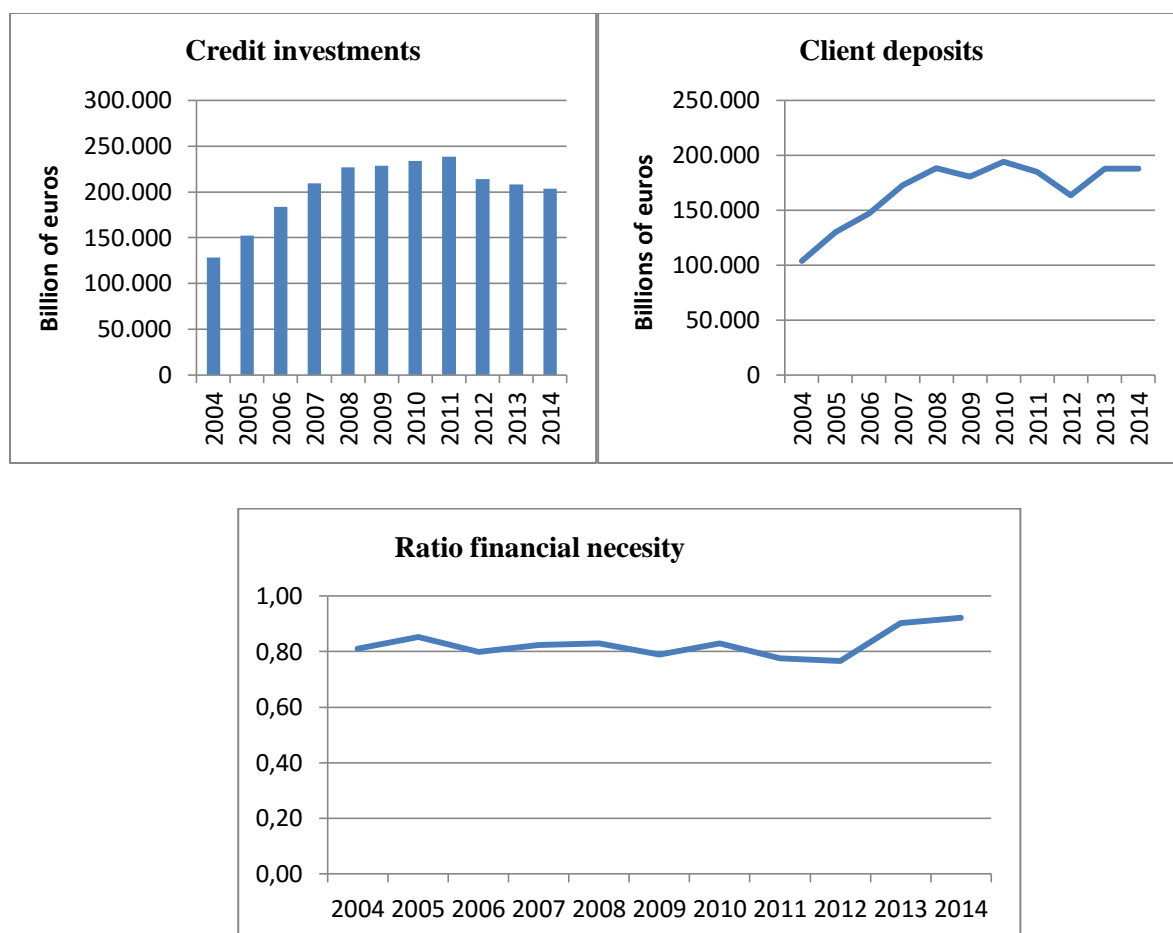


This figure represents the evolution of two indicators of banking activity in the real estate market. The left figure shows the total value of mortgage loans of BBVA for the period 2010-2015. The y axis is expressed in billions of euros. The right figure shows the investment of the bank in real-estate asset expressed in millions of euros.

In figure 2.07 we can observe that the credit investments of BBVA have increased from 2004 to 2011, but in the last 3 years they have slightly dropped. BBVA has gained many new clients between 2008 and 2012, so it would be logical if the amount of credit investments has increased and until 2012 this has been the case, but why it has dropped between 2012 and 2015 has to be investigated thoroughly, as we cannot explain that drop at this moment. The

amount of client deposits as can be seen in figure 2.07 have increased from 2004 to 2008 and the last years it has more or less stabilised. The difference between 2012 and 2013 can possibly be explained by the merger with UNNIM in 2013. Because of this merger the bank gained a considerable amount of clients and this would logically increase the total amount of client deposits. The next variable that we discuss which the financial necessity ratio clearly shows that BBVA experienced a relative increase in client deposits while the amount of credit investments of the bank have dropped since 2011. This explains the steep increase of the ratio's graphical representation between 2011 and 2014. It is likely that the bank has been more cautious since 2011 which was a difficult financial year for many Spanish banks. BBVA's is still in the danger zone but it is slowly improving.

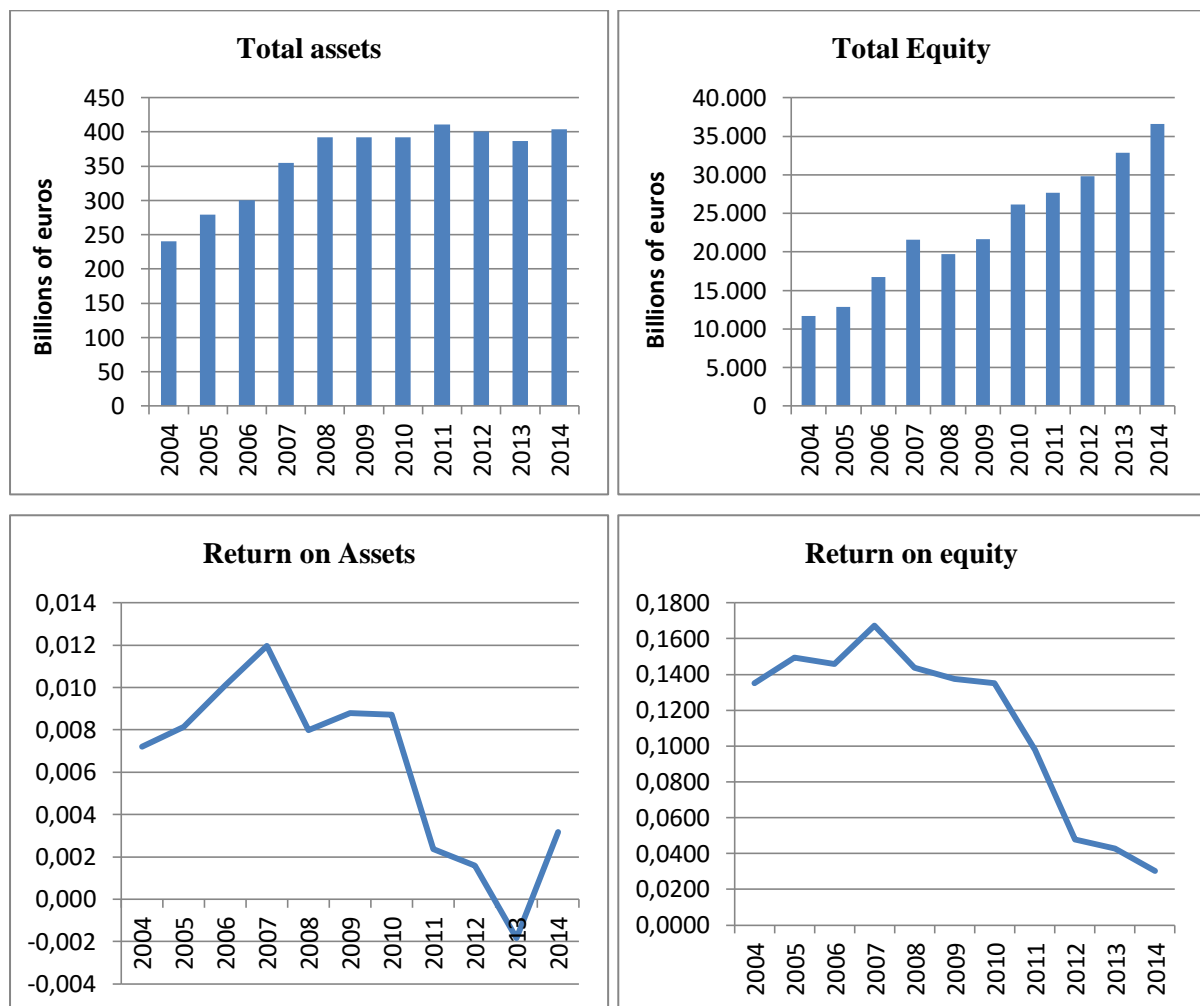
Figure 2.07 – Evolution of liquidity related variables for BBVA

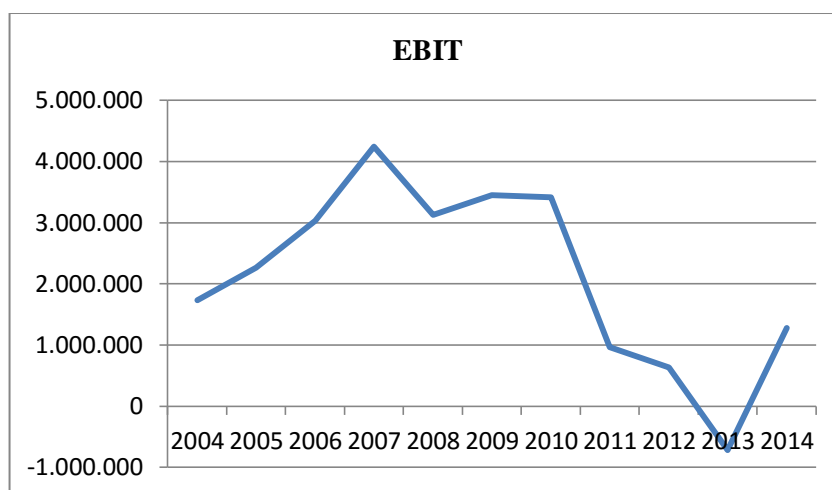


This figure represents the evolution of three indicators of banking liquidity. The top-left figure shows the total value of client credits of BBVA for the period 2004-2015. The top-right figure shows the total value of client deposits of BBVA for the period 2004-2015. The y axis for these two plots is expressed in thousands of millions of euros. The bottom figure exhibits the liquidity ratio expressed as the client deposits over the client credits.

Now after having analysed the evolution of liquidity we will move to the performance related variables of the bank which can be seen in figure 2.08. The amount of total assets of the bank has been steadily increasing until 2008 and since then it has stabilised around 400.000.000 as can be seen in figure 2.19. To assess whether the bank is proficient at generating profits with its assets we will now analyse the ROA ratio. Like Santander the ROA ratio of BBVA has dropped, however it has actually been negative in 2013. This is because the EBIT of BBVA was negative in 2013. Possibly this could indicate some financial difficulties for the bank, but overall its profit, EBIT and return on assets have been positive. So you could argue that in general the bank has been performing well. The total amount of equity of the bank it has increased as well, the return on equity ratio of the bank has dropped like the ROA, but it has remained positive because although the bank suffered a negative operational income in 2013, the net profit of the bank was positive. So this confirms that although 2013 might have been a difficult year, the bank has performed quite well throughout the crises.

Figure 2.08 – Evolution of performance related variables/metrics for BBVA

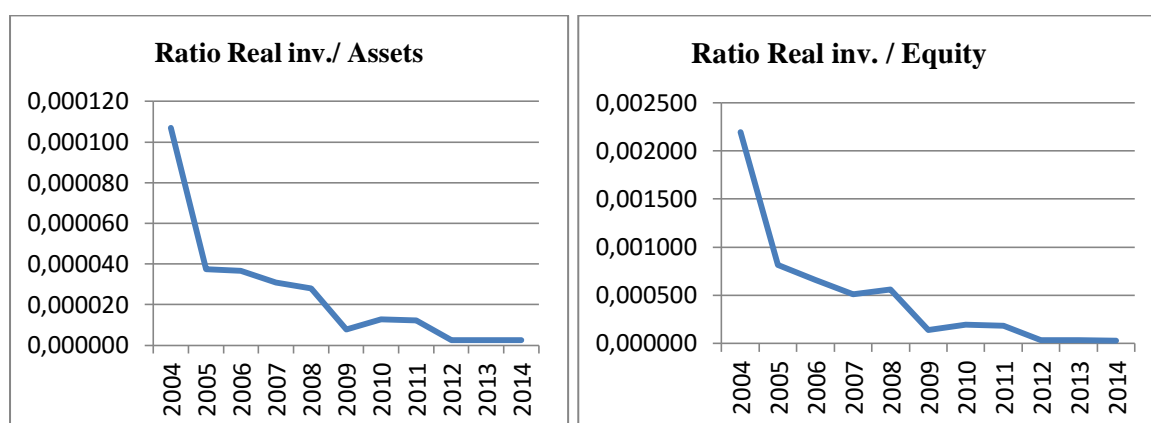




This figure represents the evolution of five indicators related to banking performance. The top-left figure shows the total value of assets. The top-right figure shows the total value of equity. The middle-left plot displays the return on assets of BBVA while the middle-right figure is the return to equity ratio (computed as the EBIT over the total value of assets and the EBIT over the equity respectively). The bottom figure exhibits the evolution of the earnings before interest and taxes (EBIT).

After having evaluated the performance of the bank we will continue our analysis of BBVA by assessing the weight of its investments in the real-estate market. Figure 2.09 illustrates the ratios that represent the weight of BBVA's investments in the real-estate market. Our previous comment that BBVA perceives the real-estate market as risky seems to be confirmed. The weight of its investment in the real-estate market has declined drastically since 2004. Also it should be mentioned that even in 2004 the weight of its investments compared to its total amount of assets was relatively low.

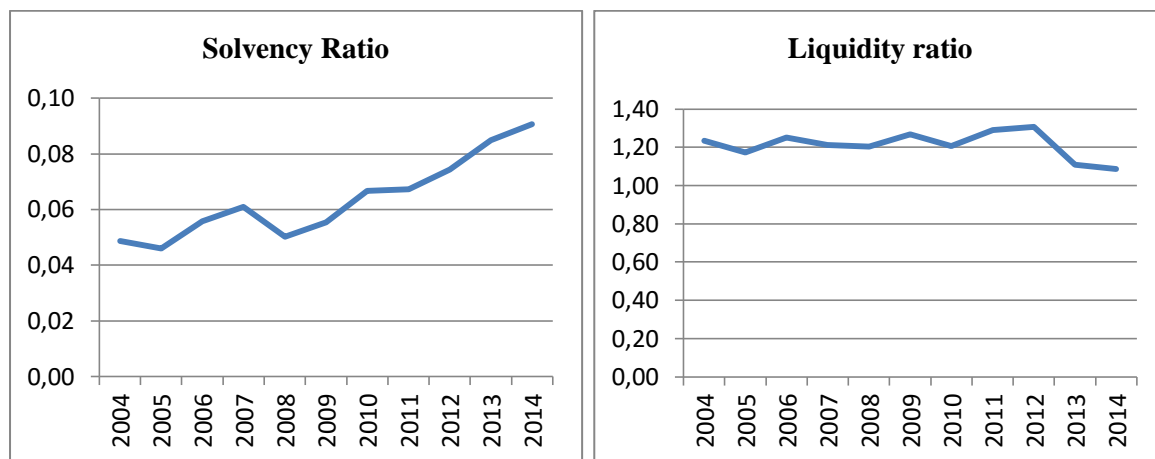
Figure 2.09 – Evolution of ratios measuring the weight on real estate investment in BBVA



This figure represents the evolution of two ratios measuring the weight that real-estate investment has in the balance of BBVA. The left figure shows the ratio between the real estate investments over the total value of assets. The right figure displays the ratio between the real estate investments over the value of equity.

Finally, to complete our analysis of BBVA we will analyse the evolution of its liquidity and solvency. Like we did with Santander we will look at the standards set by the European Central Bank. The solvency ratio of BBVA has been improving steadily over time. According to the website of the BBVA (2015) in the annual report of 2015 its solvency ratio has reached 10.3% which is even higher than in 2014 and its good compared to its peers. So we can argue that BBVA's solvency is excellent. It should be noted that the data we have used is not the annual reports, but the audits by Deloitte so that's why the annual report is available while the audit is not.

Figure 2.10 – Evolution of liquidity and solvency ratios of BBVA



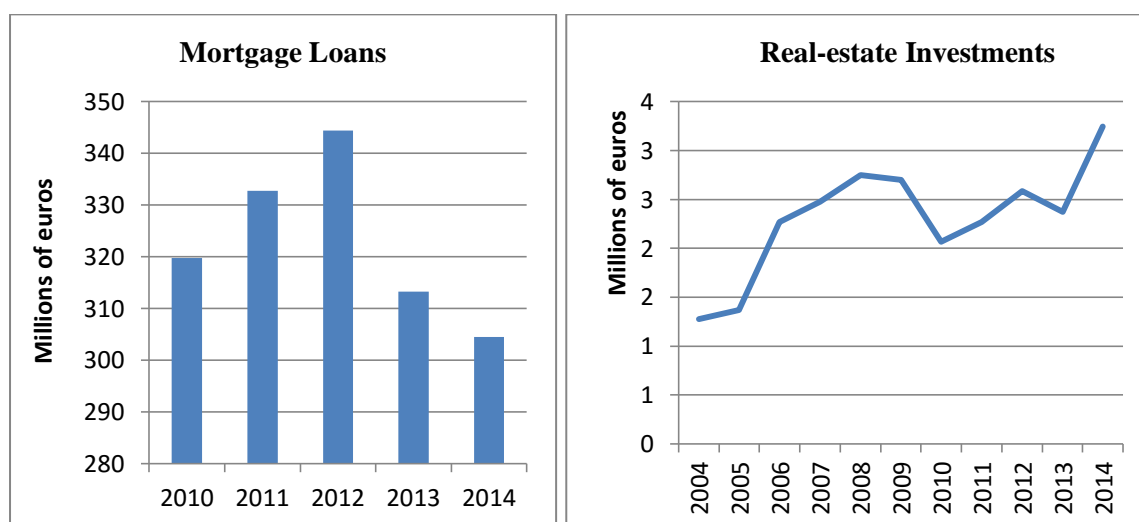
This figure represents the evolution of two ratios measuring the capacity of BBVA to meet its long-term (solvency) and short-term (liquidity) financial obligations. These ratios are computed as the ratio assets over total equity and credits over deposits respectively.

The liquidity ratio of BBVA has been stable until 2012, but then it experienced a drop. The ratio is progressing towards a better and lower value so that is positive. Overall the ratio is still good compared to its peers and according to BBVA (2015) it received excellent ratings in 2015 both in the short-term as well as the long term. So we could state that BBVA has been performing well throughout the global financial and Spanish financial crisis. It had a year with a negative operational profit, but one bad year compared to 9 good years is no reason to worry. Its liquidity and solvency are excellent and the bank has been less and less active in the real-estate sector.

Caixa Ontinyent

Caixa Ontinyent is one of the few cajas that performed well throughout the crisis, so it will be very interesting to compare its activities and performance with both the large commercial banks as well as with the other saving banks. The evolution of Caixa Ontinyent mortgage loans is interesting, unfortunately we do not possess data from 2004-2010 but you can clearly see that until 2012 the amount of mortgage loans was increasing and then it dropped significantly. The real-estate investments of the bank have been slightly increasing over the years and suddenly increased in 2013. So in 2013 the indirect investments in the form of mortgage loans dropped significantly, but the direct real-estate investments increased considerably.

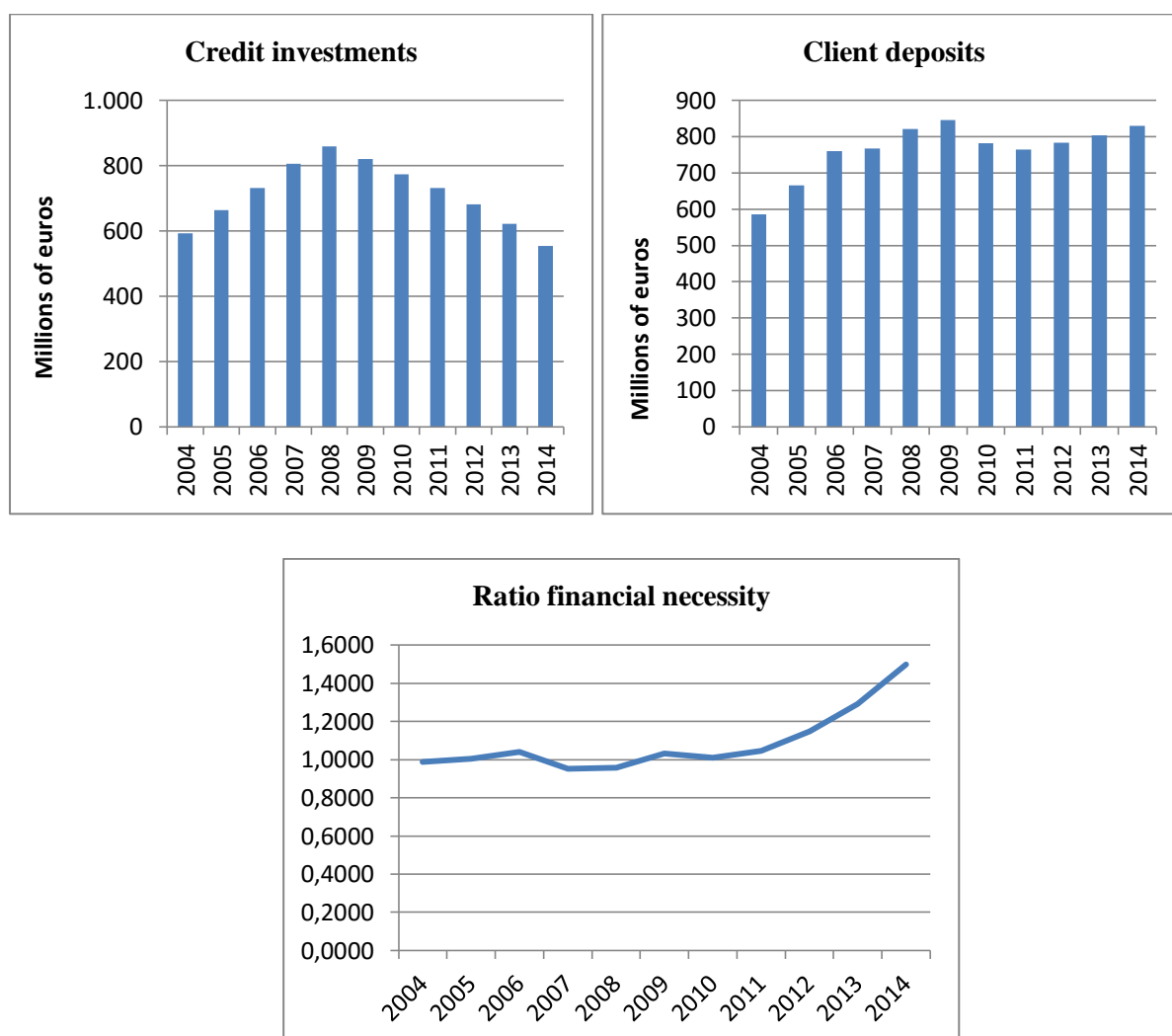
Figure 2.11 – Evolution of mortgage loans and real investments of Caixa Ontinyent



This figure represents the evolution of two indicators of banking activity in the real estate market. The left figure shows the total value of mortgage loans of Caixa Ontinyent for the period 2010-2014. The y axis is expressed in millions of euros. The right figure shows the investment of the bank in real-estate asset expressed in millions of euros for the period 2004-2014.

Now we will continue with analysing the liquidity related variables of Caixa Ontinyent which can be seen in figure 2.12 You can see that since 2008 the amount of credit investments of the bank have decreased, this could be related to the global financial crisis. The total amount of client deposits has stayed relatively stable, they increased from 2004 to 2009 and since then they initially declined, but since 2012 they have been increasing slightly. The financial necessity ratio has increased since 2008 because the denominator; credit investments has decreased while client deposits stayed relatively stable. This is a very positive development of the financial necessity ratio of Caixa Ontinyent.

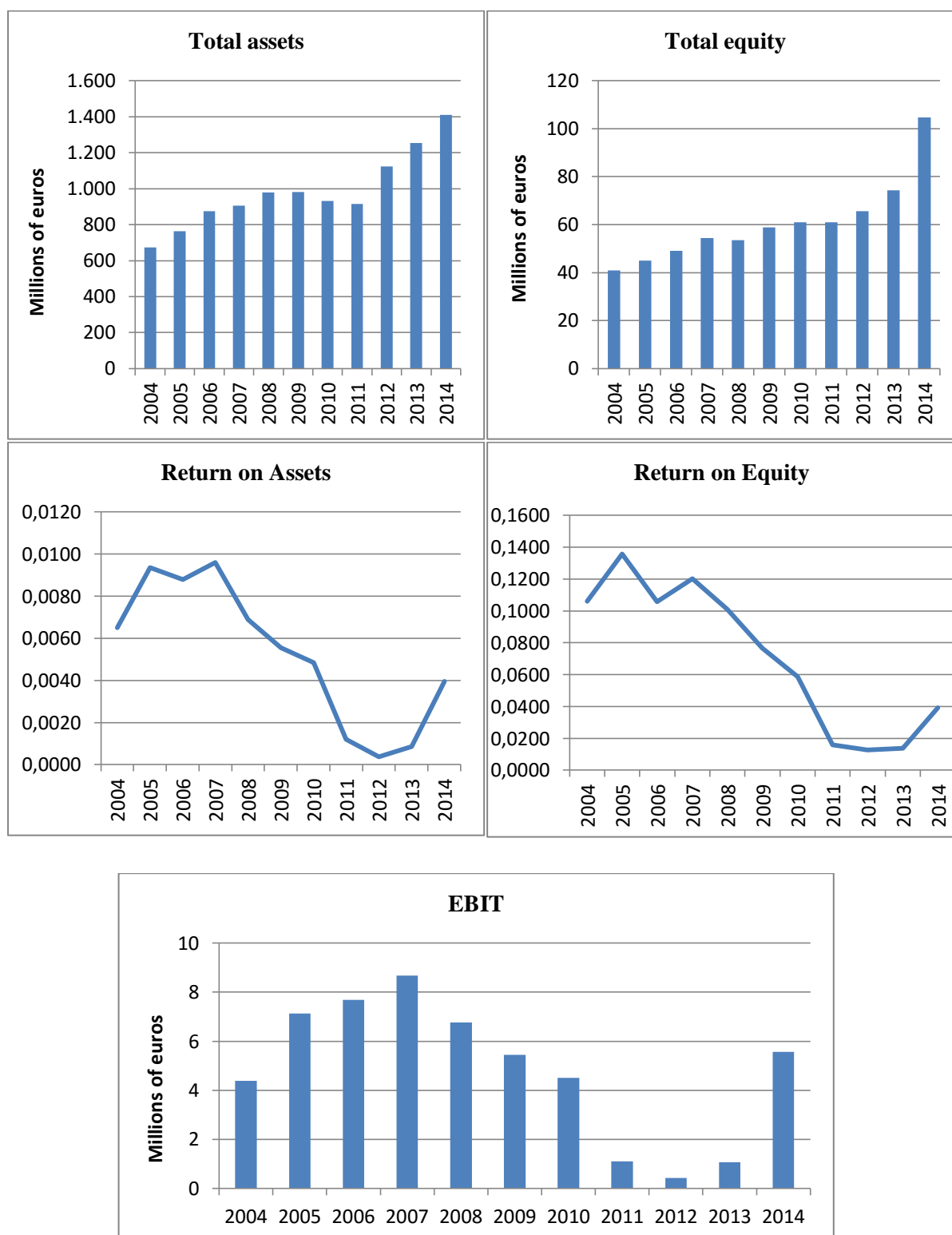
Figure 2.12 – Evolution of liquidity related variables for Caixa Ontinyent



This figure represents the evolution of three indicators of banking liquidity. The top-left figure shows the total value of client credits of Caixa Ontinyent for the period 2004-2014. The top-right figure shows the total value of client deposits of Caixa Ontinyent for the period 2004-2014. The y axis for these two plots is expressed in millions of euros. The bottom figure exhibits the liquidity ratio expressed as the client deposits over the client credits

Now we will look at the evolution of performance related variables of Caixa Ontinyent which can be seen in figure 2.13. Caixa Ontinyent's total assets and total equity have clearly increased throughout the years. Like Santander and its ROA and ROE ratios have dropped, but remained positive throughout all the years that we have analysed. The operational profit of Caixa Ontinyent has been positive as well but it experienced a significant drop between the years 2011 and 2013, but it remained positive nevertheless. This is a remarkable financial performance of a caja considering the fact that many cajas went bankrupt and/or experienced heavy losses.

Figure 2.13 – Evolution of performance related variables/metrics

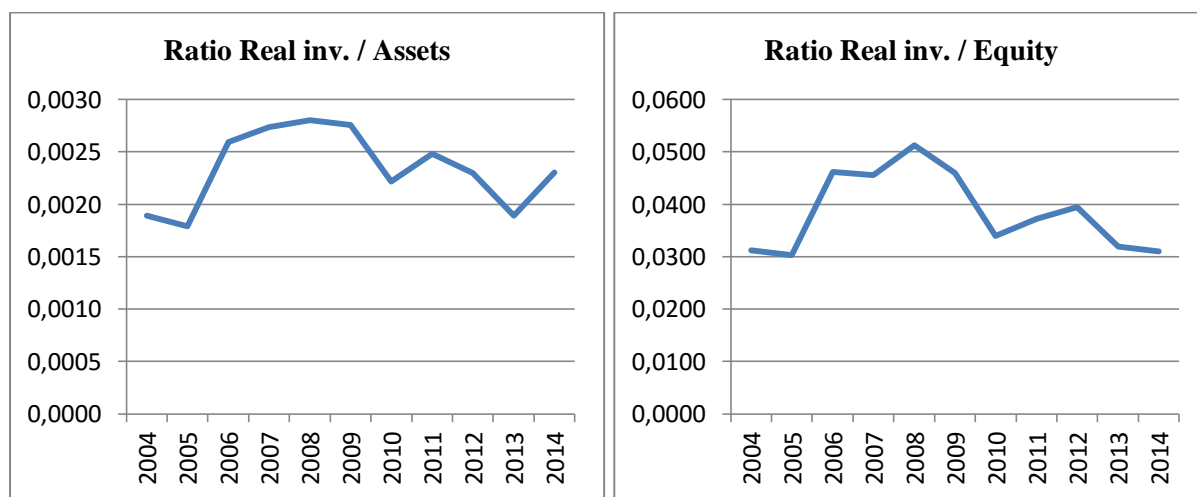


This figure represents the evolution of five indicators related to banking performance. The top-left figure shows the total value of assets. The top-right figure shows the total value of equity. The middle-left plot displays the return on assets of Caixa Ontinyent while the middle-right figure is the return to equity ratio (computed as the

EBIT over the total value of assets and the EBIT over the equity respectively). The bottom figure exhibits the evolution of the earnings before interest and taxes (EBIT).

After having analysed the performance related metrics, we will analyse the weight of Caixa Ontinyent's investments in the real-estate market, in figure 2.14 you can see a graphical representation of the evolution of the weight of Caixa Ontinyent's investments in the real-estate market.

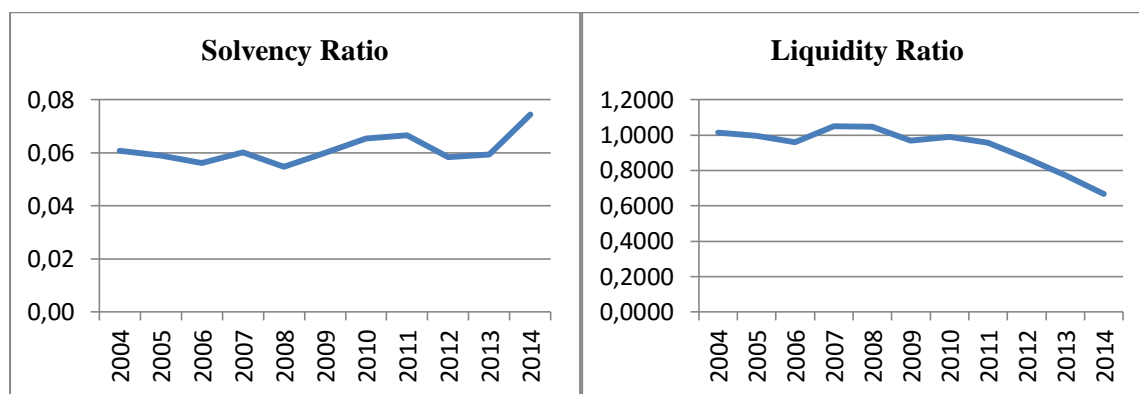
Figure 2.14 – Evolution of ratios measuring the weight on real estate investment in Caixa Ontinyent



This figure represents the evolution of two ratios measuring the weight that real-estate investment has in the balance of Caixa Ontinyent. The left figure shows the ratio between the real estate investments over the total value of assets. The right figure displays the ratio between the real estate investments over the value of equity.

Overall the weight of Caixa Ontinyent's investment in the real-estate market is higher than that of Santander and BBVA, but it is not extremely high. Also it has remained rather stable over the years, but the ratios are slightly lower after the global financial crisis and the Spanish financial crisis. Finally, we would like to look at the liquidity and solvency of Caixa Ontinyent to conclude our verdict. Both ratios can be found in figure 2.15. The solvency ratio of Ontinyent has actually increased throughout the years and although it is not as high as those of Santander and BBVA it is excellent. The evolution of its liquidity ratio is excellent. In the both the short- and long-term Caixa Ontinyent it is unlikely that Caixa Ontinyent will have problems to meet its financial obligations. Overall, we could conclude that Caixa Ontinyent performed very well throughout the crisis, it has been investing relatively more in the real-estate market than the commercial banks, but its financial performance has been excellent. There is some liquidity risk as its ratio has declined rapidly over the last years, but its performance throughout the crisis what interests us the most has been good.

Figure 2.15 – Evolution of liquidity and solvency ratios of Ontinyent

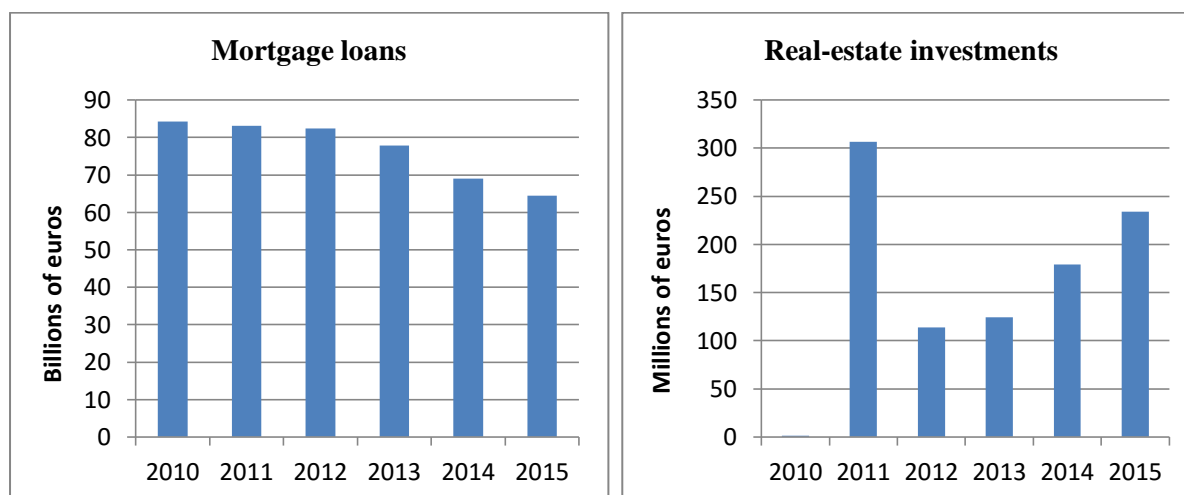


This figure represents the evolution of two ratios measuring the capacity of Ontinyent to meet its long-term (solvency) and short-term (liquidity) financial obligations. These ratios are computed as the ratio assets over total equity and credits over deposits respectively.

Bankia

Bankia is the fourth largest bank of Spain and was created in 2010 by merging 7 Spanish financial institutions. Bankia experienced a state bailout in 2012, so unlike the previously analysed institutions Bankia did experience serious financial problems. Let us start with looking at the evolution of mortgage loans and real-estate investments. We can see that the amount of mortgage loans has declined significantly since 2012; this could be because the bank is stricter with issuing mortgages or because people perceive Bankia as risky and because of that the demand of mortgage loans issued by Bankia has dropped. Real-estate investments were virtually non-existent in 2010 then spiked in 2011 and collapsed in 2012 and then slowly started to increase again. This collapse is probably related to its bail-out.

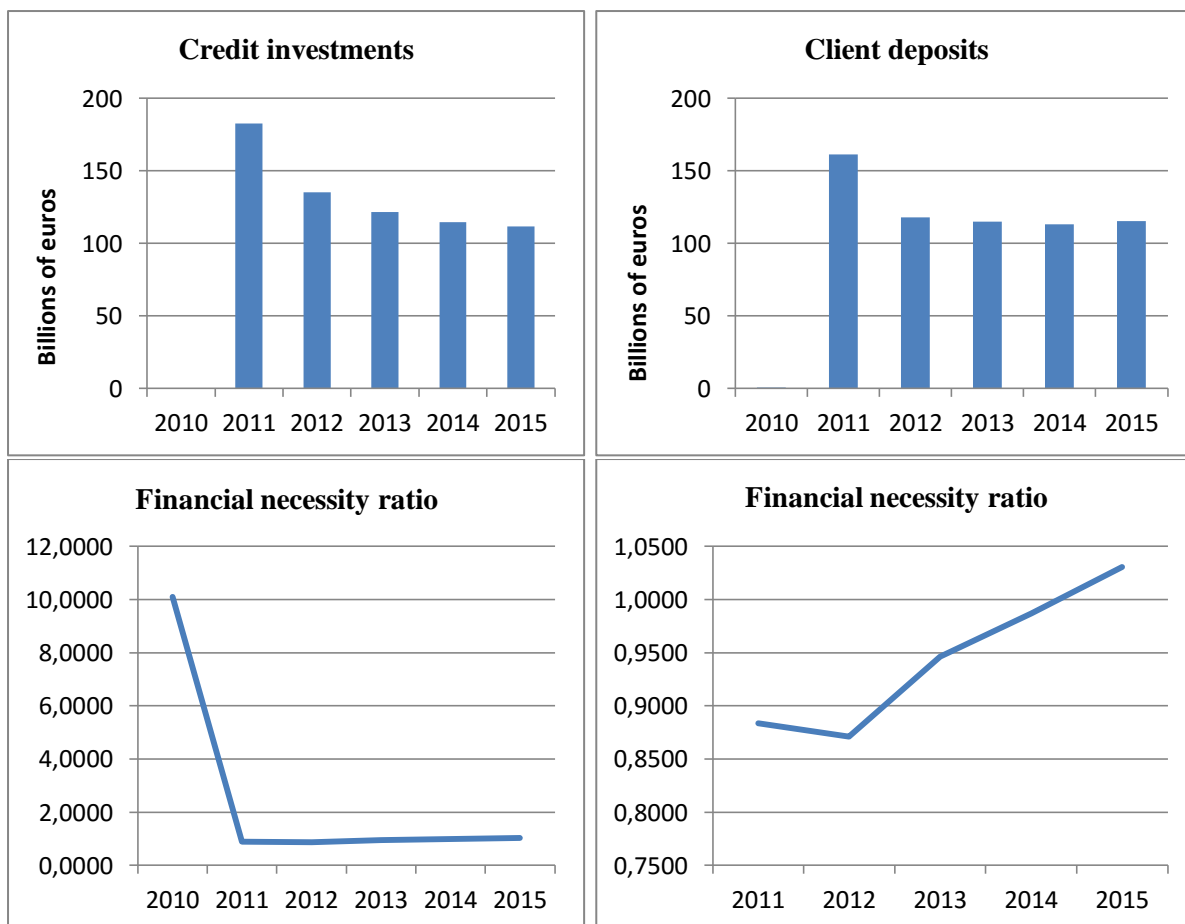
Figure 2.16 – Evolution of mortgage loans and real investments for Bankia



This figure represents the evolution of two indicators of banking activity in the real estate market. The left figure shows the total value of mortgage loans of Bankia for the period 2010-2015. The y axis is expressed in billions of euros. The right figure shows the investment of the bank in real-estate asset expressed in millions of euros.

What about the liquidity related variables of the bank? Figure 2.17 illustrates the evolution of these variables. In its start-up year the values for both variables have been very low which is normal. However, in 2011 these variables reached their peak and then the amount of credit investments decreased significantly in 2012 and has continue to decrease slightly every year. The amount of client deposits has dropped as well in 2012 and has more or less remained stable since then. For the financial necessity ratio we created two different graphs because 2010-2011 is clearly an outlier because Bankia started with ten time more client deposits than investments. Between 2010 and 2012 its liquidity ratio worsened rapidly and reached its lowest point in 2012 when the bank had to be bailed out by the state. Since 2012 the ratio has been increasing because the total amount of credit investments has decreased whereas the total amount of client deposits has remained stable. So you could argue that its liquidity variables have been improving since the state take-over.

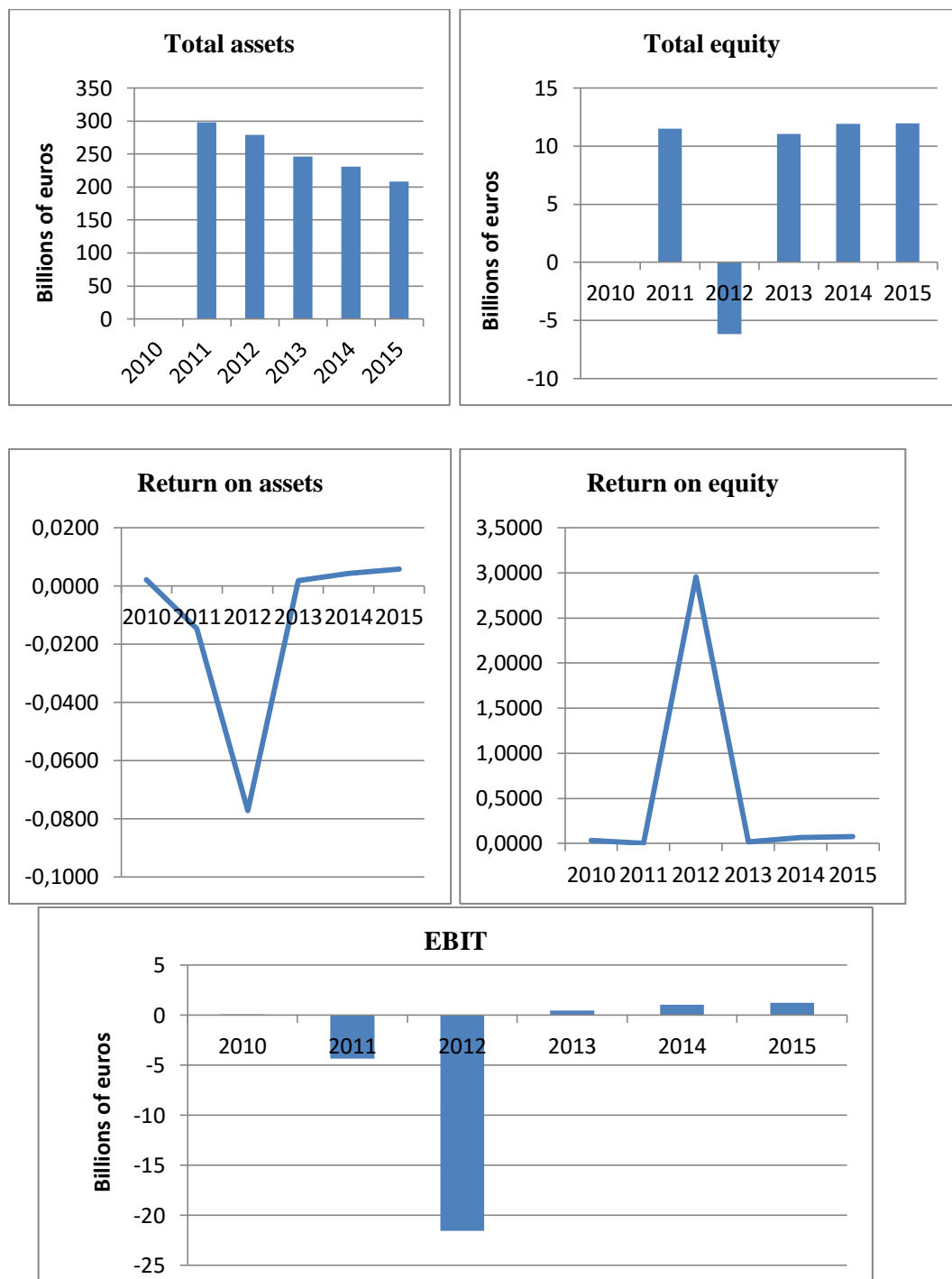
Figure 2.17 – Evolution of liquidity related variables for Bankia



This figure represents the evolution of three indicators of banking liquidity. The top-left figure shows the total value of client credits of Bankia for the period 2004-2015. The top-right figure shows the total value of client deposits of Bankia for the period 2004-2015. The y axis for these two plots is expressed in billions of euros. The bottom figure exhibits the liquidity ratio expressed as the client deposits over the client credits.

The performance of Bankia in these 5 years has been anything but stable. In 2010 it was normal for the total amount of assets to be low as the bank had just started operating, in 2011 the total amount of assets has reached its highest point but until 2015 it has continued to decline. Total equity was also low in 2010, it reached normal levels in 2011, but in 2012 the total amount of equity became negative. Negative equity is anything but desirable for a company because it means that the liabilities are more than the assets, as equity is the difference between assets and liabilities. The ROA of Bankia was also negative in 2011 and 2012 because Bankia made a loss. The return on equity in 2012 seems high but this is anything but true. ROE is computed by dividing net profit by equity and both of these values were negative. Negative divided by negative is positive which makes the return on equity seem high while in fact this is false. This artificial ratio is given by the fact that Bankia was bailed out by the Spanish Government (any other company would have gone bankrupt at this point).

Figure 2.18 – Evolution of performance related variables/metrics for Bankia

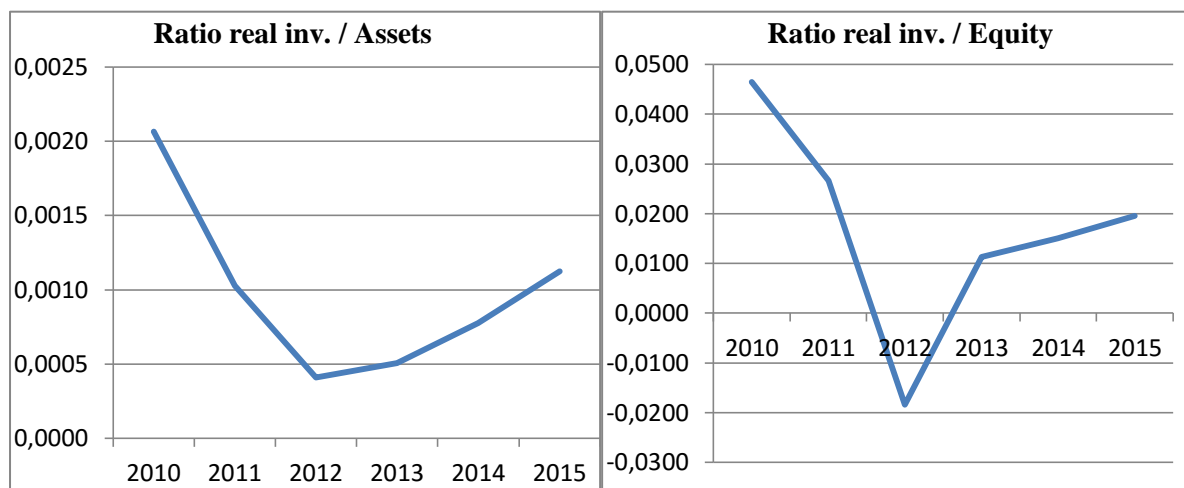


This figure represents the evolution of five indicators related to banking performance. The top-left figure shows the total value of assets. The top-right figure shows the total value of equity. The middle-left plot displays the return on assets of Bankia while the middle-right figure is the return to equity ratio (computed as the EBIT over the total value of assets and the EBIT over the equity respectively). The bottom figure exhibits the evolution of the earnings before interest and taxes (EBIT).

Could this bad performance perhaps be explained by the weight of its investments in the real-estate market? Figure 2.19 illustrates the weight of Bankia's investment in the real-

estate market. Both ratios were significantly higher before the state bail-out of Bankia. Bankia was formed by the merger of several cajas that had many toxic assets in the real-estate sector. This can clearly be seen because prior to 2012, Bankia in 2010 had a weight 0.0021 (Real-estate investments divided by total assets) this is 42 times more than the weight Santander had in 2010. In 2012 Bankia's ratio was significantly lower than in 2010, but it is still a lot higher than Santander and BBVA. It is remarkable that the ratio is increasing again to relatively high levels so it is possible that Bankia will experience a similar situation in the future even though it has been profitable in the last 3 years, but for that we should look at its solvency and liquidity ratios.

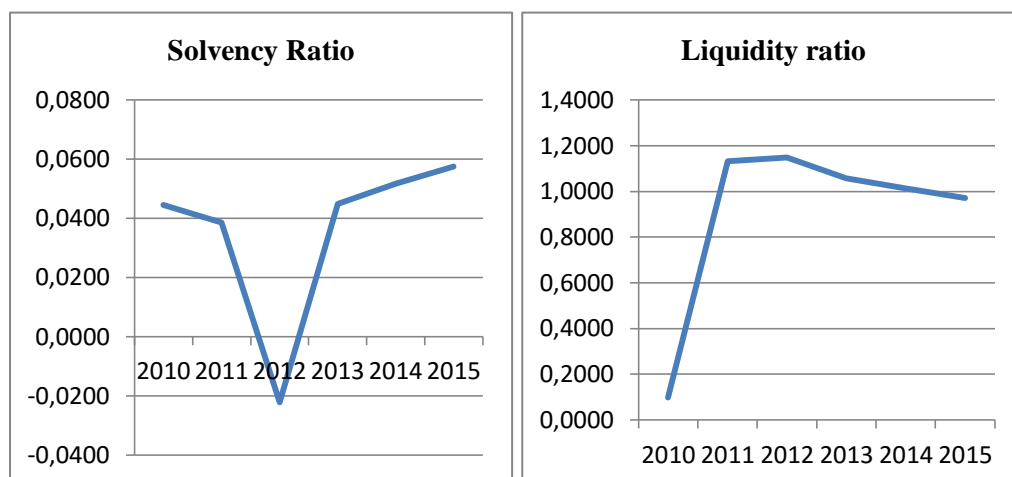
Figure 2.19 – Evolution of ratios measuring the weight on real estate investment in Bankia



This figure represents the evolution of two ratios measuring the weight that real-estate investment has in the balance of Bankia. The left figure shows the ratio between the real estate investments over the total value of assets. The right figure displays the ratio between the real estate investments over the value of equity.

From the solvency ratio it is clear that the bank experienced a serious problem in 2012. The bank was insolvent and that was why the Spanish state had to bail out the bank. The solvency ratio of the bank has been increasing the last years, but it is still lower than its peers Santander and BBVA. In addition to that the liquidity ratio of Bankia showed dangerous levels in 2011 and 2012 which confirms the problematic situation the bank experienced. The liquidity ratio of Bankia was also too high, but it has slightly improved since 2012, however it still remains high so the bank should remain careful. So we could conclude that Bankia which had a very high weight in the real-estate sector has experienced many financial problems which affected its performance, solvency and liquidity. The bank is still at risk since its liquidity ratio is still lower than desirable also the bank has been increasing its weight of investments in the real-estate sector and although this is not necessarily bad it could put the bank at risk in the future.

Figure 2.20 – Evolution of liquidity and solvency ratios in Bankia

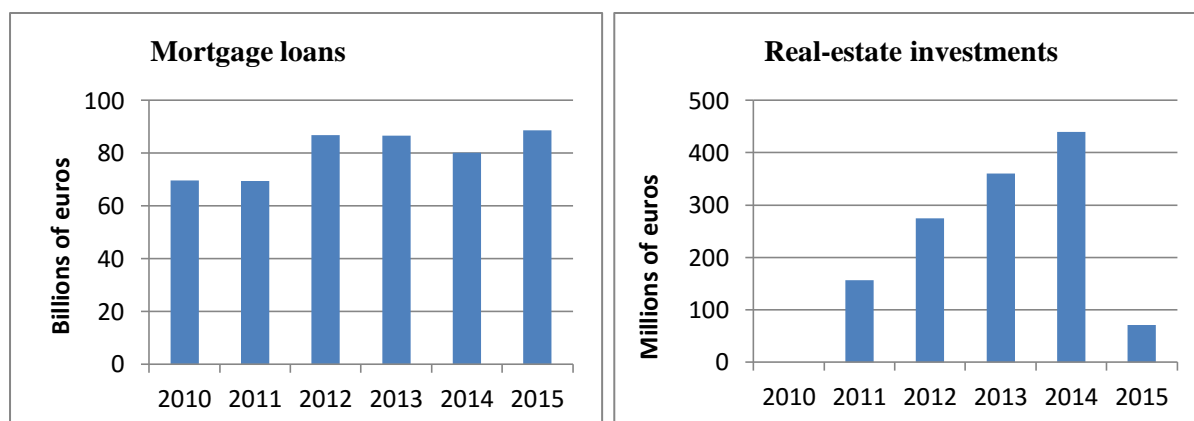


This figure represents the evolution of two ratios measuring the capacity of Bankia to meet its long-term (solvency) and short-term (liquidity) financial obligations. These ratios are computed as the ratio assets over total equity and credits over deposits respectively.

Caixa Bank

The final bank that we will discuss is the Caixa bank. First we will look at its mortgage loans and real-estate investments which can be seen in figure 2.21. The amount of mortgage loans of the bank has been relatively stable. Its real-estate investments were 0 and in 2010 and from then onwards they have increased until 2014 and in 2015 they suddenly dropped.

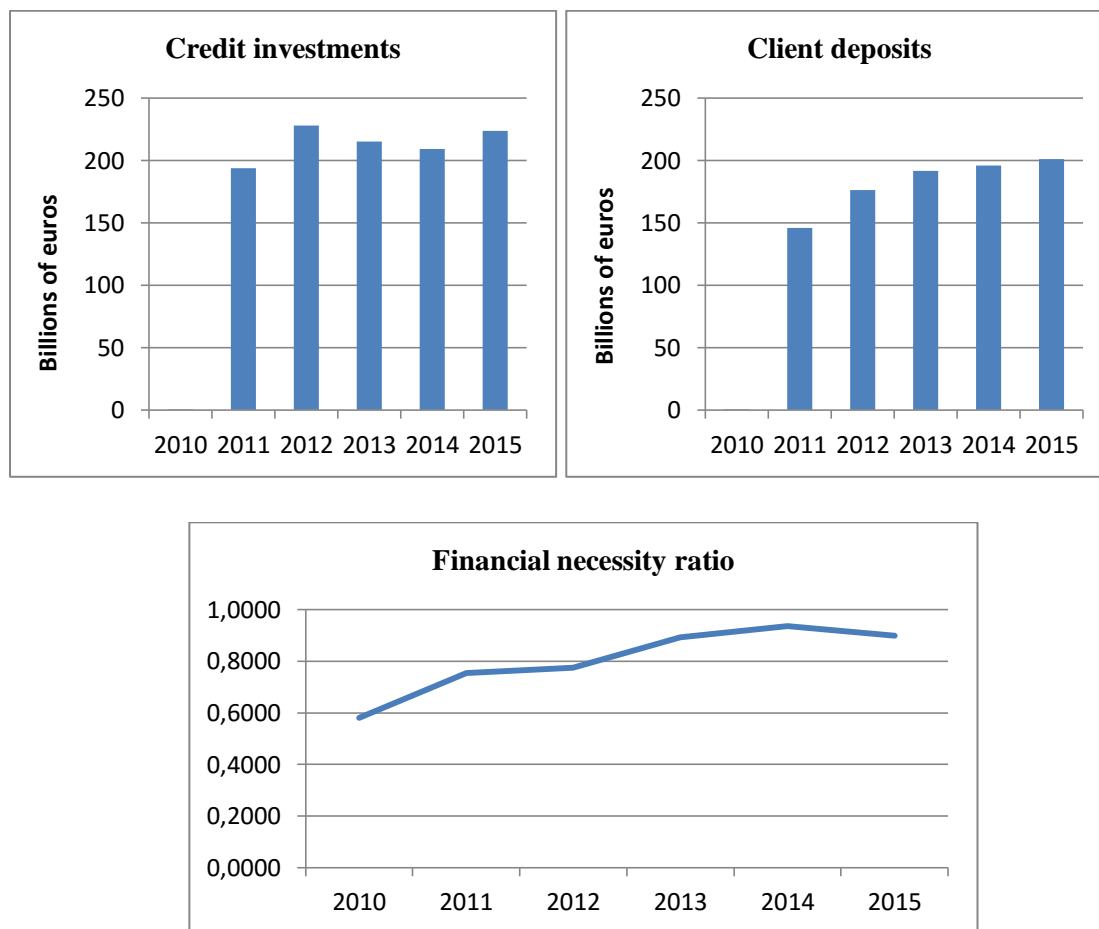
Figure 2.21 – Evolution of mortgage loans and real investments for Caixa Bank



This figure represents the evolution of two indicators of banking activity in the real estate market. The left figure shows the total value of mortgage loans of Caixa bank for the period 2010-2015. The y axis is expressed in billions of euros. The right figure shows the investment of the bank in real-estate asset expressed in millions of euros.

The amount of credit investments of Caixa bank suddenly increased between 2010 and 2011, this has likely been caused by the restructuring of the bank. In 2011 the banking and insurance activities were merged into “Criteria Caixacorp”. After 2011 the credit investments have been relatively stable. The client deposits of the bank have been increasing steadily, which can probably be explained the rapid expansion of its branch-network as well as the result of several mergers. This surely increased the amount of clients and thus its deposits. The financial necessity ratio which reflects its liquidity has been improving over time, but it is still below 1 so the bank could still have some problems to meet its short-term obligations.

Figure 2.22 – Evolution of liquidity related variables of Caixa Bank

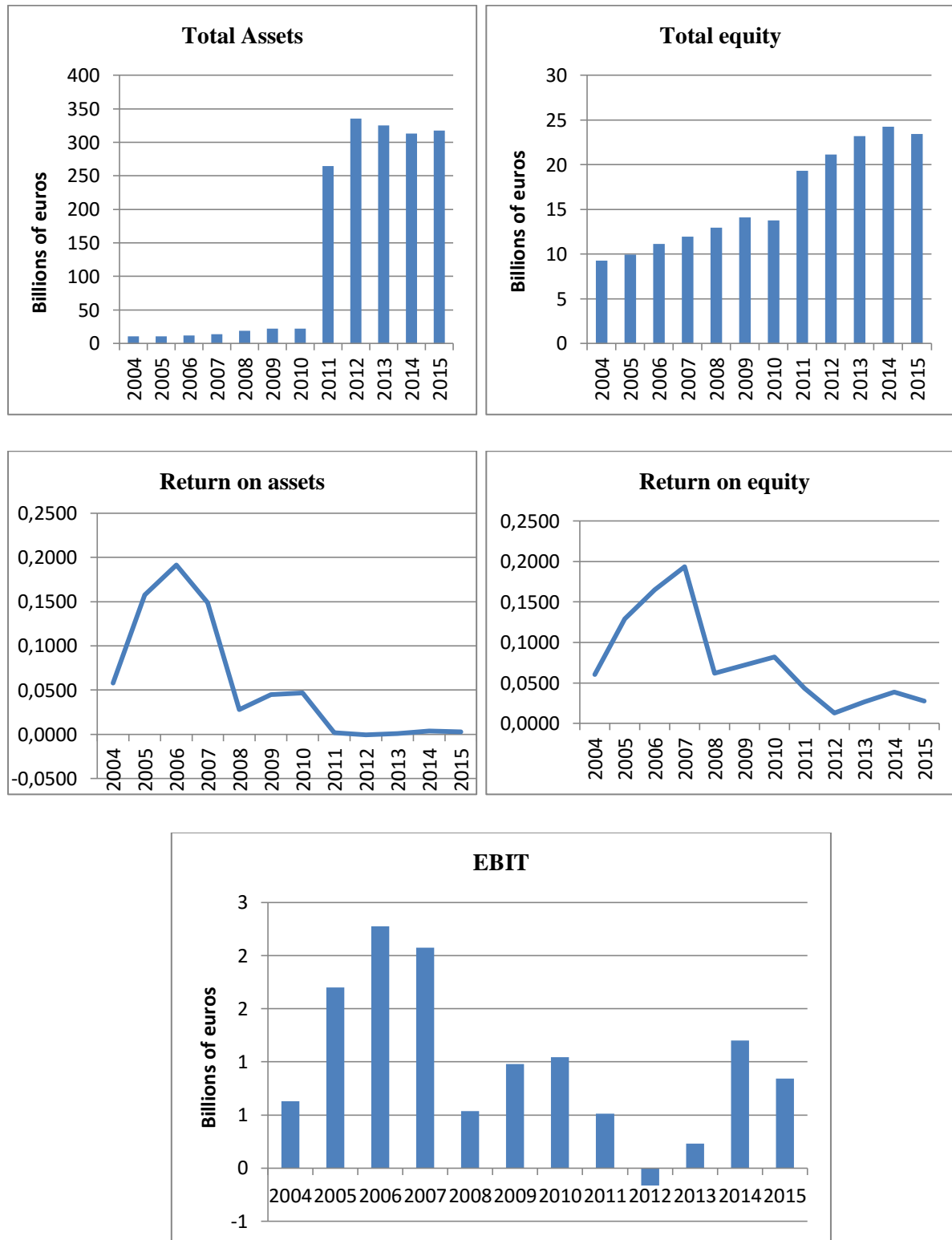


This figure represents the evolution of three indicators of banking liquidity. The top-left figure shows the total value of client credits of Caixa bank for the period 2004-2015. The top-right figure shows the total value of client deposits of Caixa bank for the period 2004-2015. The y axis for these two plots is expressed in billions of euros. The bottom figure exhibits the liquidity ratio expressed as the client deposits over the client credits.

The performance related metrics of Caixa Bank can be seen in figure 2.23 The total amount of assets and equity of the bank have increased rapidly due to the expansion of the bank. Return on assets have dropped considerably and were even negative in 2012 where the bank suffered an operational loss. The return on equity of the bank has also dropped

significantly, but it has remained positive. The operational profit of the bank was very high before the global crisis, but then it declined dramatically in 2008. In 2012 the bank experienced an operational loss and overall its operational income is not very stable.

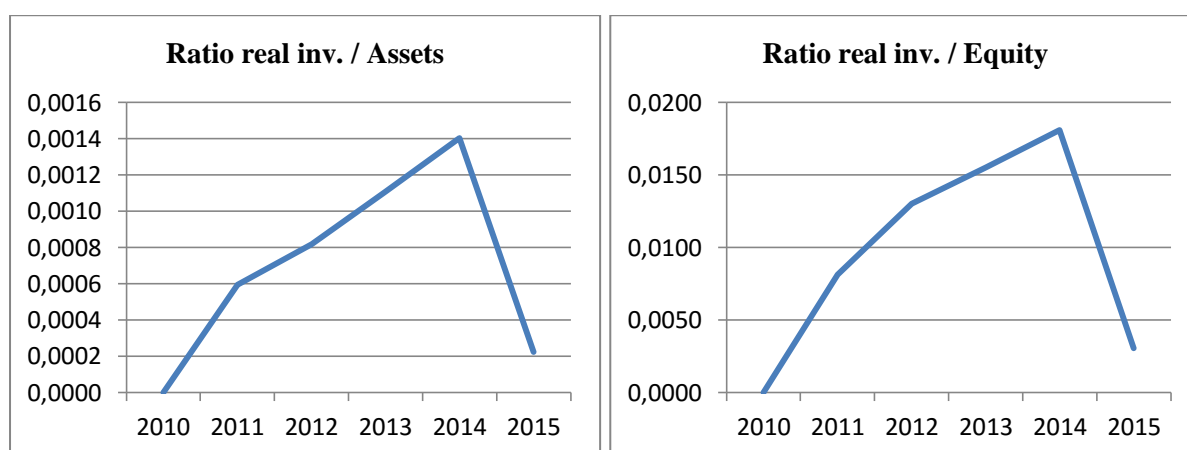
Figure 2.23 – Evolution of performance related variables/metrics for Caixa Bank



This figure represents the evolution of five indicators related to banking performance. The top-left figure shows the total value of assets. The top-right figure shows the total value of equity. The middle-left plot displays the return on assets of Caixa bank while the middle-right figure is the return to equity ratio (computed as the EBIT over the total value of assets and the EBIT over the equity respectively). The bottom figure exhibits the evolution of the earnings before interest and taxes (EBIT).

Unfortunately, there is no data on La Caixa's activity in the real-estate sector prior to 2010, because it would be interesting to see what caused the large drop in its profit in 2008. It is also possible that the bank invested earlier in the junk securities that caused the global financial crisis. The weight of Caixa Bank's investments in the real-estate sector is rather large compared to Santander and BBVA

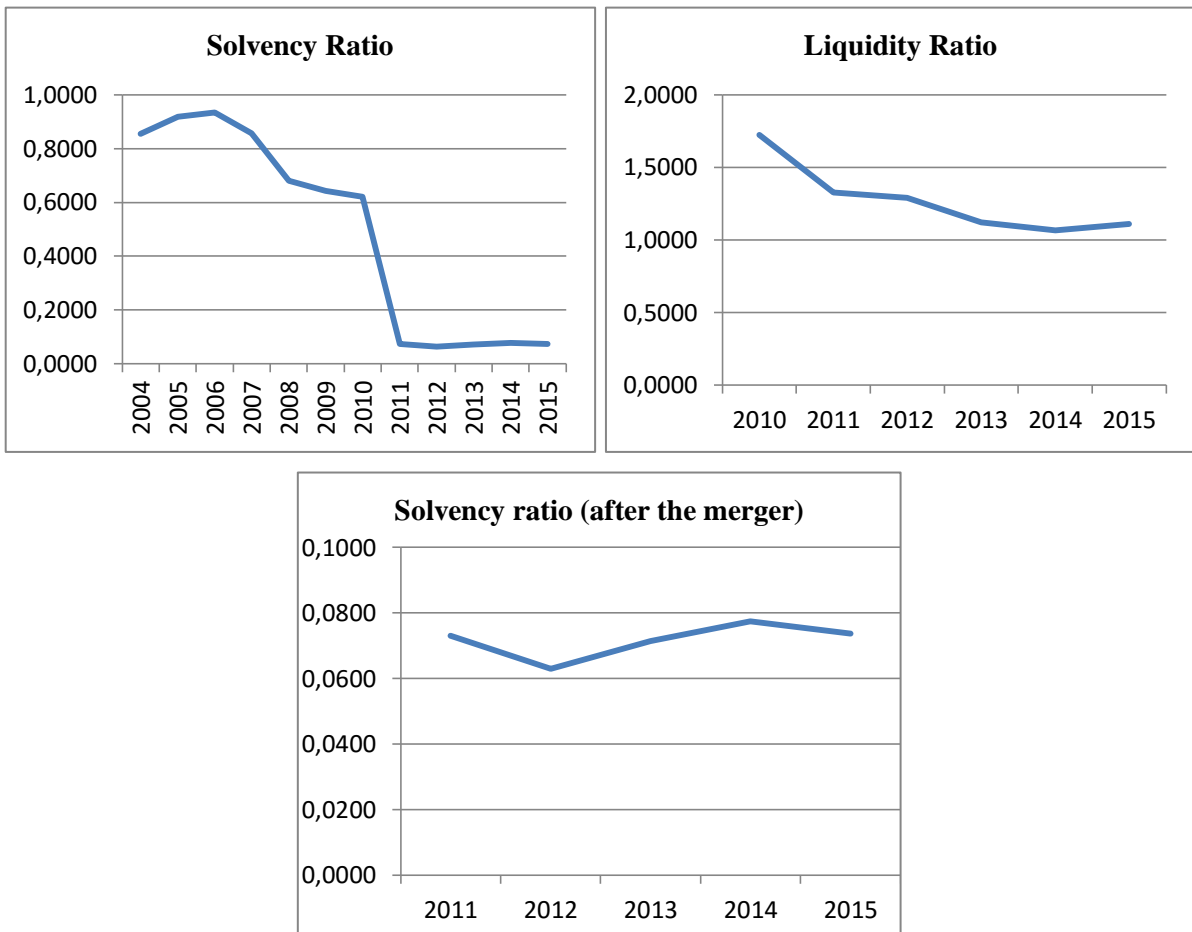
Figure 2.24 – Evolution of ratios measuring the weight on real estate investment in Caixa Bank



This figure represents the evolution of two ratios measuring the weight that real-estate investment has in the balance of Caixa Bank. The left figure shows the ratio between the real estate investments over the total value of assets. The right figure displays the ratio between the real estate investments over the value of equity.

The solvency and liquidity ratios of Caixa Bank are not as good as Santander and BBVA, its solvency ratio has dropped considerably, but due to the expansions it is hard to illustrate all these years together. From 2011-2015 it has remained relatively stable. Its liquidity ratio was very high in 2010 and it has dropped considerably, but it is still too high and a value below 1, would be optimal. Overall we can say that Caixa bank has grown very fast and had some ups and downs. It has a rather large weight of investments in the real-estate sector and its financial performance although not as bad as Bankia it is not on the same level as that of Santander and its solvency and liquidity are not optimal.

Figure 2.25 – Evolution of liquidity and solvency ratios of Caixa Bank



This figure represents the evolution of two ratios measuring the capacity of Caixa bank to meet its long-term (solvency) and short-term (liquidity) financial obligations. These ratios are computed as the ratio assets over total equity and credits over deposits respectively. We have illustrated the solvency ratio twice to clearly show the evolution of the solvency ratio since 2011 (after the merger of several Cajas).

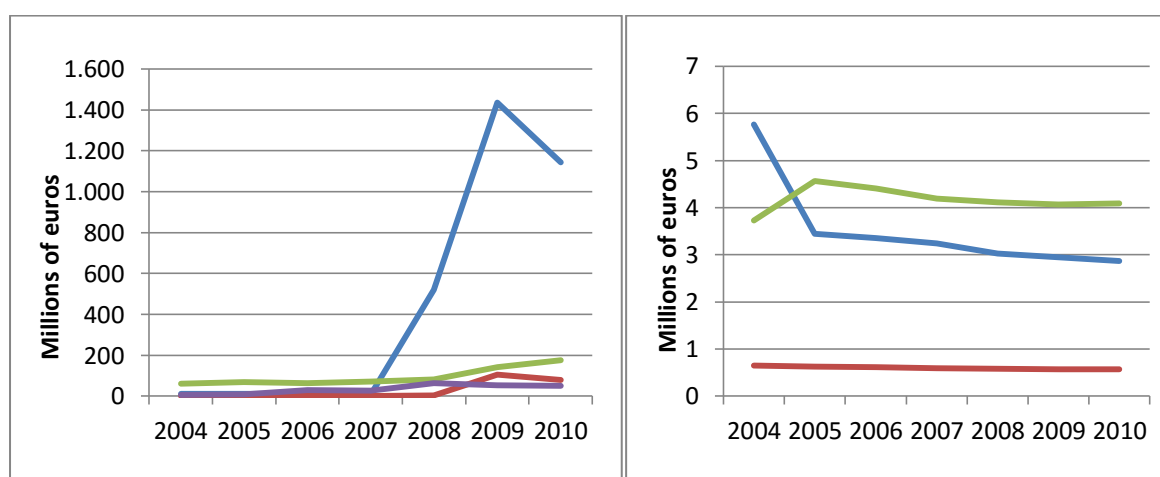
Cajas prior to their merger

Now after having described these banks we want to analyse the cajas before they merged into Caixa Bank and Bankia. . One of the hypothesis discussed in the introduction was that the construction/real-estate sector was the primary destination of financing by most financial institutions. Cajas are usually blamed to have fueled this housing bubble given the role played during the years of inflating the bubble. Next we analyse what has been the direct investment in the real-estate market of several cajas (more specifically the ones who ended up in big problems) and see if there has been any difference compared to the successful financial institutions.

Cajas that formed Bankia

As can be seen in figure 2.26 the cajas that formed Bankia are very diverse in size. For example some cajas only invested a few millions in the real-estate sector per year while the caja of Madrid invested more than 1.4 billion euros in the real-estate sector in 2009. Santander only invested 2 million in the real-estate sector in that year. Santander did not invest a lot of money directly in the real-estate sector as even small cajas such as Bancaja were investing more per year in the real-estate sector than Santander. We made various graphs to show the data more clearly.

Figure 2.26 – Evolution of real-estate investments of the Cajas that formed Bankia

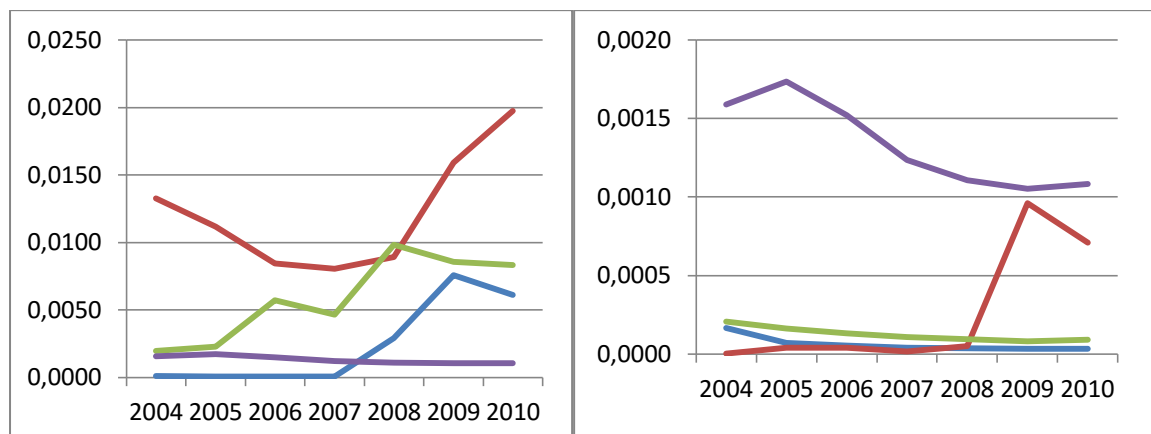


This figure shows the investment of the cajas in real-estate assets expressed in millions of euros. In the left figure we can see the evolution of the total real-estate investment in Caja Madrid (blue line), Caja Canarias (red line), Caja Laietana (green line) and Caja Segovia (purple line). In the right figure it is shown the evolution of the total real-estate investment in Bancaja (blue line), Caja Avila (red line) and Caja La Rioja (green line).

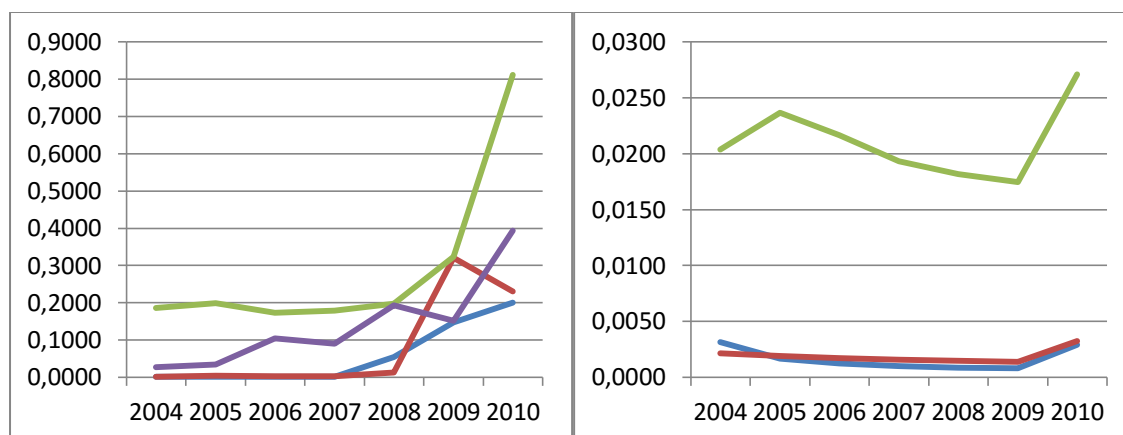
When looking at the weight of these investments in figure 2.27 you can observe that these values are ridiculously high compared to commercial banks such as Santander and BBVA. The cajas were very profitable before the housing bubble burst, but these figures clearly show that these cajas did not properly diversify their investments and that they invested extreme amounts in the real-estate market and eventually paid the price for these high-risk, high return investments. For most Cajas the percentage of its assets invested directly in the real estate market is close to 1%. And even more worrisome, the weight of these direct investments in the real estate market represents a much higher percentage of the financial institution's equity (in some cases such as Caja Laietana or Caja Segovia accounting for the 80% or 40% of the total equity).

Figure 2.27 – Evolution of ratios measuring the weight on real estate investment of the cajas that formed Bankia

Real-estate investments divided by total assets



Real-estate investments divided by total equity



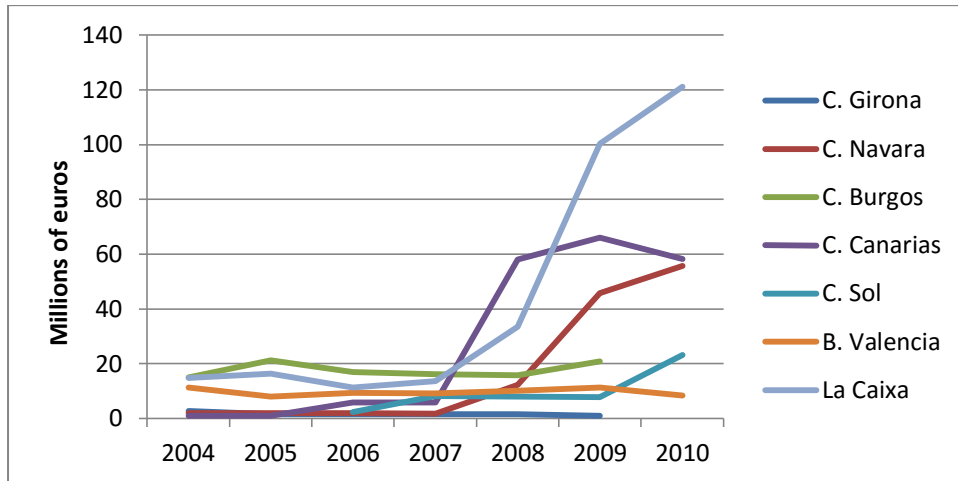
This figure represents the evolution of two ratios measuring the weight that real-estate investment has in the balances of the cajas that formed Bankia. The two figures at the top show the ratio between the real estate investments over the total value of assets. The two figures at the bottom display the ratio between the real estate investments over the value of equity. In the left figures it is plotted Caja Madrid (blue line), Caja Canarias (red line), Caja Laietana (green line) and Caja Segovia (purple line). In the right figures it is shown Bancaja (blue line), Caja Avila (red line) and Caja La Rioja (green line).

Cajas that formed Caixa Bank

Now we will analyse the cajas that merged with or were acquired by the Caixa bank. Figure 2.28 shows us the evolution of the total amount of real-estate investments by the cajas. In this figure you can clearly see that the majority of these cajas had very steep increases

between 2007 and 2010. Also the absolute amounts were very high compared to banks such as Santander. This is remarkable as the global crisis started in 2007-2008.

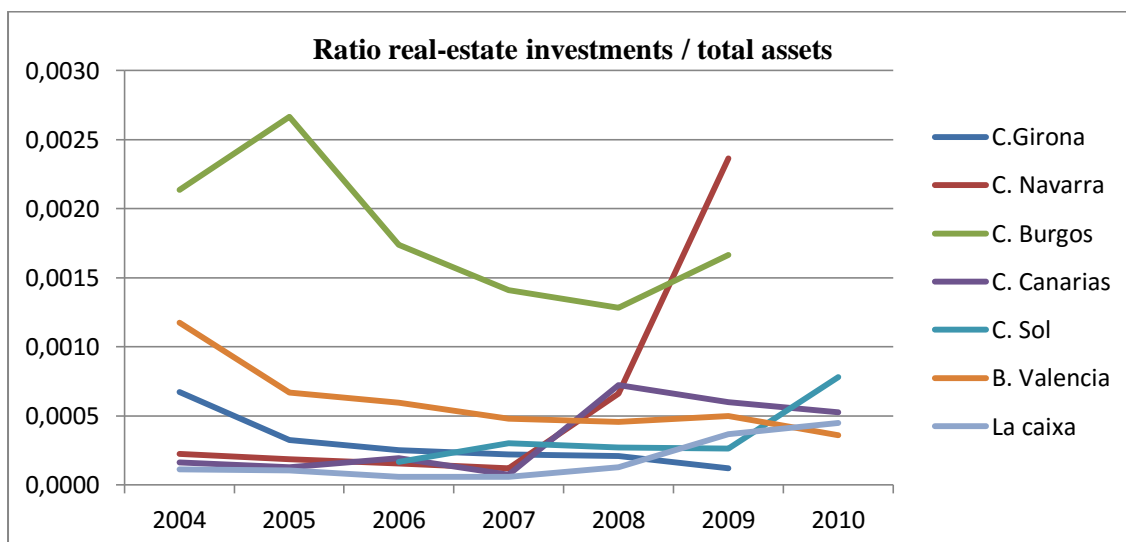
Figure 2.28 – Evolution of real-estate investments of the Cajas that formed Caixa Bank

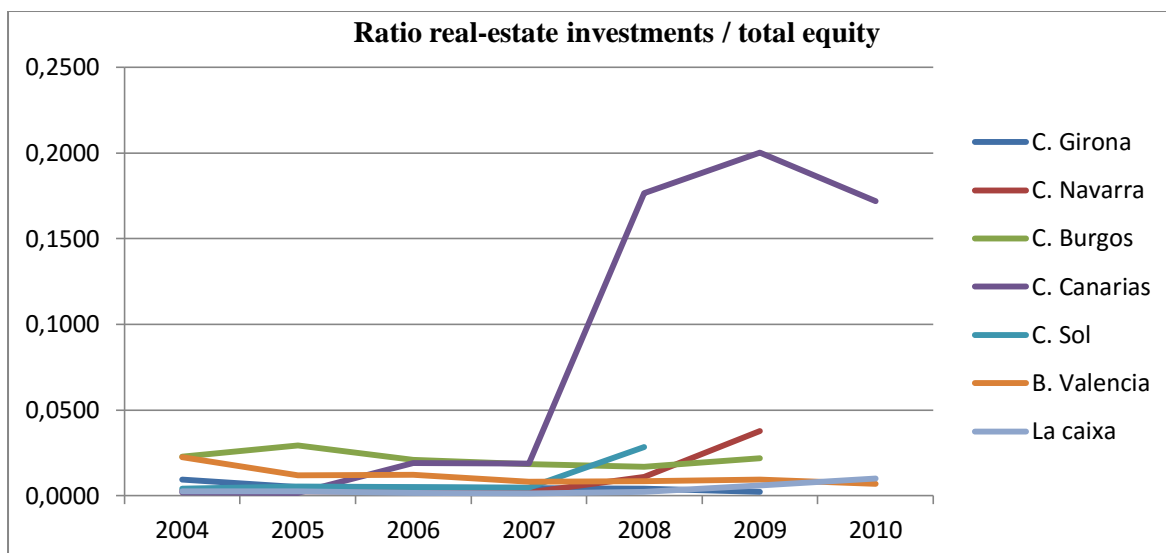


This figure shows the investment of the cajas that formed la caixa in real-estate assets expressed in millions of euros.

It is also important to look at the weight of the investments of these cajas to put these investments into perspective. From figure 2.29 it becomes clear the also the weight of investments have had large variations and increases. Comparing these weights to those of Santander and BBVA you can clearly see that these cajas were both absolutely and relatively investing significantly more in the real-estate sector than these two large commercial banks.

Figure 2.29 – Evolution of ratios measuring the weight on real estate investment in the Cajas that formed Caixa Bank





This figure represents the evolution of two ratios measuring the weight that real-estate investment has in the balance of the cajas that formed Caixa bank. The top figure shows the ratio between the real estate investments over the total value of assets. The bottom figure displays the ratio between the real estate investments over the value of equity.

For most of the Cajas forming Caixabank, the relative weight of this direct investment in the real-estate market reached unreasonable levels. The percentage of its assets invested directly in the real estate market is close to 0.1%. And even more worrisome, the weight of these direct investments in the real estate market represents a much higher percentage of the financial institution's equity (in cases such as Caja Canarias accounting for the 20% of the total equity).

Conclusion

Now we would like to conclude our paper and answer the question that we posed in the introduction.

“What investment tendencies in the Spanish real-estate sector existed in the period of 2004-2014 among Spanish Banks and how are these related to the Spanish Financial crisis?”

Our literature review clearly shows that the global financial crisis was caused by a series of excesses both on the demand and supply side had no direct impact on the Spanish banks, because generally speaking these institutions did not invest in the American mortgage securities like many other banks. However the global financial crisis did seem to have accelerated the events that led to the Spanish financial crisis as it eventually caused liquidity

restrictions in the wholesale banking market from which many cajas got their credit to invest in the real-estate / construction sector.

The Spanish financial crisis as was argued by Royo (2009) was caused by two main disequilibria among other factors. These two disequilibria are respectively unsustainable growth of the real-estate/construction sector and excessive consumption. According to Royo (2009) these disequilibria have been driven by low interest rates and thus credits. Another notable factor that contributed to the Spanish financial crisis according to Royo (2009) was the declining economic productivity. We had to be specific in this paper and that is why we have only focused on the investments in the real-estate market. We chose this variable because in 2008 it represented 172% of the Spanish GDP as stated by Zurita (2014).

To research the role the investments in the real-estate market played, we analysed both the investment tendencies as well as the financial performance of several Spanish financial institutions. We will quickly discuss the tendencies that we have discovered for each bank before giving our final conclusive statement.

Santander performed excellently in the period of 2004-2015 it did not invest a lot in the real-estate sector, although it recently has started to invest more in this sector. Santander's financial performance was excellent as it made a profit every year and both its credit and liquidity ratios are outstanding.

BBVA performed well in the period of 2004-2014. It did not invest a lot in the real-estate sector either and it is continuing to invest less and less in this market. We believe that the bank perceives the real-estate market as too risky. BBVA's financial performance was good, it had a difficult year in 2013 but overall it was a good performance and its solvency and liquidity are good and stable.

Caixa Ontiyent is an exception among the cajas and has had great performance. It did not invest as much in the real-estate market as many other cajas, it has been profitable from 2004-2015 and its liquidity and solvency ratios are good.

Bankia had two dramatic years in 2011 and 2012; it is formed by a merger of several cajas that have invested excessively in the real-estate market prior to 2010. As a result the bank has a lot of toxic assets. Bankia's financial performance has not been great, but it seems to be slowly improving. However, its investments in the real-estate sector are increasing again so it is not clear if the bank has learned from its past mistakes. Its liquidity and solvency ratios are not on the same level as its peers and its liquidity ratio could indicate liquidity problems in the future despite the fact that it has been slowly improving in the last years.

Overall we can say that Caixa bank has grown very fast and had some ups and downs it has a rather large weight of investments in the real-estate sector and its financial performance although not as bad as Bankia it is not on the same level as that of Santander and its solvency and liquidity are not optimal. Its real-estate investments have suddenly dropped in 2015 which could either indicate that the bank is experiencing problems or is perceiving the real-estate market as not profitable.

The cajas that formed Bankia and Caixa were very varied in nature but the majority of them had a large weight of investments in the real-estate market. Also a large amount of cajas drastically increased the amount of investments in the real-estate market in the period of 2007-2010 which eventually led to their inevitable downfall when the liquidity restrictions emerged.

Overall the total amount of direct real-estate investments and indirect investments such as mortgage loans seem to have declined in the recent years, which could be seen as general tendency that is possibly caused by both demand and supply side factors such as an increased perceived risk by both clients and banks and the revision of mortgage criterias.

Our data shows us that banks such as Santander and BBVA invested a lot less in the real-estate market than many of the Cajas. Surely investing in the real-estate market has been very profitable as large profits have been made prior to 2010, but these profits were the result of unsustainable investments in the real-estate market financed mainly by credits. When these credits suddenly became less available due to liquidity restrictions many cajas experienced serious financial problems and interventions were necessary. We have learned from our research that investing in the real-estate market can be a risky endeavour especially if credits are used to finance these investments. Furthermore, we have learned that the global and Spanish financial crises although different and although the global financial crisis did not affect the Spanish financial system directly it has most likely accelerated the events that led to the downfall of many Spanish financial institutions.

We would like to reply to our research question with the following answer: Several investment tendencies existed in the period of 2004-2015. Large commercial banks such as Santander and BBVA invested relatively little in the real-estate market while cajas like the Caja Madrid invested billions of euros directly into the real-estate sector. These investments mainly financed by credits appear to be directly related to the Spanish financial crisis as they inflated the house prices. Consequently when the liquidity restrictions that were caused by the global financial crisis emerged, the housing bubble burst many Spanish banks as well as families suffered severe and direct financial consequences.

Regarding the tendencies of today and the future it is likely that some banks will continue to invest large amounts in the real-estate sector as it concerns high risk, high return investments. While other banks such as BBVA perceive the real-estate market as too risky and prefer not to invest large amounts of money in this sector. However, we hope that financial institutions have learned from these investments and will invest in a more sustainable way.

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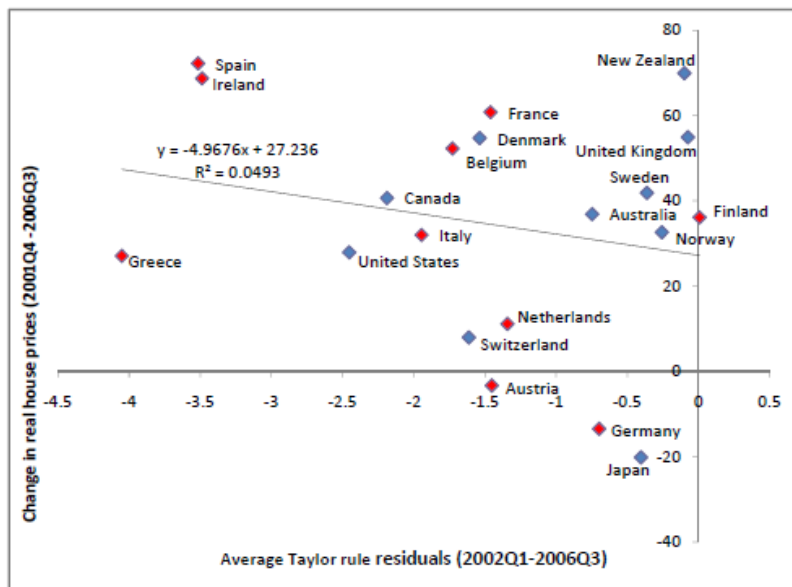
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Appendix

A1:

Figure 12: Monetary Policy and House Prices in the Advanced Economies



Source: IMF (2009)

A2.

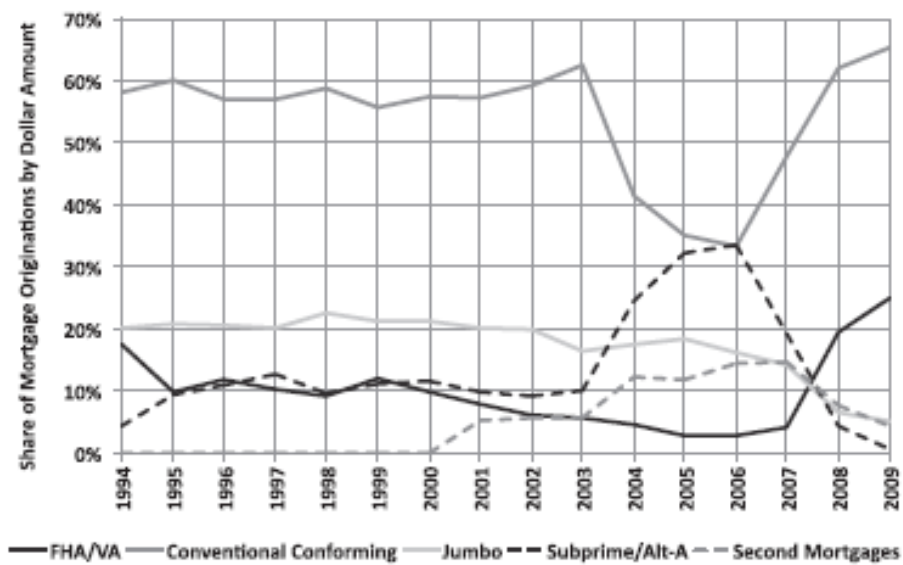


Figure 5. Origination Volume by Mortgage Type, 1990–2009⁵⁸

A3.

Tabla 1
Evolución crédito OSR. €mn

	2000	2001	2002	2003	2004	2005	2006	2007	2008	TAMI
PIB, precios corrientes	629.907	680.397	729.258	783.082	841.294	909.298	985.547	1.053.161	1.087.749	7%
Crédito OSR	559.407	624.854	701.663	802.212	945.697	1.202.617	1.508.626	1.760.213	1.869.882	16%
% del PIB	89%	92%	96%	102%	112%	132%	153%	167%	172%	
Del que:										
Adquisición de vivienda	169.280	197.192	224.830	263.192	317.268	426.954	523.595	595.929	626.620	18%
% del PIB	27%	29%	31%	34%	38%	47%	53%	57%	58%	
Construcción	42.627	46.412	57.376	65.784	78.372	100.761	134.317	153.453	151.848	17%
% del PIB	7%	7%	8%	8%	9%	11%	14%	15%	14%	
Actividades inmobiliarias	33.559	41.840	55.031	77.980	112.165	162.087	244.050	303.514	318.032	32%
% del PIB	5%	6%	8%	10%	13%	18%	25%	29%	29%	

Fuente: INE y Banco de España

A4.

EVOLUCIÓN DEL PRECIO DE LA VIVIENDA. ÍNDICE GENERAL Y VARIACIÓN INTERANUAL. ESPAÑA

Fuente: ST, Sociedad de Tasación.

