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# ERASMUS MUNDUS MASTER QEM Models and Methods of Quantitative Economics

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# Italian Bank Funding: Determinants of Bank Bond Spread

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## **Academic Year**

**2013 / 2014**



Thanks to Prof. Rigoni, Prof. Cavezzali and Dr. Veller for the opportunity to work with them.

Thanks to my family and my friends for their encouragements to pursue my goals.

Thanks to Carlo for his important support.



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## **EXECUTIVE SUMMARY**

The aim of this study is to investigate whether bank specific accounting variables could explain the variability of both fixed and floating rate bond spread. Thereafter, a deeper analysis is conducted by testing the effect that these accounting variables could have on bond spread over time, comparing the subprime crisis with the sovereign debt crisis.

Before proceeding with the empirical analysis, for a more detailed understanding of the role played by bonds in financing Italian bank, a detailed research on the main effects of the crisis on the structure of banking systems is provided in Chapter 1, first studying the case of Europe and then focusing on Italy's case. This analysis is considered of fundamental importance in understanding the particular economic and historical period under analysis.

In this respect, Paragraph 1.1 describes the trends in the Eurozone bank funding in the period 2005-2013. The explosion of the financial crisis in summer 2007 to which followed the Lehman Brothers crash the year after, triggered one of the worst crisis in the last century that spread in a very short term, affecting the main advanced economies and becoming global soon. This difficult economic framework sets the basis for the onset of the sovereign debt crisis in 2010, which had and is still having its main core in Europe. In this respect, the European banking system suffered a period of high stress and difficult access to funding sources, especially concerning peripheral countries (such as Greece, Ireland, Portugal, Spain and Italy). On the whole, five main categories have been hit: interbank funding, customer funding, debt securities, central bank funding and bank capital. Specifically, interbank liabilities reduced progressively after the third quarter of 2008. On the other hand, banks increased their operations in the domestic interbank market, likely due to a fear of contagion strengthened then by the outbreak of the sovereign debt crisis. In this context, unsecured borrowing and lending operations also fell, partially balanced by a raise in the secured market operations.

The negative effects of the financial crisis on the wholesale market favoured the trend towards long, stable, retail source of funding. In this respect, from 2008 onwards, deposits from ordinary clientele increased with respect to total assets if compared to the pre-crisis situation. Moreover, in line with the trend in the interbank market, also domestic deposits from ordinary clientele rose, indicating once again the increased tendency to prefer the internal market, considered safer in a period characterized by high credit risk and liquidity concerns. In this context, debt securities issue to total assets reduced from 2007 onwards and no significant signs of interruption are reported. In line with the trend to stabilize funding sources, long-term debt securities to total issue increased of roughly 6 per cent in the period 2005-2013. In addition, the outstanding amount of secured bonds such as covered bonds raised, while on the contrary unsecured bonds fell. To partially solve the difficult access to funding sources, several Eurozone countries issued government guaranteed bonds after 2008, although their issue decreased successively.

In this period characterized by high liquidity stress and difficult access to funding source, the European Central Bank provided two Longer Term Refinancing Operations (LTROs) with three-year maturity. These additional and non-standard monetary transactions helped Eurozone banks to meet their debt obligations and liquidity needs, especially for peripheral countries, heavily affected by the crisis. Concerning then bank capital, data reveals that from mid-2009 capital and reserves of Eurozone banks increased progressively, anticipating to some extent the issue of Basel III document in 2010 that imposed new minimum liquidity and capital requirements.

In this framework, Italy is an interesting case to analyse because the subprime crisis (first phase of the crisis) and the sovereign debt crisis (second phase of the crisis) affected it in two completely different ways. As reported in Paragraph 1.2, Italian banks remained almost profitable during the first phase of the crisis compared to the average Eurozone countries. This was supported by a traditional, home-based business model founded on retail funding, with strong national roots and low exposure to high-risk financial transactions. However, those factors that sustained the Italian banking system during the subprime crisis turned to be elements of vulnerability during the sovereign debt crisis. Overall, the Italian economy fell into recession, heavily affecting the banking system. The quality of the assets deteriorated, loans were reduced and access to liquidity sources became onerous and difficult. In addition, new capital requirements were imposed first by EBA (European Banking Authority) to the largest Italian bank and then strengthened by the issue of the Basel III document in 2010.

Analysing the balance sheet components of Italian banks during 2005-2013, two main facts come out. First, they mainly finance through direct fundraising, i.e. deposits and bonds that stand for almost 70 per cent of total liabilities. Second, on the asset side, loans represent roughly 60 per cent of total assets, despite those to MFIs reduced sensibly after 2009.

To investigate the bank ability to collect funds and practising the lending activating, the funding gap is computed in Paragraph 1.2.3. This latter is defined as the absolute difference between loans and deposits to ordinary clientele. It is reported that the Italian funding gap decreased progressively from 2007 onwards, reaching the lowest levels, both in absolute value and in percentage of total loans, during the second phase of the crisis. However these facts were only the results of a weak economy that was suffering the effects of the crisis. In line with this, the growth rate of both deposits and loans to ordinary clientele suffered significant, negative trends, especially during the second phase. In this context, bond issue to retail clientele became an important funding source for banks that helped them to sustain the amounts of loans granted, maintaining them profitable, especially during the first phase of the crisis. On the whole, bond issues increased progressively in the whole 2005-2006 period and no signs of interruption in this trend are reported, although the raise in funding costs made bond issue particularly onerous. Moreover, what makes bond funding of particular importance for Italian banks, is the fact that the percentage of bond issue (to total asset) of Italian banks is significantly higher compared to those of the average Eurozone banks in the whole period 2005-2006. Hence, analysing

the determinants of Italian bank bonds appears of great relevance to better understand the dynamics of bank funding system and to some extent, the behaviour and perceptions of investors in the bond market.

Finally, Chapter 2 describes the empirical analysis. In this regard, a brief review of the related literature is included. The first studies to analyse this topic focus on the relationship between subordinated notes and debentures (SND) and bank risk measures on the U.S. market and they date back to the 80s. However, up to 90s, no statistically significant relationship was found (for instance Avery et al. (1988), Gordon and Santomero (1990)). Thereafter, as the protection policies on SND investors changed significantly in 1989 on the U.S market, exposing bondholders to the risk to lose their money, the role of the market discipline became relevant and several researches analysed it: Flannery and Sorescu (1996), Jagtiani et al. (1999), De Young et al. (2001), Covitz et al. (2004) and Andrea Sironi (2003), this latter unlike the other concerns the European market.

Concentrating then on more recent studies regarding the European market (second group), the onset of the sovereign debt crisis made the analysis of senior bonds and long term funding (and not only SND) particularly relevant as bondholders in this particular historical context were not protected by government guaranteed and they could therefore incur in losses. To this regards, the main studies are the following ones: Albertazzi et al. (2012), Levy and Zaghini (2010), Cardillo and Zaghini (2012). The first group of studies based on the role of market discipline on SND and the second of group that no longer focuses only on SND but also on bonds and long term funding, represent the two main strands of the related literature, that is described in details in Paragraph 2.1.

For the purpose of this analysis, two databases have been constructed, the first concerning bond issues between 2006 and 2013, and the second concerning specific accounting data of the issuing banks. As a final step, these two databases are matched according to a time-criterion described in Paragraph 2.4. The final matched dataset object of this study is then analysed, first descriptively and then inferentially. In this respect, it is important to stress that in this model, new bank specific variables (which, as far as is known, have never been considered by prior studies) have been added to the standard accounting variables. In particular, these variables concern 4 main categories of bank risk: profitability, asset quality, leverage and liquidity.

Finally, the inferential analysis shows that bank accounting variables affect bond spread, partially confirming the intuitions and some of the expectations. In particular, profitability and assets quality proxies appear to be more significant in pricing bond spread, especially fix rated ones. Moreover, the temporal analysis shows interesting results that could be useful to assess first trends of these bank specific accounting variables. However, the empirical evidence suggests implementing further investigations and new analysis in order to enhance prior literature results and to develop further research ideas. Detailed information on this are reported in the concluding paragraph (Paragraph 2.8).

## **CHAPTER 1: BANK FUNDING**

### **1.1 THE RECENT TREND IN THE EUROZONE BANK FUNDING**

#### **1.1.1 INTRODUCTION**

The structure of European bank funding has been subject to important and significant changes during the recent financial crisis. In the years before the crisis erupted, the Eurozone was experiencing a prosperous and stable period characterized by high growth levels. However, in summer 2007 the U.S. subprime market deteriorated significantly, interest rates rose sharply and subprime mortgage holders became unable to repay their loans, causing strong impacts on the banking sector, especially for highly leveraged banks. Banks' overreliance on this unstable and low credit quality source of investment triggered one of the most terrible crises of the last century.

The subprime mortgage crisis spread rapidly affecting banks' short-term wholesale funding: credit risk, high financial leverage and the search for liquidity became central problems for banks, even for those that were considered until that period "too big to fail" as they could benefit from government guarantees in case of financial necessity. This is the case with Lehman Brothers investment bank that declared bankruptcy in October 2008: this date represents an important turning point as the crisis started significantly to affect other countries, leading to a recession that began in the U.S. economy but then became global with particular and significant repercussions on the European bank funding costs. This is particularly evident in Graph 1 that highlights the sharp decrease in the liquidity of the European banking system, especially in the money market, after the third quarter of 2008 although some slighter effects had already been observed since 2007. Another important episode of market stress, evident in the Chart, took place in the first quarter of 2010: in this period, the Greek government characterized by a weak economy, high structural deficit and debt levels was subject to strong insolvency problems that caused the sharp downgrade of its government bonds, classified by rating agencies as "junk" in April 2010. The spread between the yield of Greek government bonds relative to the yield of German bonds, defined as risk-free, increased dramatically, spreading the fear of contagion between Eurozone countries and triggering the beginning of the sovereign debt crisis. Thereafter, as a chain effect, the sovereign debt crisis hit other peripheral countries more vulnerable and exposed to the Greek government-debt crisis due to their weak economy and unstable government such as Portugal, Spain and Italy.

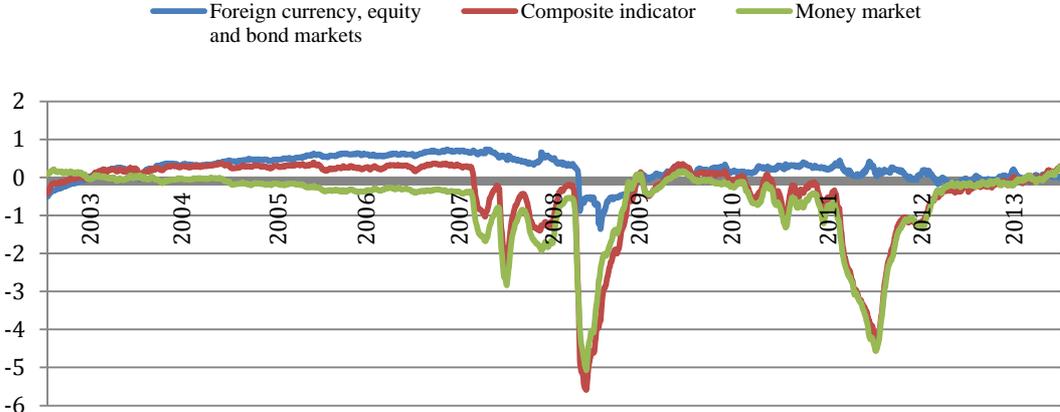
The sovereign debt crisis had important repercussions on the European banking system for three main reasons: first, several banks held government treasury bonds on their balance sheet exposing them to the risk of sovereign down-rating. Second, government bonds were often used as collateral for financial transactions by banks, so that the collateral value reduced when the government creditworthiness decreased and third, thanks to the high interconnections between sovereign spread

and bank CDS demonstrated by historical data (Rixtel and Gasperini, 2013), the government rating had a direct effect on the funding cost for banks.

As the sovereign debt crisis deepened in summer 2011 (spreading to Spain and Italy), access to short and long term resources became challenging even for highly rated banks and the banking system suffered a period of tension and stress (see Graph 1).

In this historical framework, as already mentioned at the beginning of the paragraph, the Eurozone bank funding structure changed significantly from the pre-crisis period, affecting five main categories: interbank funding, customer funding, debt securities, central bank funding and capital.

**Graph 1. Euro Area Financial Market Liquidity Indicator**



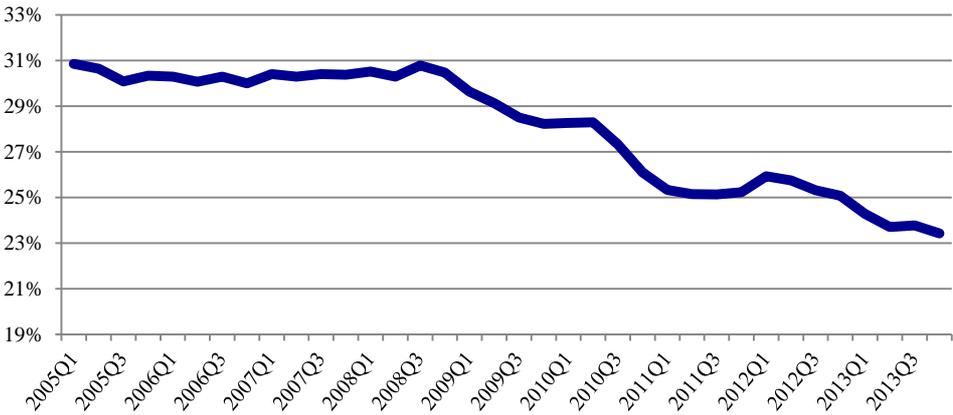
Source: European Central Bank -Statistical Data Warehouse-

### 1.1.2 INTERBANK FUNDING

The interbank funding market was the first funding category hit by the financial crisis. In the pre-crisis period, banks were able to finance their operations in the interbank market at favourable Euribor<sup>1</sup> rates close to the Overnight Index Swap. However, at the outbreak of the subprime mortgage crisis, the spread between these two rates increased sharply, raising bank funding costs and therefore reducing interbank market operations. This framework of market tension and stress was clearly evident in the liabilities of banks' balance sheets in the Eurozone. Graph 2 describes the behaviour of interbank liabilities<sup>2</sup> to total assets for Monetary Financial Institutions (MFIs)<sup>3</sup> resident in the Eurozone in the period 2005 to 2013. As expected, after a period characterised by a stable level of interbank liabilities at around 30 per cent, the percentage decreased steadily from the third quarter of 2008 until the fourth quarter of 2010 when the decline in the ratio stopped for almost two years before resuming. Note that there has been a significant difference in the percentage of interbank liabilities since 2008, no longer reaching the pre-crisis levels.

Despite this decreasing trend in the interbank market as a whole, the uncertainty about the counterparty's solvency, caused by the credit risk concerns after the outbreak of the crisis and the fear of contagion, triggered mainly by the beginning of the sovereign debt crisis, led banks to increase the interbank funding operations inside their country, producing a sort of "home bias". Graph 2 represents the ratio of domestic interbank liabilities for Eurozone banks in relation to total assets: the ratio decreased steadily from the beginning of 2005 until the second quarter of 2007, suggesting an increasing integration with non-domestic markets. It then remained stable with a small peak in the end of 2007 before increasing sharply from the third quarter of 2008 when the Lehman Brothers

**Graph 2. Interbank liabilities to total assets**



Source: Processing of European Central Bank -Statistical Data Warehouse-

<sup>1</sup> Euro Interbank Offered Rate.

<sup>2</sup> Interbank liabilities are defined as deposit from MFIs, Eurozone counterpart.

<sup>3</sup> The Eurosystem is excluded from MFIs.

investment bank crashed. Moreover, after the deepening of the sovereign debt crisis in summer 2011, the percentage of domestic interbank liabilities to total assets increased progressively after a downtrend period, probably caused by the concern of contagion due to sovereign debt risk.

In line with banks' credit risk aversion and the liquidity tensions in the money market, unsecured borrowing and lending decreased substantially after 2008, suggesting a preference for more stable and secured sources of funding. In the unsecured borrowing market, the average daily productivity level in 2010 halved from the level in 2007, revealing a dramatic change in the banks' business model (see Chart 3 European Central Bank, 2012a). By contrast, in the unsecured lending market, the decrease in the daily average productivity became less strong and the overnight unsecured lending remained almost unchanged from the pre-crisis period, probably related to the preference for transactions characterised by low credit risk exposure (see Graph A.3 European Central Bank, 2012a). Note that, the decline in the unsecured market was partially compensated by an increase in secured market operations.

**Graph 3. Domestic Interbank liabilities in total assets**



Source: Processing of European Central Bank -Statistical Data Warehouse-

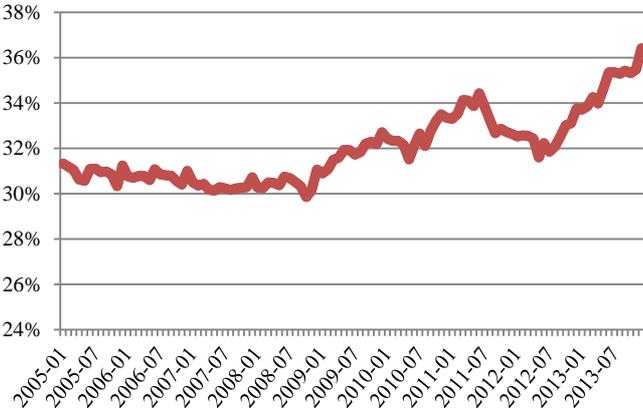
**1.1.3 CUSTOMER FUNDING**

The outbreak of the subprime crisis had significant and negative consequences on the wholesale market: the high wholesale funding costs led to a change in the banks’ funding structure into more stable and durable source of funding such as retail deposits, long-term funding and equity. This tendency was then emphasised by the Basel III document developed by the Basel Committee on Banking Supervision that required banks to satisfy new minimum requirements in terms of both capital and liquidity, with the aim of improving their ability to face economic shocks and market stress without experiencing financial difficulties. Graph 4 shows the trend in the ratio between non-bank deposit liabilities<sup>4</sup> and total assets for Eurozone MFIs (excluding Eurosystems) between 2005 and 2013: after a slight decline, the ratio increased progressively from the third quarter of 2008 reaching 34 per cent in the second quarter of 2011. The percentage of non-bank deposits then decreased until the second quarter of 2012 before starting to rise again. The cause for this decline can be explained by the fact that, as the sovereign debt crisis deepened, several banks in the peripheral countries suffered from “bank run”, namely the sudden large-scale withdrawals from banks because of perceived bank insolvency risk or simply as a precaution caused by the difficult economic situation. Nevertheless, the outflow was not particularly consistent since the percentage of deposit remained above the pre-crisis levels.

As it is evident from Graph 5, domestic non-bank liabilities represent a considerable fraction of total liabilities and this fact is consistent with the tendency of banks towards domestic funding discussed in the previous paragraph.

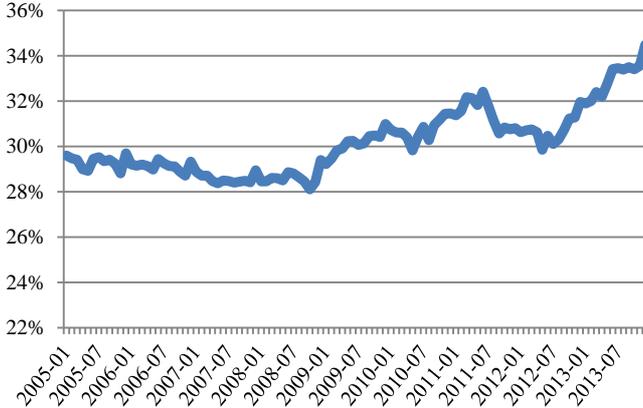
Retail funding through deposit is an important and stable source of funding and its costs are reflected by the interest rates paid by banks to households and non-financial institutions. As a result of

**Graph 4. Non-bank deposit liabilities in total assets**



Source: Processing of European Central Bank -Statistical Data Warehouse-

**Graph 5. Domestic non-bank deposit liabilities to total assets**



Source: Processing of European Central Bank - Statistical Data Warehouse-

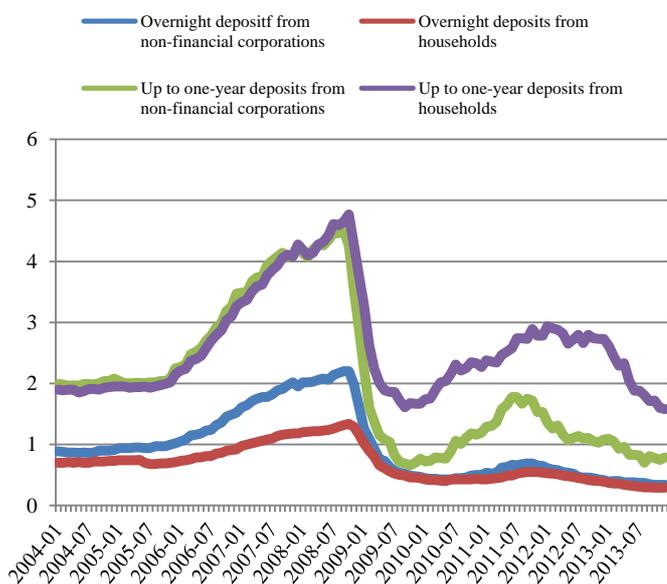
<sup>4</sup> Non bank-deposit liabilities are considered deposits from non-MFIs.

the monetary policies adopted, deposit interest rates started to increase progressively from the end of 2005 reaching the peak of 4.77 per cent for term deposit in the third quarter of 2008 (see Graph 6). Thereafter, as the crisis strongly impacted the wholesale market, banks moved to retail funding so that interest rates declined until the third quarter of 2009.

Graph 7 shows the spread of deposit interest rates with respect to their reference rate, this latter is defined for overnight funding as the Eonia rate (Euro Overnight Index Average) while for term funding as the 3-month Euribor rate (Euro Interbank Offered Rate). It appears evident that, while the percentage of deposits' interest rate increased from late 2005, the spread of deposit fell reaching the lowest value (especially for households overnight deposits) when Lehman Brothers collapsed. This highlights the strong stress suffered by banks in the interbank market. Indeed, the increase in the interest rate on deposits was completely absorbed by the higher increase in the Eonia and 3-month Euribor rates.

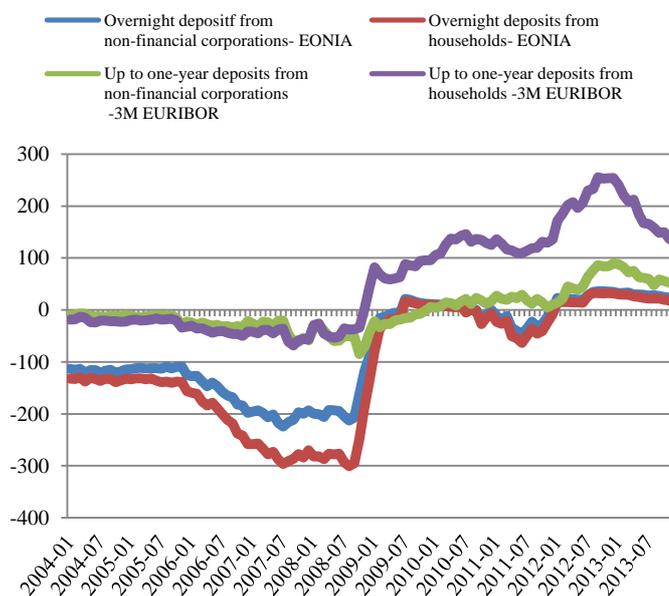
In addition, Graph 6 shows that, while in the pre-crisis period term deposit from non-financial corporations and households were almost at the same level, in the post-crisis period they differentiated substantially, suggesting an increased competition in the retail market.

**Graph 6. Eurozone average rates of deposits held at banks in the Eurozone (%)**



Source: European Central Bank -Statistical Data Warehouse-

**Graph 7. Eurozone spread of deposits held at banks over money market rates (%)**



Source: European Central Bank -Statistical Data Warehouse-

### 1.1.4 DEBT SECURITIES

The financing structure of debt securities (see Chart 17 for type and composition, European Central Bank, 2012a) changed considerably from the pre-crisis period, becoming highly segmented across Eurozone countries. This segmentation intensified as the sovereign debt crisis deepened between April and July 2011, spreading to Italy and Spain, and in the second quarter of 2012, this latter period was especially difficult for the Spanish market that suffered a period of high market tension. In this framework, gross bond issuance decreased substantially from 2008 onwards and the strongest effects hit the bond market of Greece, Ireland Portugal and afterwards those of Italy and Spain, although for the latter countries the effect was less strong. Subsequently, even the core European countries like German and France, characterized by a strong economy, were partially affected by this trend and therefore, on the whole, the ratio of bond issuance to total assets decreased substantially on the average for Eurozone banks. This decreasing trend (see Graph 8) started before the outbreak of the U.S. subprime crisis and it reached a negative peak of 15 per cent in the third quarter of 2008. In the following years the percentage increased marginally before decreasing progressively until the end of 2013, without evident signs of interruption. In addition to this negative trend, also the composition and type of bonds changed from the pre-crisis period, especially for those countries most affected by the crisis. Indeed, banks moved to more stable and secured source of funding. As it appears evident from Graph 9, after a downtrend period, probably reflected by an increase of short-term wholesale funding, the ratio of long-term bonds to total bonds increased substantially from the beginning of 2009 and the amount of long-term debt securities accounted for the largest proportion of total debt securities. Note that, from the beginning of 2009 to the end of 2013, the percentage of long-term bonds increased of almost 6 per cent while the percentage of total debt

**Graph 8. Debt securities to total asset**



Source: Processing of European Central Bank -Statistical Data Warehouse-

**Graph 9. Long-term debt securities to total debt securities**



Source: Processing of European Central Bank -Statistical Data Warehouse-

securities in total assets decreased of around 1 per cent. In this context, also the amount of secured debt securities (such as covered bonds) increased significantly, especially for peripheral countries since their access to unsecured market was particularly arduous when the crisis intensified. This new bank funding structure, more oriented to stable and secured sources of funding as covered bonds whose issue increased from 2008, together with the loss of confidence that characterized bond investors, decreased the amount of unsecured bond issuance due to a lack of demand.

The difficulty of banks to access to funding sources after the onset of the financial crisis, led to the introduction of governments guaranteed schemes by some Eurozone countries, in order to help banks to satisfy their liquidity needs. Government guaranteed bonds were first issued on the bond market in the period 2008-2009 and became an important source of funding for banks, revealing their efficiency in sustaining bank funding. Thereafter, when the crisis deepened in 2011, they were reintroduced, however their relevance in the bond market reduced successively and in the end of 2012 only low amounts of government guaranteed bonds were still present in the market.

### **1.1.5 CENTRAL BANK FUNDING AND BANK CAPITAL**

In the open market the Eurosystem generally provides liquidity to financial sectors through two regular operations: the Main Refinancing Operations (MROs) and the Long Term Refinancing Operations (LTROs), characterized respectively by one-week and three-month maturity. The first fulfil short-term funding requirements, whereas the second gives supplementary long-term funding. Nevertheless, as the financial crisis burst in Summer 2011, tensions in the money market required to implement non-standard monetary measures in addition to the regular operations, with the aim of helping banks to maintain lending to households and non-financial institutions and therefore ensuring the stability of the Euro currency. In this respect, the European Central Bank (ECB) conducted two three-year Longer Term Refinancing Operations (LTROs), characterized by fix rate and full allotment: the first on 21<sup>st</sup> December 2011 that introduced in the market €489 billion to 523 credit institutions and the second on 29<sup>th</sup> February 2012 that provided €529 billion. These two operations increased the amount of base money in the economy and helped banks to satisfy their liquidity necessities, reviving the entire European economy in a moment characterised by pressure in the funding market. The banks to which these operations were addressed, were clearly those located in countries that either took part at the EU-IMF financial assistance programmes or suffered considerably the effects of the crisis.

In this context, Eurozone banks became heavily dependent on Eurosystem funding and in the end of 2011, when the crisis intensified, the percentage of central bank's funding in total deposit liabilities was about 5 per cent for Eurozone banks (see Chart 23 European Central Bank, 2012a). However, banks' reliance on ECB liquidity was highly heterogeneous across Eurozone and peripheral countries were clearly the more dependent, especially in the second quarter of 2012. Indeed, the Eurosystem financed more than 27 per cent of Greece's assets in the end of 2012, almost 11 per cent

for Spain's assets, 9 per cent for Ireland and Portugal and as last, 6 per cent of Italy's assets (see Graph 12 Rixtel and Gasperini, 2013).

In addition to bank funding needs, partially satisfied by ECB liquidity provisions, Eurozone monetary financial institutions went towards a more stable and durable source of funding (see Paragraph 1.1.3) to cope with tensions in the money market due to the onset of the financial crisis.

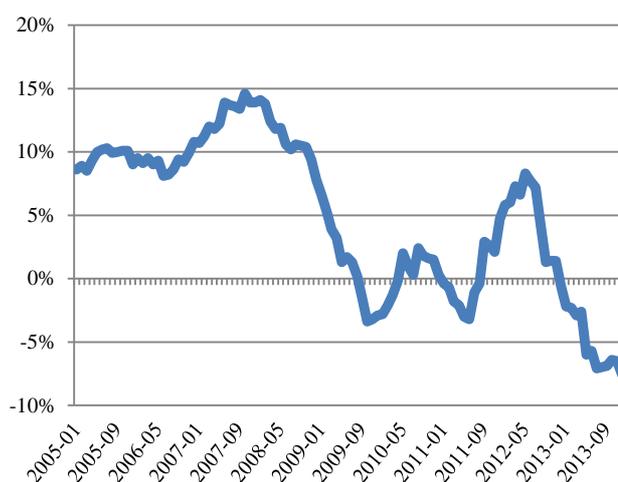
Graph 10 describes the path of capital and reserves in total assets between 2005 and 2013. Capital and reserves include, according to ECB definition, equity capital (i.e. ordinary and saving shares), non-distributed benefits and funds, specific and general provisions against loans, securities and other types of assets<sup>5</sup>. In the pre-crisis period, the percentage of capital and reserves to total assets maintains roughly stable at around 5.5 per cent, whereas the growth rate of assets increased substantially from 9 per cent in April 2006 to 14.6 per cent in October 2011, probably due to higher banks risk-taken. A trend turning point is evident from the third quarter of 2008 where the percentage increased progressively (see Graph 10) mainly due to a raise in capital and reserves (as the growth rate of assets sharply decreased). This tendency is in line with the reductions of bank leverage, anticipating to some extent the Basel III new minimum requirements that were successively introduced. Moreover, Graph 11 reveals two negative peaks in the assets growth rate: the first in the second quarter of 2010, whereas the second in the third quarter of 2011, highlighting the intensification of the crisis in the Eurozone. Then, after a positive trend until mid-2012, the growth rate started to decrease again and in November 2013 was equal to -6.5 per cent.

**Graph 10. Capital and reserves in total assets**



Source: Processing of European Central Bank -Statistical Data Warehouse-

**Graph 11. Annual growth rate of assets**



Source: Processing of European Central Bank -Statistical Data Warehouse-

<sup>5</sup> See for further details "Manual of MFI balance sheets statistics", European Central Bank, 2012.

## **1.2 ITALIAN BANK FUNDING**

### **1.2.1 THE IMPACT OF THE FINANCIAL CRISIS ON ITALIAN BANKS**

In the European financial crisis context, Italy is an interesting case to analyse because its impact changed sensibly from the first phase to the second phase of the financial crisis, unlike other Eurozone countries. The first phase is related to the subprime crisis, burst on the U.S. market in the summer 2007 and ended in 2009, while the second phase started in 2010 with the onset of the sovereign debt crisis that had (and is still having) the strongest effects in the Eurozone. Note that, between 2009 and 2010, there was a small temporary recovery, quickly halted by the outbreak of the Greek sovereign debt crisis.

During the first stage, the Italian banking system was heavily hit by the negative spillovers of the financial crisis which made funding and access to liquidity sources arduous and costly; however on the whole the impact of the subprime crisis on the Italian banking business was slight compared to the effects suffered by the average Eurozone countries. In Italy no banks bankrupted during the subprime phase and in line with this trend, the Italian government provided low amounts of public interventions to sustain the banking system, namely 0.3 per cent of the GDP, unlike the Eurozone countries that allocated facilities for an amount equal to 30 per cent of their GDP.

The strength elements of the Italian banking system are attributed to its low risk profile characterised by low levels of leverage, high capitalization and supported by a low integration of innovative financial operations that reduced banks exposure toward high-risk financial instruments. Moreover, Italy was characterized by a traditional business model based on stable retail funding that favoured a well balance between borrowing and lending: banks mainly obtained funding from retail deposits and bonds, that were then used to provide funds to ordinary clientele, namely households and medium-size enterprises (SMEs). Note that, loans granted by banks were a fundamental source of external funding for firms and this highlights the important role that the banking system had in the Italian economy. In addition to having a home-based economy, the Italian banking system was also characterized by strong territorial roots: long-term relationships with retail clientele were strengthened by the short distance between clients and credit institutions thanks to a spread network of banks.

Overall, Italian banks remained profitable during the first phase of the crisis, unlike the main Eurozone countries. Inversely, during the second stage, the Italian banking system suffered a period of high tension and market stress that brought the Italian economy into a deep recession. The strength elements during the first phase became factors of vulnerability in the sovereign debt phase: the low financial integrations limited bank profitability to the profit margin between the interest paid (bonds and loans) and earned (deposits). This high dependence on this source of earning reduced considerably the bank profitability when the crisis hit this sector. Moreover, the low growth rates that characterized the Italian economy in the pre-crisis years weakened the system and had negative impacts on bank assets quality and sovereign debt level, especially after 2010. Indeed, data reveals that the amount of non-performing loans to total loans increased considerably in 2010, strongly affecting the economy

being highly exposed on lending. Concerning indebtedness, Italy had the second highest level of sovereign debt with respect to GDP in the end of 2010 across Eurozone countries, namely 126.8 per cent, just after Greece whose level of public debt to GDP was equal to 147.3 per cent. The high sovereign debt level, together with the decreasing Italian creditworthiness mainly reflected by the high Btp-Bund spread that reached the level of 558 basis points on 9<sup>th</sup> November 2011, raised incredibly the amount of funds required to finance the public debt. This spread the fear about the sustainability of the public debt and therefore the ability of the Italian government to meet its obligations. In this framework, the sovereign debt crisis impacted the Italian banking system through different channels: first Italian banks held significant amount of government bonds, in particular domestic monetary financial institutions possessed 18.5 per cent of Italian government bonds on 31<sup>st</sup> December 2010 (percentage of the total amount of government bonds). In line with this, the European Banking Authority (EBA) increased the capital requirements for the largest Italian banks that were more exposed to the sovereign debt risk, since they held significant amounts of government bonds: the five biggest Italian banks subject to the new EBA requirements were UniCredit, Intesa Sanpaolo<sup>6</sup>, Banca Monte dei Paschi di Siena, Banco Popolare and Unione di Banche Italiane. Note that, the EBA capital requirements to Italian banks were significantly higher with respect to the average Eurozone banks.

Second, government bonds were also used by banks as collateral in their refinancing operations, therefore the value of collateral decreased and banks were required to find additional guarantees. As a last reason, the high interconnection between the Italian government and banking sector led investors to associate the country's creditworthiness with the bank credit risk, reflected by the high bank CDS spread that additionally increased the weight of the crisis on the Italian banking system.

In this context, further capital requirements were imposed by the Basel III document approved in 2010 that set Italian bank in the position to satisfy new minimum requirements both in term of capital and liquidity in a period characterized by difficult access to funding sources and low expected economic growth.

On the whole, the Italian economy fell into recession: income decreased and so consumption and sales did, impacting the stability of the economy. Moreover, the low consumer wealth affected also the amounts of money saved and deposited, reducing substantially the bank capacity of self-financing, increasing therefore its need of liquidity.

Liquidity stress was partially reduced thanks to two Longer Term Refinancing Operations, presented in the previous paragraph, which were fundamental to help Italian banks to meet their obligations and repay their expiring bonds. In both LTROs, the Italian credit institution received almost one third of the entire capital allotted by the European Central Bank.

To sum up, the Italian situation in the first stage of the crisis was overall stable and favourable compared to the average Eurozone banks thanks to a traditional banking system characterized by

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<sup>6</sup> Regarding Intesa Sanpaolo no further capital increase was required since no capital deficit was reported.

stable retail funding. Nevertheless, the second stage of the crisis heavily affected the Italian banking system, those elements that sustained the economy during the subprime crisis became factors of weakness in the sovereign debt phase. Moreover, additional capital requirements were set both by the EBA and by the Basel III that required banks to find additional capital in a period characterized by credit squeeze, high funding cost at low growth rates.

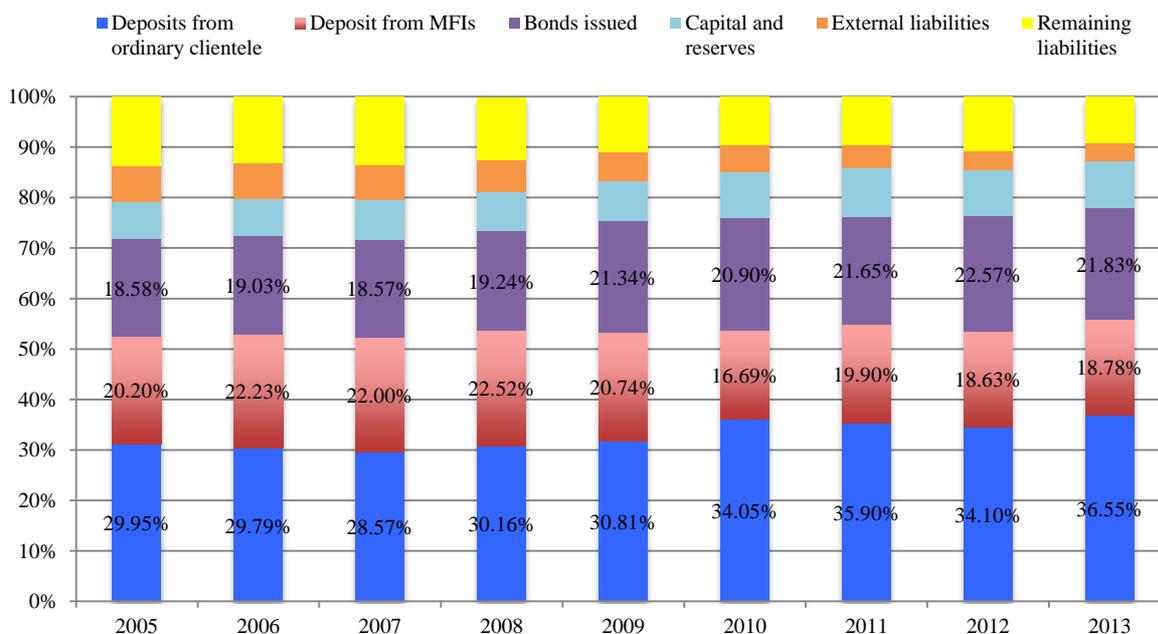
## 1.2.2. ITALIAN BANKS: MAIN TRENDS IN THE BALANCE SHEET

### COMPONENTS

In this important historical period for the Italian economy, it is interesting to analyse in detail the trend change of the balance sheet's structure, in order to capture the main effects of the crisis on the Italian banking system. In this respect, Graph 12 describes the liability composition (as a percentage of total liabilities) of Italian banks between 2005 and 2013. As it appears evident, the direct fundraising, composed by deposits and bonds, corresponds to almost 70 per cent of the total bank liabilities and therefore represents the main source of funding for banks. Analysing the direct fundraising components, deposits from ordinary clientele<sup>7</sup> represents the highest amount equal, on average, to 32 per cent. This component is an important source of funding for Italian banks that maintained a stable trend even after the onset of the financial crisis.

In line with Eurozone banks, interbank liabilities of Italian banks decreased sensibly after 2009 from 20.74 per cent to 16.69 per cent, then they rose slightly but without reaching the pre-crisis levels.

**Graph 12. Italian banks: liabilities composition (% of total liabilities)  
-Eurozone counterpart except for external liabilities-**



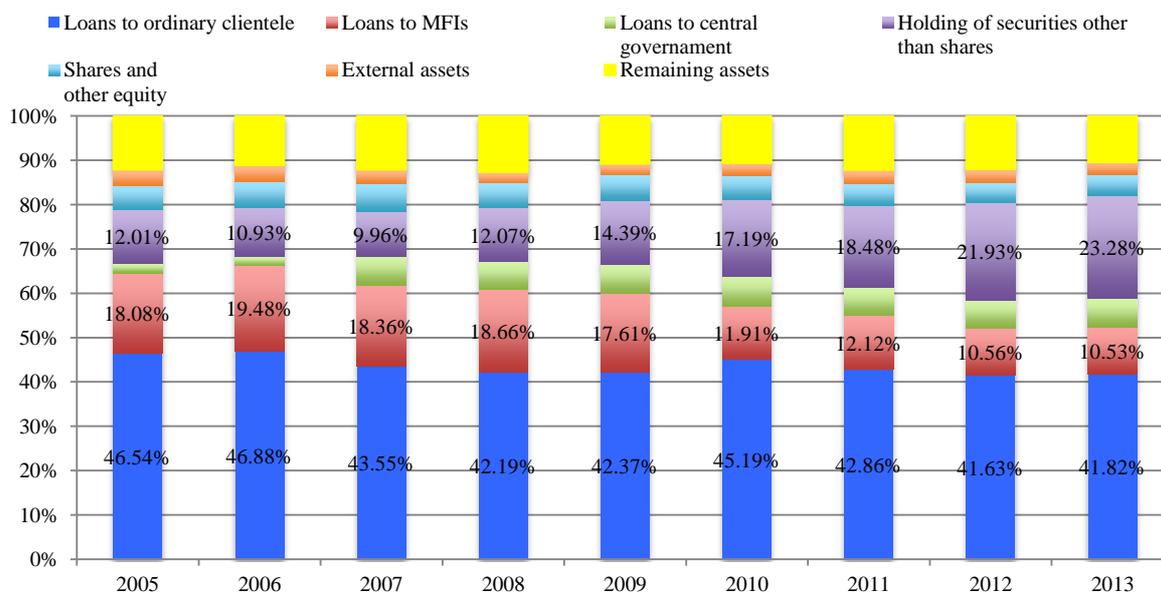
Source: Processing of European Central Bank -Statistical Data Warehouse-

<sup>7</sup> Ordinary clientele stands for no-MFIs excluding general government

Bonds count almost one fifth of total liabilities and one third of total direct fundraising; as such they represent another important source of funding for banks that, as Graph 12 shows, increased progressively over time from 18.6 per cent to 21.8 per cent in the period 2005-2013, unlike the main trend in the Eurozone countries (see Paragraph 1.1.4). The amount of bonds issued decreased only in 2010 for a negligible percentage. Despite not being reported in the Graph, on average, roughly 90 per cent of total direct fundraising is obtained from the internal market (i.e. Italian residents) since Italy, as already reported, has a home-based banking system characterized by strong territorial roots.

Graph 13 describes the assets composition (as a percentage of total assets) of Italian banks in the period 2005-2013. Loans count for the biggest amount of total assets, in line with the percentage level of direct fundraising, confirming the lending based business that characterised Italian banks. Nevertheless, data reveals a change in the lending structure: the percentage of loans decreased of almost 8 per cent from 2005 to 2013, mainly due to the drop in loans to Monetary Financial Institutions that passed from 17.61 per cent in 2009 to 11.91 per cent in 2010. On the other hand, loans to central government increased substantially from 2007 onwards, whereas the percentage of loans to ordinary clientele<sup>8</sup>, which counted for roughly 70 per cent of total loans, reduced after the onset of the subprime crisis. In 2010 loans to consumers increased by 3 per cent with respect to the previous year, probably due to the small recovery that characterized the period 2009-2010. Thereafter, it decreased again in line with the deepening of the sovereign debt crisis that reduced consumers' income, effecting their wealth and propensity to save. Note that, holding of securities other than shares increased

**Graph 13. Italian banks: assets composition (% total assets)  
-Eurozone counterpart except external assets-**



Source: Processing of European Central Bank -Statistical Data Warehouse-

<sup>8</sup> Ordinary clientele stands for no-MFIs excluding general government.

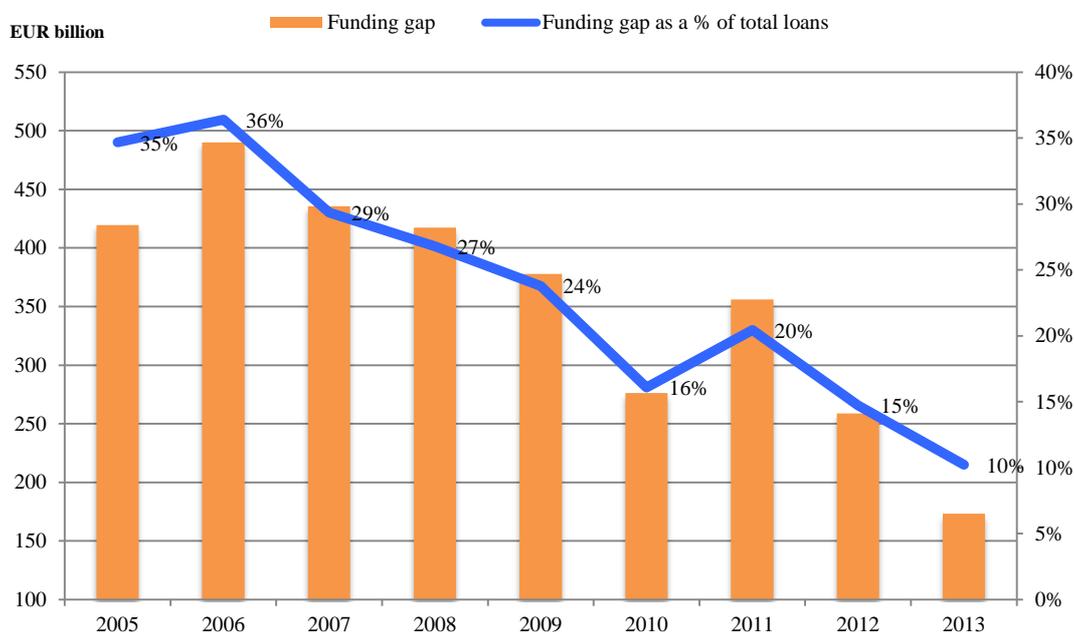
progressively from 2007 reaching 23.28 per cent of total assets in 2013, indicating that Italian banks reinforced their position in the financial market as investor.

### 1.2.3 ITALIAN FUNDING GAP

The Italian banking system was characterized by a traditional business model with strong national roots, in which the main activity of banks relied on collecting savings from the public (mainly through deposits and bonds to retail clientele) and practising the lending activity (see art.10 Consolidate Banking Law). This type of system sustained Italian banks during the first phase of the crisis (see Paragraph 1.2.1) keeping them profitable thanks to a positive differential between marginal revenues and marginal costs. In this respect, the funding gap became an important index to measure the balance between funding and lending activities. More specifically, it is defined as to the amount of loans granted to ordinary clientele<sup>9</sup> not covered by retail funding, where the latter is defined by the most traditional funding source for banks, i.e. deposits<sup>10</sup>.

Graph 14 shows the trend of the Italian funding gap between 2005 and 2013 to capture the changes in the Italian banking system after the outbreak of the financial crisis to which followed the subprime crisis and successively the sovereign-debt crisis. Note that, the decision to base the

**Graph 14. Trend of Italian Funding gap in absolute value and in percentage of total loans -Eurozone counterpart-**



Source: Processing of European Central Bank -Statistical Data Warehouse-

<sup>9</sup> Loans to ordinary clientele are those to non-MFIs excluding the general government.

<sup>10</sup> Retail deposits are those to non-MFIs excluding general government.

descriptive analysis of the funding gap on the Eurozone market and not on the domestic market relies on the fact that roughly 90 per cent of total loans and 87 per cent of total deposits<sup>11</sup> (2005-2013) concern the internal market. Therefore, results will remain explicative despite previous observations on the important role of this traditional, home-based economy.

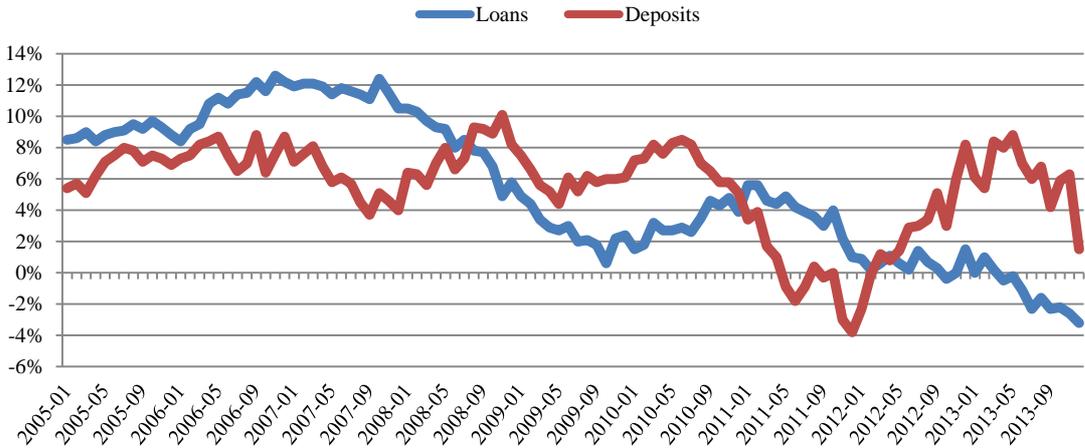
In the pre-crisis period (2005-2007), the Italian funding gap was on average equal to €448 billion in absolute value, or 33 per cent of total loans to ordinary clientele, meaning that almost one third of loans granted was not financed through deposits. This was the result of a higher annual growth rate of loans compared to deposits, whose difference (in terms of rates) rose from 2006 (see Graph 15).

The high funding gap in 2005-2007 does not reveal that Italian banks were not sound but simply shows the inefficiency of deposits alone to cover the amounts of loans granted to ordinary clientele. Nevertheless, Italian banks had access to other funding sources such as for instance retail bonds (see Graph 16) that helped banks maintain a good balance between loans granted and liquidity sources available.

After the Lehman Brothers crash in the third quarter of 2008 (first phase of the crisis), the trend between the two annual growth rates reversed (see Graph 15): deposits exceeded loans that decreased progressively to rates close to zero at the end of 2009 (0.6 per cent). Consequently, the percentage of funding gap to total loans progressively decreased.

Thereafter, with the onset of the sovereign-debt crisis in 2010 (second phase of the crisis), the annual growth rate of deposits drop sharply by more than 10 per cent in only one year reaching the negative rate of -3 per cent at the end of 2011, when the crisis intensified, and returning positive from

**Graph 15. Italian banks: annual growth rate of loans and deposits non-MFIs (excluding general government)**



Source: Processing of European Central Bank -Statistical Data Warehouse-

<sup>11</sup> The counterpart sector of both loans and deposits is the Eurozone.

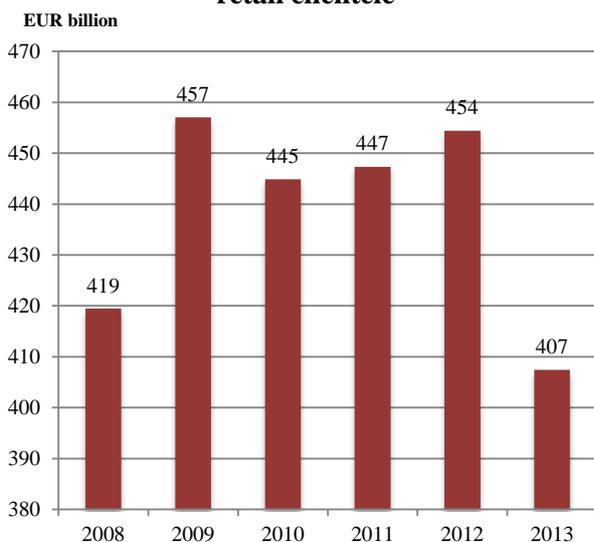
the first quarter of 2012 onwards with a volatile trend. On the other hand, the annual growth rate of loans progressively decreased until it reached the negative value of -3.2 per cent at the end of 2013.

Overall, the Italian funding gap both in the first and second phase decreased if compared to the pre-crisis period, reflected also by an increasing trend in the ratio between deposits and loans (see Graph 17). In particular, it reached the lowest value of 15 and 10 per cent respectively in 2012 and 2013.

However, the interpretation of this low gap can be misleading if the macroeconomic context of reference is not taken into account. Indeed, it is truth that the amount of loans was almost entirely covered by deposits but this was only the result of a weak economy that was suffering the negative spillovers of the crisis. Access to funding sources was difficult and costly and it intensified during the sovereign-debt crisis (see Paragraph 1.2.1). The available income and wealth of households reduced, which decreased their tendency to save money, therefore deposits to retail clientele, which were (and still are) the main source of funding for banks, fell dramatically. Italian banks in this context of liquidity stress lowered the amount of loans granted, weakening the economy and impacting in particular small and medium-sized enterprises, which were highly dependent on this source of liquidity.

In this respect, banks found an important source of funding by issuing bonds to retail clientele. This funding source was fundamental to sustain the banking system especially during the first stage of the crisis, maintaining a stable liquidity level necessary to finance loans and keep banks profitable. In other words, the traditional business model based on retail funding, together with a well balance between loans and both deposits and bonds, helped Italian banks to mitigate the impact of the subprime crisis on their banking system.

**Graph 16. Italian bank bond to retail clientele**



Source: Processing of Bank of Italy -Statistical Database-

**Graph 17. Deposits to loans ratio**



Source: Processing of Bank of Italy -Statistical Database-

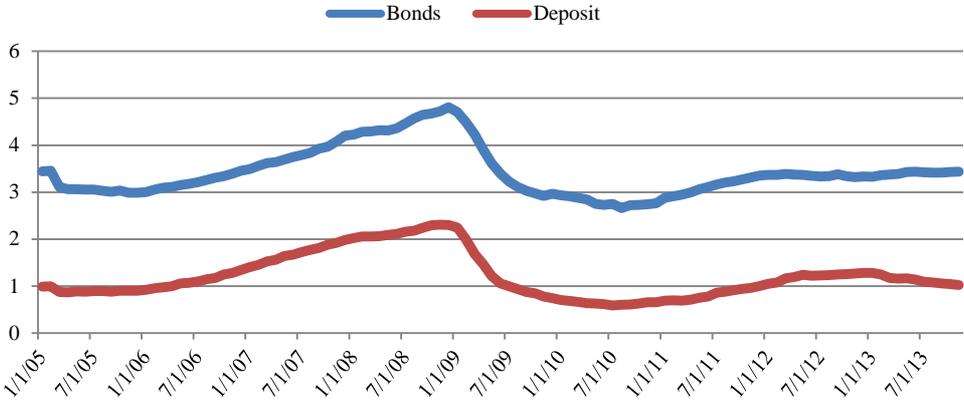
As is it evident in Graph 16, the outstanding amount of bonds to retail clientele<sup>12</sup> increased from 2008, reaching the highest value of €457 billion in 2009 and maintaining at about this level in the following years with the exception of 2013. It is important to highlight that bond issue did not decrease despite the high cost that characterized this category, which became particularly onerous after the onset of the crisis.

Graph 15 shows the changes in the cost structure of these two main funding sources, i.e. deposits and bonds. Their interest rates increased progressively from the beginning of 2007 reaching a peak of 4.7 per cent for bonds and 2.3 per cent for deposits in the third quarter of 2008 and this rise in funding costs was, on average, equal to 1.5 per cent.

Fortunately, interest rates did not maintain at this high level and decreased in the period 2009-2010 until they reached levels slightly lower than in the pre-crisis period, suggesting a small recovery in the economy. In mid-2011, when the sovereign debt crisis intensified, interest rates increased partially, concerning especially bonds whose interest rates were roughly equal to 3.3 per cent. Instead, the interest rate of deposits was 1.3 per cent, maintaining successively at around this levels until the end of 2013.

The raise in funding costs reduced banks profit margins, making particularly onerous bond pricing, whose issue, however, did not reduce.

**Graph 15. Bank interest rates (%)**



Source: Processing of Bank of Italy -Statistical Database-

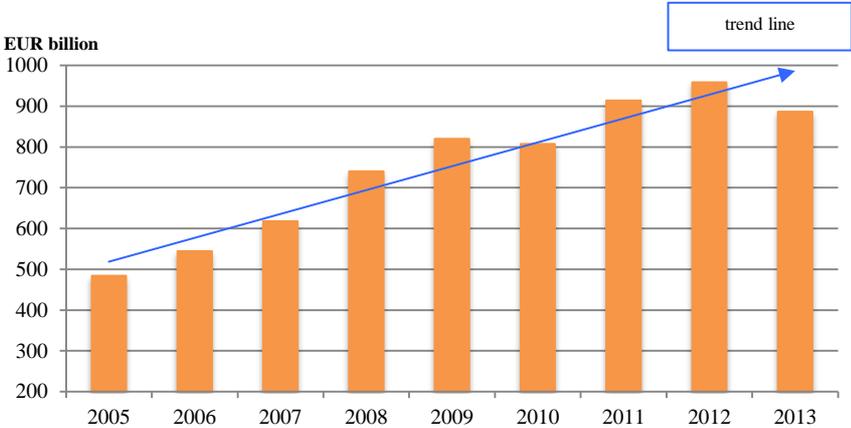
<sup>12</sup> Bank bonds to retail clientele are defined as the year-end amount of bonds issued by Italian bank and held for safekeeping by Italian residents (non-bank sector).

### 1.2.4 ITALIAN BANK BONDS

The relevance of bonds as a source of funding for Italian banks has increased in the last decade. Unlike other funding sources, bond issue increased progressively over time both in absolute value and in percentage of total assets. As it is evident in Graph 16, the outstanding amount of bonds issued by Italian banks increased progressively from 2005 onwards, reaching the amount of €958 billion in 2012, without significantly reducing after the raise in bond funding costs (see Graph 15).

In addition, the importance of bonds issue as a source of funding for Italian banks was not prominent only in the national framework but also in the European one. To be specific, comparing the amounts of bonds issued by Italian banks with those issued by the average Eurozone countries, the former was significantly greater than latter for the whole period 2005-2013 (see Graph 17).

**Graph 16. Bonds issued by banks resident in Italy**



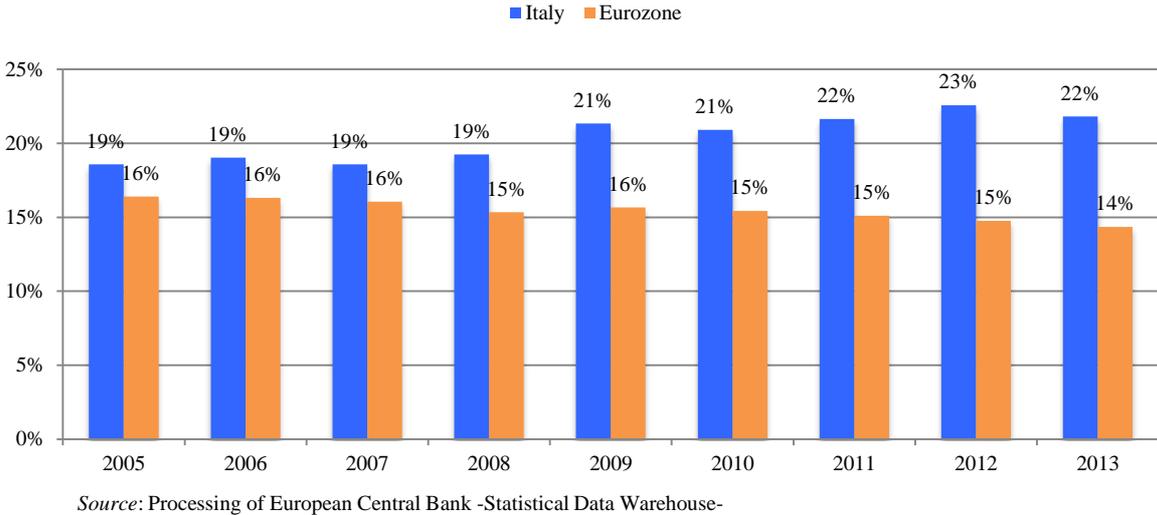
Source: Processing of European Central Bank -Statistical Data Warehouse-

The percentage of Italian bonds to total assets stood at least 3 per cent higher than that of the Eurozone and in addition this differential increased progressively over time, reaching the highest values from 2011 onwards when the sovereign debt crisis spread to Italy. This points out that bond funding represents a key source for Italian banks to sustain its activities in a period of recession.

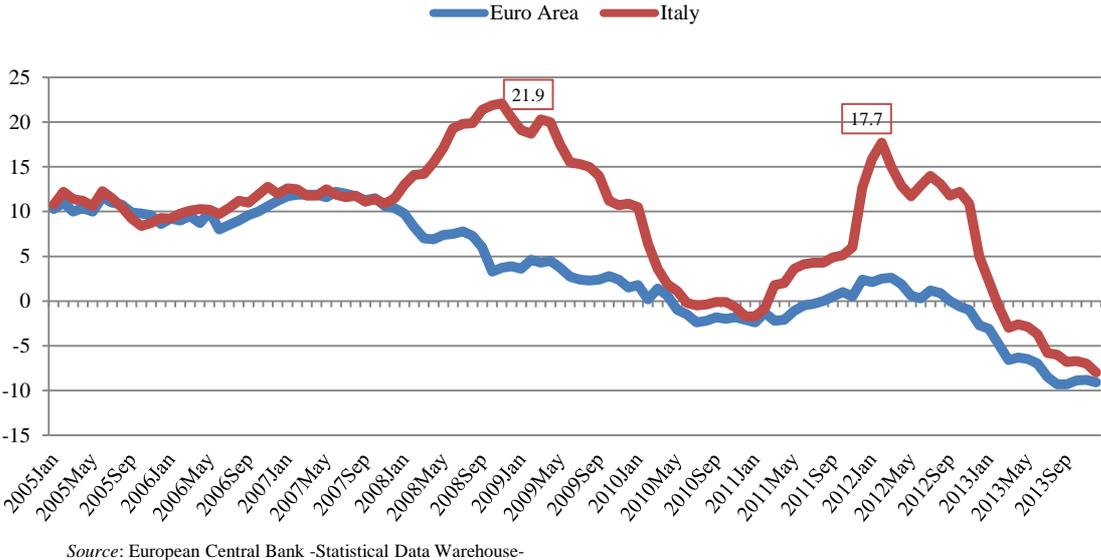
In line with this trend, the growth rate of Italian bonds increased substantially compared to Eurozone banks (see Graph 18) reaching two main peaks, the first of 21.9 per cent in the third quarter of 2008 (18.6 per cent higher than those of Eurozone banks) and the second of 17.7 per cent (15.2 per cent higher than those of Eurozone banks). These two peaks represent two important moments in the Italian economy, namely the Lehman Brothers crash and the intensification of the sovereign debt crisis, that reflect a turning point in the growth rate trend of Italian bonds, after which indeed the gap between the two rates (Italian and Eurozone growth rate) reduced progressively up to extinguish.

The relevance of bank bonds is further strengthened by the fact that, analysing the liability components of both Italy and the Eurozone (see Graphs A.3-A.20 in the Appendix), no other significant or constant differences are observed between the two during the time span. For instance, deposits that represent the first traditional source of funding for Italian banks remained almost in line with those of the Eurozone and no significant trend comes out.

**Graph 17. Bonds issued (% tot liabilities) in period 2005-2013: comparison between Italy and Eurozone**



**Graph 18. Growth rate (%) of bonds issued by banks comparison Italy vs Eurozone**



## CHAPTER 2: EMPIRICAL STUDY

### 2.1 RELATED LITERATURE

The first studies in related literature investigated the relationship between subordinated notes and debentures (SND) and bank risk measures on the U.S. market. The focus on this type of bond, i.e. SND, was driven by the fact that, in the period between the late 80s and early 90s, the U.S market was characterized by important changes in the protection of bondholders. In particular, before 1989 SND investors were protected by government guarantees in case of bank insolvency so that the former were not sensitive to the real risk level of the banks<sup>13</sup>. These policies then changed significantly and investors, no longer protected, started to lose money.

In this historical context, many authors tested the role of the market discipline<sup>14</sup> on SND spread to analyse the ability of bond investors to efficiently price the risk taken by banks. The general idea that motivated these studies was that investors, as long as protection policies existed, would not perceive the real bank risk, while on the contrary, they would be affected by them if they knew that there was the possibility of losing their money. Hence, the role of market discipline became the subject of several researches.

Among these studies, the following are of particular relevance: Flannery and Sorescu (1996) examined the sensitivity between SND and bank-specific risk measures on the secondary market using a sample data of 442 bonds issued mainly by bank holding companies (BHCs). They regressed bond spread on accounting measures of risk and showed that investors began to price bank risk measures when conjectural government guarantees were at least partially removed. Using a sample data of subordinated bonds issued by the 100 largest U.S. commercial banks and BHCs outstanding at year-end 1997, Jagtiani et al. (1999) analysed the relationship between bond spread and bank credit risk, the latter measured using bank accounting variables. Statistically, they found a significant positive effect of accounting variables on bond spread both for banks and BHCs. Moreover, the explanatory power of the regression increases (higher value of adjusted  $R^2$ ) when the variables of the model are interacted with the bank's leverage ratio to capture non-linear risk relationships. This latter regression reveals that the market reacts by penalizing less-capitalized banks more. To test the robustness of the model, authors substituted subordinated debts with senior debts and similar results were obtained, revealing that the model fits well even for senior bonds.

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<sup>13</sup> Indeed before 1989 no statistical significant relationship between SND spread and bank risk measure was found. See for instance Avery et al (1988), Gorton and Santomero (1990).

<sup>14</sup> Market discipline is “*the process by which informed market investors gather and evaluate information about a firm's activities and prospects, and incorporate that information into traded securities*” (cit. by Flannery et al 1996).

De Young et al. (2001) investigated the relationship between private information obtained by government inspectors<sup>15</sup> and SND spread issued by bank holding companies. Their results reveal a significant, positive impact of private information on bond spread that is not immediately perceived by SND yields for a couple of quarters since this kind of information is not instantly disclosed to investors. As a consequence, private information possessed by government supervisors is relevant to predict future bond spread. Moreover, they found that investors evaluate more the effect of the regulatory discipline than the type of information obtained from the examination (i.e. good or bad exam information). Indeed, their results reveal that good exam information increases bond spread for those banks that received medium ratings by supervisors, while bad exam information decreases bond spread for low rated banks: investors perceive good or bad information as an expected reduction or increase in the supervisory discipline that therefore increases or decreases the probability of bankruptcy<sup>16</sup>.

Covitz et al. (2004) carried out a test on the U.S. market (sample period 1985-2002) so see if the decision to issue subordinated debt, measured by the probit model, was related to bank-specific risk proxies. They found that funding managers price bank-specific accounting variables when they decide to issue subordinated bonds and that banks with low exam ratings are less likely to issue SNDs. Their results also reveal that market conditions, more specifically the unemployment rate and market volatility, effect the decision to issue bonds. Indeed, both high unemployment rate and high market volatility (the latter being a measure of bond market stress) decrease, *ceteris paribus*, the probability that funding managers will issue subordinated debts.

Another important study that also analysed the risk sensitivity of subordinated debts, but differs from the previous cited papers by using data from European banks, is the paper by Andrea Sironi (2003). He was one of the first to expand the literature by investigating the role played by market discipline in the European banking industry. More specifically, he tested the relationship between bond spread and accounting figures on a sample of 290 SND issued from 1991 to 2000. He found that ratings and bank-specific accounting variables affect bond primary market spread, measured as the difference between bond interest rate and Treasury bond interest rate with similar maturity, and that the explanatory power of accounting proxies increases significantly when interacted with country dummies in the regression.

Thereafter, focusing on more recent studies about the European market, it is observed that also bonds and long term funding (not only SND) became object of analysis in several related researches. The increase in the relevance of these latter can be explained by the fact that, in a period of crisis, investing in bonds was probably perceived as riskier compared to the pre-crisis period. Indeed, bonds were (and still are nowadays) excluded from Deposit Insurance Schemes. Therefore, the lack of

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<sup>15</sup> Government inspectors examine different aspect of the issuing bank: capital adequacy, asset quality, management, earnings, liquidity, sensitivity to market risk. Then, their evaluations are summarised by CAMEL ratings, from which authors extrapolated proxy of supervisors' private information.

<sup>16</sup> Note that no effect was found for high rated banks both in case of good and bad information.

protection schemes, together with this particular period of crisis that brought many Eurozone countries in recession, increased the probability for investors to incur in losses. In this respect, the study of bond became important for the role played by market discipline since investors were not protected and they could indeed lose their money.

Among the studies before the sovereign-debt crisis whose epicentre was in Europe, there is, for instance, the paper by Grasso et al. (2010). They analysed a sample of Italian bank debt securities, mainly plain-vanilla, issued between 2005 and 2009 and found that plain-vanilla bond rates are weakly related to both liquidity and credit risk proxies<sup>17</sup> at issue and returns offered to retail investors are, *ceteris paribus*, much lower than the ones offered to institutional investors. They also found that the performance of bonds a posteriori is generally lower than that of Treasury bonds and that this effect is stronger when computed using primary market prices rather than secondary market prices as the latter are generally lower. Thus, the gap between the two yields reduces because of the inverse relation between interest rates and bond prices.

Concerning the European studies after the sovereign-debt crisis, there are two main research groups. The first, such as that of Ugo Albertazzi et al. (2012), investigated the effects of the crisis on the banking system. They analysed the effect of Btp-Bund spread<sup>18</sup> on bank bond yields to measure the impact of the sovereign debt crisis on the activities of Italian banks. Using data between 1991 and 2011, they empirically demonstrated that higher Btp-Bund spread has significant, negative consequences on the cost of bank funding, reducing bank profitability. In particular, their econometric analysis reveals that a temporary increase on Btp-Bund spread raises bank bond interest rates with a stronger effect in periods of crisis<sup>19</sup> (the latter is obtained interacting the spread variable with the dummy variable of sovereign-debt crisis to capture non linear effects). Moreover, they found that the positive relationship between Btp-Bund spread and bank bond yields is stronger for debt securities compared to the one, still positive but weaker, of repos and households' deposit interest rates<sup>20</sup>, while no significant effect on overnight deposit was found.

The second research group investigated the effects of both explicit and implicit government guarantees on bond funding. Concerning the former, several governments introduced guaranteed schemes in order to help banks to access to long-term funding and to reduce their funding costs. These explicit government guarantees have substantially increased from the beginning of the financial crisis and their efficiency has been object of debates. Avram Levy and Andrea Zaghini (2010) analyzed the effect of government guaranteed schemes on bank bond using a sample of European and US debt

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<sup>17</sup> The liquidity proxy is defined as the natural logarithm of the issuing amount while for the credit risk proxy, Moody's issuing rates are used.

<sup>18</sup> The Btp-Bund spread is defined as the difference between the interest rate of 10-year Italian bond and 10-year German bond, considered as benchmark.

<sup>19</sup> A temporary Btp-Bund spread increase of 100 b.p. increases, *ceteris paribus*, bank bond yield by 70 b.p. in normal time while by 100 b.p. during period of crisis - Source: U. Albertazzi, T. Ropele, G. Sene and F. M. Signoretti (2012)-

<sup>20</sup> A temporary Btp-Bund spread increase of 100 b.p. increases, *ceteris paribus*, repos and households' interest by respectively by 34 b.p. and 21 b.p. while by 40 b.p. for both during period of crisis -Source: U. Albertazzi, T. Ropele, G. Sene and F. M. Signoretti (2012)-

securities. They found that the spread at issue of government guaranteed bonds depends mainly on the creditworthiness of the guarantor rather than on the issuing bank or bond characteristics. In particular, both high sovereign rating and low sovereign CDS<sup>21</sup> (defined as credit risk measures in the study) reduces significantly bank bonds spread at launch and the effect of the former is much higher, *ceteris paribus*, than the effect of the latter<sup>22</sup>. As debt security spread is mainly explained by government's characteristics, authors concluded that this type of guarantee may lead to important inefficiencies in the banking system: "weak" banks in highly rated countries may face lower funding costs with respect to "strong" banks in low rated countries.

Concerning implicit guarantees, Andrea Cardillo and Andrea Zaghini (2012) investigated the effect of AAA-rated governments on banks long-term funding costs using data on 6,400 bank bonds (senior, subordinated and guaranteed bonds) issued between 2006 and 2012 in the Eurozone, UK and USA<sup>23</sup>. They found that AAA-rated countries provide an implicit positive guarantee on banks reducing their funding costs on the whole sample. Moreover, analysing the non linear effects of government guaranteed bonds, that for this purpose were interacted with sovereign ratings, they discovered that non-AAA rated countries increase significantly bond spread revealing that guarantees schemes are efficient in pursuing their goal only in case of AAA-rated guarantor. Note that this conclusion is consistent with the results of Avram Levy and Andrea Zaghini (2012). Authors supported this empirical evidence arguing that non AAA-rated governments provide negative spillovers on the bank cost of debt. Moreover, these effects can exhibit in different forms: mainly, requiring additional collaterals, reducing bank value of collaterals, increasing the risk of contagion, lowering bank rating and providing losses. Despite the important role played by the government's creditworthiness, they showed that it goes in second place if bank CDS exists, in this case the bond spread reflects more the characteristics of the issuing institution, revealing its significant role in pricing bonds.

In addition to the previous main strands, there are also other lines of researches that explored further topics, such as that of Cécile Casteuble et al. (2013). They argued that bank bond spread depends not only on the single effect of risk and return but on the joint effect of the two variables, measured by the risk-return efficiency score. This latter is obtained by estimating the best practice frontier (BPF), which in turn is computed using the Stochastic Frontier Analysis method. The BPF represents the points where the risk-return levels are optimal: if a banks has an efficiency score close to 1, it means that its risk-return level is far from the efficient BPF measure, otherwise in the opposite case the efficiency score will be close to 0.

According to their idea, investors expect higher interests for riskier securities but, at the same time, require higher interests for bad managed banks especially in periods of crisis, highlighting the importance of the efficient risk management. More specifically, they analysed on the primary market a

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<sup>21</sup> CDS stands for Credit Default Swap

<sup>22</sup> Note that the characteristics of issuer or the issue are not irrelevant in pricing bond but they simply play a minor role compared to country-specific factors.

<sup>23</sup> Each county involved is separately considered in the regression and the analysis is done on the primary market.

sample of European listed banks from 14 countries during the period 1996-2011 and they showed that low risk-return levels have a negative impact on bond spread, increasing the gap between bond yield and Treasury bond yield. As a consequence, as they expected, inefficient banks were more subject to higher funding costs.

In the analysis of the determinants of bank bond, attention should also be given to corporate bonds due to their connections and similarities<sup>24</sup>. In this respect, two researches appear interesting for this study: the first by Giampaolo Gabbi and Andrea Sironi (2005) that investigated the determinants of corporate bonds' primary market price using a sample data of 3,403 Eurobonds issued by Canadian, European, Japanese and US companies between 1991 and 2001. They empirically demonstrated that the strongest factor explaining corporate bond volatility is bond rating, measured either by Moody's or Standard & Poors' (as expected low rating negatively effect bond spread). Moreover, to capture the evolution of ratings over time, authors made two separate regressions dividing the sample period in two sub-samples (the first is 1991-96 and the second is 1997-01) and they found that the explanatory power of ratings increase in the sample period thanks to a higher adjusted  $R^2$  in the second-period regression. They also found that expected tax treatments are relevant in pricing corporate bonds, in particular higher expected tax treatments increase significantly corporate bond prices. This latter variable is measured by two proxies, the annual coupon that is subject to different tax treatments according to the country bonds are traded in and a dummy variable indicating weather the bond is registered or not. Long Chen et al. (2007) investigated the impact of bond liquidity on corporate bond spread in the secondary market using a sample of 4,000 corporate bonds belonging to different rating classes (from investment to speculative categories) and issued on U.S. market during the period 1995-2003. They discovered that bond liquidity<sup>25</sup> is a key factor in determining corporate bond volatility and yield spread<sup>26</sup>. In particular, they found that more illiquid securities lead to higher spread and that bond liquidity explains more bond volatility than bond ratings alone, in contract with the previous paper of Gabbi and Sironi (2005) that instead highlights the determinant role played by ratings in pricing corporate bonds.

This study focuses on senior bonds issued by Italian banks in the spirit of the recent papers about the European market that analysed the determinants not only of SND but also of bonds and long-term funding. After the outbreak of the financial crisis, senior bonds became an important source of funding for banks that were not subject to protection policies. As a consequence, it is expected that bonds were more disciplined by investors in this context since the perceived default risk had increased if compared to the period before the crisis. In this respect, analysing the determinants of bond spread, differentiating the analysis between the pre- and post-crisis period, appears particularly important for

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<sup>24</sup> Many factors affecting corporate pricing can be also studied for bank bonds, leading generally to similar results.

<sup>25</sup> Three variables define bond liquidity: the first proxy is measured by the bid-ask spread, the second by the proportion of zero returns while the third is estimated using a model developed by Lesmond et al. (1999)

<sup>26</sup> Bond yield spread is defined as the difference between the bond yield and the yield of a comparable maturity Treasury bond.

the role played by market discipline. Moreover, the decision to analyse the Italian banking industry, characterized by the peculiarities described in Paragraph 1.2, allows capturing better the effect of the sovereign-debt crisis and the changes in bond funding not only before and after the financial crisis outbreak but also between the first and second phase of the crisis.

In addition, this study expands the existing literature in different directions. First, the bank variables in this study are more specific than in the majority of papers. Indeed, the decision to focus only on Italy's case, if on one side it does not permit obviously for country comparison, on the other it allows analysing deeper and more accurately the accounting specific variable of Italian banks, collecting detailed data on financial statements that are not available on commercial datasets, generally used in the majority of international studies. Second, new bank-specific variables are added in the model and some variations of the standard definitions are introduced, in order to improve the interpretation of the results and allow analysing deeper the different aspects of bank risk. This enriches the analysis and contributes to assess the robustness of the model. Third, bond spread in case of fix-coupon rate is not measured as the difference between the interest rate of bank bonds and the Treasury bonds with similar maturity but a different benchmark is defined: the Interest Rate Swap. This decision relies on three main reasons: first, Italian treasury bonds cannot be considered truly risk-free due to the low rating of the Italian government in the sample period. Second, aligning the bond maturity with the Treasury bond maturity is hardly feasible, as they generally do not have exactly the same expiration day. However, the use of Interest Rate Swap eliminates this problem that may distort the analysis, allowing for a perfect comparison of the two yields. As a last reason, the majority of Treasury bonds are issued at 100 and in this sense are called pair yields. However, since they have a fix coupon rate, their price oscillates between this benchmark of 100 according to the market conditions after the issue. Therefore, comparing a pair yield bank bond with a Treasury bond that was issued pair but it is likely not to be pair anymore, may produce bias, since the comparison is not homogeneous and non-pair yield financial instruments possess different properties. Also in this case, the use of Interest Rate Swap removes this potential bias, since the former are by definition pair yield at launch.

## **2.2 RESEARCH QUESTION AND THEORETICAL FRAMEWORK**

This study investigates the impact of the European financial crisis on the bond funding of Italian banks. This aim is pursued in two steps. First, investigating on the primary market the relationship between bank specific accounting variables and bond spread. Second, analysing the change in terms of impact that these variables may have been subject to if comparing the first and second period of the crisis.

As is evident from the related literature, three main categories affect bond funding (see Rixtel and Gasperini, 2012). First, bank-specific characteristics where, in this respect, a fundamental role is played by bank accounting data (Flannery and Soreau, 1996, Jagtiani et al., 1999, Sironi, 2003, Gabbi and Sironi, 2005, Grasso et al., 2010 etc.). Indeed, as pointed out in the related literature, the relationship between bank accounting variables and bond spread is significant in pricing this latter. For instance, banks characterized by different levels of accounting profitability indexes generally face different issues, which are reflected in the bank cost at issuance.

Second, national characteristics as, for instance, the spread between Btp and Bund (see Ugo Albertazzi et al., 2012) that heavily affected peripheral countries especially during the sovereign debt crisis and that spelt over to banks increasing significantly their funding costs, or in addition, country's credit risk and creditworthiness generally measured by Moody's and Standard & Poor's ratings that play another important role in the structure of bond funding (see Andrea Cardillo and Andrea Zaghini, 2010).

The third category concerns macroeconomic factors. Indeed, both national and bank-specific characteristics must be interpreted and assessed by comparing them with the economic and financial framework they are observed in. Certainly, the effect of each single variable is sensibly influenced by the soundness of the country of reference (such as, whether the county is experiencing financial difficulties or is in recession). For instance, in the pre-crisis years European banks were characterised by high leverage levels, generally associated to greater amount of debt securities issues while, on the other hand, in the post-crisis years a progressively deleverage occurred that decreased debt issue (see Rixtel and Gasperini, 2012).

For the purpose of this study, all the previous elements affecting bond funding are analysed and adjusted in line with the Italian banking industry, being the country object of this analysis. However, a deeper and detailed research on bank accounting items has been carried out. Indeed, bank specific accounting index have been collected, according to the related literature and general knowledge. This category concerns the main core of this study and detailed information on it is found in the following paragraphs.

## 2.3 DATA COLLECTION AND SOURCE

For the data collection of this study, three main steps have been carried out to obtain the final set of data that will be successively analysed. In the first step, bond issues by Italian banks have been collected in the period 2006-2013, using Thomson Reuters as a unique source for the bond data research. In particular, from this data source, information on the bond issuer (bank name, listed and unlisted bank status), bond characteristics (bond type, coupon, maturity day, issuing price, etc.) and issuing country (Btp-Bund spread, Moody's and Standard & Poor's issuing rating) has been downloaded. In addition to this data, further information on the swap yield curve and on the reference rates of floating coupons has been gathered, necessary to compute the bond spread. The resulting bond database, obtained collecting all this data, is composed of 18,763 bond issues by 338 Italian banks in the period 2006-2013, concerning only plain-vanilla senior bonds with either fixed or floating coupon rate.

As a second step, starting from the sample composed of 338 issuing banks obtained in the previous passage, accounting data of these banks has been collected. This banking data has been extrapolated from the Italian Banking Association (ABI) database. Gathering the accounting information of these 338 issuing banks from ABI, a new rich database has been constructed composed of 2,015 observations between 2006 and 2011.

These 2,015 observations correspond to the distribution of these 338 banks over the sample period, where to each bank is associated a univocal code provided by ABI to identify it. These codes represent the primary key necessary to compute the third passage of the data collection. Of the total 338 banks 15 are groups, therefore for them both consolidated and individual financial statement is available, while for the remaining 323 (that are not part of a bank group) only individual financial statements are included in the database<sup>27</sup>.

The important characteristic of this database relies on the fact that to each bank code is associated, by year and type of financial statement (individual or consolidated according to the issuing bank<sup>28</sup>) more than 6,700 accounting items that belong mainly to the notes of the account but also to the balance sheet and income statement. This highlight how much detailed this database is if compared to common datasets, where this kind of specific information is not available. Note that in this latter database many missing values are present. Indeed, since the rules to fill out financial statements changed over time, some accounting items are not available in ABI database in all years of the sample.

In the third and final step, the database obtained collecting bond issues of 338 Italian banks (first step) have been matched with the database composed of the accounting items of these issuing banks (second step), using as primary key the bank identification code provided by ABI. In other

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<sup>27</sup> Detailed information on these issuing banks is available in Table A.1 of the Appendix.

<sup>28</sup> Obviously, as previously explained, if issuing banks belongs to a group both consolidated and individual financial statement is available, otherwise if it does not belong to a group only individual financial statement is provided.

words, to each bond issue, defined by the issuing bank code, have been associated the corresponding accounting items of the bank identified with that specific code (i.e. the issuing bank), according to a time-specific criteria explained in details in the following paragraphs.

## 2.4 METHODOLOGY OF THE RESEARCH

Bank bond spread reflects the cost suffered by banks at issuance and, as such, it is a function of three main factors: (1) accounting figures of the issuing bank, (2) external ratings at launch that measure the creditworthiness of the bond, the issuing bank and the country of issue and then (3) a set of variables to control for both bond and bank issuing characteristics. In this framework, the empirical analysis involves the following regression:

$$\text{BOND SPREAD}_{i,Day/Month/Year} = \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i,Year-t} + \gamma(\text{EXTERNAL RATINGS})_{i,Day/Month/Year} + \lambda(\text{CONTROLS})_{i,Day/Month/Year} + \varepsilon_{i,Day/Month/Year} \quad (1)$$

where:

- $\text{BOND SPREAD}_{i,Day/Month/Year}$  = if *fix coupon rate*: the difference between the yield to maturity at issuing date *Day/Month/Year* of issue *i* and the yield of the corresponding Interest Rate Swap with the same bond's maturity;  
 = if *floating coupon rate*: the fix part of the floating coupon rate of the bond issue *i* occurred in date *Day/Month/Year*, i.e. the spread over the reference rate<sup>29</sup>. In the majority of the cases, the reference rate is defined as the Euribor rate, however for detailed information of all floating rate benchmarks see Table 1 at the end of this paragraph;
- $\text{BANK ACCOUNTING FIGURES}_{i,Year-t}$  = the specific accounting variables obtained from the financial statement of the issuing bank, filled out in *Year-t*. This latter stands for to the bond issuing year adjusted according to a time-specific criterion that is shortly explained, where the variable *t* corresponds the time adjustment;
- $\text{EXTERNAL RATINGS}_{i,Day/Month/Year}$  = the external rating associated to the bank, the bond and the country of issuance;
- $\text{CONTROLS}_{i,Day/Month/Year}$  = the set of variables to control both for bond and bank characteristics at issuing date *Day/Month/Year*.

<sup>29</sup> For some floating coupon rates defined as a percentage of the reference rate, the spread is obtained from the complementary percentage computed with respect to the reference rate. For instance, if the floating coupon is defined as 70 per of the 3-month Euribor rate, the bond spread corresponds to 30 per cent of the 3-month Euribor rate.

The decision to adopt a specific time-criterion for the independent variables, BANK ACCOUNTING FIGURES (1), relies on the fact that the actual information present on the bond market at issuance must be taken into account in the analysis. Therefore, analyse the impact of these accounting variables on bond spread, extrapolating these banking data from the financial statement filled out the same year of the bond issue, may be biased since it fails to take into consideration the time necessary to this accounting information to disclose in the bond market.

In other words, the spread of the bank bonds issued in date *Day/Month/Year* may not be influenced by the bank accounting figures of the same issuing year but, for instance, of the previous year (i.e. *Year-1*) or two years before (i.e. *Year-2*) and so on. Therefore, a time-adjustment criterion is required. In this respect, being aware that there is not a unique criterion or precise rule to adjust for this delay, three different time-criteria are defined, to try to capture the appropriate time moment in which the independent variable affects the dependent variable:

a) The first time-criterion requires bonds issued before April 30<sup>th</sup> of the issuing year (*Year*) to be matched to the bank accounting data obtained from the financial statement filled out two years before the issuing year, namely *Year-2* (see Equation (2) below), while bonds issued after April 30<sup>th</sup> must be matched to the bank accounting data belonging to the financial statement of one year before the bond issue, i.e. *Year-1* (see Equation (3) below). Therefore, if for instance bonds were issued on 15<sup>th</sup> October 2009, it must be linked to the accounting data of 2008.

Note that, April 30<sup>th</sup> is an important date for the fiscal year since it corresponds to the day in which bank financial statements are generally approved. An additional explanation of this method is provided by the following Figure.



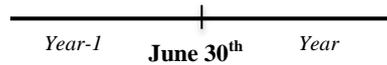
The following equations according to the first criterion are defined:

$$\begin{aligned} \text{BOND SPREAD}_{i, \text{before April } 30^{\text{th}}} &= \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i, \text{Year}-2} + \\ &\quad \gamma(\text{EXTERNAL RATINGS})_{i, \text{Day/Month/Year}} + \\ &\quad \lambda(\text{CONTROLS})_{i, \text{Day/Month/Year}} + \varepsilon_{i, \text{Day/Month/Year}}, \end{aligned} \quad (2)$$

$$\begin{aligned} \text{BOND SPREAD}_{i, \text{after April } 30^{\text{th}}} &= \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i, \text{Year}-1} + \gamma \\ &\quad (\text{EXTERNAL RATINGS})_{i, \text{Day/Month/Year}} + \\ &\quad \lambda(\text{CONTROLS})_{i, \text{Day/Month/Year}} + \varepsilon_{i, \text{Day/Month/Year}}. \end{aligned} \quad (3)$$

b) The second time-criterion requires bonds issued before June 30<sup>th</sup> of the issuing year (*Year*) to be matched to the accounting variables obtained from the financial statement of the year before the issue, i.e. *Year-1*, otherwise that of the same issuing year, i.e. *Year* (see Figure below). Therefore, it is implicitly assumed that bonds price bank accounting figures of the same issuing year with a delay of more than 6 months.

Moreover, June 30<sup>th</sup> corresponds to another important date in the fiscal year, namely the day in which banks generally fill out their six-month financial statement.

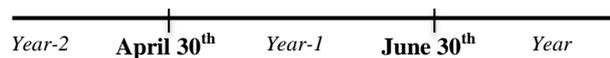


The following equations according to the second criterion are defined:

$$\begin{aligned} \text{BOND SPREAD}_{i, \text{before June } 30^{\text{th}}} &= \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i, \text{Year}-1} + \\ &\quad \gamma(\text{EXTERNAL RATINGS})_{i, \text{Day/Month/Year}} + \\ &\quad \lambda(\text{CONTROLS})_{i, \text{Day/Month/Year}} + \varepsilon_{i, \text{Day/Month/Year}}, \end{aligned} \quad (4)$$

$$\begin{aligned} \text{BOND SPREAD}_{i, \text{after June } 30^{\text{th}}} &= \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i, \text{Year}} + \\ &\quad \gamma(\text{EXTERNAL RATINGS})_{i, \text{Day/Month/Year}} + \\ &\quad \lambda(\text{CONTROLS})_{i, \text{Day/Month/Year}} + \varepsilon_{i, \text{Day/Month/Year}}. \end{aligned} \quad (5)$$

c) The third time-criterion is obtained combining the two previous ones. Therefore, if bonds are issued between April 30<sup>th</sup> and June 30<sup>th</sup> they must be matched to the accounting data obtained from the financial statement of the year before the bond issue, namely *Year-1*, whereas if bonds are issued before April 30<sup>th</sup> and after June 30<sup>th</sup> the rule to apply refers to criterion one and criterion two respectively (see Figure below).



The following equations according to the third criterion are defined:

$$\begin{aligned} \text{BOND SPREAD}_{i, \text{between April and June } 30^{\text{th}}} &= \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i, \text{Year}-1} + \\ &\quad \gamma(\text{EXTERNAL RATINGS})_{i, \text{Day/Month/Year}} + \\ &\quad \lambda(\text{CONTROLS})_{i, \text{Day/Month/Year}} + \varepsilon_{i, \text{Day/Month/Year}}, \end{aligned} \quad (6)$$

$$\begin{aligned} \text{BOND SPREAD}_{i,\text{before April } 30^{\text{th}}} &= \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i,\text{Year}-2} + \\ &\quad \gamma(\text{EXTERNAL RATINGS})_{i,\text{Day/Month/Year}} + \\ &\quad \lambda(\text{CONTROLS})_{i,\text{Day/Month/Year}} + \varepsilon_{i,\text{Day/Month/Year}}, (2'') \end{aligned}$$

$$\begin{aligned} \text{BOND SPREAD}_{i,\text{after June } 30^{\text{th}}} &= \alpha + \beta(\text{BANK ACCOUNTING FIGURES})_{i,\text{Year}} + \\ &\quad \gamma(\text{EXTERNAL RATINGS})_{i,\text{Day/Month/Year}} + \\ &\quad \lambda(\text{CONTROLS})_{i,\text{Day/Month/Year}} + \varepsilon_{i,\text{Day/Month/Year}}. (4'') \end{aligned}$$

Three different specifications of the general Equation (1) are employed that are also applied to the all the previous Equations (2)- (6) according to the time-criterion selected. The first specification concerns bank risk measures, which include profitability, financial leverage, assets quality and liquidity variables. The second is based on both Moody's and Standards & Poor's issuer ratings and Btp-Bund spread, while the third and last specification concerns bank and bond specific characteristics.

Note that, the decision to focus only on the primary market relies on the fact that this study analyses the determinants of bank bonds as they play an important role in financing Italian banks during the financial crisis and, in this context, bond spread at launch is an accurate measure of the bank cost of debt issued.

In the following section all the independent variables, according to the three specifications, are defined.

#### INDIPENDENT VARIABLES:

1) Bank accounting figures are the first group of independent variables presented in the general Equation (1) at the beginning of the paragraph. They are extrapolated from an accurate analysis of the notes to the account in which specific accounting variables are selected referring to previous studies and integrated with new additional variables to improve the interpretation of the results.

In the model, the first specification, as already stated, is based on four categories of bank credit risk: bank profitability, financial leverage, liquidity and assets quality.

##### a) *Profitability measures*

Three proxies for profitability are defined:

<i>ROA</i>	the ratio of annual net income <sup>30</sup> to the current year-end total assets;
<i>P_MARGIN</i>	the ratio between net income and revenues <sup>31</sup> ;
<i>ASSET_UTILIZ</i>	the ratio between revenues and the current year-total assets.

<sup>30</sup> Net income is equal to the intermediation margin netted by operative costs and write-downs, with the addition of gains or losses from both shareholding and investment assignments.

<sup>31</sup> Revenues are equal to the sum of interest receivable and similar proceeds, commission receivable, dividends and similar proceeds, trading activity net income.

These three variables highlight different aspects of bank profitability. The first corresponds to the Return On Asset index and it measures the bank's ability to generate earnings from its assets. The expected sign of this variable is not univocal as high values can reflect both a prosperous banking system and also higher bank risk-taking. The former variable reduces bond spread, whereas the latter increases it since indicates higher default probability.

The second and the third proxy are both obtained from the Du Pont identity, an equation that divides the Return on Equity index (ROE) into three parts: profit margin, assets utilization (also called assets turnover) and financial leverage (this latter variable is shortly defined). Profit margin measures bank capacity to create profit from the positive revenues in its income statement; this variable can also be used in assessing bank efficiency in managing costs since bad cost management generally reduces profit margins. The last proxy represents the assets turnover that measures bank efficiency to generate revenues from its assets. All these last two proxies, *P\_MARGIN* and *ASSET\_UTILIZ*, should negatively affect bond spread.

b) Financial leverage measures

The following leverage measures are employed in the model:

<i>LEVI</i>	the ratio of total book liabilities to the book value of equity;
<i>LEVI.1</i>	the ratio of total book liabilities to Tier1 (computed according to Basel II requirements);
<i>LEV2</i>	the ratio of total book assets to the book value of equity (equity multiplier);
<i>LEV2.2</i>	the ratio of total assets to Tier1 (computed according to Basel II requirements).

The first proxy, *LEVI*, refers to the standard accounting definition of leverage and it should negatively affect bond spread since higher debt levels compared to total equity indicate higher bank insolvency risk that therefore increases its probability of default. Nevertheless, in the financial and banking sector, a different variation of this definition is generally employed to measure leverage. The underlying idea is that banks finance their assets both through debt and equity<sup>32</sup>, in this respect higher levels of total assets with respect to total equity, *LEV2*, indicate that banks mainly finances its assets by borrowing instead of using its equity. Therefore both *LEV2* (equity multiplier) and the previous variable *LEVI* should have a positive effect on bond spread, since higher values indicate that the bank relies heavily on debt financing increasing its default probability. Note that these two variables, *LEVI* and *LEV2*, are two different interpretations of the same concept that appears evident also in their structure; indeed the third proxy minus one equals the first one.

The other variables defined, namely *LEVI.1* and *LEV2.2*, are simply slight variations of the two definitions previously stated. In particular, the difference relies on the denominator: total equity is substituted with Tier 1<sup>33</sup>, i.e. an alternative expression of bank equity that measure better bank creditworthiness and financial strength.

<sup>32</sup> Remark: total asses is equal to total liabilities plus total equity.

<sup>33</sup> Computed according to Basel II criteria.

In addition to the previous proxies, Leverage Ratio is introduced as an alternative measure of financial leverage:

*LEV\_RATIO*                    the Capital Measure<sup>34</sup> divided by the Exposure Measure<sup>35</sup>.

This variable is computed according to Basel III requirements with some simplifications imposed by the nature of the limited available information of the database of study. The Basel Committee on Banking Supervision introduced this variable as an additional capital requirement on banks due to the recent crisis in order to increase bank supervision and regulation. The minimum requirement imposed is equal to 3 per cent<sup>36</sup>. As such, this variable should negatively affect bond spread: the higher the percentage of capital ratio (assuming that the condition is satisfied), the lower the leverage exposure and therefore the bank probability of default.

All the proxies previously defined are non-risk adjusted; therefore to complete the specifications regarding leverage variables, the Tier 1 Capital Ratio (risk-adjusted index) is defined:

*TIER1\_RWA*                    the ratio of Tier1 (computed according to Basel II requirements) to the total risk weighted assets<sup>37</sup>.

According to Basel II, the Tier 1 Capital must be at least 4 per cent of risk-weighted assets at all times, however the Basel Committee on Banking Supervision, with the introduction of Basel III new capital requirements, raises it up to 6 per cent plus a conservation buffer of 2.5 per cent.

This proxy is expected to negatively affect yield spread since higher values improve bank's creditworthiness and stability.

### c) Assets quality measures

Concerning asset quality, 5 proxies are defined:

*BLR*                                the ratio of the total gross exposure of impaired loans to the total gross exposure (composed of both impaired and performing loans).

This variable measures the Relevance of Bad Loans. As such, a high level corresponds to a greater exposure of impaired loans with respect to total gross exposure that in turn indicates a high percentage of bad loans. Therefore, high *BLR* levels increase bank's credit risk and a positive sign is expected.

*NPLC*                                one minus the ratio of the total net exposure impaired loans to the total gross exposure impaired loans.

This proxy measures Non-Performing Loans Coverage. The larger the amount of potential losses accounted on the balance sheet with respect to the total exposure, the higher the coverage of bad loans and in turn the lower the assets quality and the higher the bank probability of default. Hence, a

<sup>34</sup> The Capital Measure for the leverage ratio is the Tier1 in accordance with Basel II standards.

<sup>35</sup> The Exposure Measure equals the sum of total book assets (netted by derivatives and SFTs) plus derivative exposures and security financial transaction exposures.

<sup>36</sup> "Implementation of the leverage ratio requirements has begun with bank-level reporting to national supervisors of the leverage ratio and its components, and will proceed with public disclosure starting 1 January 2015" cit. from "Revised Basel II leverage ratio framework and disclosure requirements" (2013), Basel Committee on Banking Supervision, Bank of International Settlements, Consultative Document.

<sup>37</sup> The denominator is weighted with respect to the assets credit risk: the higher the credit risk, the higher the weight.

positive sign for *NPLC* is expected. However, also a negative sign can be predicted. Indeed, higher values of *NPLC* can reflect sound banks that have already a big cushion against unexpected losses since they have already accrued a significant quantity.

*WDPL* the ratio of the total portfolio write-downs of performing loans over the total gross exposure of performing loans.

The Write-Downs on Performing Loans index expresses the amount of prudential allocations with respect to the total gross exposure of performing loans. By definition, performing loans are low insolvency risk but despite this fact, some write-down adjustments may be required according to the client's rating and to the statistics of the category the loan belongs to. Therefore, this variable measures the expected loss of performing loans and it should positively affect bond spread.

These proxies just defined qualify the impact of credit risk by using losses already accounted into the balance sheet. However, for the following variable a different approach is used that employs internal ratings as proxy for the default probability:

*ARPP* the weighted average of balance sheet exposures.

This variable measures the Average Rating of Performing Portfolio, where weights are given by balance sheet exposures. In other words, *ARPP* is obtained by dividing the sum of each rating class weighted to the corresponding balance sheet exposure by the sum of the weights. The higher the rating, the lower the weight, according to an increasing scale from class 1, high rating, to class 6, low rating. As such, this variable should positively impact bond spread as a higher value indicates higher credit risk.

*NLTA* the ratio of net loans to total assets.

There are two interpretations of the Net Loans to Total Assets index; one relates this proxy to the liquidity category while the other to the assets quality category. In particular, the first relies on the fact that high *NLTA* levels indicate that the bank is lending considerable large amounts compared to its assets, increasing liquidity risk and consequently the bank probability of default. Whereas, the second interpretation is related to the fact that loans are generally the riskier part of bank assets, therefore the greater amounts of loans a bank grants, the more it is exposed to default risk.

Note that, despite the different explanations, both lead to the same positive expected effect on bond yield.

d) The following *liquidity measure* is defined as proxy:

*NSFR* the ratio of the available stable funding to the required stable funding.

The Net Stable Funding Ratio is an accounting index, introduced by the Basel Committee<sup>38</sup> on Banking Supervision to face the issues suffered by several banks during the financial crisis due to a wrong management of liquidity: the minimum requirement imposed to banks is equal to 100 per cent. The available stable funding measures the stability of bank funding sources (i.e. bank's liabilities

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<sup>38</sup> See Basel III: Net Stable Funding Ratio, Consultative Document, Basel Committee on Banking Supervision, January 2014.

items) in a time horizon of one year, more specifically each accounting item is weighted according to a factor that reflects the degree of stability of the item and the total available stable funding is then obtained summing all the weighted amounts. Whereas, the required stable funding depends on the liquidity characteristics of bank assets (still on a time horizon of one year): higher weights are given to assets that are expected to be more illiquid and, analogously, the total required stable funding is then the result of the sum of the weighted amounts. The specific weights applied to both the numerator and the denominator are reported in Table 1 and they are defined according to Basel III document with some required simplifications.

Through this index, the Basel Committee aimed to decrease the probability that a reduction in the stable funding compromises the liquidity position of banks, increasing their probability of default. Hence, higher levels indicate greater amounts of stable funding compared to illiquid asset and this should negatively affect bond spread.

**Table 1: Net Stable Funding Ratio**

<i>Available Stable Funding</i>	<i>Weighted factor</i>	<i>Required Stable Funding</i>	<i>Weighted factor</i>
Tier 1	100%	Loans to clientele with residual maturity more than one year	100%
Tier2	100%	Loans to banks with residual maturity more than one year	100%
Debt securities with residual maturity of more than one year	100%	Other debt securities with residual life more than one year	85%
Deposits and current accounts- clientele with residual maturity more than one year	100%	Loans to clientele with residual maturity less than one year	85%
Other liabilities with residual maturity more than one year	100%	O.I.C.R shares with residual maturity more than one year	85%
Deposits and current accounts- clientele with residual maturity less than one year (*)	85%	Treasury bonds with residual maturity less than one year	5%
Debt securities with residual maturity of less than one year (**)	85%	Loans to banks with residual maturity less than one year	0%
Deposits and current accounts- Banks with residual maturity less than one year (*)	0%		
Deposits and current accounts- Banks with residual maturity more then one year	0%		

(\*) Sight and indefinite duration deposits are included

(\*\*) Sight and indefinite duration debt securities are included

2) The second group of independent variables are polled as rating measures, generally they can be associated to the issuer, the issue or the government; in all cases low ratings i.e. low creditworthiness, should increase default risk and therefore bond yield spread. Regarding banks (i.e. the issuers), Moody's and Standard & Poor's ratings are defined as proxies (*MOODY* and *S&P*) and associated to the corresponding financial institutions at the time of the bond issue. Each rating is converted into a number according to an increasing scale that associates value 1 to the highest rating and value 16 to the worst rating (see Table 3). Therefore, high values of both *MOODY* and *S&P* (low ratings) should positively affect bond spread.

The government rating is measured as the spread between the yield of 10-year Italian Treasury bond and 10-year German Treasury bond, this latter defined as risk-free rate (the corresponding proxy is labelled as *BTPvsBUND*). As such, it reflects the country creditworthiness and financial wealth in terms of the difference of the two yields. Hence, high *BTPvsBUND* levels indicate high probability of insolvency and therefore high default risk<sup>39</sup>.

For a lack of data, bond ratings are not included in the model. However, a dummy variable indicating whether the bond is listed or not is presented in the following paragraph.

**Table 2: Rating scale**

<i>S&amp;P's</i>	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+
<i>Moody's</i>	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa
<i>Conversion Scale</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	NA

3) The third group is composed of control variables and the following proxies are defined:

*BANK\_SIZE 1*            the natural logarithm of total year-end assets;

*BANK\_SIZE 2*            the ratio between bank total assets to the total assets of the largest bank in the sample year.

The first is an absolute measure, while the second is a relative one; therefore the latter variable should quantify more accurately the size of the bank. Nevertheless, both variables negatively affect bond spread as big banks tend to be safer thanks to a more diversified portfolio and to the support of the government in case of financial necessity (namely the “too big to fail” issue).

*BOND\_SIZE*            the natural logarithm of the bond issued amount.

The higher the bond size, the larger the issuing bank, therefore for the previous observations on bank size, this variable should negatively impact bond spread.

*LIST\_BOND*            the dummy variable that equals 1 if the bond is listed and zero if it is not listed;

<sup>39</sup> Note that this explanation assumed that changes on Btp-Bund spread are due to only movements in Italian Treasury bond yields and not in German Treasury bond yields. Indeed, changes of the latter are rare and can be neglected.

*INST\_RETAIL* the dummy variable that equals 1 if bonds are offered to institutional investors and 0 if they are offered to retail investors.

Specifically, a bond is classified as institutional if the minimum purchase amount is greater than 50,000. This dummy should capture the different bond yields offered to retail investors and to institutional investors. In this respect, the related literature suggests that lower interest rates are offered to retail investors, probably due to the reduced available information that this category has on the bond market.

*MATURITY* the natural logarithm of the bond maturity.

This variable should positively impact bond spread, as longer maturities are perceived as riskier by investors that therefore require higher yields.

**Table 3. Expected sign of the coefficients of the regression**

	MAIN INDEPENDENT VARIABLES																	
	of which: bank-specific accounting figures															of which: external rating measures		
	Financial leverage						Profitability			Assets quality					Liquidity			
	LEV1	LEV1.1	LEV2	LEV2.2	LEV_RATIO	TIER1_RWA	ROA	PROFIT_MARG	ASSET_UTILIZ	BLR	NPLC	WDPL	ARPP	NLTA	NSFR	MOODY	S&P	BTPvs BUND
PREDICTED SIGN	+	+	+	+	-	-	+/-	-	-	+	+/-	+	+	+	-	+	+	+

**Table 4. Benchmark for floating coupon rate**

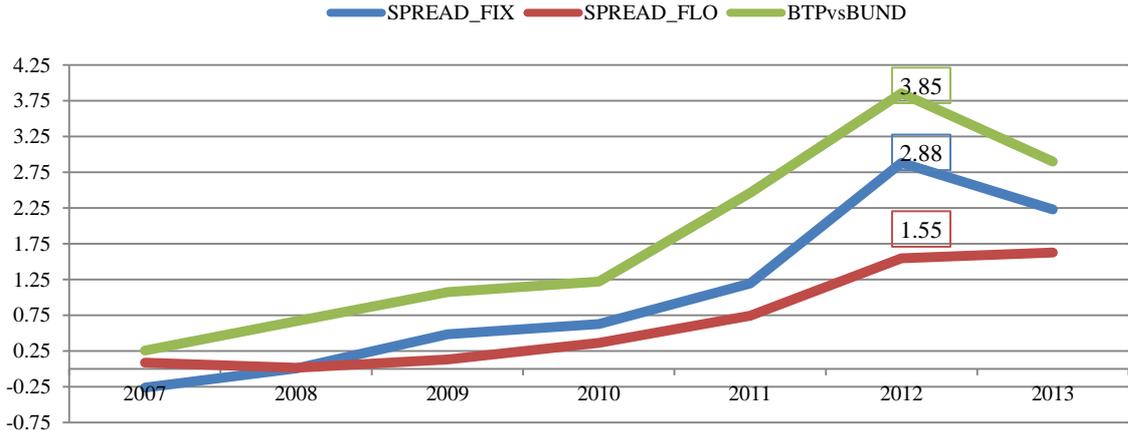
Benchmark	Meaning
EIEUD (1M,3M, 6M, 1Y)	EURIBOR
EIEUR (1M,2M, 3M, 6M)	EURIBOR
EURSWE (2Y, 10Y, 30Y)	IRS
EU (3MAV, 6MAV)	EURO 6 MONTHS EURIBOR AVERAGE
EUIT (3MA, 3MAV, 6MAV)	EURO 6M ITALIAN MONTHLY AVERAGE (USING EURIBOR DAILY RATES)
ECB01	EUROPEAN CENTRAL BANK REFERENCE RATE
HICPDMS	HARMONIZED INDEX OF CONSUMER PRICES ALL ITEMS EXCLUDING TOBACCO (2005=100)
ITOTR (3M, 6M, 1Y)	ITALIAN BOT AUCTION SIMPLE YIELD
LIEUR (6M)	TASSO EUR LIBOR A 6 MESI-EURO 2 MONTH LIBOR-BBA 11AM
TEC10	TAUX À ECHEANCE CONTANTE
EONIA	TASSO EONIA

### 2.5 DESCRIPTIVE ANALYSIS OF THE MATCHED SAMPLE

For the purpose of this analysis, the first time-criterion is selected. To recall, it associates to each issue that took place before April 30<sup>th</sup> the accounting data of the financial statement filled out two years before the bond issue, otherwise that of the year before. This decision relies on the fact that there is a mismatch between the first and the second dataset presented in Paragraph 2.4; indeed the former is composed of data between 2006 and 2011 while the latter between 2006 and 2013. Therefore, since in some years accounting data is unfortunately unavailable, in the final database some observations will be lost during the matching process, according to the time-criterion chosen. In this respect, this analysis focuses mainly on the years concerning the first and second phase of the crisis, considered more important and they are obtained matching the two initial datasets according to the first time-criteria<sup>40</sup>, despite the fact that this decision eliminates the observations of 2006. Note that, as far as is known, there is not a precise a priori role on which to base the selection of one of the three. Moreover, to be thorough, the other two time-criteria will be used to check the robustness of the model. The final matched database, object of this analysis, is composed of 15548 bond issues by 338 Italian banks during the period 2007-2013. Of these 15548, 10214 are fixed rate bond issues, the remaining being floating rate bond issues.

The dummy variable *INST\_RETAIL* shows that, in the sample, 96.7 per cent of the total issue concerns retail clientele, highlighting once more the important role that this sector has in financing Italian banks. Indeed, institutional investors represent a net minority that is clearly dominated by retail

**Graph 19. Sample descriptive analysis: changes in bond spread (both fixed and floating rate bond spread) and Btp-Bund**



Source: Processing of the sample data

<sup>40</sup> To be clearer, since both second and third time-criterion associate to each bond issue the accounting data of the financial statements filled out either the same issuing year or the year before it, the data of 2012 and 2013 will be partially or entirely deleted during the matching process. (Remark that, concerning the third time-criterion bond issues are also associated to the financial statements filled two year before the bond issuance. However, this does not change the considerations previously stated).

investors. The majority of the bond issues have a maturity of 3 years on average; more precisely, 81.4 per cent of the total are defined short-term (i.e. maturity less than 5 years), 18.3 per cent medium-term (i.e. maturity between 5 and 12 years) and only 0.3 long-term (i.e. maturity greater than 12 years). Moreover, only 3.6 of the total bonds are listed bonds, while the majority is unlisted.

The spread of both fixed and floating rate bonds followed a progressive, increasing path during the sample period 2007-2013 (see Graph 19). To be more specific, this trend began in 2008, intensified in 2010 with the onset of the sovereign-debt crisis reaching a peak of 2.8 for fixed rate bonds and the level of 1.6 for floating rate bonds in 2012, when the crisis hit Italy. This is in line with the increasing gap between 10-year Italian Treasury bonds and 10-year German Treasury bonds; indeed, the Btp-Bund spread, that is associated to each bond issue, reached the dramatically high level of 3.8 in 2012 due to the deterioration of Italy's creditworthiness.

As far as the issuer is concerned, the number of banks is homogeneously distributed in the sample period with the exception of 2013, a year in which they substantially decreased. Note that, in Table 5 the sum of issuer banks per year is not equal to 338 (i.e. the total issuer banks), this is simply explained by the fact that banks generally issue bonds in more than one year. Therefore, the sum is greater compared to the total number of banks in the sample. In this context, 39.5 per cent of the total issued bonds in each year (i.e. 2007-2013), 24.7 per cent in 6 years, 13 per cent in 5 years, 6.7 per cent in 4 years and the remaining only in 3 years or less.

Moody's and S&P's issuer ratings at launch are assigned respectively to 26 per cent and 32 per cent of the total issues and they provide an equal rating class, according to the conversion scale (Table 3), in 14 per cent of the cases in which both are available. Table 5 shows that S&P average values are always greater compared to Moody's, indicating a worse assessment of the issuing banks. Moreover, they substantially increased from 2011 onwards due to a decrease of approximately two positions in the rating class.

**Table 5. Sample descriptive analysis -distribution per year**

Year	N. of issues				N. of issuers	Bond spread		S&P		MOODY	
	by type of coupon		by type of investor			Fix	Floating	N.	Mean	N.	Mean
	Fix	Floating	Retail	Institutional							
2007	888	532	1404	16	241	-0.2589	-0.2589	600	5.7750	528	4.6572
2008	1824	1601	3404	21	292	0.0087	0.0087	1125	5.7716	977	4.5558
2009	1894	1172	3059	7	289	0.4836	0.4836	967	6.1851	746	4.6769
2010	1630	852	2457	25	268	0.6288	0.6288	807	6.3879	632	4.7959
2011	2022	789	2728	83	274	1.1941	1.1941	979	6.6047	788	5.5749
2012	1568	268	1523	313	273	2.8808	2.8808	406	8.6921	304	7.5789
2013	388	120	453	55	179	2.2332	2.2332	103	10.0000	72	8.8333
Tot	10214	5334	15028	520	1816	0.9324	0.3246	4987	6.4405	4047	5.1305

Bank specific accounting variables, associated to each bond issue according to the first time-criterion, have different trends in the sample period. To assess this evolution, Graphs 20.1-23 provide an overview of their mean value changes between 2007 and 2013. Regarding bank profitability, the *ROA* index maintained on average a stable, positive level in the first period of the sample before dropping sharply in 2008 and registering the negative peak of -0.01 in 2009. Thereafter, a small recovery is reported (2009-2010) but was not strong enough to reach positive index values. As expected, after the outbreak of the sovereign debt crisis, bank profitability decreased progressively recording values lower than those of 2009. A similar path is observed for the Profit Margin index (*P\_MARGIN*); indeed, these two variables measure similar but slightly different aspects of bank profitability and are therefore expected to be highly correlated.

The third proxy of this category is the Asset Utilization index (*ASSET\_UTILIZ*) that measures bank efficiency to generate profits from its assets. As shown in Graph 20.3, until 2009 the index followed a slight but positive path that changed in 2009 when it decreased until 2011, maintaining at around the level of 0.04 afterwards.

Analysing these three Graphs, it seems that the effect of both the Lehman Brothers crash and the onset of the Greek sovereign-debt crisis hit *ROA* and *P\_MARGIN* of Italian banks in the short-term and *ASSET\_UTILIZ* roughly one year later. Overall, it is evident that the first phase of the crisis did not affect the profitability of Italian banks as seriously as the second phase did.

As far as leverage is concerned, Graph 21.1 shows the trend of both *LEVI* and *LEVI.1* which, to recall, differ only in the denominator<sup>41</sup>: the former is defined as total liabilities over total equity, while the latter as total liabilities to Tier 1. As expected, *LEVI* stands below *LEVI.1* since generally the total book value of equity represents a greater amount. Between 2008 and 2011 both indexes increased slightly either due to an increase in liabilities or a reduction in the accounting items that compose both variables in the denominator. Thereafter, *LEVI* and *LEVI.1* followed two specular but symmetric paths, since the average value of equity decreased and, at the same time, Tier 1 rose. To some extent, this latter trend can be related to the new minimum capital requirements introduced by Basel III in 2010. On the whole, this Graph does not highlight a precise bank trend in either leveraging up or deleveraging; indeed, it depends on the index analysed. However, the gap between these two proxies decreased, converging at the same level at the end of the sample period.

*LEV\_RATIO* does not seem to have suffered the effects of the first phase of the crisis since it increased until 2011, revealing that banks on average had a significantly higher Capital Measure (Tier 1) compared to Exposure measure. On the other hand, in the second phase, this variable decreased progressively but still maintained over the required level 3 per cent, on average. In this context, note that, 98.8 per cent of the banks in the sample have a *LEV\_RATIO* at least equal to 3 per cent, as imposed by Basel III.

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<sup>41</sup> In the descriptive analysis *LEV2* and *LEV2.2* are omitted simply because, being slight variations of *LEVI* and *LEV2.2* respectively, a similar trend is expected.

Concerning Tier1 Capital Ratio (*TIER1\_RWA*) the minimum requirement of 6 per cent<sup>42</sup> is respected by 96.2 per cent of banks in the sample. In addition, Graph 21.3 shows that it rose sharply from 2011 onwards, indicating that on average banks increased their Tier 1 Capital with respect to risk-weighted assets, contributing to increase their financial wealth. This effect is probably linked, to some extent, to the introduction of the Basel III document in 2010.

With regards to the assets quality category, the relevance of bad loans (*BLR*) rose progressively after the onset of the financial crisis in 2008. This is mainly due to an increase in write-downs on impaired loans as reported by the increasing trend of *NPLC*. Overall, the quality of assets deteriorated and therefore banks to reduce their credit risk increase write-downs. In this context, also the expected loss of performing loans grew, measured by the index write-downs on performing loans (*WDPL*). This indicates that the assets deterioration afflicted the entire class of loans, without exception of performing ones<sup>43</sup>. Note, that these three variables do not show a significant trend change when comparing the first and the second phase of the crisis.

In line with this deterioration in the assets quality, the Average Rating of Performing Portfolio increased in the period 2008-2011<sup>44</sup>, reaching a peak of 3.89 at the end of it. However, *ARPP* decreased progressively thereafter. This result can be explained by the fact that, with the onset of the financial crisis, the “cleansing” policies of the financial statements imposed on banks led to a downgrading of several performing loans. As a result, bank profitability worsened but, at the same time, performing loans that were not downgraded improved. Therefore, after the introduction of these “cleansing” policies, the Average Rating of Performing Portfolio improved and its index reduced, as reported in Graph 22.4.

In line with the observations in Paragraph 1.2.3, the average amount of loans to total assets (*NLTA*) increased progressively in 2007-2011: banks granted considerably large amount of loans to clientele, increasing their liquidity risk. Thereafter, as the crisis intensified, the deterioration in the quality of the assets, together with a difficult access to funding sources and the necessity to reduce liquidity risk, affected banks propensity to grant loans and consequently the index decreased. The last category regards liquidity, whose main indicator is the Net Stable Funding Ratio index (*NSFR*). This proxy suffers a potential bias, since the accounting data necessary to compute it, is available in ABI database only from 2009 onwards. Therefore, to control partially for this lack of data, *NSFR* for the 6 largest Italian banks (Intesa SanPaolo, Monte dei Paschi di Siena, Unione di Banche Italiane, Banca Popolare di Vicenza and Veneto Banca) is computed and introduced in the final dataset in those years in which data is not directly available in ABI database. This accounting information is directly extrapolated from the financial statements of these 6 banks available on the

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<sup>42</sup> Without taking into account the conservative buffer.

<sup>43</sup> Note that, the progressive deterioration in the assets quality is consistent with the statements reported in Paragraph 1.2.1.

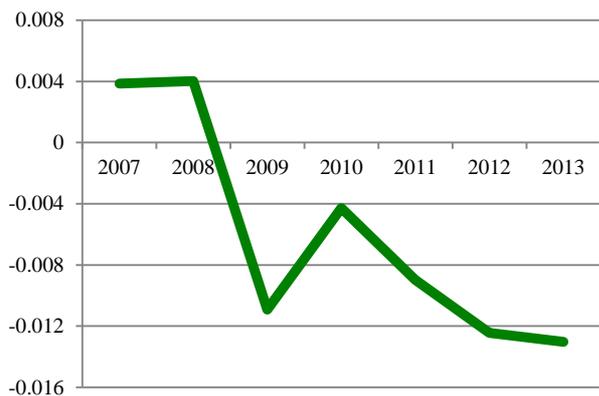
<sup>44</sup> Recall that, to highest rating class weight 1 is assigned, while to the worst rating class weight 6 is associated.

website of each one. Certainly, this is taken into account in the inferential analysis and detailed information on this is available in the following paragraph<sup>45</sup>.

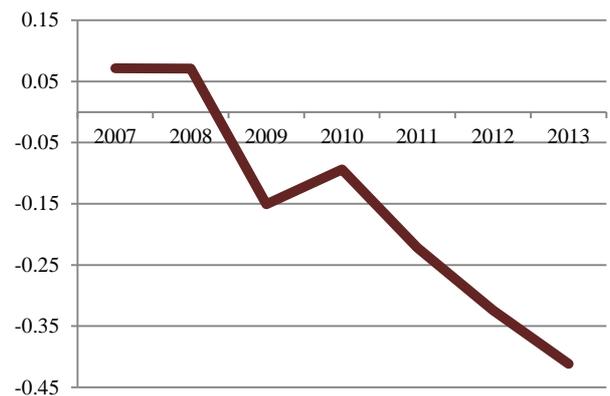
Graph 23 shows that the 6 largest Italian banks raised their *NSFR* index during the first years of the crisis, indicating a trend towards stable, likely traditional, long-term funding sources. However, from 2009 the index decreased sharply especially for the biggest Italian banks that suffered heavier the effect of the crisis if compared to the whole sample. Nevertheless, they maintained on average above the minimum required level of 100 per cent imposed by Basel III. In this context, note that, only 0.4 per cent of the whole sample did not satisfy this level. Further and detailed information on sample characteristics is provided in Table 6.

To sum up, Italian bank profitability reduced in the sample in particular during the second phase of the crisis and also the available stable funding sources. In this context of high liquidity stress that intensified from 2010 onwards, the quality of the assets deteriorated progressively, while no a priori univocal trend from leverage measures comes out.

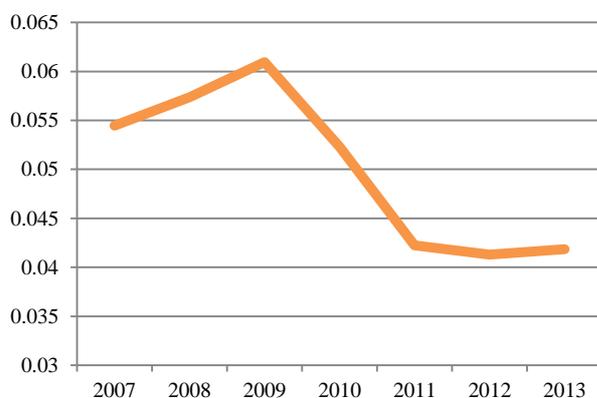
**Graph 20.1 ROA**



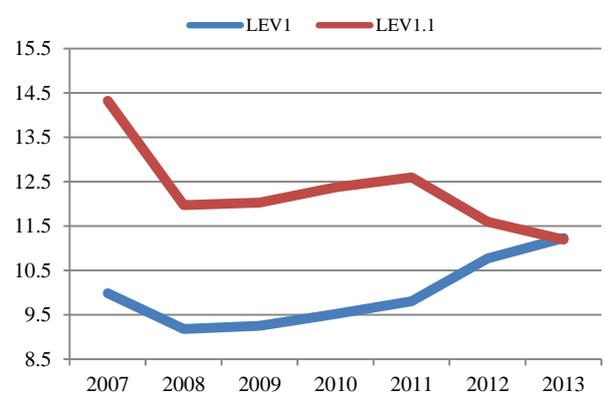
**Graph 20.2 PROFIT\_MARGIN**



**Graph 20.3 ASSET\_UTILIZ**

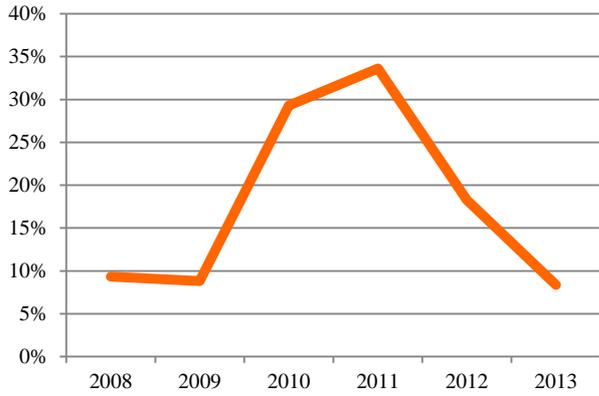


**Graph 21.1 LEV1 and LEV1.1**

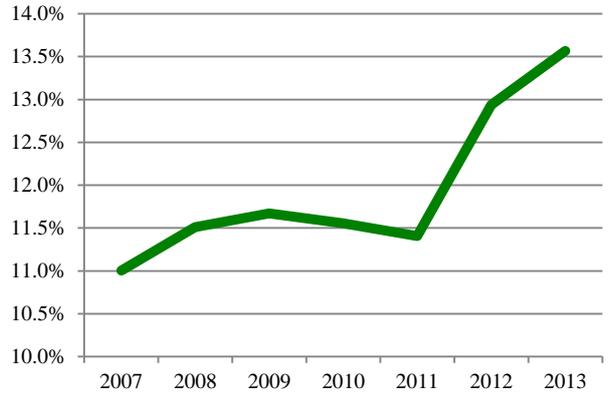


<sup>45</sup> Note that, in the final matched database, several missing values are present. However, these ones are negligible if compared to the consistent lack of data that concern the *NSFR* index in the first years of the sample. Therefore, only for *NSFR* a solution to the issue is provided.

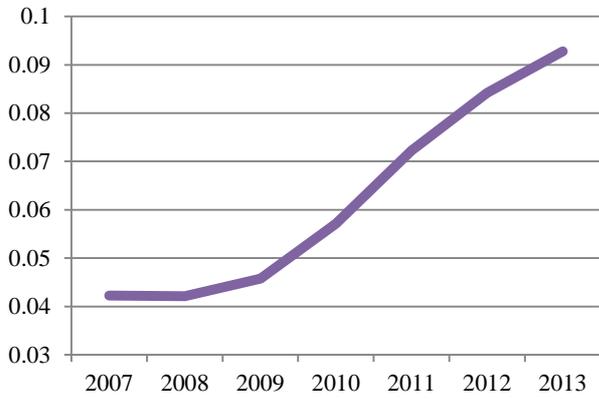
**Graph 21.2 LEV\_RATIO (%)**



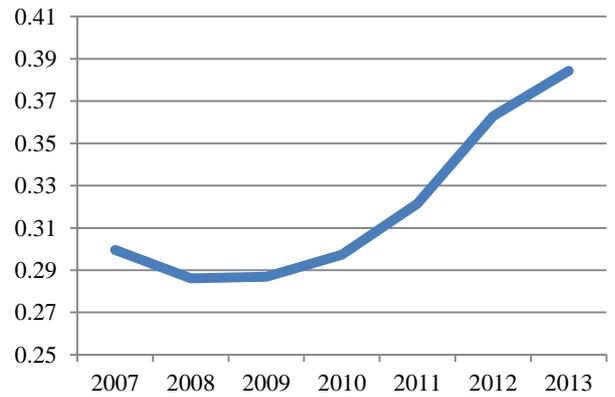
**Graph 21.3 TIER1\_RWA (%)**



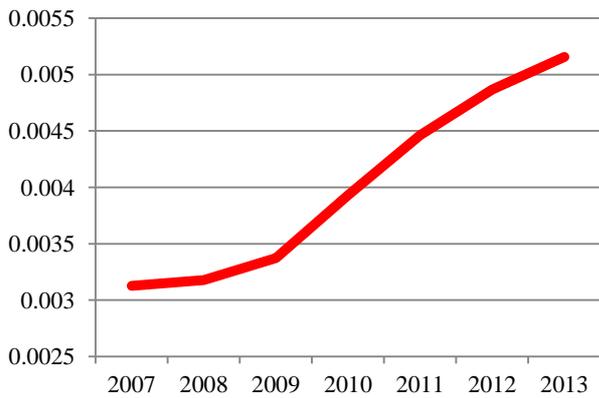
**Graph 22.1 BLR**



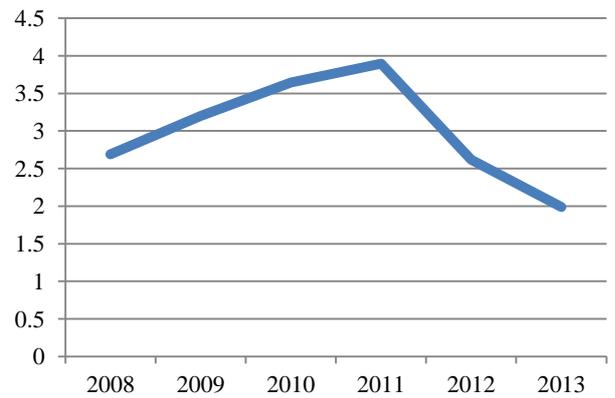
**Graph 22.2 NPLC**

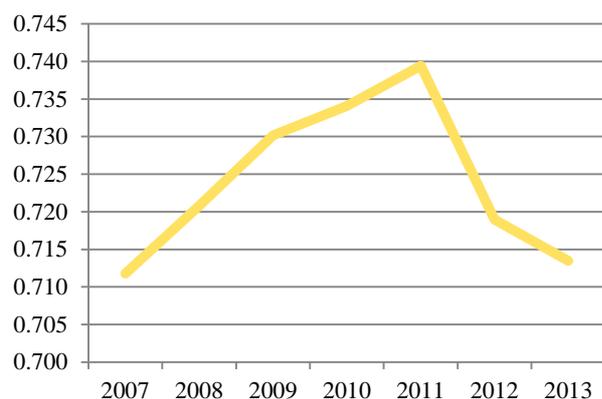
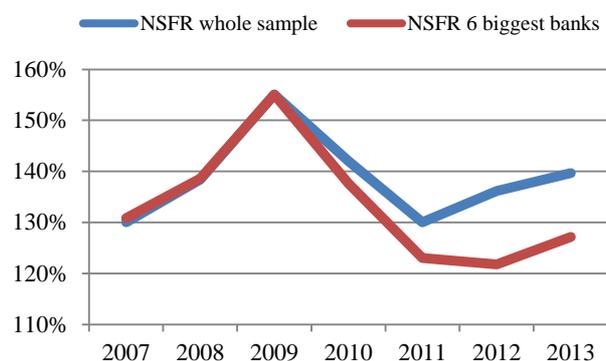


**Graph 22.3 WDPL**



**Graph 22.4 ARPP**



**Graph 22.5 NLTA****Graph 23 NSFR whole sample vs. the 6 biggest Italian banks**

Source: Processing of the sample data

**Table 6. Sample summary statistics**

Variables name	N	Mean	Median	Max	Min	Standard deviation
<i>SPREAD_FIX</i>	10214	0.9324	0.6110	4.9830	-3.8950	1.2385
<i>SPREAD_FLO</i>	5334	0.3223	0.1000	6.0000	-2.0000	0.7007
<i>BTPvsBUND</i>	15548	1.5731	1.2380	5.5790	0.1850	1.2549
<i>S&amp;P</i>	4987	6.4405	6.0000	12.0000	4.0000	1.4113
<i>MOODY</i>	4047	5.1305	5.0000	12.0000	3.0000	1.4715
<i>MATURITY</i>	15548	3.3964	3.0027	30.0192	0.2493	1.6047
<i>BOND_SIZE</i>	15534	15.0337	14.9141	23.2082	7.6009	1.8426
<i>BANK_SIZE1</i>	15035	14.8002	13.5912	20.6501	9.5592	2.6872
<i>BANK_SIZE2</i>	15035	0.0622	0.0009	1.0000	0.0001	0.1500
<i>ROA</i>	15035	-0.0053	-0.0006	0.0210	0.1727	-12.2014
<i>P_MARGIN</i>	15035	-0.1169	-0.0135	0.4683	2.4465	-171.0555
<i>ASSET_UTILIZ</i>	15035	0.0518	0.0530	0.0822	0.0100	0.0094
<i>LEVI</i>	15035	9.6845	9.0559	41.6521	3.2861	0.0227
<i>LEVI.1</i>	13414	12.1778	10.7280	48.7466	5.2387	0.0094
<i>LEV2</i>	15031	10.6864	10.0559	42.6521	3.2851	1.0227
<i>LEV2.2</i>	12798	13.3490	11.8221	49.9170	5.4592	0.0104
<i>LEV_RATIO</i>	12299	0.1996	0.0829	91.2775	3.2292	0.0001
<i>TIER_RWA (%)</i>	14947	11.7239	11.2500	29.9600	4.7016	0.0076
<i>BLR</i>	10514	0.0501	0.0430	1.0000	0.0332	0.0000
<i>NPLC</i>	10506	0.2963	0.3019	0.7638	0.0051	0.1193
<i>WDPL</i>	10509	0.0035	0.0034	0.0328	0.0020	0.0000
<i>ARPP</i>	3654	3.2621	3.0768	5.3309	1	1.1892
<i>NLTA</i>	15035	0.7271	0.7628	0.9018	0.0945	0.0000
<i>NSFR</i>	6786	1.3839	1.3349	3.4136	0.3163	0.4889

## **2.6 INFERENCE ANALYSIS**

### **2.6.1 INTRODUCTION**

The descriptive analysis has highlighted a potential bias in the sample due to the fact that accounting data on *NSFR* is available in the ABI database for all banks only from 2009. To partially solve this lack of data without losing important information in the analysis, *NSFR* for the 6 largest Italian banks is collected and computed by hand. As a result, this index is available for these big banks in each year of the sample, while for the whole sample of banks (composed of 332 banks) only from 2009 in ABI database. Because of these unbalanced dataset, three sub-samples (sample A, B and C) of different sizes are used in the regression analysis. Sub-sample A (4,388 observations) is composed of the 6 main Italian banks for which the *NSFR* index is always available (therefore, the final matched dataset of sub-sample A has observations from 2007 to 2013). Sub-sample B (6,593 observations) includes all banks (both larger banks and smaller banks) for which the *NSFR* index is available in ABI database (therefore, the final matched dataset of sub-sample B has observations from 2010 to 2013<sup>46</sup>). Sample C (15,065 observations) consists of the whole initial matched database<sup>47</sup> excluding the *NSFR* variable (i.e. matched sample period 2007-2013). These three sub-samples are then analysed using the fixed effect estimator, setting ABI codes as the panel variable. The decision to employ this type of regression relies simply on the fact that it allows to control for unobserved heterogeneity among the explanatory variables that is assumed to be present in this model.

Finally the inferential analysis proceeds as follows. Paragraph 2.6.2 investigates whether bank specific accounting variables effectively measure bond spread or not (both for fixed and floating rate bonds) and if the estimated coefficients of the regressions reflect the expectations described in Paragraph 2.4. Thereafter, Paragraph 2.6.3 analyses the main changes of these accounting variables on bond spread over time, comparing the first and second phase of the crisis.

### **2.6.2 DO BANK SPECIFIC ACCOUNTING VARIABLES EXPLAIN THE VARIABILITY OF BOND SPREAD?**

As a first step, we grouped accounting variables per category and tested their effects on the pricing of fixed rate bonds. In other words, all the proxies concerning leverage, liquidity, profitability and asset quality are regressed per category on bond spread to investigate and provide a first overview of their impact and significance, based on each sub-sample analysed. With regards to leverage, note that, among the four variables proposed in Paragraph 2.4 (*LEV1*, *LEV1.1*, *LEV2*, *LEV2.2*), the first one

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<sup>46</sup> Recall that the first time-criteria requires bonds issued before April 30<sup>th</sup> of the issuing year to be matched to the bank accounting data obtained from the financial statement filled out two years before the issuing year, otherwise that of the year before. As a result, being accounting data available only from 2009 onwards, the final matched dataset of sub-sample B has observations from 2010 to 2013.

<sup>47</sup> In this context, initial sample means simply the one before the introduction of the *NSFR* index for the 6 largest Italian banks.

is selected (i.e. total liabilities to total equity) since, as far as it is known, *LEVI* is the most common, traditional definition of financial leverage that is generally employed in several related studies.

Table 7 shows that, on the whole, each category is relevant in pricing bond spread and this seems to be true independently from the sample analysed. To be more specific, the three leverage proxies, *LEVI*, *TIER1\_RWA* and *LEV\_RATIO* are all highly significant except for *LEV\_RATIO* in sub-sample B. However, the expected sign of both *TIER1\_RWA* and *LEV\_RATIO* is positive, contrary to expectations. Nevertheless, these simple regressions per category do not provide a precise conclusion regarding the effect of each variable on fixed rate bond spread, since it is likely that important regressors are not included in this model. In addition,  $R^2$  in sample A is significantly higher than in both sub-samples B and C, suggesting that leverage proxies are more relevant for big banks.

*NSFR* and *NLTA*, proxies of liquidity, are both significant with a negative estimated coefficient at the 1% level<sup>48</sup>. Profitability proxies are also highly significant and have a negative expected sign, since high levels of both *ROA* and *ASSET\_UTILIZ* generally reduce bank probability of default. Note that, in these latter regressions *P\_MARGIN*, being positively correlated with *ROA*, is not included in the model (the correlation coefficient is equal to 0.98). Indeed, adding both variables in the regression is likely to bias the estimated coefficients.

The last analysed category concerns assets quality proxies. In this respect, Table 7 shows that *BLR* increases bond spread and remains highly significant in all Equations (9)-(12). Moreover, also *NPLC* has a positive, significant coefficient sign, suggesting that high index levels are perceived as an indicator of high expected losses that therefore increase bank probability of default.

However, *ARPP* has an unexpected, significant, positive coefficient sign in both Equations (9) and (11), while is omitted in Equation (12) to control for the consistent reduction in the number of ABI code that is reported in sample C (see Equation (11)). This decrease is simply due to missing values, indeed the *ARPP* index is not available for all banks in the sample.

The same problem arises in sample B (see Equation (10)): the number of ABI code registered drops to 7. Unfortunately, in this case, the issue cannot be easily controlled since it involves all assets quality proxies and not only one (i.e. *ARPP* for sample C). Indeed, the decision to include in this sub-sample only accounting data from 2009 onwards (to control for the *NSFR* issue), reduced strongly the number of observations in the final matched database, affecting mainly the assets quality category to which the data was already not available for all banks. Therefore, to be thorough, the regression is reported in Table 7 but the estimated coefficients are not considered relevant and effective to assess the impact that assets quality proxies have on bond spread.

Finally, *WDPL* appears relevant as a proxy for the assets quality category, being statistically significant in both Equations (9) and (11) at the 1% level, although it has an unexpected, negative and significant sign in Equation (12).

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<sup>48</sup> Note that, the regression concerning the liquidity category is not computed for sample C since, to recall, it does not include the *NSFR* index.

Overall, each category is relevant in pricing fixed rate bond spread, especially profitability and assets quality variables to which the highest  $R^2$  are registered and in addition leverage proxies in sub-sample A<sup>49</sup>. Nevertheless, as already reported, this analysis per category concerns simple regressions that are likely not to take into account important aspects affecting the dependent variable. Therefore, to better estimate the effect that these accounting variables have in pricing fixed rate bonds, further analyses are required.

In this respect, a “step-by-step” analysis is conducted on the data and results are reported in Tables 8.1-8.3. To be more specific, starting from a simple regression model that involves common accounting variables, new bank specific proxies are added one-by-one to the initial regression to investigate the impact, significance and evolution of each one on bond spread. Thereafter, for completeness, a final regression that involves all independent variables is run, expecting to strengthen the results obtained in the previous regressions (i.e. those in Equations (1) to (11) for sub-sample A and (1) to (9) for sub-sample C). This process is then repeated for each sub-sample. Concerning sample B, Table 8.3 includes only profitability, leverage and liquidity proxies since, as previously reported, assets quality variables are not statistically sufficient in terms of number of observations for the purpose of this analysis.

Moreover, note that, since including of all accounting variables in the complete regression leads to collinearity issues, more than one final equation is presented according to the estimated correlation coefficients among the explanatory variables (Equations (12)- (13) in Table 8.1 and Equations (11)-(12) in Table (8.2)) and to the need to control for the number of banks within the panel (Equation (13) in table 8.2).

Several important results emerge in Tables 8.1-8.3. As far as leverage is concerned, *LEVI* always has a positive (as expected), statistically significant sign coefficient at the 1% level in each sub-sample, despite the fact that, in the complete Equation (11) of Table 8.2, the index has an expected negative sign although significant only at the 10% level.

Equations (2) in Tables 8.1-8.3 show that *TIERI\_RWA* has a positive, significant coefficient as in the analysis per category and at odds with expectations. However, in the final regressions it is rarely significant and in Equation (12) in Table 8.1 has also a negative sign. A similar problem arises for *LEV\_RATIO* whose coefficient sign is not as expected and almost always statistically significant at the 1% level.

The unexpected sign of both variables (*TIERI\_RWA* and *LEV\_RATIO*) can be explained by four main reasons. First, there could be a measurement error issue; in particular for *LEV\_RATIO* whose computation required some simplifications due to the limited available information compared to the Basel III requirements. Second, these variables may not be proper or correct proxies of bank leverage. Third, it is likely that some hidden effects have not been taken into account in the regression model.

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<sup>49</sup> Obviously, we are aware that  $R^2$  is affected by the number of proxies in each regression that is not constant among the categories.

Finally, the fourth reason concerns the fact that the new capital requirements imposed by EBA (European Banking Authority) to the largest Italian banks after the onset of the financial crisis, and then strengthened by the Basel III document approved in 2010, led to a significant increase in bank capital (and therefore Tier 1) in a period in which the low Italy's creditworthiness rose the spread both of Btps and also of bonds. Therefore, the positive estimated coefficient of these variables (especially of *LEV\_RATIO* but also of *TIER1\_RWA*) may not be due to a causal effect but simply to a spurious one.

With regards to the liquidity variables, the *NSFR* index has an expected negative, highly significant coefficient sign in both sub-samples A and B, although this index becomes not significant in the complete regressions of sub-sample A, probably because some hidden effects are not taken into account. Negative, statistically significant coefficient signs for all profitability proxies appear in each sub-sample. Indeed, *ROA*, *P\_MARGIN* and *ASSET\_UTILIZ* are all significant at the 1% level, revealing the importance that this category can have in reducing bank costs at issuance. Moreover, the estimated coefficients of *ROA* are generally higher for large banks compared to those in both sub-sample B and C. The last category concerns assets quality: *NPLC*, *WDPL* and *BLR* are statistically significant (almost always at the 1% level) as in the analysis per category with a positive coefficient sign in sub-samples A and C, despite the fact that *WDPL* is never significant in the complete regressions of sub-sample C.

On the other hand, *NLTA* has a negative, significant coefficient sign in both sample A and C, suggesting that loans granted to ordinary clientele are generally not perceived as risky assets by investors (at odds with expectations). Unexpectedly, *ARPP* maintains a negative, statistically significant coefficient sign also in the "step-by-step" analysis. Finally, control variables in the model are almost always statistically significant. In particular, as expected, *MATURITY* raises fixed rate bond spread, while *BOND\_SIZE* reduced it. Quite surprisingly, *BANK\_SIZE* has a positive and significant coefficient sign in each sub-sample. One possible explanation for this result relies on the fact that large banks are not perceived by bondholders as protected by "too big to fail" government guarantees and considering the deterioration of Italy's creditworthiness during the sample period, this positive sign seems to be motivated.

So far, the effect of the bank-specific accounting variables on the fixed rate bond spread has been analysed. Considering instead the floating rate bond spread, the same inferential analysis is conducted and estimated results are reported in Tables 9-10.3. Overall, in the floating rate bond spread analysis, the empirical evidence, with some exceptions, shows similar results to those presented in the fixed rate bond spread analysis.

Specifically, with regard to the analysis per category (see Table 9), the leverage variables have a significant coefficient sign in each sub-sample as for the case of fixed rate bonds. Only *LEV\_RATIO* appears ambiguous; indeed it has a positive, significant coefficient sign in sub-sample C, a negative one in sub-sample A, while it is not significant in sub-sample B.

Both liquidity and profitability proxies maintain the same estimated coefficient signs as in Table 7 and are all statistically significant at the 1% level (except *ROA* in Equation (8) of Table 9). Concerning the assets quality variables, *BLR* has positive, significant coefficients at the 1% level, despite its effect seeming weaker if compared to that of fixed rate bonds. In addition, both *NLPC* and *ARPP* have positive coefficient signs, although they are not always significant. Finally, *WDPL* never has statistically significant coefficients, suggesting that it is not a key variable in pricing floating rate bond spread<sup>50</sup>.

Tables 10.1-10.3 report the “step-by-step” analysis for the case of floating rate bond spread: *LEVI* is never statistically significant in the final regressions of sub-sample A, while it is rarely significant with an unexpected negative sign in sub-sample C. This result may indicate that this index reduces importance when other accounting variables are introduced in the model. Both *TIER1\_RWA* and *LEV\_RATIO* are never statistically significant in the complete regressions of sub-sample A, although *TIER1\_RWA* is always significant in both sub-samples B and C even if it has an unexpected positive sign. One possible reason of this fact is related to the additional capital requirements imposed to banks, as previously explained in the case of fixed rate bonds. The *NSFR* index has an unexpected positive sign in the complete regressions of sub-sample A. However, this index is significant and negative (as expected) at the 1% level in Equation (5) of sub-sample B. *NLTA* has a negative, although not always statistically significant sign in both sub-samples A and B, while no univocal coefficient sign comes out in the regressions on sub-sample C. Both *P\_MARGIN* and *ASSET\_UTILIZ* have significant, negative coefficient signs in almost each sub-sample, indicating that they hold a relevant role also in the case of floating rate bonds.

Concerning sub-sample A, *ROA* is highly significant in Equations (1)-(11) of Table 10.1, while it loses importance when other accounting variables are added in the regression analysis (Equation (13) of Table 10.1). On the other hand, this index is rarely significant in Equations (1)-(11) of sub-sample C, although it becomes significant at the 1% level in Equations (11)-(13) of Table 10.2. Finally, with regard to the assets quality category, *BLR* is statistically significant with positive coefficient signs only in sub-sample C, while it is never significant in sub-sample A. *NPLC* has positive and generally statistically significant coefficients in sub-sample A and C as for fixed rate bonds, indicating once again that high levels are perceived as high expected losses that therefore increase floating rate bond spread. In addition, *ARPP* has negative although rarely significant coefficient signs in sub-sample A, while it has positive (as expected) statistically significant coefficients in the complete regression of sub-sample C.

To conclude, bank specific accounting variables seem to explain better fixed rate bonds compared to floating ones. Indeed, the estimated coefficients of floating rate bonds has sometimes unexpected or not significant signs in the complete regressions. Three reasons may explain this fact.

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<sup>50</sup> Note that the same conclusions concerning assets quality variables in sample B still hold for the case of floating rate bonds.

First, some hidden and relevant effects are not taken into account. Therefore, the results could be biased by some omitted variables. Second, the number of observations is not statistically sufficient when compared to that of fixed rate bonds. Third, floating bonds, being for their nature more exposed to the market, are likely to be more influenced and explained by macroeconomic elements than by specific ones.

**Table 7 – Fixed effect regressions of fixed rate bond spread on bank accounting variables: analysis per category**

	Sub-sample A	Sub-sample B	Sub-sample C	Sub-sample A	Sub-sample B	Sub-sample A	Sub-sample B	Sub-sample C	Sub-sample A	Sub-sample B	Sub-sample C	Sub-sample C
	Leverage			Liquidity		Profitability			Assets Quality			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>LEVI</i>	0.142*** (0.0189)	0.193*** (0.0101)	0.208*** (0.00770)									
<i>TIER1_RWA</i>	0.294*** (0.0268)	0.042*** (0.0137)	0.095*** (0.00781)									
<i>LEV_RATIO</i>	24.793*** (9.037)	0.223 (0.247)	0.014*** (0.00471)									
<i>NSFR</i>				-0.805*** (0.0814)	-4.128*** (0.218)							
<i>NLTA</i>				-6.120*** (0.851)	-18.493*** (0.904)				-20.033*** (1.451)	6.573 (4.470)	-11.808*** (0.919)	-0.764** (0.351)
<i>ROA</i>						-81.424*** (3.950)	-40.783*** (2.965)	-0.221*** (0.0842)				
<i>ASSET_UTILIZ</i>						-18.882*** (2.984)	-105.21*** (4.769)	-73.024*** (1.093)				
<i>BLR</i>									41.074*** (2.034)	96.812*** (11.69)	42.028*** (1.699)	26.801*** (0.773)
<i>NPLC</i>									4.055*** (1.105)	26.013*** (3.745)	7.269*** (0.822)	1.228*** (0.353)
<i>WDPL</i>									209.032*** (39.44)	-466.834*** (157.8)	172.754*** (37.03)	-31.087** (13.22)
<i>ARPP</i>									-0.781*** (0.246)	-0.387 (0.267)	-0.467*** (0.115)	
Constant	-3.861*** (0.315)	-0.781*** (0.193)	-2.021*** (0.123)	6.335*** (0.626)	20.92*** (0.873)	1.399*** (0.165)	5.833*** (0.222)	4.686*** (0.0566)	12.943*** (1.021)	9.268*** (2.786)	11.203*** (0.807)	0.644** (0.321)
Observations	2,331	4,864	8,217	3,167	3,247	3,167	4,892	9,910	1,924	1,240	2,204	6,467
R-squared	0.255	0.079	0.099	0.048	0.139	0.338	0.224	0.319	0.328	0.262	0.303	0.201
Number of ABI codes	6	302	318	6	245	6	303	324	5	7	25	277

Reported are regression coefficients and standard errors (in parenthesis). The dependent variable is the fixed rate bond spread defined as the difference between the yield to maturity at issuance of the fixed rate bond and the corresponding Interest Rate Swap with the same maturity. Bank specific accounting variables are regressed per category on bond spread. In this respect, since *NLTA* can be considered both a proxy of liquidity and of assets quality, for completeness it is included in both categories. Note that, concerning profitability, *P\_MARGIN* is omitted because of collinearity with *ROA*.

Explanatory variables are defined as follows:

<i>LEVI</i>	the ratio of total book liabilities to the book value of equity.
<i>TIER1_RWA</i>	the ratio of Tier1 to the total risk weighted assets.
<i>LEV_RATIO</i>	the Capital Measure divided by the Exposure Measure.
<i>NSFR</i>	the ratio of the available stable funding to the required stable funding.
<i>NLTA</i>	the ratio of net loans to total assets.
<i>ROA</i>	the ratio of annual net income to the current year-end total assets.
<i>ASSET_UTILIZ</i>	the ratio between revenues and the current year-total assets.
<i>BLR</i>	the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans).
<i>NPLC</i>	the ratio of total net exposure impaired loans to total gross exposure impaired loans.
<i>WDPL</i>	the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.
<i>ARPP</i>	the weighted average of balance sheet exposures.

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.

**Table 8.1 – Fixed effect regressions of fixed rate bond spread on bank accounting variables: “step-by-step” analysis of sub-sample A**

VARIABLES	Sub-sample A												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<i>LEVI</i>	0.0997*** (0.1176)	0.103*** (0.0143)	0.140*** (0.0171)	0.153*** (0.0135)	0.0877*** (0.0157)	0.130*** (0.0131)	0.146*** (0.0134)	0.135*** (0.0137)	0.145*** (0.0138)	0.134*** (0.0135)	0.134*** (0.0182)	0.112*** (0.0249)	0.0735** (0.0269)
<i>TIER1_RWA</i>		0.169*** (0.0175)										-0.119* (0.0811)	-0.031 (0.058)
<i>LEV_RATIO</i>			40.12*** (6.172)									92.54*** (12.98)	94.59*** (13.08)
<i>NSFR</i>				-0.153** (0.0673)								0.053 (0.169)	0.168 (0.160)
<i>NLTA</i>					-7.383*** (0.888)							-5.224** (2.482)	-5.154** (2.689)
<i>ROA</i>	-105.1*** (2.4638)	-74.19*** (3.373)	-72.44*** (5.090)	-83.18*** (3.283)	-100.9*** (3.797)		-70.26*** (4.200)	-73.83*** (6.562)	-89.41*** (3.622)	-83.77*** (3.218)	-87.35*** (6.035)		-26.14** (12.15)
<i>P_MARGIN</i>						-3.758*** (0.130)							
<i>ASSET_UTILIZ</i>							-15.04*** (2.884)					-101.863*** (8.344)	-100.152*** (9.219)
<i>BLR</i>								3.600* (2.067)				17.87*** (5.052)	
<i>NPLC</i>									1.893*** (0.546)			6.868*** (1.178)	4.477*** (1.496)
<i>WDPL</i>										-159.9*** (23.63)		291.23*** (68.43)	167.993*** (59.94)
<i>ARPP</i>											-0.652*** (0.098)	-2.612*** (0.283)	-0.1219*** (0.267)
<i>BOND_SIZE</i>	-0.125*** (0.00822)	-0.127*** (0.00800)	-0.096*** (0.00992)	-0.126*** (0.00811)	-0.124*** (0.00803)	-0.130*** (0.00794)	-0.129*** (0.00809)	-0.128*** (0.00816)	-0.124*** (0.00812)	-0.125*** (0.00806)	-0.107*** (0.0106)	-0.103*** (0.0103)	-0.102*** (0.0103)
<i>BANK_SIZE2</i>		2.219*** (0.461)	5.318*** (0.961)	4.041*** (0.424)	1.247** (0.541)	3.348*** (0.416)	3.814*** (0.426)	3.974*** (0.426)	3.995*** (0.424)	4.411*** (0.427)	-1.765 (1.530)		
<i>MATURITY</i>	0.0341*** (0.0429)	0.0467 (0.0419)	0.00475 (0.0505)	0.0722* (0.0425)	0.0792* (0.0421)	0.0810* (0.0414)	0.0779* (0.0424)	0.0561 (0.0425)	0.0609 (0.0425)	0.0667 (0.0423)	0.0366 (0.0552)	0.120** (0.0542)	0.118** (0.0545)
Constant	1.2586*** (0.19944)	-0.307 (0.231)	-2.277*** (0.353)	0.273 (0.263)	6.524*** (0.818)	0.398* (0.230)	1.035*** (0.306)	0.122 (0.246)	1.308*** (0.386)	0.897*** (0.253)	-0.305 (0.353)	12.16*** (1.463)	10.97*** (1.425)
Observations	3,165	3,165	2,329	3,165	3,165	3,165	3,165	3,115	3,115	3,115	1,947	1,924	1,924
R-squared	0.3924	0.427	0.371	0.411	0.422	0.435	0.415	0.402	0.404	0.410	0.363	0.401	0.392
Number of ABI codes	6	6	6	6	6	6	6	6	6	6	5	5	5

Reported are regression coefficients and standard errors (in parenthesis). The dependent variable is the fixed rate bond spread defined as the difference between the yield to maturity at issuance of the fixed bond and the corresponding Interest Rate Swap with the same maturity. Concerning the complete regressions, in Equation (12) both *ROA* and *P\_MARGIN* are omitted because highly correlated with *BLR*. Moreover, *BANK\_SIZE2* is also omitted for the same issue. In Equation (13) *ROA* is reintroduced while *BLR* is omitted.

Explanatory variables are defined as follows:

<i>LEVI</i>	the ratio of total book liabilities to the book value of equity..
<i>TIER1_RWA</i>	the ratio of Tier1 to the total risk weighted assets.
<i>LEV_RATIO</i>	the Capital Measure divided by the Exposure Measure.
<i>NSFR</i>	the ratio of the available stable funding to the required stable funding.
<i>NLTA</i>	the ratio of net loans to total assets.
<i>ROA</i>	the ratio of annual net income to the current year-end total assets.
<i>P_MARGIN</i>	the ratio between net income and revenues.
<i>ASSET_UTILIZ</i>	the ratio between revenues and the current year-total assets.
<i>BLR</i>	the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans).
<i>NPLC</i>	the ratio of total net exposure impaired loans to total gross exposure impaired loans.
<i>WDPL</i>	the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.
<i>ARPP</i>	the weighted average of balance sheet exposures.
<i>BOND_SIZE</i>	the natural logarithm of the bond issued amount.
<i>BANK_SIZE2</i>	the ratio between bank total assets to the total assets of the largest bank in the sample year.
<i>MATURITY</i>	the natural logarithm of bond maturity.

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.

**Table 8.2 – Fixed effect regressions of fixed rate bond spread on bank accounting variables: “step-by-step” analysis of sub-sample C**

Sub-sample C													
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<i>LEVI</i>	0.118*** (.00062)	0.300*** (0.00757)	0.308*** (0.00804)	0.209*** (0.00631)	0.191*** (0.00628)	0.0813*** (0.00584)	0.180*** (0.0103)	0.180*** (0.0105)	0.203*** (0.0103)	0.107*** (0.0123)	-0.0352* (0.014)	-0.0224 (0.0191)	0.045*** (0.0103)
<i>TIER1_RWA</i>		0.0612*** (0.00581)									0.0479 (0.0340)	0.0370 (0.0343)	0.0993** (0.0124)
<i>LEV_RATIO</i>			0.0147*** (0.00448)								79.565*** (10.43)	73.308*** (10.58)	1.495* (0.8646)
<i>NLTA</i>				4.469*** (0.313)							-6.674*** (1.584)	-6.711*** (1.657)	-0.368 (0.767)
<i>ROA</i>	-0.336*** (0.0997)	-0.231** (0.0915)	-0.169* (0.0922)	-0.26*** (0.0937)		-0.191** (0.0826)	-0.153 (0.0947)	-0.173* (0.0957)	-0.176* (0.0963)	-95.86*** (4.247)	-43.39*** (15.250)		
<i>P_MARGIN</i>					-0.030*** (0.00663)								
<i>ASSET_UTILIZ</i>						-64.75*** (1.184)					-28.87*** (6.129)	-37.45*** (4.955)	-30.19*** (2.467)
<i>BLR</i>							6.914*** (0.454)						21.267*** (2.585)
<i>NPLC</i>								2.874*** (0.304)				5.561*** (1.000)	9.643*** (0.905)
<i>WDPL</i>									-57.90*** (13.41)		24.22 (38.10)	24.787 (39.74)	4.893 (17.937)
<i>ARPP</i>										-0.606*** (0.8512)	-0.382*** (0.1421)	-0.568*** (0.1471)	
<i>BOND_SIZE</i>	0.0104 (0.0078)	-0.0111 (0.00722)	0.0295*** (0.00811)	-0.00922 (0.00738)	-0.00765 (0.00746)	-0.039*** (0.00654)	-0.084*** (0.00666)	-0.082*** (0.00673)	-0.077*** (0.00676)	-0.094*** (0.00971)	-0.099*** (0.0100)	-0.099*** (0.0100)	-0.068 (0.0076)
<i>BANK_SIZE2</i>		8.354*** (0.226)	8.493*** (0.276)	7.533*** (0.221)	7.217*** (0.223)	3.253*** (0.208)	6.422*** (0.211)	6.857*** (0.211)	7.571*** (0.208)	8.00 (0.766)			
<i>MATURITY</i>	0.215*** (0.0322)	0.192*** (0.0354)	0.117*** (0.0328)	0.156*** (0.0328)	0.177*** (0.0331)	0.116*** (0.0290)	0.113*** (0.0311)	0.125*** (0.0314)	0.145*** (0.0316)	0.053 (0.0484)	0.054 (0.0509)	0.068 (0.0508)	-0.042 (0.0349)
Constant	-0.578*** (0.156)	-3.229*** (0.157)	-2.939*** (0.157)	-4.786*** (0.272)	-1.409*** (0.138)	3.731*** (0.153)	-1.003*** (0.153)	-2.727*** (0.233)	-0.900*** (0.161)	0.318 (0.240)	6.522*** (1.023)	8.002*** (1.083)	4.392*** (0.646)
Observations	9.896	9.841	8.216	9.896	9.896	9.896	6.470	6.467	6.467	2.615	2.203	2.203	4.804
R-squared	0.042	0.195	0.186	0.156	0.139	0.343	0.217	0.200	0.191	0.339	0.370	0.370	0.2685
Number of ABI codes	324	322	320	324	324	324	279	277	279	75	25	25	268

Reported are regression coefficient and standard errors (in parenthesis). The dependent variable is the fixed rate bond spread defined as the difference between the yield to maturity at issuance of the fixed bond and the corresponding Interest Rate Swap with the same maturity. Note that, in the final Equation (13) the index ARPP is omitted to control for the number of observations within each panel.

Explanatory variables are defined as follows:

- LEVI* the ratio of total book liabilities to the book value of equity.  
*TIER1\_RWA* the ratio of Tier1 to the total risk weighted assets.  
*LEV\_RATIO* the Capital Measure divided by the Exposure Measure.  
*NSFR* the ratio of the available stable funding to the required stable funding.  
*NLTA* the ratio of net loans to total assets.  
*ROA* the ratio of annual net income to the current year-end total assets.  
*P\_MARGIN* the ratio between net income and revenues.  
*ASSET\_UTILIZ* the ratio between revenues and the current year-total assets.  
*BLR* the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans)  
*NPLC* the ratio of total net exposure impaired loans to total gross exposure impaired loans.  
*WDPL* the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.  
*ARPP* the weighted average of balance sheet exposures.  
*BOND\_SIZE* the natural logarithm of the bond issued amount.  
*BANK\_SIZE2* the ratio between bank total assets to the total assets of the largest bank in the sample year.  
*MATURITY* the natural logarithm of bond maturity.

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.

**Table 8.3 – Fixed effect regressions of fixed rate bond spread on bank accounting variables: “step-by-step” analysis of sub-sample B**

VARIABLES	Sub-sample B						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>LEVI</i>	0.0923*** (0.00973)	0.221*** (0.0141)	0.244*** (0.0138)	0.172*** (0.0135)	0.303*** (0.0189)	0.174*** (0.0119)	0.264*** (0.0116)
<i>TIER1_RWA</i>		0.0810*** (0.0131)					
<i>LEV_RATIO</i>			0.257 (0.230)				
<i>NLTA</i>				-0.897 (0.699)			
<i>NSFR</i>					-2.561*** (0.330)		
<i>ROA</i>	-64.46*** (2.859)	-47.61*** (3.294)	-41.58*** (3.226)	-49.59*** (3.187)	-20.16*** (4.859)	-17.33*** (3.330)	
<i>P_MARGIN</i>						-103.7*** (4.671)	
<i>ASSET_UTILIZ</i>							-0.207*** (0.0452)
<i>BOND_SIZE</i>	0.0347*** (0.0101)	0.0410*** (0.00986)	0.0388*** (0.00990)	0.0390*** (0.0100)	-0.0238** (0.0107)	0.0250*** (0.00953)	0.0422*** (0.0102)
<i>BANK_SIZE2</i>		8.195*** (0.666)	8.993*** (0.660)	6.954*** (0.642)	5.560*** (1.001)	6.501*** (0.606)	10.62*** (0.602)
<i>MATURITY</i>	0.135*** (0.0440)	0.152*** (0.0430)	0.153*** (0.0432)	0.143*** (0.0435)	0.238*** (0.0481)	0.173*** (0.0413)	0.118*** (0.0444)
Constant	-0.525*** (0.194)	-3.285*** (0.265)	-2.543*** (0.236)	-1.038* (0.589)	1.517*** (0.552)	3.266*** (0.309)	-2.436*** (0.224)
Observations	4,878	4,858	4,851	4,878	3,241	4,878	4,878
R-squared	0.161	0.209	0.201	0.182	0.209	0.262	0.143
Number of ABI codes	303	302	303	303	245	303	303

Reported are regression coefficient and standard errors (in parenthesis). The dependent variable is the fixed rate bond spread defined as the difference between the yield to maturity at issuance of the fixed bond and the corresponding Interest Rate Swap with the same maturity. The step-by-step analysis in this Table concerns only leverage, liquidity and profitability proxies. This relies on the fact that it is not possible to control for the number of ABI codes within each group in the regression concerning assets quality variables.

Explanatory variables are defined as follows:

*LEVI* the ratio of total book liabilities to the book value of equity.  
*TIER1\_RWA* the ratio of Tier1 to the total risk weighted assets.  
*LEV\_RATIO* the Capital Measure divided by the Exposure Measure.  
*NSFR* the ratio of the available stable funding to the required stable funding.  
*NLTA* the ratio of net loans to total assets.  
*ROA* the ratio of annual net income to the current year-end total assets.  
*P\_MARGIN* the ratio between net income and revenues.  
*ASSET\_UTILIZ* the ratio between revenues and the current year-total assets  
*BOND\_SIZE* the natural logarithm of the bond issued amount.  
*BANK\_SIZE2* the ratio between bank total assets to the total assets of the largest bank in the sample year.  
*MATURITY* the natural logarithm of bond maturity

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.

**Table 9 – Fixed effect regressions of floating rate bond spread on bank accounting variables: analysis per category**

VARIABLES	Sub-sample A	Sub-sample B	Sub-sample C	Sub-sample A	Sub-sample B	Sub-sample A	Sub-sample B	Sub-sample C	Sub-sample A	Sub-sample B	Sub-sample C	Sub-sample C
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Leverage			Liquidity		Profitability			Assets Quality			
<i>LEVI</i>	0.0454* (0.0236)	0.0260*** (0.00865)	0.0636*** (0.00593)									
<i>TIER1_RWA</i>	0.347*** (0.0365)	0.0937*** (0.0181)	0.0376*** (0.00635)									
<i>LEV_RATIO</i>	-52.86*** (12.41)	0.106 (0.169)	0.00516** (0.00249)									
<i>NSFR</i>				-0.227*** (0.0596)	-3.851*** (0.277)							
<i>NLTA</i>				-8.147*** (0.967)	-21.48*** (1.550)				-13.95*** (1.874)	-10.49 (7.801)	-4.872*** (0.802)	-1.045*** (0.290)
<i>ROA</i>						-27.73*** (5.474)	-31.17*** (3.724)	-0.0713 (0.0438)				
<i>ASSET_UTILIZ</i>						-25.23*** (4.151)	-44.79*** (7.433)	-30.28*** (0.969)				
<i>BLR</i>									12.42*** (2.369)	7.990 (18.22)	16.48*** (1.934)	13.16*** (0.679)
<i>NPLC</i>									0.598 (1.244)	3.795 (6.068)	3.2565*** (0.862)	0.324 (0.254)
<i>WDPL</i>									-32.89 (43.70)	-231.5 (240.1)	-46.44 (39.41)	-20.06 (13.27)
<i>ARPP</i>									0.203 (1.871)	0.296** (0.673)	0.335** (0.161)	
Constant	-0.365 (0.393)	-0.602*** (0.229)	-0.680*** (0.0931)	6.439*** (0.671)	21.36*** (1.439)	1.492*** (0.237)	2.440*** (0.334)	1.931*** (0.0522)	9.010*** (1.241)	9.533** (4.582)	4.224*** (0.812)	0.612** (0.276)
Observations	934	1,672	4,064	1,216	1,019	1,216	1,678	5,129	789	486	937	4,026
R-squared	0.220	0.029	0.042	0.076	0.188	0.187	0.119	0.169	0.179	0.119	0.155	0.109
Number of ABI codes	6	222	283	6	129	6	224	291	5	7	19	282

Reported are regression coefficients and standard errors (in parenthesis). The dependent variable is the floating rate bond spread defined as the spread over the reference rate at issuance of the floating bond. Bank specific accounting variables are regressed per category on bond spread. In this respect, since *NLTA* can be considered both a proxy of liquidity and of assets quality, for completeness it is included in both categories. Note that, concerning profitability, *P\_MARGIN* is omitted because of collinearity with *ROA*.

Explanatory variables are defined as follows:

*LEVI* the ratio of total book liabilities to the book value of equity.  
*TIER1\_RWA* the ratio of Tier1 to the total risk weighted assets.  
*LEV\_RATIO* the Capital Measure divided by the Exposure Measure.  
*NSFR* the ratio of the available stable funding to the required stable funding.  
*NLTA* the ratio of net loans to total assets.  
*ROA* the ratio of annual net income to the current year-end total assets.  
*ASSET\_UTILIZ* the ratio between revenues and the current year-total assets.  
*BLR* the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans).  
*NPLC* the ratio of total net exposure impaired loans to total gross exposure impaired loans.  
*WDPL* the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.  
*ARPP* the weighted average of balance sheet exposures.

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively

**Table 10.1 – Fixed effect regressions of floating rate bond spread on bank accounting variables: “step-by-step” analysis of sub-sample A**

VARIABLES	Sub-sample A												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<i>LEVI</i>	0.0878*** (0.0138)	0.0326* (0.0194)	0.123*** (0.0218)	0.113*** (0.0163)	0.0304 (0.0187)	0.0991*** (0.0161)	0.105*** (0.0160)	0.0588*** (0.0163)	0.0645*** (0.0166)	0.0568*** (0.0161)	0.0988*** (0.0224)	0.0076 (0.0281)	0.0249 (0.0310)
<i>TIER1_RWA</i>		0.169*** (0.0232)										0.0866 (0.120)	0.114 (0.103)
<i>LEV_RATIO</i>			13.98 (8.879)									11.652 (17.46)	10.36 (17.52)
<i>NSFR</i>				-0.0731 (0.0559)								0.3936** (0.228)	0.446*** (0.196)
<i>NLTA</i>					-10.04*** (1.229)							-5.998* (3.247)	-4.348 (3.781)
<i>ROA</i>	-50.91*** (3.385)	-29.73*** (4.643)	-30.40*** (7.157)	-39.07*** (4.548)	-62.56*** (5.259)		-23.52*** (5.737)	-37.20*** (8.348)	-42.46*** (4.631)	-40.92*** (4.322)	-44.11*** (7.661)		14.279 (17.86)
<i>P_MARGIN</i>						-1.780*** (0.180)							
<i>ASSET_UTILIZ</i>							-18.38*** (4.120)					-52.875*** (12.56)	-60.16*** (13.64)
<i>BLR</i>								1.063 (2.629)				-4.448 (7.816)	
<i>NPLC</i>									0.979 (0.682)			3.192** (1.353)	4.373** (1.919)
<i>WDPL</i>										-88.99*** (28.44)		-180.06** (91.79)	-220.0*** (77.26)
<i>ARPP</i>											-0.6395*** (0.1457)	-0.5049 (0.4168)	-0.5963 (1.88e-08)
<i>BOND_SIZE</i>	0.0537*** (0.0112)	0.0608*** (0.0110)	0.0610*** (0.0134)	0.0513*** (0.0112)	0.0566*** (0.0109)	0.0516*** (0.0110)	0.0477*** (0.0111)	0.0653*** (0.0109)	0.0661*** (0.0109)	0.0658*** (0.0108)	0.0538*** (0.0141)	0.0722*** (0.0134)	0.0722*** (0.0134)
<i>BANK_SIZE2</i>		-0.352 (0.527)	1.477 (1.063)	1.655*** (0.454)	-2.005*** (0.633)	1.233*** (0.457)	1.297*** (0.458)	1.190*** (0.434)	1.286*** (0.439)	1.398*** (0.438)	2.741*** (1.699)		
<i>MATURITY</i>	0.280*** (0.0593)	0.240*** (0.0580)	0.183*** (0.0701)	0.267*** (0.0591)	0.282*** (0.0576)	0.275*** (0.0587)	0.270*** (0.0587)	0.214*** (0.0570)	0.221*** (0.0570)	0.212*** (0.0567)	0.316*** (0.0748)	0.305*** (0.0706)	0.306*** (0.0706)
Constant	-2.034*** (0.223)	-2.584*** (0.272)	-3.266*** (0.440)	-2.487*** (0.310)	6.020*** (1.097)	-2.384*** (0.282)	-1.338*** (0.406)	-2.162*** (0.283)	-1.633*** (0.439)	-1.722*** (0.300)	-2.700*** (0.429)	7.334*** (1.749)	7.387*** (1.742)
Observations	1,216	1,216	934	1,216	1,216	1,216	1,216	1,187	1,187	1,187	816	789	789
R-squared	0.227	0.268	0.210	0.238	0.277	0.250	0.249	0.221	0.222	0.227	0.218	0.249	0.249
Number of ABI codes	6	6	6	6	6	6	6	6	6	6	5	5	5

Reported are regression coefficients and standard errors (in parenthesis). The dependent variable is the floating rate bond spread defined as the spread over the reference rate at issuance of the floating rate bond.

Explanatory variables are defined as follows:

- LEVI* the ratio of total book liabilities to the book value of equity.  
*TIER1\_RWA* the ratio of Tier1 to the total risk weighted assets.  
*LEV\_RATIO* the Capital Measure divided by the Exposure Measure.  
*NSFR* the ratio of the available stable funding to the required stable funding.  
*NLTA* the ratio of net loans to total assets.  
*ROA* the ratio of annual net income to the current year-end total assets.  
*P\_MARGIN* the ratio between net income and revenues.  
*ASSET\_UTILIZ* the ratio between revenues and the current year-total assets.  
*BLR* the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans)  
*NPLC* the ratio of total net exposure impaired loans to total gross exposure impaired loans.  
*WDPL* the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.  
*ARPP* the weighted average of balance sheet exposures.  
*BOND\_SIZE* the natural logarithm of the bond issued amount.  
*BANK\_SIZE2* the ratio between bank total assets to the total assets of the largest bank in the sample year.  
*MATURITY* the natural logarithm of bond maturity.

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively

**Table 10.2 – Fixed effect regressions of floating rate bond spread on bank accounting variables: “step-by-step” analysis of sub-sample C**

Sub-sample C													
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<i>LEVI</i>	0.0500*** (0.00499)	0.103*** (0.00561)	0.129*** (0.00668)	0.129*** (0.00609)	0.0965*** (0.00541)	0.0433*** (0.00560)	0.0444*** (0.00687)	0.0526*** (0.00723)	0.0598*** (0.00697)	0.0267 (0.0111)	-0.214 (0.0236)	-0.328** (0.0210)	-0.0064 (0.0113)
<i>TIER1_RWA</i>		0.0136*** (0.00457)									0.1054** (0.0457)	0.1125** (0.0359)	0.0449*** (0.0144)
<i>LEV_RATIO</i>			0.00560** (0.00238)								-5.466 (14.452)	-4.7331 (3.307)	-10.794*** (4.710)
<i>NLTA</i>				3.037*** (0.274)							-2.4839 (2.078)	-2.931 (1.775)	3.4677*** (0.789)
<i>ROA</i>	-0.0783* (0.0473)	-0.0672 (0.0456)	-0.0618 (0.0526)	-0.0615 (0.0451)		-0.0707 (0.0432)	-0.0333 (0.0354)	-0.0344 (0.0364)	-0.0350 (0.0364)	57.777*** (5.460)		-26.60*** (7.423)	-1.1746*** (0.504)
<i>P_MARGIN</i>					-0.0067** (0.00325)								
<i>ASSET_UTILIZ</i>						-25.34*** (1.074)					-6.936 (7.952)	-1.209 (8.759)	-26.723*** (2.267)
<i>BLR</i>							9.482*** (0.651)				8.6926*** (3.196)		
<i>NPLC</i>								0.941*** (0.235)			3.5931*** (1.079)	1.7923 (1.057)	1.0699*** (0.518)
<i>WDPL</i>									-47.87*** (13.78)		-87.099* (41.96)	122.955*** (40.36)	-58.98*** (19.72)
<i>ARPP</i>										-0.523*** (0.117)	0.3652* (0.1743)	0.4862** (0.2028)	
<i>BOND_SIZE</i>	0.0453*** (0.00643)	0.0422*** (0.00621)	0.0481*** (0.00716)	0.0446*** (0.00613)	0.0425*** (0.00620)	0.0373*** (0.00588)	0.0506*** (0.00547)	0.0534*** (0.00562)	0.0538*** (0.00561)	0.0525*** (0.0127)	0.0673*** (0.0124)	0.0669*** (0.0105)	0.057*** (0.00824)
<i>BANK_SIZE2</i>		3.193*** (0.172)	4.127*** (0.226)	3.665*** (0.171)	3.177*** (0.168)	1.573*** (0.173)	1.417*** (0.161)	2.320*** (0.153)	2.614*** (0.152)	-3.573*** (0.992)			
<i>MATURITY</i>	-0.000553 (0.0272)	-0.0277 (0.0264)	-0.0328 (0.0315)	-0.0110 (0.0261)	-0.0350 (0.0263)	-0.0308 (0.0250)	0.0936*** (0.0236)	0.0795*** (0.0242)	0.0826*** (0.0242)	0.302*** (0.0655)	0.205*** (0.063)	0.06*** (0.0537)	0.0625** (0.0378)
Constant	-0.850*** (0.110)	-1.655*** (0.120)	-1.843*** (0.129)	-4.065*** (0.262)	-1.429*** (0.111)	0.620*** (0.136)	-1.709*** (0.108)	-2.110*** (0.181)	-1.379*** (0.119)	-1.464*** (0.258)	0.685** (1.22)	6.518*** (1.084)	0.931 (0.689)
Observations	5.129	5.096	4.074	5.129	5.129	5.129	4.033	4.028	4.031	1.035	937	937	2.972
R-squared	0.031	0.106	0.125	0.120	0.098	0.191	0.152	0.108	0.107	0.206	0.2079	0.354	0.212
Number of ABI codes	291	291	284	291	291	291	283	283	282	41	19	19	268

Reported are regression coefficients and standard errors (in parenthesis). The dependent variable is the floating rate bond spread defined as the spread over the reference rate at issuance of the floating rate bond.

Explanatory variables are defined as follows:

- LEVI* the ratio of total book liabilities to the book value of equity.  
*TIER1\_RWA* the ratio of Tier1 to the total risk weighted assets.  
*LEV\_RATIO* the Capital Measure divided by the Exposure Measure.  
*NSFR* the ratio of the available stable funding to the required stable funding.  
*NLTA* the ratio of net loans to total assets.  
*ROA* the ratio of annual net income to the current year-end total assets.  
*P\_MARGIN* the ratio between net income and revenues.  
*ASSET\_UTILIZ* the ratio between revenues and the current year-total assets.  
*BLR* the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans)  
*NPLC* the ratio of total net exposure impaired loans to total gross exposure impaired loans.  
*WDPL* the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.  
*ARPP* the weighted average of balance sheet exposures.  
*BOND\_SIZE* the natural logarithm of the bond issued amount.  
*BANK\_SIZE2* the ratio between bank total assets to the total assets of the largest bank in the sample year.  
*MATURITY* the natural logarithm of bond maturity.

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively

**Table 10.3 – Fixed effect regressions of floating rate bond spread on bank accounting variables: “step-by-step” analysis of sub-sample B**

VARIABLES	Sub-sample B						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>LEVI</i>	0.0219*** (0.00824)	0.119*** (0.0195)	0.170*** (0.0176)	0.218*** (0.0263)	0.108*** (0.0216)	0.163*** (0.0174)	0.157*** (0.0175)
<i>TIER1_RWA</i>		0.0998*** (0.0184)					
<i>LEV_RATIO</i>			0.162 (0.157)				
<i>NLTA</i>				-0.127 (0.645)			
<i>NSFR</i>					-5.035*** (1.101)		
<i>ROA</i>	-40.51*** (3.328)	-26.48*** (4.549)	-14.46*** (4.209)	7.600 (8.312)	-20.41*** (4.250)	-6.825 (4.409)	
<i>ASSET_UTILIZ</i>						-43.94*** (7.213)	
<i>P_MARGIN</i>							-0.811*** (0.172)
<i>BOND_SIZE</i>	0.0552*** (0.0129)	0.0544*** (0.0124)	0.0556*** (0.0125)	0.0551*** (0.0155)	0.0575*** (0.0124)	0.0581*** (0.0124)	0.0548*** (0.0125)
<i>BANK_SIZE2</i>		4.569*** (0.741)	6.413*** (0.681)	8.168*** (1.475)	6.121*** (0.676)	6.014*** (0.673)	5.904*** (0.677)
<i>MATURITY</i>	-0.00799 (0.0568)	-0.0268 (0.0548)	-0.0218 (0.0553)	0.0452 (0.0716)	-0.0272 (0.0550)	-0.00749 (0.0548)	-0.0305 (0.0552)
Constant	-0.605*** (0.219)	-3.109*** (0.315)	-2.683*** (0.312)	-3.590*** (1.056)	1.689* (0.969)	-0.591 (0.434)	-2.432*** (0.298)
Observations	1,678	1,675	1,672	1,019	1,678	1,678	1,678
R-squared	0.113	0.178	0.161	0.157	0.173	0.182	0.165
Number of ABI codes	224	222	222	129	224	224	224

Reported are regression coefficients and standard errors (in parenthesis). The dependent variable is the floating rate bond spread defined as the spread over the reference rate at issuance of the floating rate bond. The step-by-step analysis in this Table concerns only leverage, liquidity and profitability proxies. This relies on the fact that it is not possible to control for the number of ABI codes within each group in the regression concerning assets quality variables.

Explanatory variables are defined as follows:

<i>LEVI</i>	the ratio of total book liabilities to the book value of equity.
<i>TIER1_RWA</i>	the ratio of Tier1 to the total risk weighted assets.
<i>LEV_RATIO</i>	the Capital Measure divided by the Exposure Measure.
<i>NSFR</i>	the ratio of the available stable funding to the required stable funding.
<i>NLTA</i>	the ratio of net loans to total assets.
<i>ROA</i>	the ratio of annual net income to the current year-end total assets.
<i>P_MARGIN</i>	the ratio between net income and revenues.
<i>ASSET_UTILIZ</i>	the ratio between revenues and the current year-total assets.
<i>BOND_SIZE</i>	the natural logarithm of the bond issued amount.
<i>BANK_SIZE2</i>	the ratio between bank total assets to the total assets of the largest bank in the sample year.
<i>MATURITY</i>	the natural logarithm of bond maturity.

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.

### 2.6.3 DID BANK SPECIFIC ACCOUNTING VARIABLE CHANGE THEIR IMPACT DURING THE TWO PHASES OF THE CRISIS?

The question of whether bank specific accounting variables changed their effect and significance over time is investigated analysing two historical periods, the first concerning the years between 2008 and 2011 and the second those between 2008 and 2013. Note that, the decision to omit in the temporal analysis the period prior to 2008 relies simply on the fact that the number of observations before this year is not statistically sufficient for the purpose of this analysis. Therefore, this study focuses only on the first and second phase of the crisis. Tables 11.1-12 show the estimated regression coefficients of sub-samples A and B<sup>51</sup>. In particular, the same fixed effect regressions as in the “step-by-step” analysis are reported, adding *BTPvsBUND*, *S&P* and *INST\_RETAIL* variables for

<sup>51</sup> Sub-sample C is omitted from this analysis since it has observations only from 2010 onwards.

the completeness of the model<sup>52</sup>. Only the final regressions are omitted in Tables 11.2-12 due to collinearity issues among the explanatory variables.

As far as fixed rate bond spread are concerned, *LEVI* has an unexpected negative, often significant sign in sub-sample A during the sovereign debt phase. A possible reason of this result is based (as for *LEV\_RATIO* and *TIERI\_RWA*) on the additional capital requirements set by EBA to the largest Italian banks that particularly affect them from 2010 onwards, the period in which the Basel III document was issued. In this respect, during the second phase, *LEVI* has almost always a positive, significant coefficient sign in sub-sample C, probably because these requirements affect more the larger banks compared the average Italian ones. Nevertheless, both sub-samples report a positive (as expected) coefficient sign of *LEVI* during the first phase of the crisis, although it is rarely significant in sub-sample A.

Concerning sub-sample A, the *ROA* index appears more relevant in the first phase of the crisis; indeed it always has negative, statistically significant coefficient signs, suggesting that high index levels were perceived by investors as an indication of sound, profitable banks and not of high bank risk-taking. On the contrary, *ROA* is often not significant during the second phase.

In sub-sample C, this index almost always has negative coefficient signs, despite not being always significant. In addition, the *P\_MARGIN* index, being highly correlated with *ROA*, is statistically significant in sub-sample A only in the first crisis phase, while surprisingly it is never significant in sub-sample C.

As far as the assets quality category is concerned, *BLR* has a high, positive and significant coefficient sign in both sub-samples during the second phase of the crisis. This result is consistent with the issue of the deterioration in the assets quality that hit several Italian banks after the onset of the sovereign debt crisis. In this context, *NPLC* reports a positive, statistically significant coefficient sign during the first phase, suggesting that high values were perceived as an indication of higher expected losses. On the other hand, this index has an opposite but still significant coefficient sign in both sub-samples during the second phase. This interesting result may be related to the fact that, in a period in which the quality of the assets was particularly low, those banks that have already occurred significant large quantities were perceived by bondholder as less likely to bankrupt thanks to lower credit risk compared of those with low *NPLC* levels.

Overall, the effect of some accounting variables changed if comparing the first and the second phase of the crisis and some interesting results not evident in the “step-by-step” analysis come out. Nevertheless, some proxies become unexpectedly insignificant. Two main reasons may explain this: first, some hidden effects concerning this particular historical period under analysis are not properly taken into account. Second, the introduction of variables such as *BTPvsBUND* and *S&P* in the model,

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<sup>52</sup> *S&P* is omitted in sub-sample C to control partially for the number of observations in the panel. In addition, the *LIST\_BOND* variable that was initially added in the regressions has been then omitted because of collinearity.

that for their nature have strong impacts at the macro level, may have reduced the significance of these specific-bank accounting variables.

With regards to external variables, *BTPvsBUND* has strong, positive, significant coefficient sign as expected in all regressions. In addition,  $R^2$  increases substantially during the second phase when this variable is introduced in the model. Indeed, the intensification of the crisis and the consequent reduction of Italy's creditworthiness, affected heavily the Italian banking system raising bond spread. In addition, *S&P* has always positive, significant coefficient signs in sub-sample A that are generally higher in the second phase.

Finally, control variables are generally significant in both sub-samples. To be more specific, *MATURITY* reports significant coefficients signs mainly during the second stage of the crisis. Indeed, as the crisis deepened, the fear to incur in losses may have led investors to favour short-term investments compared to long ones, generally perceived as riskier. In the majority of the regressions *BOND\_SIZE* and *BANK\_SIZE* have negative and positive coefficient signs respectively, as in the "step-by-step" analysis. *INST\_RETAIL* has positive coefficient signs in both periods, in disagreement with the related literature, although this coefficient may be biased since the majority of issues concern retail clientele<sup>53</sup>.

Considering instead floating bond spread, the temporal analysis focuses only on sub-sample A, since the number of observations within each panel in sub-sample C is not statistically sufficient. Table 12 reports results for the 6 largest Italian banks. On the whole, the model seems to work better for fixed rate bonds compared to floating ones, confirming the conclusions previously stated in the "step-by-step" analysis. Indeed,  $R^2$  maintains at low levels despite the introduction of *BTPvsBUND*, *S&P* and *INST\_RETAIL* in the regression analysis. Certainly, the low explanatory power of the model is also related to the limited number of observations if compared to those concerning fixed rate bonds. Nevertheless, the following results come out. First, *NSFR* is never significant, while *LEVI* is rarely significant. Second, *ROA* has generally positive coefficients in the second phase (as also *PROFIT\_MARGIN*) and, on the contrary, negative ones in the first phase, although not always significant. This sign change may indicate that, while during the first phase of the crisis high index levels reflected sound banks, on the other hand during the sovereign debt phase high levels reflected high bank risk-taking. Third, *ASSET\_UTILIZ*, that is significant at the 5% level, considerably decreases floating rate bond spread during the second phase. Fourth, assets quality proxies are not always significant and they often have unexpected coefficient signs (for instance *BLR*, *WDPL*, *ARPP*). However, *NPLC* maintains (as in the temporal analysis concerning fixed rate bonds) a positive, significant coefficient sign in the first phase, while a negative one in the second phase. This latter result suggests that the conclusions on this index reported in the case of fixed rate bond still hold in case of floating rate ones.

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<sup>53</sup> In particular 96.7 per cent of the total issue concerns retail clientele.

**Table 11.1 – Fixed effect regressions of fixed rate bond spread on bank accounting variables: temporal analysis of sub-sample A**

Sub-sample A																
VARIABLES	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>LEVI</i>	0.0343 (0.0272)	-0.0967*** (0.0328)	0.0140 (0.0278)	-0.0157 (0.0315)	0.0472** (0.0240)	-0.0514* (0.0264)	0.0267 (0.0245)	-0.0515** (0.0249)	0.0839*** (0.0278)	-0.150*** (0.0343)	0.0256 (0.0249)	-0.0962*** (0.0331)	0.218*** (0.0340)	-0.242*** (0.0427)	0.0592 (0.0368)	-0.1230*** (0.0278)
<i>ROA</i>	-14.98** (6.433)	-14.64 (12.31)	-6.969* (12.71)	8.241 (12.99)	-23.04*** (6.339)	-2.768 (11.99)			-58.89*** (11.73)	39.86* (20.48)	-16.17** (6.917)	-20.02 (14.75)	-53.70*** (7.911)	-128.0*** (25.85)	-36.444*** (10.80)	-42.450 (12.82)
<i>NSFR</i>	0.0650 (0.0754)	1.684** (0.846)														
<i>BOND_SIZE</i>	-0.161*** (0.00929)	-0.0792*** (0.0130)	-0.160*** (0.00929)	-0.0778*** (0.0129)	-0.159*** (0.00908)	-0.0768*** (0.0130)	-0.159*** (0.00929)	-0.0766*** (0.0129)	-0.160*** (0.00924)	-0.0806*** (0.0132)	-0.161*** (0.00930)	-0.0771*** (0.0133)	-0.162*** (0.00913)	-0.0816*** (0.0131)	-0.144*** (0.0122)	-0.0811*** (0.0135)
<i>BANK_SIZE2</i>	-0.923 (0.731)	15.48*** (4.581)	-0.644 (0.898)	15.97*** (4.609)	-0.348 (0.703)	10.82** (4.629)	-0.884 (0.710)	12.46*** (4.578)	-1.629** (0.723)	15.78*** (4.354)	-1.034 (0.718)	12.36** (5.021)	0.386 (0.725)	22.30*** (4.603)	-3.100* (2.333)	11.03** (4.641)
<i>S&amp;P</i>	0.171** (0.0843)	0.300*** (0.0372)	0.196** (0.0869)	0.308*** (0.0379)	0.209** (0.0820)	0.282*** (0.0366)	0.285*** (0.0365)	0.334*** (0.0903)	0.286*** (0.0903)	0.172** (0.0380)	0.302*** (0.0860)	0.172** (0.0394)	0.321*** (0.0842)	0.358*** (0.0396)	0.2149*** (0.120)	0.281*** (0.0407)
<i>MATURITY</i>	-0.0629 (0.0495)	0.429*** (0.0648)	-0.0609 (0.0494)	0.456*** (0.0642)	-0.0755 (0.0483)	0.448*** (0.0642)	-0.0521 (0.0493)	0.449*** (0.0642)	-0.0625 (0.0491)	0.470*** (0.0653)	-0.0622 (0.0496)	0.474*** (0.0664)	-0.0784 (0.0486)	0.470*** (0.0649)	-0.1512** (0.0667)	0.4927*** (0.0685)
<i>BTPvsBUND</i>	0.674*** (0.0600)	0.470*** (0.0282)	0.656*** (0.0579)	0.483*** (0.0285)	0.889*** (0.0617)	0.467*** (0.0298)	0.665*** (0.0579)	0.475*** (0.0288)	0.758*** (0.0615)	0.450*** (0.0299)	0.658*** (0.0579)	0.454*** (0.0303)	0.927*** (0.0657)	0.443*** (0.0298)	0.794*** (0.108)	0.4515*** (0.0308)
<i>INST_RETAIL</i>	-0.184 (0.223)	0.250** (0.124)	-0.189 (0.223)	0.218* (0.123)	-0.146 (0.218)	0.219* (0.123)	-0.193 (0.223)	0.219* (0.123)	-0.173 (0.222)	0.305** (0.129)	-0.181 (0.223)	0.247* (0.129)	-0.0953 (0.219)	0.271** (0.127)	-0.132 (0.231)	0.2745** (0.131)
<i>NLTA</i>			1.701 (2.252)	3.244** (1.490)												
<i>ASS_UTILIZ</i>					34.42*** (3.750)	-7.527 (10.64)										
<i>P_MARGIN</i>							-0.905*** (0.275)	-0.0816 (0.472)								
<i>BLR</i>									-14.31*** (3.224)	71.14*** (18.68)						
<i>WDPL</i>											-12.54 (34.71)	-53.73 (82.11)				
<i>NPLC</i>													8.386*** (1.039)	-24.53*** (4.825)		
<i>ARPP</i>															-0.789*** (0.158)	-1.2952*** (0.3425)
Constant	0.979 (0.620)	-5.518*** (1.588)	-0.174 (1.850)	-6.638*** (1.925)	-1.521** (0.644)	-2.422* (1.280)	2.146*** (0.344)	-3.106*** (1.036)	0.206 (0.622)	-7.798*** (1.539)	1.237* (0.634)	-2.747** (1.377)	3.237*** (0.632)	-21.81*** (3.765)	3.598*** (1.128)	2.509 (1.100)
Observations	1,826	1,027	1,826	1,027	1,826	1,027	1,826	1,027	1,826	977	1,826	977	1,826	977	1,037	910
R-squared	0.219	0.522	0.219	0.522	0.254	0.520	0.217	0.520	0.227	0.523	0.219	0.516	0.246	0.589	0.182	0.520
Number of ABI codes	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5

Reported are regression coefficient and standard errors (in parenthesis). The dependent variable is the fixed bond spread defined as the difference between the yield to maturity at issuance of the fixed rate bond and the corresponding Interest Rate Swap with the same maturity. Note that both TIER1\_RWA and LEV\_RATIO are omitted because not significant.

Explanatory variables are defined as follows:

- LEVI* the ratio of total book liabilities to the book value of equity.  
*ROA* the ratio of annual net income to the current year-end total assets  
*NSFR* the ratio of the available stable funding to the required stable funding  
*BOND\_SIZE* the natural logarithm of the bond issued amount.  
*BANK\_SIZE2* the ratio between bank total assets to the total assets of the largest bank in the sample year.  
*S&P* S&P's issuer ratings at launch  
*MATURITY* the natural logarithm of bond maturity.  
*BTPvsBUND* the spread between the yield of 10-year Italian Treasury bond and 10-year German Treasury bond  
*INST\_RETAIL* the dummy variable that equals 1 if bonds are offered to institutional investors; and 0 if they are offered to retail investors  
*NLTA* the ratio of net loans to total assets  
*TIER1\_RWA* the ratio of Tier1 to the total risk weighted assets.  
*ASSET\_UTILIZ* the ratio between revenues and the current year-total assets  
*P\_MARGIN* the ratio between net income and revenues.  
*BLR* the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans)  
*WDPL* the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.  
*NPLC* the ratio of total net exposure impaired loans to total gross exposure impaired loans.  
*ARPP* the weighted average of balance sheet exposures

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.

**Table 11.2 – Fixed effect regressions of fixed rate bond spread on bank accounting variables: temporal analysis of sub-sample C**

VARIABLES	Sub-sample C															
	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>LEVI</i>	0.0345*** (0.0101)	0.0256*** (0.00613)	0.0400*** (0.00992)	0.0292*** (0.00604)	0.0222** (0.00961)	0.0390*** (0.00571)	0.0262** (0.0126)	-0.0641** (0.0296)	0.0280** (0.0126)	-0.000940 (0.0299)	0.0403*** (0.0130)	-0.0774** (0.0330)	0.01014 (0.0172)	0.0479** (0.0211)	0.0234** (0.00978)	0.0739*** (0.0109)
<i>ROA</i>	-0.0646 (0.0610)	-10.27*** (2.542)	-0.0601 (0.0608)	-11.40*** (2.639)			-0.0802 (0.0722)	25.64 (17.70)	-0.0812 (0.0722)	-25.66* (14.59)	-0.0796 (0.0720)	-85.03*** (20.09)	-27.06*** (7.289)	-7.311* (9.671)	-0.0648 (0.0612)	-6.850** (2.771)
<i>BONDS_SIZE</i>	-0.103*** (0.00604)	-0.0280*** (0.00851)	-0.103*** (0.00602)	-0.0290*** (0.00850)	-0.103*** (0.00605)	-0.0311*** (0.00852)	-0.114*** (0.00651)	-0.0729*** (0.0131)	-0.114*** (0.00650)	-0.0706*** (0.0132)	-0.112*** (0.00649)	-0.0716*** (0.0132)	-0.134*** (0.0112)	-0.0691*** (0.0121)	-0.103*** (0.00607)	-0.0250*** (0.00848)
<i>NLTA</i>	1.307*** (0.331)	-1.171** (0.532)														
<i>BANK_SIZE</i>	0.467 (0.463)	1.642*** (0.487)	0.731 (0.463)	1.363*** (0.464)	0.177 (0.458)	1.889*** (0.450)	0.103 (0.494)	8.369* (4.284)	0.293 (0.492)	8.637* (5.028)	0.686 (0.500)	9.584*** (4.427)	-0.884*** (1.959)	2.623** (1.214)	0.188 (0.460)	2.833*** (0.551)
<i>MATURITY</i>	-0.000199 (0.0270)	0.293*** (0.0355)	0.00830 (0.0269)	0.289*** (0.0355)	0.00545 (0.0270)	0.284*** (0.0355)	-0.0162 (0.0297)	0.419*** (0.0619)	-0.0129 (0.0296)	0.403*** (0.0630)	-0.00561 (0.0296)	0.415*** (0.0622)	-0.133** (0.0589)	0.479*** (0.0572)	0.00376 (0.0271)	0.280*** (0.0355)
<i>BTPvsBUND</i>	0.627*** (0.0244)	0.634*** (0.0117)	0.709*** (0.0257)	0.643*** (0.0122)	0.645*** (0.0240)	0.651*** (0.0113)	0.657*** (0.0285)	0.559*** (0.0257)	0.663*** (0.0283)	0.574*** (0.0258)	0.692*** (0.0291)	0.573*** (0.0257)	0.798*** (0.0840)	0.566*** (0.0221)	0.647*** (0.0243)	0.621*** (0.0118)
<i>INST_RETAIL</i>	0.228** (0.115)	0.943*** (0.0492)	0.246** (0.115)	0.948*** (0.0494)	0.234** (0.115)	0.957*** (0.0495)	0.198 (0.129)	0.418*** (0.113)	0.206 (0.129)	0.389*** (0.114)	0.205 (0.129)	0.405*** (0.113)	-0.0385 (0.192)	0.355*** (0.101)	0.233** (0.116)	0.951*** (0.0489)
<i>ASSET_UTILIZ</i>			10.22*** (1.505)	7.618* (4.207)												
<i>P_MARGIN</i>					-0.00484 (0.00435)	0.0425 (0.0361)										
<i>BLR</i>							0.926* (0.545)	63.61*** (12.45)								
<i>WDPL</i>									-15.72 (12.80)	104.0 (79.94)						
<i>NPLC</i>											1.273*** (0.306)	-12.42*** (3.391)				
<i>ARPP</i>													-0.8066*** (0.1114)	-0.9146*** (0.2228)		
<i>TIER1_RWA</i>															0.000542 (0.00586)	0.0200* (0.0106)
Constant	-0.00781 (0.300)	0.441 (0.415)	0.199 (0.186)	-0.771*** (0.258)	1.045*** (0.138)	-0.443*** (0.159)	1.152*** (0.168)	-4.868*** (1.286)	1.208*** (0.171)	-1.934 (1.402)	1.851*** (0.235)	-9.923*** (2.719)	2.214*** (0.342)	3.0855*** (0.882)	1.030*** (0.157)	-1.196*** (0.218)
Observations	5,220	3,912	5,220	3,912	5,220	3,912	4,596	1,110	4,595	1,110	4,593	1,110	1,285	1,330	5,192	3,894
R-squared	0.182	0.554	0.187	0.554	0.179	0.551	0.169	0.503	0.169	0.492	0.172	0.497	0.163	0.475	0.179	0.560
Number of ABI codes	286	297	286	297	286	297	275	12	275	12	273	12	27	64	285	296

Reported are regression coefficient and standard errors (in parenthesis). The dependent variable is the fixed bond spread defined as the difference between the yield to maturity at issuance of the fixed rate bond and the corresponding Interest Rate Swap with the same maturity. Note that *LEV\_RATIO* is omitted because not significant.

Explanatory variables are defined as follows:

- LEVI* the ratio of total book liabilities to the book value of equity.  
*ROA* the ratio of annual net income to the current year-end total assets  
*NSFR* the ratio of the available stable funding to the required stable funding  
*BOND\_SIZE* the natural logarithm of the bond issued amount.  
*BANK\_SIZE2* the ratio between bank total assets to the total assets of the largest bank in the sample year.  
*S&P* S&P's issuer ratings at launch  
*MATURITY* the natural logarithm of bond maturity.  
*BTPvsBUND* the spread between the yield of 10-year Italian Treasury bond and 10-year German Treasury bond  
*INST\_RETAIL* the dummy variable that equals 1 if bonds are offered to institutional investors; and 0 if they are offered to retail investors  
*NLTA* the ratio of net loans to total assets  
*ASSET\_UTILIZ* the ratio between revenues and the current year-total assets  
*P\_MARGIN* the ratio between net income and revenues.  
*BLR* the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans)  
*WDPL* the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.  
*NPLC* the ratio of total net exposure impaired loans to total gross exposure impaired loans.  
*ARPP* the weighted average of balance sheet exposures

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively

**Table 12 – Fixed effect regressions of floating rate bond spread on bank accounting variables: temporal analysis of sub-sample A**

Sub-sample A																
VARIABLES	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013	2008-2011	2011-2013
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>LEV1</i>	-0.0238 (0.0229)	0.0654 (0.0733)	-0.0386 (0.0322)	-0.0181 (0.0730)	-0.0190 (0.0224)	0.119** (0.0483)	-0.0254 (0.0226)	0.0811* (0.0473)	-0.000310 (0.0252)	0.0523 (0.0709)	-0.0324 (0.0227)	-0.0605 (0.0734)	0.0624* (0.0333)	-0.130 (0.107)	-0.0904*** (0.0319)	0.0806 (0.0507)
<i>ROA</i>	-10.78* (6.253)	108.6*** (27.26)	-3.336 (14.17)	75.45** (29.28)	-13.63** (6.253)	124.6*** (20.78)			-29.30*** (10.70)	38.52 (46.44)	-8.000 (6.405)	28.61 (36.63)	-23.94*** (7.198)	36.31 (66.30)	-1.5815 (8.617)	106.0*** (24.18)
<i>NSFR</i>	0.0114 (0.0471)	1.149 (1.942)														
<i>BONDS_SIZE</i>	0.0647*** (0.00961)	0.0754*** (0.0266)	0.0652*** (0.00965)	0.0804*** (0.0266)	0.0670*** (0.00958)	0.0782*** (0.0264)	0.0646*** (0.00961)	0.0722*** (0.0267)	0.0661*** (0.00960)	0.0780*** (0.0280)	0.0658*** (0.00960)	0.0741*** (0.0279)	0.0660*** (0.00954)	0.0745*** (0.0280)	0.0596*** (0.0114)	0.0687** (0.0271)
<i>BANK_SIZE2</i>	-0.969* (0.527)	20.88*** (7.606)	-0.662 (0.750)	11.31 (8.131)	-0.775 (0.525)	9.076 (8.199)	-0.927* (0.521)	25.75*** (7.708)	-1.103** (0.526)	18.49** (7.421)	-1.179** (0.534)	10.60 (8.451)	-0.317 (0.553)	23.29*** (7.501)	-4.912*** (1.881)	16.88** (7.973)
<i>S&amp;P</i>	-0.122* (0.0692)	0.193*** (0.0714)	-0.113 (0.0697)	0.147** (0.0741)	-0.0748 (0.0699)	0.181** (0.0709)	-0.127* (0.0719)	0.203*** (0.0720)	-0.0369 (0.0792)	0.139* (0.0781)	-0.107 (0.0690)	0.199** (0.0837)	0.00192 (0.0765)	0.177** (0.0815)	-0.110 (0.0950)	0.144* (0.0815)
<i>MATURITY</i>	0.296*** (0.0503)	0.375*** (0.143)	0.295*** (0.0503)	0.389*** (0.143)	0.305*** (0.0501)	0.381*** (0.142)	0.295*** (0.0503)	0.379*** (0.144)	0.299*** (0.0502)	0.376** (0.146)	0.296*** (0.0502)	0.392*** (0.146)	0.304*** (0.0500)	0.304*** (0.146)	0.365** (0.146)	0.469*** (0.148)
<i>BTPvsBUND</i>	0.290*** (0.0574)	0.222*** (0.0594)	0.284*** (0.0545)	0.196*** (0.0604)	0.351*** (0.0580)	0.170*** (0.0624)	0.284*** (0.0553)	0.239*** (0.0601)	0.337*** (0.0595)	0.200*** (0.0619)	0.306*** (0.0554)	0.175*** (0.0627)	0.380*** (0.0603)	0.194*** (0.0617)	0.503*** (0.0871)	0.174*** (0.0600)
<i>INST_RETAIL</i>	0.156 (0.222)	0.353** (0.175)	0.159 (0.222)	0.343* (0.174)	0.206 (0.221)	0.320* (0.174)	0.158 (0.222)	0.375** (0.176)	0.175 (0.221)	0.247 (0.191)	0.153 (0.221)	0.272 (0.190)	0.206 (0.221)	0.252 (0.190)	0.0493 (0.346)	0.416** (0.177)
<i>NLTA</i>			1.530 (2.570)	-9.409** (4.467)												
<i>ASSET_UTILIZ</i>					12.59*** (4.040)	-68.10** (26.54)										
<i>P_MARGIN</i>							-0.450 (0.289)	4.856*** (0.892)								
<i>BLR</i>								-6.710** (3.178)		-32.73 (40.46)						
<i>WDPL</i>										59.02* (31.24)		-360.9** (173.6)				
<i>NPLC</i>													3.520*** (0.996)	-20.06* (11.42)		
<i>ARPP</i>															-0.1653 (0.151)	-1.507** (0.6673)
Constant	-0.380 (0.466)	-9.880*** (3.653)	-1.407 (1.822)	1.753 (5.278)	-1.543*** (0.592)	-2.278 (3.280)	-0.318 (0.466)	-9.993*** (2.488)	-0.885* (0.519)	-5.863 (3.740)	-0.634 (0.478)	-3.228 (3.402)	-0.112 (0.457)	-22.18*** (8.362)	0.392 (0.537)	-8.302*** (2.462)
Observations	778	366	778	366	778	366	778	366	778	337	778	337	778	337	471	345
R-squared	0.166	0.221	0.166	0.230	0.176	0.234	0.165	0.214	0.171	0.136	0.170	0.146	0.179	0.143	0.221	0.224
Number of ABI codes	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5

Reported are regression coefficient and standard errors (in parenthesis). The dependent variable is the floating rate bond spread defined as the spread over the reference rate at issuance of the floating rate bond.

Note that both TIER1\_RWA and LEV\_RATIO are omitted because not significant.

Explanatory variables are defined as follows:

- LEV1* the ratio of total book liabilities to the book value of equity.
- ROA* the ratio of annual net income to the current year-end total assets
- NSFR* the ratio of the available stable funding to the required stable funding
- BOND\_SIZE* the natural logarithm of the bond issued amount.
- BANK\_SIZE2* the ratio between bank total assets to the total assets of the largest bank in the sample year.
- S&P* S&P's issuer ratings at launch
- MATURITY* the natural logarithm of bond maturity.
- BTPvsBUND* the spread between the yield of 10-year Italian Treasury bond and 10-year German Treasury bond
- INST\_RETAIL* the dummy variable that equals 1 if bonds are offered to institutional investors; and 0 if they are offered to retail investors
- NLTA* the ratio of net loans to total assets
- ASSET\_UTILIZ* the ratio between revenues and the current year-total assets
- P\_MARGIN* the ratio between net income and revenues.
- BLR* the ratio of total gross exposure impaired loans over total gross loans exposure (i.e. impaired plus performing loans)
- WDPL* the ratio of total portfolio write-downs for performing loans over total gross exposure of performing loans.
- NPLC* the ratio of total net exposure impaired loans to total gross exposure impaired loans.
- ARPP* the weighted average of balance sheet exposures

\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.\*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 per cent level, respectively.

## 2.7 ROBUSTENESS CHECKS

To assess the robustness of the model, different variations of the accounting variables and time-criteria are applied to the “step-by-step” regression analysis.

As a first step, concerning fixed bond spread, *LEV1* is substituted first with *LEV1.1*, then *LEV2* and *LEV2.2*, repeating the process for each sample A, B, C. In addition, *BANK\_SIZE2* is replaced with *BANK\_SIZE1*.

The results show that, in sample A, *LEV1.1* (and also *LEV2.2*) has unexpected negative, significant coefficient signs when to the simple starting regression new accounting variables are added, although in the complete regressions it is not significant. This result differs from the conclusions in Table 8.1; however, in line with Graph 21.2, it is likely that the additional capital requirements imposed mainly to the largest Italian banks has affected heavier Tier 1, increasing it, with respect of total equity. Therefore, in a period 2008-2013 in which bond spread raised progressively (see Graph 19), *LEV1.1* (and also *LEV2.2*) decreased while *LEV1* increased. As a result, the effect of *LEV1.1* (and also *LEV2.2*) on bond spread, in line with that of *TIER\_RWA* and *LEV\_RATIO* (see Paragraph 2.6), could be spurious.

In accordance with the fact these additional capital requirements affected heavier large banks, in both sub-sample B and C, the positive effect of *LEV1.1* (and also *LEV2.2*) on bond spread is less pronounced. Nevertheless, it is still present especially in the complete regressions of sub-sample B.

Note that, despite the positive effect of both *LEV1.1* and *LEV2.2* on bond spread, the other independent variables in the model maintain the same significant coefficient signs in accordance with Tables 8.1-8.3. In addition, no significant changes of  $R^2$  are reported.

Concerning instead *LEV2*, the estimated coefficients show similar results with those in Tables 8.1-8.3 for each sample analysed. Indeed, as already reported *LEV1* and *LEV2* are linearly correlated. Moreover,  $R^2$  of these regressions maintain once again at the same levels.

To conclude, in this first analysis, the model is robust for *LEV2*, while for both *LEV1.1* and *LEV2.2* some unexpected signs are reported. Nevertheless, these results concern only leverage and do not change or affect the conclusions on the other accounting variables.

As a second step, the first time-criterion is replaced first with the second time-criterion<sup>54</sup> and then with the third one<sup>55</sup>. The process is repeated for each sample.

The estimated coefficients, using these time-criteria, do not show relevant differences. Indeed, both the significance level and coefficient sign of the variables remain in line with the conclusions previously reported, although  $R^2$  in sample A (using the third time-criteria) reduces slightly.

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<sup>54</sup> To recall, the second time-criteria requires bonds issued before June 30<sup>th</sup> of the issuing year to be matched to the accounting variables obtained from the financial statement of the year before the issue, otherwise that of the same issuing year.

<sup>55</sup> To recall, the third time-criteria requires bonds issued between April 30<sup>th</sup> and June 30<sup>th</sup> to be matched to the accounting data obtained from the financial statement of the year before the bond issue, whereas if bonds are issued before April 30<sup>th</sup> and after June 30<sup>th</sup>, the rule to apply refers respectively to criterion one and criterion two.

The same variations are then applied to floating bond spread. Replacing *LEV1* with the alternatives *LEV1.1*, *LEV2* and *LEV2.2*, the estimated coefficient of the “step-by-step” regressions show that the model works properly with *LEV2* in each sub-sample, as expected. However, the same issue concerning fixed rate bonds comes out also in the case of floating ones, when either *LEV1.1* or *LEV2.2* are added in the model. Apart from the unexpected sign of these two variables, already motivated in the beginning of the paragraph, the other coefficient signs do not change in each sub-sample analysed, indicating once again that the issue concerns only these variables and does not compromise the robustness of the conclusions previously stated.

Concerning the second step of the robustness checks, namely the use of the two alternative time-criteria, results show that no significant change occurred in each sample, apart from the variable *WDPL* that is often omitted because of collinearity. Moreover, both the number of ABI codes in each group and  $R^2$  remain almost in line with the ones in Tables 10.1-10.3.

## 2.8 CONCLUSIONS

In the analysis per category no significant differences stand out between fixed and floating rate bonds. Indeed, each category regarding leverage, liquidity, profitability and assets quality seems significant in pricing bond spread independently from the sub-sample analysed (i.e. sub-sample A, B and C), with the only exception of *NPLC* and *WDPL* (assets quality proxies) that are rarely significant in the case of floating rate bonds.

Nevertheless, the “step-by-step” inferential analysis highlights different aspects, both among the sub-samples and also between fixed and floating rate bonds, that did not come out in the previous analysis. Specifically, as far as fixed rate bonds are concerned, four main results come out. First, *LEV1* is almost always statistically significant. However, this index appears to be more relevant in explaining fixed rate bonds of large banks (i.e. sub-sample A) compared to those of the whole sample, which includes both small and large banks (i.e. sub-sample B). Second, all profitability proxies (*ROA*, *PROFIT\_MARGIN* and *ASS\_UTILIZ*) are almost always significant in each-subsample, reducing considerably bank costs at issue time. Third, assets quality variables explain fixed rate bonds variability; in particular, *BLR*, *NPLC* and *WDPL* raise it, although the *WDPL* variable is significant only in sub-sample A. Moreover, the importance of these proxies is probably strengthened by the particular period under analysis characterized by a progressive deterioration in bank assets quality, particularly strong after the onset of the sovereign debt crisis. Fourth, the *NLTA* index (proxy of both liquidity and assets quality) is generally always significant with an unexpected negative sign, suggesting that loans are not perceived as risky assets by investors.

In addition to these four main results concerning fixed rate bonds, some issues also arose in the analysis, which require further investigations on this topic. In this respect, *LEV\_RATIO* and sometimes also *TIER1\_RWA* have unexpectedly positive, significant coefficient signs. One possible reason of this result (as reported in Paragraph 2.6.2) is based on the additional capital requirements imposed on

banks by EBA and then strengthened by the issue of the Basel III document, leading to a significant increase in bank capital in a period characterized by high levels of bond spread. Concerning the liquidity category, the NSFR index is highly significant in both sub-samples B and C in the “step-by-step” analysis, although it becomes unexpectedly not significant in the complete regressions. Finally *ARPP* is always significant with a negative sign, at odds with expectations. On the whole, important results come out in the inferential analysis of fixed rate bonds, demonstrating that bank specific accounting variable affect bond spread.

Concerning instead floating rate bonds, the “step-by-step” analysis shows that, on the whole, bank specific accounting variables reduce their significance level in the complete regressions, although profitability proxies (*ROA*, *PROFIT\_MARGIN*, *ASSET\_UTILIZ*), *NPLC* and *BLR* (this latter only for sub-sample C) remain almost significant. Moreover, also for the case of floating rate bonds unexpected sign are reported in the regressions such as *WDPL*.

The temporal analysis of fixed rate bond spread shows four main results. First, *LEVI* has a negative coefficient sign in sub-sample A during the second phase of the crisis, while it has a positive one during the first phase, despite being not always significant. This result can be related once more to the additional capital requirements imposed on banks that, as previously reported, increase bank capital (decreasing therefore *LEVI*) in a period in which bond spread were particularly high.

Second, the *ROA* index seems more important during the second phase of the crisis. Third, *BLR* has a positive, significant coefficient sign in each sub-sample during the sovereign debt phase and in line with the deterioration in the assets quality. Fourth, *NPLC* increases fixed bond spread during the first phase of the crisis, indicating that high index level were perceived as higher expected losses, while it reduces it during the second phase, suggesting on the contrary that higher index levels were perceived by bondholders as a big cushion against unexpected losses.

As far as floating rate bonds are concerned, the temporal analysis has less explanatory power as reported by significant lower values of  $R^2$  compared to those of the fixed rate bond analysis. Nevertheless, the following main results come out. First, the *ROA* index has generally positive coefficients during the sovereign debt crisis, while negative ones during the subprime crisis, despite not being always significant. This sign change suggest that *ROA* index was an indicator of profitable banks in the first phase, while on the other hand it reflected high bank risk-taking in the second phase. Second, *ASSET\_UTILIZ* sensibly decreased floating rate bond spread during the sovereign debt crisis. Third, the same sign change of *NPLC* as for fixed rate bonds is reported in the case of floating rate ones. Overall, this temporal analysis could be useful capture initial trends of these accounting proxies over time. However, to better investigate the impact that the crisis had on these bank accounting variables, some changes and further analysis are required. Indeed, more specific time period can be analysed. For instance, instead of associating the first period of the crisis with the years between 2008 and 2011, it would have been more rigorous to use as initial sample year the third quarter of 2008 that corresponds to the Lehman Brother crash.

To conclude, the simple model proposed in this study works certainly better for fixed rate bonds compared to floating rate ones. Moreover, interesting results in the inferential analysis comes out that could be a good starting point for implementing further researches. Nevertheless, the empirical analysis shows also some issues that certainly require additional investigations and analysis to control better for the effect of the new policies introduced and capital requirements imposed on banks after the onset of the financial crisis.

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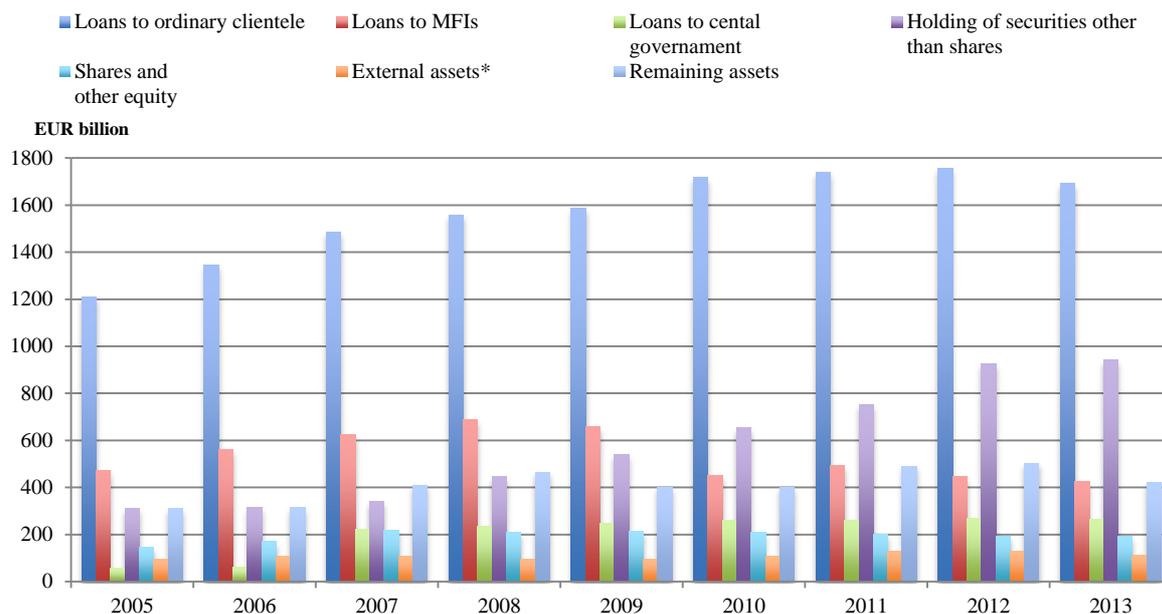
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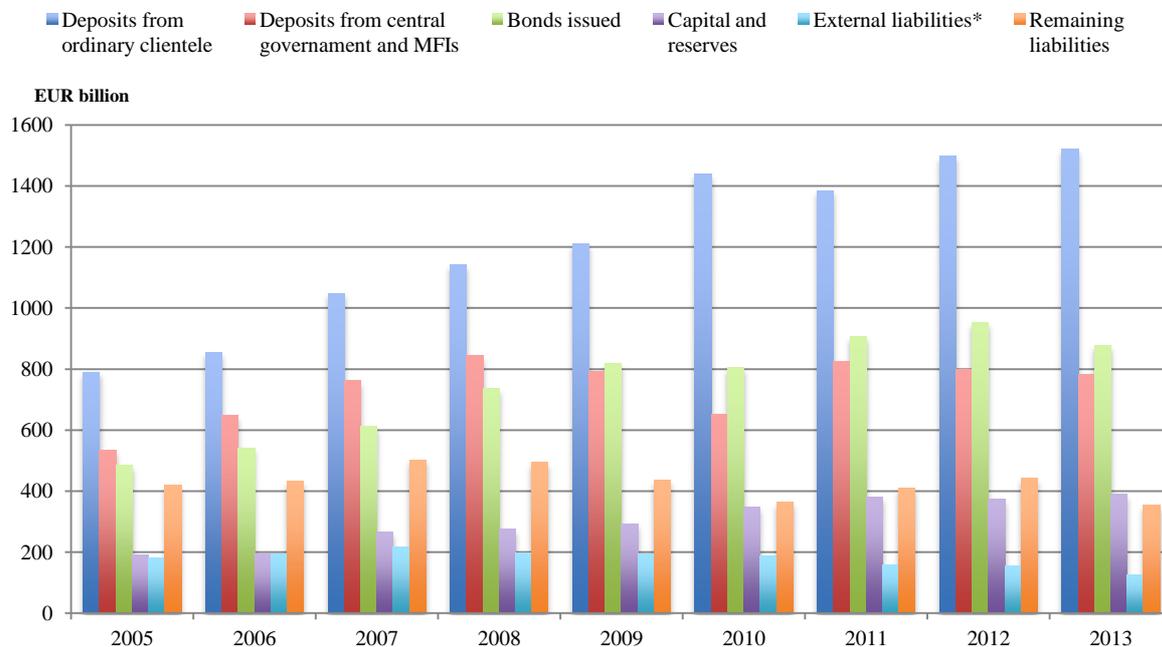
## **APPENDIX**

**Graph A.1 Italian banks: assets composition -Eurozone counterpart-**



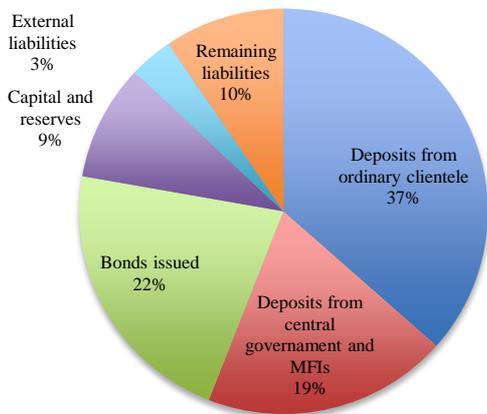
Source: Processing of European Central Bank -Statistical Data Warehouse-

**Graph A.2 Italian banks: liabilities composition -Eurozone counterpart-**

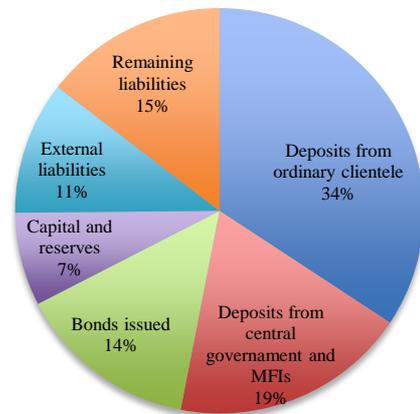


Source: Processing of European Central Bank -Statistical Data Warehouse-

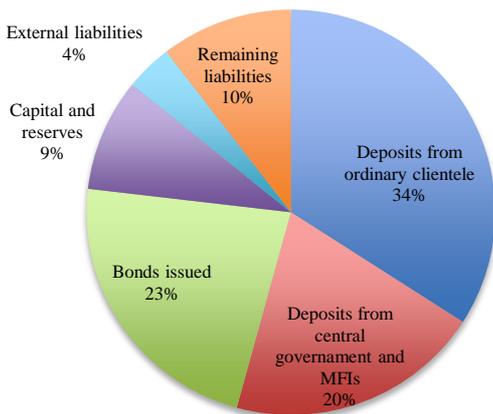
**Graph A.3 Italian Banks: Liabilities composition in 2013 -Eurozone counterpart-**



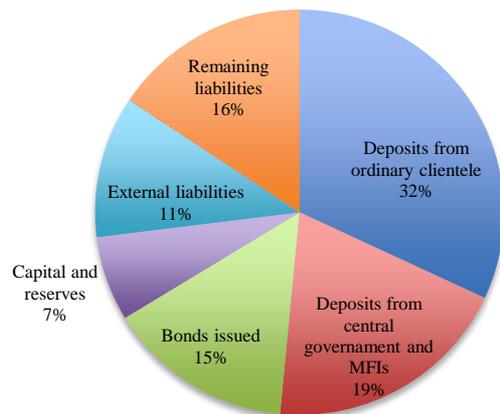
**Graph A.4 Eurozone Banks liabilities composition in 2013-Eurozone counterpart-**



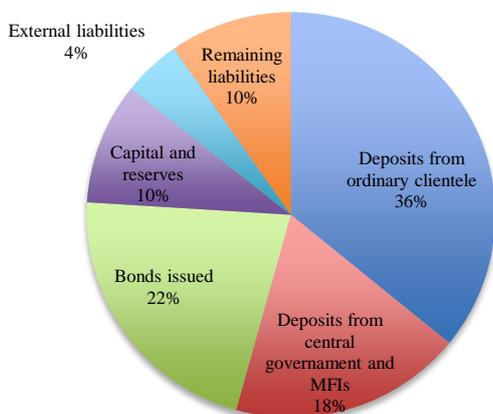
**Graph A.5 Italian Banks: Liabilities composition in 2012 -Eurozone counterpart-**



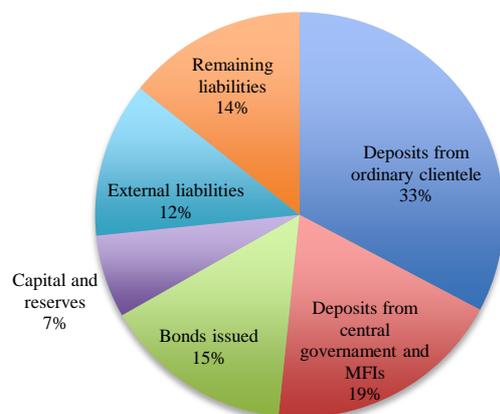
**Graph A.6 Eurozone Banks: Liabilities composition in 2012 -Eurozone counterpart-**



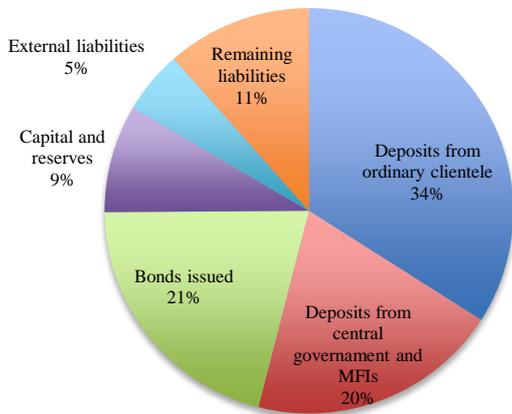
**Graph A.7 Italian Banks: Liabilities composition in 2011 -Eurozone counterpart-**



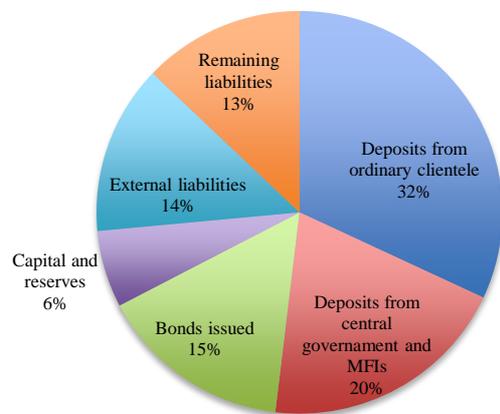
**Graph A.8 Eurozone Banks: Liabilities composition in 2011 -Euro Area counterpart-**



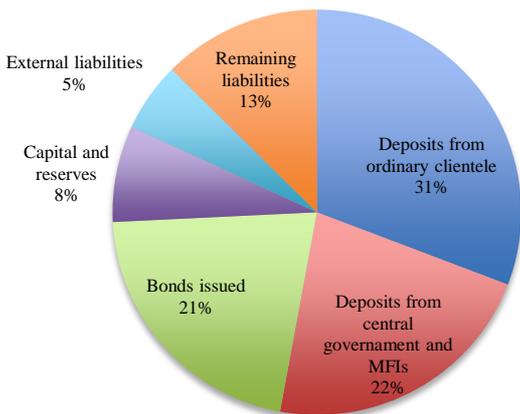
**Graph A.9 Italian Banks: Liabilities composition in 2010 -Eurozone counterpart-**



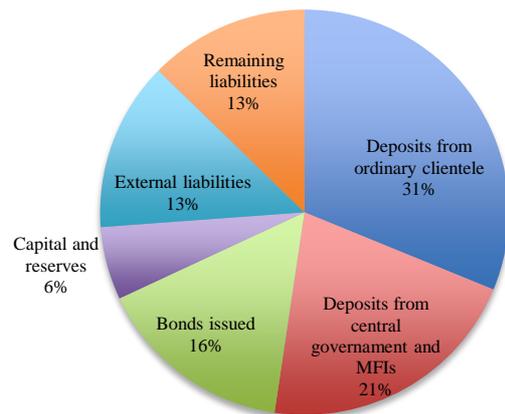
**Graph A.10 Eurozone Banks: Liabilities composition in 2010 -Eurozone counterpart-**



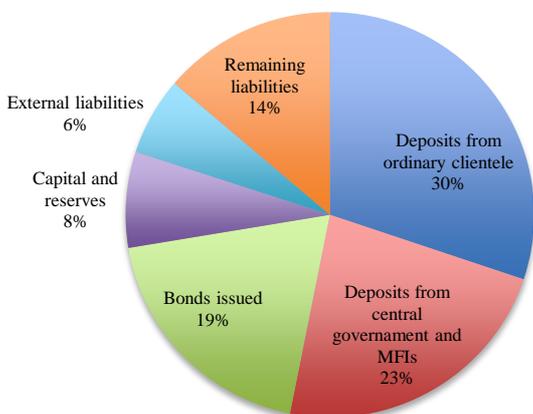
**Graph A.11 Italian Banks: Liabilities composition in 2009 -Eurozone counterpart-**



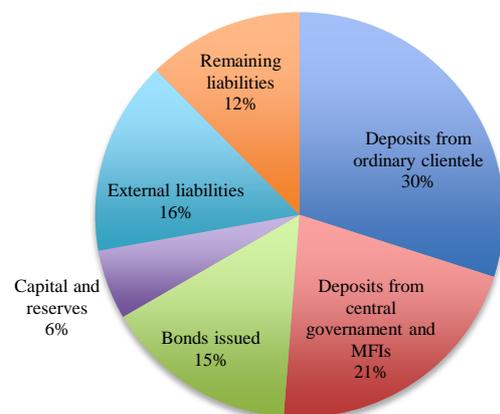
**Graph A.12 Eurozone Banks: Liabilities composition in 2009 -Eurozone counterpart-**



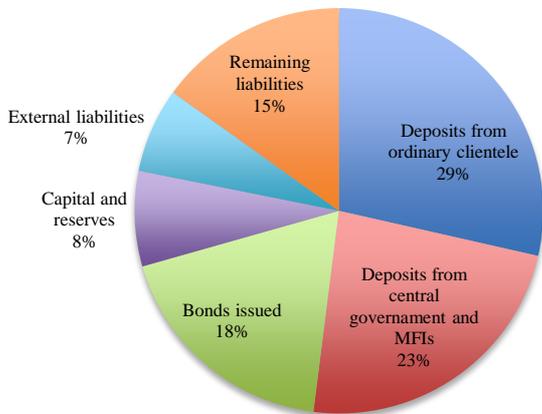
**Graph A.13 Italian Banks: Liabilities composition in 2008 -Eurozone counterpart-**



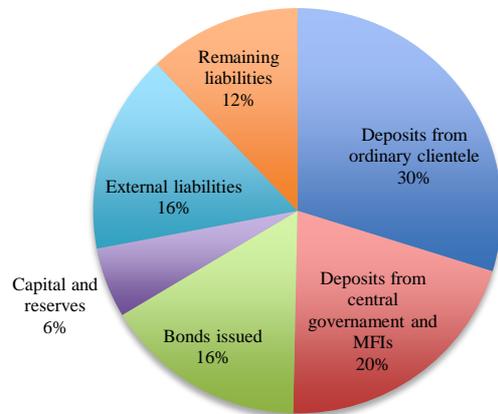
**Graph A.14 Eurozone Banks: Liabilities composition in 2008 -Eurozone counterpart-**



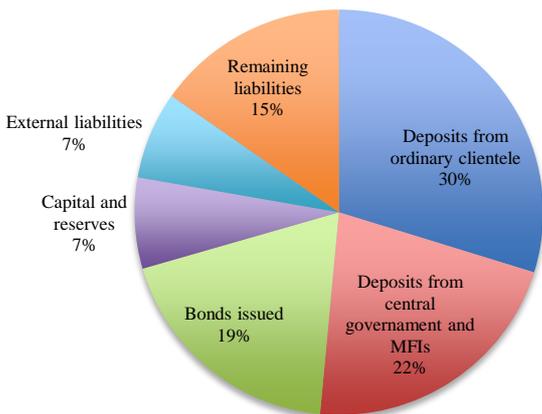
**Graph A.15 Italian Banks: Liabilities composition in 2007 -Eurozone counterpart-**



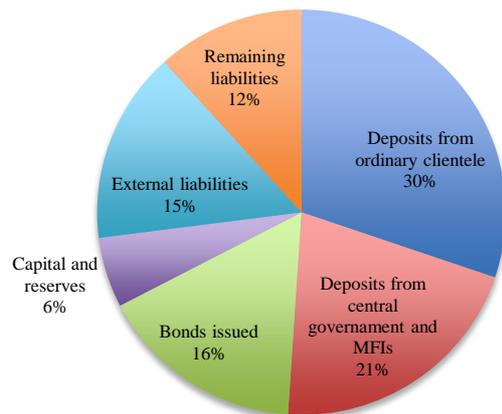
**Graph A.16 Eurozone Banks: Liabilities composition in 2007 -Eurozone counterpart-**



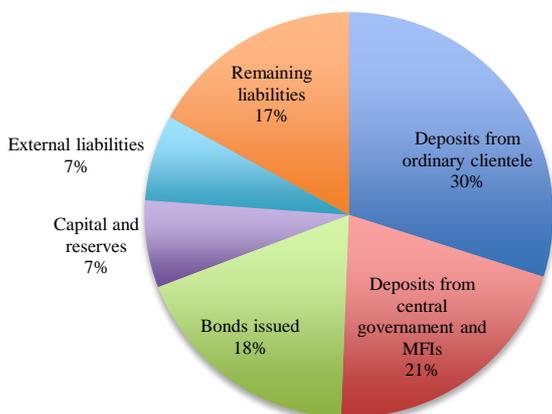
**Graph A.17 Italian Banks: Liabilities composition in 2006 -Eurozone counterpart-**



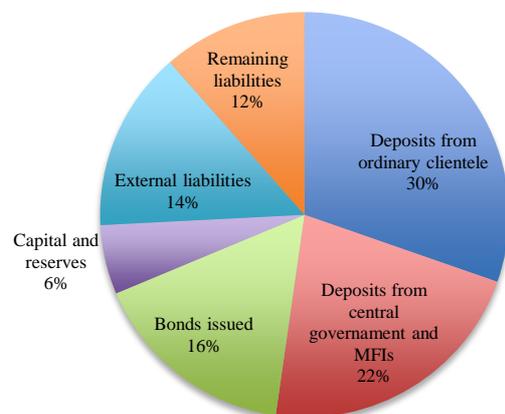
**Graph A.18 Eurozone Banks: Liabilities composition in 2006 -Eurozone counterpart-**



**Graph A.19 Italian Banks: Liabilities composition in 2005 -Eurozone counterpart-**



**Graph A.20 Eurozone Banks: Liabilities composition in 2005 -Eurozone counterpart-**



Source: Processing of European Central Bank -Statistical Data Warehouse

**Table A.1 Issuing bank characteristics**

<i>ABI_ code</i>	<i>Issuing Bank</i>	<i>Classification</i>	<i>Bank group</i>
8616	BANCA ADIGE PO CREDITO COOPERATIVO LUSIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
5034	BANCO POPOLARE - SOCIETA' COOPERATIVA	BANCHE POPOLARI COOPERATIVE	GRUPPO BANCO POPOLARE
3111	UNIONE DI BANCHE ITALIANE SOCIETA' COOPERATIVA PER AZIONI	BANCHE POPOLARI COOPERATIVE	GRUPPO UNIONE DI BANCHE ITALIANE
5728	BANCA POPOLARE DI VICENZA - SOCIETA' COOPERATIVA PER AZIONI	BANCHE POPOLARI COOPERATIVE	GRUPPO BANCARIO BANCA POPOLARE DI VICENZA
5035	VENETO BANCA S.C.P.A.	BANCHE POPOLARI COOPERATIVE	GRUPPO BANCARIO VENETO BANCA
3069	INTESA SANPAOLO S.P.A.	BANCHE SPA	GRUPPO BANCARIO INTESA SANPAOLO
8982	BANCA ADRIA - CREDITO COOPERATIVO DEL DELTA SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8450	BANCA ALPI MARITTIME CREDITO COOPERATIVO CARRU' - SOCIETA' COOPERATIVA PER AZIONI	BANCHE DI CREDITO COOPERATIVO	
1030	BANCA MONTE DEI PASCHI DI SIENA S.P.A.	BANCHE SPA	GRUPPO MONTE DEI PASCHI DI SIENA
8669	BANCA ALTO VICENTINO CREDITO COOPERATIVO -SOCIETA' COOPERATIVA PER AZIONI	BANCHE DI CREDITO COOPERATIVO	
7095	BANCA APUANA -CREDITO COOPERATIVO DI MASSA CARRARA SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8186	BANCA ATESTINA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
2008	UNICREDIT, SOCIETA' PER AZIONI	BANCHE SPA	GRUPPO UNICREDIT
8509	BANCA CENTRO EMILIA - CREDITO COOPERATIVO" SOCIETA' COOPERATIVA"	BANCHE DI CREDITO COOPERATIVO	
8324	BANCA CENTROPADANA CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8885	BANCA CRAS - CREDITO COOPERATIVO - CHIANCIANO TERME - COSTA ETRUSCA - SOVICILLE	BANCHE DI CREDITO COOPERATIVO	
8474	BANCA DI CREDITO COOPERATIVO PICENA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7076	BANCA CREMASCA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8454	BANCA CREMONESE CREDITO COOPERATIVO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8610	BANCA DEI COLLI EUGANEI - CREDITO COOPERATIVO - LOZZO ATESTINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8892	BANCA DEI DUE MARI DI CALABRIA - CREDITO COOPERATIVO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8456	BANCA DEI SIBILLINI-CREDITO COOPERATIVO DI CASAVECCHIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8930	BANCA DEL CANAVESE - CREDITO COOPERATIVO DI VISCE E DEL VERBANO CUSIO OSSOLA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8590	BANCA DEL CENTROVENETO - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA - LONGARE (VI)	BANCHE DI CREDITO COOPERATIVO	
8154	BANCA DEL CILENTO - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA PER AZIONI	BANCHE DI CREDITO COOPERATIVO	
8595	BANCA DEL CROTONESE CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7107	BANCA DEL FERMANO - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8325	BANCA DEL MUGELLO - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8811	BANCA DEL VALDARNO - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8940	BANCA DELLA BERGAMASCA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8522	BANCA DELLA COSTA D'ARGENTO - CREDITO COOPERATIVO DI CAPALBIO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7084	BANCA DELLA MARCA CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8636	BANCA DELLA MAREMMA - CREDITO COOPERATIVO DI GROSSETO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7067	BANCA DELLA TUSCIA CREDITO COOPERATIVO -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8315	BANCA DELLA VALPOLICELLA CREDITO COOPERATIVO DI MARANO (VERONA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7071	BANCA DELLA VALSASSINA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8726	BANCA VERSILIA LUNIGIANA E GARFAGNANA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7048	BANCA DELL'ELBA CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8019	BANCA DELLO JONIO - CREDITO COOPERATIVO - ALBIDONA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8916	BANCA DI ANCONA, CREDITO COOPERATIVO -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8345	BANCA DI ANGHIARI E STIA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8379	BANCA DI BEDIZZOLE TURANO VALVESTINO CREDITO COOPERATIVO -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8385	BANCA DI BIENTINA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	

8883	BANCA DI BOLOGNA CREDITO COOPERATIVO -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	GRUPPO BANCARIO BANCA DI BOLOGNA
8436	BANCA DI CAPRANICA CREDITO COOPERATIVO SOCIETA' COOPERATIVA PER AZIONI	BANCHE DI CREDITO COOPERATIVO	
8439	BANCA DI CARAGLIO, DEL CUNEESE E DELLA RIVIERA DEI FIORI - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8894	BANCA DI CARNIA E GEMONESE - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8458	BANCA DI CASCINA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8623	BANCA DI CAVOLA E SASSUOLO CREDITO COOPERATIVO -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7070	BANCA DI CESENA - CREDITO COOPERATIVO DI CESENA E RONTA - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	GRUPPO BANCARIO BANCA DI CESENA
8485	BANCA DI CHIANCIANO TERME CREDITO COOPERATIVO VAL D'ORCIA-AMIATA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8531	BANCA DI COSENZA CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8434	BANCA DI CREDITO COOPERATIVO ABRUZZESE - CAPPELLE SUL TAVO -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7098	BANCA DI CREDITO COOPERATIVO ANTONELLO DA MESSINA - SOCIETA'COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7104	BANCA DI CREDITO COOPERATIVO - BANCA DI SIRACUSA IN SIGLA BCC BANCA DI SIRACUSA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8538	BANCA DI CREDITO COOPERATIVO CAMUNA (ESINE-BRESCIA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8988	BANCA DI CREDITO COOPERATIVO DEGLI ULIVI - TERRA DI BARI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7092	BANCA DI CREDITO COOPERATIVO DEI CASTELLI ROMANI -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7066	BANCA DI CREDITO COOPERATIVO DEI COMUNI CILENTANI -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8637	BANCA DI CREDITO COOPERATIVO DEL FRIULI CENTRALE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8700	BANCA DI CREDITO COOPERATIVO DEL METAURO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8777	BANCA DI CREDITO COOPERATIVO DEL TUSCOLO - ROCCA PRIORA - SOCIETA' COOPERATIVA PER AZIONI	BANCHE DI CREDITO COOPERATIVO	
8743	BANCA DI CREDITO COOPERATIVO DEL VELINO - COMUNE DI POSTA PROVINCIA DI RIETI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8407	BANCA DI CREDITO COOPERATIVO DEL VENEZIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7086	BANCA DI CREDITO COOPERATIVO DELL'ADRIATICO TERAMANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8326	BANCA DI CREDITO COOPERATIVO DELLA CATTEDRALE DI ADRIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7103	BANCA DI CREDITO COOPERATIVO DELLA COSTA ETRUSCA, -SOCIETA' COOPERATIVA PER AZIONI A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8633	BANCA DI CREDITO COOPERATIVO DELLA MONTAGNA PISTOIESE - MARESCA - - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8462	BANCA DI CREDITO COOPERATIVO DELLA ROMAGNA OCCIDENTALE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8872	BANCA DI CREDITO COOPERATIVO DELLA SIBARITIDE - SPEZZANO ALBANESE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8867	BANCA DI CREDITO COOPERATIVO DELLA SILA PICCOLA - TAVERNA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8396	BANCA DI CREDITO COOPERATIVO DELLA VALTROMPIA - BOVEGNO (BS) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8329	BANCA DI CREDITO COOPERATIVO DELL'ALTA BRIANZA - ALZATE BRIANZA (COMO) - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	GRUPPO BANCA DELL'ALTA BRIANZA
8904	BANCA DI CREDITO COOPERATIVO DELLE PREALPI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8320	BANCA DI CREDITO COOPERATIVO DI ALTAVILLA SILENTINA E CALABRITTO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8344	BANCA DI CREDITO COOPERATIVO DI ANAGNI -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8342	BANCA DI CREDITO COOPERATIVO DI AQUARA -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8374	BANCA DI CREDITO COOPERATIVO DI BARLASSINA (MILANO) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8375	BANCA DI CREDITO COOPERATIVO DI BASILIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8381	BANCA DI CREDITO COOPERATIVO DI BELLEGRA -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8030	BANCA DI CREDITO COOPERATIVO DI BORGHETTO LODIGIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8692	BANCA DI CREDITO COOPERATIVO DI BRESCIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8404	BANCA DI CREDITO COOPERATIVO DI BUSTO GAROLFO E BUGUGGIATE -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8514	BANCA DI CREDITO COOPERATIVO DI CALCIO E COVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8425	BANCA DI CREDITO COOPERATIVO DI CAMBIANO - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8428	BANCA DI CREDITO COOPERATIVO DI CAMPIGLIA DEI BERICI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8431	BANCA DI CREDITO COOPERATIVO DI CAPACCIO PAESTUM - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8452	BANCA DI CREDITO COOPERATIVO DI CARTURA (PADOVA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8453	BANCA DI CREDITO COOPERATIVO DI CARUGATE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	

8457	CREDITO COOPERATIVO VALDARNO FIORENTINO BANCA DI CASCIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8460	BANCA DI CREDITO COOPERATIVO DI CASSANO DELLE MURGE E TOLVE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8461	BANCA DI CREDITO COOPERATIVO DI CASTAGNETO CARDUCCI -SOCIETA'COOPERATIVA PER AZIONI	BANCHE DI CREDITO COOPERATIVO	
8473	BANCA DI CREDITO COOPERATIVO DI CASTIGLIONE MESSER RAIMONDO E PIANELLA - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8515	BANCA DI CREDITO COOPERATIVO DI CREMENO - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
7091	BANCA DI CREDITO COOPERATIVO DEL LAMETINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8532	BANCA DI CREDITO COOPERATIVO DI DOBERDO' E SAVOGNA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8086	BANCA DI CREDITO COOPERATIVO DI FALCONARA MARITTINA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8519	BANCA DI CREDITO COOPERATIVO DI FANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8550	BANCA DI CREDITO COOPERATIVO DI FIUGGI -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8551	BANCA DI CREDITO COOPERATIVO DI FIUMICELLO ED AIELLO DEL FRIULI (UD) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8553	BANCA DI CREDITO COOPERATIVO DI FLUMERI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8562	BANCA DI CREDITO COOPERATIVO DI FORNACETTE - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	GRUPPO BANCARIO BANCA DI FORNACETTE
8574	BANCA DI CREDITO COOPERATIVO DI GATTEO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8554	BANCA DI CREDITO COOPERATIVO DI GAUDIANO DI LAVELLO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8586	BANCA DI CREDITO COOPERATIVO DI GHISALBA (BERGAMO) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8578	BANCA DI CREDITO COOPERATIVO DI GRADARA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8591	BANCA DI CREDITO COOPERATIVO DI IMPRUNETA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8592	BANCA DI CREDITO COOPERATIVO DI INZAGO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8601	BANCA DI CREDITO COOPERATIVO VALLE DEL TORTO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8619	BANCA DI CREDITO COOPERATIVO DI LESMO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8607	BANCA DI CREDITO COOPERATIVO DI LOCOROTONDO CASSA RURALE E ARTIGIANA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8626	BANCA DI CREDITO COOPERATIVO DI MACERONE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7010	BANCA DI CREDITO COOPERATIVO DI MAIERATO (PROVINCIA DI VIBO VALENTIA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8631	BANCA DI CREDITO COOPERATIVO DI MANZANO (UDINE) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8689	BANCA DI CREDITO COOPERATIVO DI MARCON - VENEZIA SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8639	BANCA DI CREDITO COOPERATIVO DI MASIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8662	BANCA DI CREDITO COOPERATIVO DI MONTECORVINO ROVELLA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8126	BANCA DI CREDITO COOPERATIVO DI MONTEPAONE -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8670	BANCA DI CREDITO COOPERATIVO DI MONTEPULCIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8672	BANCA DI CREDITO COOPERATIVO DI MONTERENZIO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8716	BANCA DI CREDITO COOPERATIVO DI PALESTRINA -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8731	BANCA DI CREDITO COOPERATIVO DI PERGOLA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8728	BANCA DI CREDITO COOPERATIVO DI PIOVE DI SACCO (PADOVA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8730	BANCA DI CREDITO COOPERATIVO DI PITIGLIANO -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8735	BANCA DI CREDITO COOPERATIVO DI POMPIANO E DELLA FRANCIACORTA - POMPIANO (BS) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8736	BANCA DI CREDITO COOPERATIVO DI PONTASSIEVE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8747	BANCA DI CREDITO COOPERATIVO DI PRATOLA PELIGNA (L'AQUILA) -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7083	BANCA DI CREDITO COOPERATIVO PRIVERNATE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8757	BANCA DI CREDITO COOPERATIVO DI QUINTO VICENTINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8769	BANCA DI RIPATRANSONE - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8778	BANCA DI CREDITO COOPERATIVO DI RONCIGLIONE -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8829	VIBANCA - BANCA DI CREDITO COOPERATIVO DI SAN PIETRO IN VINCIO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8792	BANCA DI CREDITO COOPERATIVO DI SALA DI CESENATICO -SOCIETA' COOPERATIVA.	BANCHE DI CREDITO COOPERATIVO	
8800	BANCA DI CREDITO COOPERATIVO DI SAN BIAGIO PLATANI -SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8805	BANCA DI CREDITO COOPERATIVO DI SAN GIORGIO E MEDUNO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	

8997	BANCA DI CREDITO COOPERATIVO DI SAN MARCO DEI CAVOTI E DEL SANNIO-CALVI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8847	BANCA DI CREDITO COOPERATIVO SAN VINCENZO LA COSTA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8843	BANCA DI CREDITO COOPERATIVO DI SANTELENA (PADOVA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8039	BANCA DI CREDITO COOPERATIVO DI SASSANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8851	BANCA DI CREDITO COOPERATIVO DI SATURNIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8855	BANCA DI CREDITO COOPERATIVO DI SCAFATI E CETARA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8907	BANCA DI CREDITO COOPERATIVO DI SCANDALE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8824	BANCA DI CREDITO COOPERATIVO DI SERINO (AVELLINO) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8865	BANCA DI CREDITO COOPERATIVO DI SESTO SAN GIOVANNI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8866	BANCA DI CREDITO COOPERATIVO DI SIGNA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8877	BANCA DI CREDITO COOPERATIVO DI STARANZANO E VILLESSE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8901	BANCA DI CREDITO COOPERATIVO DI TRIUGGIO E DELLA VALLE DEL LAMBRO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7112	BANCA DI CREDITO COOPERATIVO DI VIGEVANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8922	BANCA DI CREDITO COOPERATIVO DI VIGNOLE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8703	BANCA DI CREDITO COOPERATIVO EUGANEA DI OSPEDALETTO EUGANEO (PD) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8951	BANCA DI CREDITO COOPERATIVO GIUSEPPE TONIOLO DI GENZANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8661	BANCA DI CREDITO COOPERATIVO IRPINA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8954	BANCA DI CREDITO COOPERATIVO LA RISCOSSA DI REGALBUTO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8794	BANCA DI CREDITO COOPERATIVO LAUDENSE - LODI SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8958	BANCA DI CREDITO COOPERATIVO MUTUO SOCCORSO DI GANGI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8499	BANCA DI CREDITO COOPERATIVO OROBICA DI BARIANO E COLOGNO ALSERIO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8356	BANCA DI CREDITO COOPERATIVO PORDENONESE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8976	BANCA DI CREDITO COOPERATIVO S. GIUSEPPE" DI PETRALIA SOTTANA - SOCIETA' COOPERATIVA"	BANCHE DI CREDITO COOPERATIVO	
8941	BANCA DI CREDITO COOPERATIVO SAN MARCO DI CALATABIANO - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8712	BANCA DI CREDITO COOPERATIVO SEN. PIETRO GRAMMATICO DI PACECO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8587	BANCA DI CREDITO COOPERATIVO VALDOSTANA - COOPERATIVE DE CREDIT VALDOTAINE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	GRUPPO BANCA VALDOSTANA
8745	BANCA DI CREDITO COOPERATIVO VALLE SERIANA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8995	BANCA DI CREDITO COOPERATIVO VALMARECCHIA NEI COMUNI DI RIMINI E VERUCCHIO (RIMINI) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7108	BANCA DI CREDITO COOPERATIVO AGRIGENTINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8575	BANCA DI CREDITO COOPERATIVO AGROBRESCIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7109	BANCA DI CREDITO COOPERATIVO BANCA BRUTIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8437	BANCA DI CREDITO COOPERATIVO DEL BASSO SEBINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8928	BANCA DI CREDITO COOPERATIVO DEL CARSO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8802	BANCA DI CREDITO COOPERATIVO DEL CHIANTI FIORENTINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7060	BANCA DI CREDITO COOPERATIVO DEL GARIGLIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7049	BANCA DI CREDITO COOPERATIVO DEL GOLFO DI GELA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8985	BANCA DI CREDITO COOPERATIVO DEL NISSENO DI SOMMATINO E SERRADIFALCO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8933	BANCA DI CREDITO COOPERATIVO DEL POLESINE - ROVIGO (RO) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8330	BANCA DI CREDITO COOPERATIVO DELLA BASSA FRIULANA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8913	BANCA DI CREDITO COOPERATIVO DELLA VALLE DEL FITALLIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8331	BANCA DI CREDITO COOPERATIVO DELL'ALTO RENO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8530	BANCA DI CREDITO COOPERATIVO DI ALBA, LANGHE E ROERO - SOCIETA' COOPERATIVA (ABBR. BANCA D'ALBA CREDITO COOPERATIVO SC)	BANCHE DI CREDITO COOPERATIVO	GRUPPO BANCARIO BANCA D'ALBA
8338	BANCA DI CREDITO COOPERATIVO DI ALBEROBELLO E SAMMICHELE DI BARI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8362	BANCA DI CREDITO COOPERATIVO DI ARBOREA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8406	BANCA DI CREDITO COOPERATIVO DI BARBARANO ROMANO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7012	BANCA DI CREDITO COOPERATIVO DI BARI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	

8149	BANCA DI CREDITO COOPERATIVO DI BASCIANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7096	BANCA DI CREDITO COOPERATIVO DI CAGLIARI SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8606	BANCA DI CREDITO COOPERATIVO DI CANOSA - LOCONIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8440	BANCA DI CREDITO COOPERATIVO DI CARATE BRIANZA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8441	BANCA DI CREDITO COOPERATIVO DI CARAVAGGIO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8833	BANCA DI CREDITO COOPERATIVO DI CASALGRASSO E SANT'ALBANO STURA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8466	BANCA DI CREDITO COOPERATIVO DI CASTEL GOFFREDO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8472	BANCA DI CREDITO COOPERATIVO DI CASTENASO (BOLOGNA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8214	BANCA DI CREDITO COOPERATIVO DI CERNUSCO SUL NAVIGLIO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8487	BANCA DI CREDITO COOPERATIVO DI CHERASCO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8491	BANCA DI CREDITO COOPERATIVO DI CIVITANOVA MARCHE E MONTECOSARO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8503	BANCA DI CREDITO COOPERATIVO DI CONVERSANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8508	BANCA DI CREDITO COOPERATIVO DI CORINALDO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8517	BANCA DI CREDITO COOPERATIVO DI CRETA - CREDITO COOPERATIVO PIACENTINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8744	BANCA DI CREDITO COOPERATIVO DI DOVERA E POSTINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8549	BANCA DI CREDITO COOPERATIVO DI FILOTTRANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8572	BANCA DI CREDITO COOPERATIVO DI GAMBATESA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8618	BANCA DI CREDITO COOPERATIVO DI LEZZENO (COMO) - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8679	BANCA DI CREDITO COOPERATIVO DI MOZZANICA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7110	BANCA DI CREDITO COOPERATIVO DI NAPOLI SOCIETA' COOPERATIVA PER AZIONI (IN SIGLA B.C.C. DI NAPOLI)	BANCHE DI CREDITO COOPERATIVO	
8699	BANCA DI CREDITO COOPERATIVO DI OFFANENGO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8704	BANCA DI CREDITO COOPERATIVO DI OSTRA E MORRO D'ALBA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8705	BANCA DI CREDITO COOPERATIVO DI OSTRA VETERE SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8713	BANCA DI CREDITO COOPERATIVO DI PACHINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8720	BANCA DI CREDITO COOPERATIVO DI PEDEMONTE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8753	BANCA DI CREDITO COOPERATIVO DI PIANFEI E ROCCA DE' BALDI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8486	BANCA DI PISTOIA CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8765	BANCA DI CREDITO COOPERATIVO DI RECANATI E COLMURANO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8787	BANCA DI CREDITO COOPERATIVO DI RIANO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8327	BANCA DI CREDITO COOPERATIVO DI ROMA SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	GRUPPO C.R.A. DI ROMA
8810	BANCA DI CREDITO COOPERATIVO DI SAN GIOVANNI ROTONDO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8817	BANCA DI CREDITO COOPERATIVO DI SAN MARZANO DI SAN GIUSEPPE - TARANTO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8850	BANCA DI CREDITO COOPERATIVO DI SARSINA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8869	BANCA DI CREDITO COOPERATIVO DI SORISOLE E DI LEPRENO (BERGAMO) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8871	BANCA DI CREDITO COOPERATIVO DI SPELLO E BETTONA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8445	BANCA DI CREDITO COOPERATIVO DI TERRA D'OTRANTO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8071	BANCA DI CREDITO COOPERATIVO DI VALLEDOLMO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8422	BANCA DI CREDITO COOPERATIVO DI VERGATO (BOLOGNA) SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8919	BANCA DI CREDITO COOPERATIVO DI VEROLAVECCHIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8952	BANCA DI CREDITO COOPERATIVO G. TONILO" DI SAN CATALDO (CALTANISSETTA) SOCIETA' COOPERATIVA"	BANCHE DI CREDITO COOPERATIVO	
8784	BANCA DI CREDITO COOPERATIVO MONTE PRUNO DI ROSCIGNO E DI LAURINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8987	BANCA DI CREDITO COOPERATIVO SAN VINCENZO DE' PAOLI" DI CASAGIOVE SOCIETA' COOPERATIVA PER AZIONI"	BANCHE DI CREDITO COOPERATIVO	
8968	BANCA DI CREDITO COOPERATIVO SANGRO TEATINA DI ATESSA	BANCHE DI CREDITO COOPERATIVO	
8990	BANCA SANTO STEFANO - CREDITO COOPERATIVO - MARTELLAGO-VENEZIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8732	BANCA DI CREDITO COOPERATIVO VICENTINO - POJANA MAGGIORE (VICENZA) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8556	BANCA DI FORLI' - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	

8812	BANCA DI FORMELLO E TREVIGNANO ROMANO DI CREDITO COOPERATIVOSOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8630	BANCA DI MANTIGNANA - CREDITO COOPERATIVO UMBRO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7074	BANCA DI MONASTIER E DEL SILE - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7088	BANCA DI PERUGIA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8826	BANCA DI PESARO CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
6260	CASSA DI RISPARMIO DI PISTOIA E PESCIA S.P.A. (IN SIGLA CARIPIT S.P.A.)	BANCHE SPA	
8970	BANCA DI RIMINI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8309	BANCA DI ROMANO E S. CATERINA - CREDITO COOPERATIVO (VI) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7087	BANCA DI TARANTO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7026	BANCA DI TERAMO DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8715	BANCA DI UDINE CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8416	BANCA DI VERONA CREDITO COOPERATIVO CADIDAVID SOCIETA' COOPERATIVA PER AZIONI	BANCHE DI CREDITO COOPERATIVO	
8931	BANCA DI VITERBO CREDITO COOPERATIVO (PROV. DI VITERBO) - SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8946	BANCA DON RIZZO - CREDITO COOPERATIVO DELLA SICILIA OCCIDENTALE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7090	BANCA MALATESTIANA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8414	BANCA MOLISANA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8673	CHIANTIBANCA - CREDITO COOPERATIVO S.C.	BANCHE DI CREDITO COOPERATIVO	
8429	BANCA PADOVANA CREDITO COOPERATIVO S. C.	BANCHE DI CREDITO COOPERATIVO	
8332	BANCA PICENA TRUENTINA CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7058	BANCA REGGIANA CREDITO COOPERATIVO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7073	BANCA ROMAGNA COOPERATIVA - CREDITO COOPERATIVO ROMAGNA CENTRO E MACERONE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8965	BANCA S. BIAGIO DEL VENETO ORIENTALE DI CESAROLO, FOSSALTA DI PORTOGRUARO E PERTEGADA - B.C.C. - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8969	BANCA SAN FRANCESCO CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8807	BANCA DI SAN GIORGIO E VALLE AGNO - CREDITO COOPERATIVO DI FARA VICENTINO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8839	BANCA SUASA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8489	BANCA VALDICHIANA CREDITO COOPERATIVO TOSCO-UMBRO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8448	BANCA VENETA 1896 CREDITO COOPERATIVO DELLE PROVINCE DI VERONA E ROVIGO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8322	BANCA VERONESE CREDITO COOPERATIVO DI CONCAMARISE SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO	
8351	BANCASCIANO CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8676	B.C.C. DEL GARDA - BANCA DI CREDITO COOPERATIVO COLLI MORENICI DEL GARDA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8693	BANCA DI CREDITO COOPERATIVO DI NETTUNO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8382	BENE BANCA CREDITO COOPERATIVO DI BENE VAGIENNA (CUNEO) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
3599	CASSA CENTRALE BANCA - CREDITO COOPERATIVO DEL NORD EST SOCIETA' PER AZIONI (IN SIGLA CASSA CENTRALE BANCA)	BANCHE SPA	
8340	CASSA PADANA BANCA DI CREDITO COOPERATIVO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	GRUPPO CASSA PADANA
8024	CASSA RURALE ADAMELLO - BRENTA BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8163	CASSA RURALE ALTA VALDISOLE E PEJO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8016	CASSA RURALE ALTO GARDA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8305	CASSA RURALE ALTA VALLAGARINA DI BESENELLO, CALLIANO, NOMI, VOLANO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8252	CASSA RURALE CENTRO VALSUGANA DI SPERA, STRIGNO, TELVE - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8057	CASSA RURALE CENTROFIEMME - CAVALESE - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
7077	CASSA RURALE DEL CREMASCO BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8102	CASSA RURALE DELLA BASSA VALSUGANA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8132	CASSA RURALE DELLA VALLE DEI LAGHI - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8013	CASSA RURALE DI ALDENO E CADINE - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8031	CASSA RURALE DI BRENTONICO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	
8055	CASSA RURALE DI CASTELLO TESINO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO	

8058	CASSA RURALE DI CAVARENO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8063	CASSA RURALE DI CONDINO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8184	CASSA RURALE DI FIEMME - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8091	CASSA RURALE DI FOLGARIA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8107	CASSA RURALE DI ISERA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8026	CASSA RURALE DI LEDRO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8121	CASSA RURALE DI LEVICO TERME - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8123	CASSA RURALE DI LIZZANA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8138	CASSA RURALE DI MEZZOCORONA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8139	CASSA RURALE DI MEZZOLOMBARDO E SAN MICHELE ALL'ADIGE - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8145	CASSA RURALE MORI - VAL DI GRESTA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8178	CASSA RURALE DI PERGINE - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8042	CASSA RURALE DI RABBI E CALDES - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8209	CASSA RURALE DI ROVERE' DELLA LUNA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8210	CASSA RURALE DI ROVERETO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8232	CASSA RURALE DI SAONE - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8251	CASSA RURALE DI STREMBO, BOCENAGO E CADERZONE - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8264	CASSA RURALE DI TASSULLO E NANNO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8304	CASSA RURALE DI TRENTO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8282	CASSA RURALE DI TUENNO - VAL DI NON - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8088	CASSA RURALE DON LORENZO GUETTI DI QUADRA - FIAVE' - LOMASO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8905	CASSA RURALE ED ARTIGIANA BANCA DI CREDITO COOPERATIVO DEL SANNIO - CALVI - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8738	CASSA RURALE ED ARTIGIANA DELL'AGRO PONTINO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8386	CASSA RURALE ED ARTIGIANA DI BINASCO - CREDITO COOPERATIVO "SOCIETA' COOPERATIVA"	BANCHE DI CREDITO COOPERATIVO
8393	CASSA RURALE ED ARTIGIANA DI BORGO SAN GIACOMO (BRESCIA) - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8397	CASSA RURALE ED ARTIGIANA DI BOVES - BANCA DI CREDITO COOPERATIVO (BOVES-CUNEO) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8399	CASSA RURALE ED ARTIGIANA DI BRENDOLA CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8430	CASSA RURALE ED ARTIGIANA DI CANTU' - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8469	CASSA RURALE ED ARTIGIANA DI CASTELLANA GROTTE CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8511	CASSA RURALE ED ARTIGIANA DI CORTINA D'AMPEZZO E DELLE DOLOMITI - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8770	CASSA RURALE ED ARTIGIANA DI RIVAROLO MANTOVANO (MANTOVA) CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8772	CASSA RURALE ED ARTIGIANA DI ROANA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8927	CASSA RURALE ED ARTIGIANA DI TREVISO CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8910	CASSA RURALE ED ARTIGIANA DI VESTENANOVA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8973	CASSA RURALE ED ARTIGIANA S. GIUSEPPE CREDITO COOPERATIVO CAMERANO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8078	CASSA RURALE GIUDICARIE VALSABBIA PAGANELLA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8120	CASSA RURALE LAVIS - VALLE DI CEMBRA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8200	CASSA RURALE NOVELLA E ALTA ANAUNIA - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8316	CASSA RURALE PINETANA FORNACE E SEREGNANO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8179	CASSA RURALE PINZOLO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8140	CASSA RURALE VAL DI FASSA E AGORDINO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8279	CASSA RURALE VALLI DI PRIMIERO E VANOI - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8899	CASSA RURALE - BANCA DI CREDITO COOPERATIVO DI TREVIGLIO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8749	CENTROMARCA BANCA - CREDITO COOPERATIVO, SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
7085	CREDITO COOPERATIVO FRIULI (ABBREVIATO CREDIFRIULI) - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
7099	CREDITO ARETUSEO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA (IN SIGLA CREDITO ARETUSEO - BCC)	BANCHE DI CREDITO COOPERATIVO

8446	BANCA AREA PRATESE CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
7082	CREDITO COOPERATIVO BOLOGNESE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8717	CREDITO COOPERATIVO CASSA RURALE ED ARTIGIANA DI PALIANO SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8622	CREDITO COOPERATIVO - CASSA RURALE ED ARTIGIANA DI LUCINICO,FARRA E CAPRIVA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8427	CREDITO COOPERATIVO FIORENTINO - CAMPI BISENZIO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
7057	CREDITO COOPERATIVO INTERPROVINCIALE VENETO - SOCIETA' COOPERATIVA (IN BREVE CREDIVENETO CREDITO COOPERATIVO)	BANCHE DI CREDITO COOPERATIVO
7062	CREDITO COOPERATIVO MEDIOCRATI S.C. A R.L.	BANCHE DI CREDITO COOPERATIVO
8258	CREDITO COOPERATIVO CENTRO CALABRIA - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8771	CREDITO COOPERATIVO DELL'ADDA E DEL CREMASCO - CASSA RURALE - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8542	CREDITO COOPERATIVO RAVENNATE ED IMOLESE SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
7080	CREDITO ETNEO - BANCA DI CREDITO COOPERATIVO, SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA	BANCHE DI CREDITO COOPERATIVO
8917	CREDITO TREVIGIANO - BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8003	CREDITO VALDINIEVOLE BANCA DI CREDITO COOPERATIVO DI MONTECATINI TERME E BIENTINA SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
7075	CREDIUMBRIA BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
7072	EMIL BANCA - CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8000	ICCREA BANCA S.P.A. - ISTITUTO CENTRALE DEL CREDITO COOPERATIVO (IN FORMA ABBREVIATA ICCEA BANCA S.P.A.)	BANCHE SPA
8001	MANTOVABANCA 1896 CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8852	ROMAGNA EST BANCA DI CREDITO COOPERATIVO - SOCIETA' COOPERATIVA	BANCHE DI CREDITO COOPERATIVO
8986	ROVIGOBANCA CREDITO COOPERATIVO - SOC. COOP	BANCHE DI CREDITO COOPERATIVO