

Determinants of bank profitability in the Euro Area before and after the crisis

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The banking sector plays a crucial role in the modern economies; this statement is especially true for countries in which the transmission of purchasing power is not widely guaranteed by traded securities. Therefore, it's not surprising that the soundness of the banking system, and in particular bank profitability, is a relevant element of concern for policymakers and regulators. The new regulatory framework introduced by Basel III has strengthened this assumption; in fact the choice for the banks that need to improve their regulatory capital ratio is between self-financing (i.e. retaining a major part of net profits) and capital increase. The success of both these strategies relies on the ability of a bank to generate an adequate return on equity; this result will be hard to meet in a sector in which the competition and the costs generated by the compliance to new regulation are soaring over time.

Since the seminal works of Short (1979) and Bourke (1989), academic literature has widely investigated the main determinants of bank profitability. Competitive dynamics, continuously changing regulation, introduction of new accounting standards have contributed in subsequent years to make challenging the research activity, giving birth to different strands of literature. From a geographical point of view, we can divide works based on a cross-country comparison (Molyneux and Thornton, 1992; Demirguc-Kunt and Huizinga, 1999; Goddard et al., 2004a; Athanasoglou et al., 2006; Pasiouras and Kosmidou, 2007; Goddard et al., 2011; Dietrich and Wanzenried, 2014; ElKelish and Tucker, 2015) from others that focuses on a single country (Athanasoglou et al., 2008; Alexious and Sofoklis, 2009; Alper and Anbar, 2011; Dietrich and Wanzenried, 2011; Trujillo-Ponce, 2013; Lusignani and Onado, 2014; Brighi and Venturelli, 2014).

In the past, expected differences in the behaviour of the banks and in their ability to obtain profits were seen as correlated with their dimension and geographical scope (small vs. big banks, domestic vs. multinational players); more recently, the focus has been switched toward features linked to elements of governance and market relevance (cooperatives vs. savings vs. commercial banks, listed vs. unlisted intermediaries, systemic vs. non systemic players). Moreover, beside internal determinants of profitability (Bourke, 1989; Demirguc-Kunt and Huizinga, 1999; Goddard et al., 2004b; Pasiouras and Kosmidou, 2007) has grown the importance of market characteristics from a competitive and macroeconomic point of view (Bourke, 1989; Athanasoglou et al., 2008; Demirguc-Kunt and Huizinga, 1999; Molyneux and Thornton, 1992; Demirguc-Kunt and Huizinga, 2000; Beckmann, 2007; Albertazzi and Gambacorta, 2009; Genay and Podjasek, 2014; Saeed, 2014).

More recently, interest has been raised on peripheral and emerging economies (Flamini et al., 2009; Javaid et al., 2011; Olson and Zoubi, 2011; Misra, 2015) and on the effect of the crisis on bank profitability; however existing literature on this latter theme is still limited (Bolt et al., 2012; Beltratti and Stulz, 2012).

This variety observed in literature is in line with the developing business model of the banks, which nowadays must compete in a challenging environment, much more segmented and complex than in the past. Moreover, the recent financial crisis has evidenced the risks underlying some competitive and operative strategies previously carried on by part of the banking system. For example, the expansion of credit and the extreme leverage had been seen in the past as good schemes to improve the profitability of the banks; after the crisis, these same strategies has been widely considered (also by prudential regulation) as a potential dangerous source of instability. The recent crisis has been also very different from previous periods of instability; in effect it was worldwide and much longer. In this context, profitability has dropped universally and transversally to different sectors.

Our work aims to highlight how the dynamics observed before and after the crisis in bank profitability have been influenced by selected characteristics of governance and business model. In particular, we are interested in testing the persistence of some variables in explaining the profitability of Euro Area banks in the period 2005-2013.

Our paper aims to contribute to this literature in different ways. First of all, the time span under investigation allows us to better investigate the crisis period. Moreover, the geographical scope of our sample reduce the heterogeneity problems usually linked to cross country analysis; in effect, the legal and regulatory framework of the Euro Area is

widely homogeneous and Basel II and Basel III provisions have strengthened this harmonization. Finally, we test how governance elements have affected bank profitability before and after the recent financial crisis.

Data and methodology

In order to explore the determinants of bank profitability before and during the crisis we use bank-level data derived from consolidated and individual bank balance sheets and income statements, as available from Bankscope database. We control for consolidation codes in order to prevent double counting of observations; moreover, we consider only commercial, cooperative and saving banks. For macroeconomic and competitive conditions we use data from World Bank, European Central Bank and Eurostat. Our data set covers 12 Euro Area countries; the eleven “first entrants” (Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain) and Greece. The sample covers the period 2005-2013. To mitigate the impact of outliers, we winsorize all bank-specific variables at the 2.5% and 97.5% levels; different strategies (like a lighter winsorize at the 1% and 99%) don’t affect our main results.

Table 1 lists the variables used in this study; Table 2 summarizes the descriptive statistics of these variables, highlighting the mean-median values before and during the crisis. Panel composition is outlined in Table 3.

We use the following random effect panel model to explore the determinants of bank profitability before and during the crisis:

$$\Pi_{it} = c + \sum_{j=1}^J \beta_j X_{it-1}^j + \sum_{m=1}^M \beta_m X_{it}^m + \sum_{d=1}^D \beta_d X_{it}^d + \varepsilon_{it}$$

where Π_{it} is the profitability of bank i at time t , c is the constant term and ε_{it} the disturbance term. Our explanatory variables are grouped into bank-specific (X_{it-1}^j) and macroeconomic and market specific ones (X_{it}^m); moreover, we include a set of dummies (X_{it}^d) that account for specific bank characteristics of interest.

The crisis has severely affected banks balance sheets, reducing the path-dependency of profitability measures; this fact limits the use of GMM models that have been widely used in recent literature. Further developments of our empirical set-up are directed to create subsamples of banks suitable to be explored by dynamic models, in order to obtain appropriate robustness checks for our results.

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Mean Pre-crisis	Median Pre-crisis	Mean Crisis	Median Crisis
ROAA	18245	0.34	0.41	-1.06	1.76	0.41	0.27	0.30	0.27
ROAE	18243	4.30	4.84	-12.32	20.67	5.26	4.17	3.84	3.47
NIM	18242	2.44	0.69	0.49	4.23	2.53	2.51	2.40	2.48
OpProf_TA	18245	0.73	0.64	-1.12	2.74	0.73	0.61	0.73	0.64
Eq_TA	18245	7.99	3.73	2.85	25.70	7.56	6.47	8.20	7.41
Loan_Dep	18245	101.97	53.79	21.00	288.91	100.68	89.75	102.59	87.99
Cost_Income	18245	67.86	11.80	35.24	100.00	67.54	68.00	68.02	68.00
NetLoans_TA	18245	58.83	16.87	9.12	87.95	59.05	61.70	58.73	60.83
Loans_growth	18245	5.45	10.38	-15.17	47.94	6.14	2.90	5.12	3.69
Exp_emp	18245	4.06	0.25	3.65	4.83	4.03	4.01	4.08	4.05
NII_NOI	18245	0.71	0.13	0.19	0.96	0.70	0.72	0.72	0.74
SelfFin_Eq	18245	3.79	4.39	-13.26	17.09	4.99	4.04	3.20	2.88
TA	18245	13.46	1.71	8.82	21.51	13.39	13.21	13.49	13.30
NPLs_Loans	6398	6.49	4.76	0.42	22.12	5.61	4.54	6.73	5.57
GDP_growth	18245	0.69	2.97	-8.90	6.50	2.17	2.40	-0.03	0.40
L1.GDP_growth	18245	0.96	3.00	-8.90	6.50	2.66	3.30	0.15	0.60
L2.GDP_growth	18245	1.20	2.94	-8.90	6.50	2.03	1.20	0.80	1.50
HICP	18245	1.94	0.90	-1.70	4.70	2.49	2.30	1.68	1.60
HHI	18245	0.04	0.03	0.02	0.37	0.03	0.02	0.04	0.03
L1.MktCap_GDP	18245	45.42	28.63	11.65	337.55	61.04	54.62	37.86	38.02

Table 2: Variables definition

Variable	Description	Source
ROAA	Return on average assets	Bankscope
ROAE	Return on average equity	Bankscope
NIM	Net interest margin over average earning assets	Bankscope
OpProf_TA	Operating profits over total assets	Bankscope
Eq_TA	Equity over total assets	Bankscope
Loan_Dep	Loans to deposits ratio	Bankscope
Cost_Income	Cost income ratio	Bankscope
NetLoans_TA	Net Loans over total assets	Bankscope
Loans_growth	Loans growth	Bankscope
Exp_emp	Natural Logarithm of expenses per employee	Bankscope
NII_NOI	Net interest income over net operating income	Bankscope
SelfFin_Eq	Self-financing over equity	Bankscope
TA	Natural Logarithm of total assets	Bankscope
NPLs_Loans	Non performing loans to gross loans	Bankscope
GDP_growth	Annual real GDP growth	Eurostat
L1.GDP_growth	Annual real GDP growth – 1 lag	Eurostat
L2.GDP_growth	Annual real GDP growth – 2lag	Eurostat
HICP	Harmonized index of consumer prices – Euro Area	Eurostat
HHI	Herfindahl Hirschman index for credit institutions Total Assets	European Central Bank
L1.MktCap_GDP	Market capitalization over GDP – 1 lag	World Bank

Table 3: Sample composition

Bank type	Whole period		Pre-Crisis (2005-2008)		Crisis (2009-2013)	
	N° of observations	N° of banks	N° of observations	N° of banks	N° of observations	N° of banks
Full Sample	18,245	3,152	5,951	2,616	12,294	2,928
<i>Commercial</i>	2,817	594	890	421	1,927	531
<i>Saving</i>	4,213	729	1,430	546	2,783	690
<i>Cooperative</i>	11,215	1,829	3,631	1,649	7,584	1,707

According to mainstream literature, we consider three dependent variables able to explain bank profitability: ROAA, ROAE and NIM over average earning assets. ROAA (return on average total assets) explains bank capacity to generate profits from the managed assets and it's widely considered the key ratio to evaluate bank profitability (Golin, 2013). ROAE (return on average equity) reveals how much profit a company generates with the shareholders' capital. Some scholars have underlined that these two indicators can be affected by relevant drawbacks. On the one hand, ROAA doesn't take into account off balance sheet transactions (Goddard et al., 2004a); on the other hand, ROAE can be unable to give relevant information about the level of the risks related to bank investments (Haldane, 2009). Moreover, the higher the equity (and the lower the leverage), the higher will be ROAA and the lower will be the ROAE (Dietrich and Wanzenried, 2011). We choose to employ both profitability measures in order to limit their specific limitations.

The third variable to measure bank's economic performance is NIM (net interest margin), given by interest revenues minus interest expenses, and expressed as the ratio between net interest returns and the average earning assets. This ratio may be considered a proxy for the income generation capacity of the traditional banking business, i.e. lending and borrowing money.

The following bank-specific characteristics are used as internal determinants of performance; we use lagged version of these variables in order to prevent endogeneity problems:

- OpProf_TA: the ratio Operating Profits to Total Assets measure bank's capacity to create profit from the day-to-day management. Operating Profits typically include net interest and non-interest income, operating income and expenses, other operating profits or losses and loan and other credit impairment charges. The ratio

is closely related to bank's profits, so we expect a positive effect on profitability even if this effect should be offset because of strong loans impairments;

- **Eq_TA**: the ratio of Equity to Total Assets is widely considered a measure of capital strength. High ratios are usually indicators of low leverage, and therefore low riskiness: consequently, on the basis of the conventional risk-return hypothesis, they are associated with lower expected profitability. However, as noted in Dietrich and Wanzenried (2014), lower levels of risk strengthen bank soundness and reduce funding costs, with a positive effect on its profitability. Given these opposite effects, the impact of bank's capitalization on profitability is not theoretically determinate.
- **Loan_Dep**: the ratio Loans to Deposits is a measure of the activity of financial intermediation carried out by a bank. Banks with a high loans/deposits ratio usually present a higher NII_NOI (see below) as lending and borrowing money are typically interest-based activities. We expect that Loan_Dep ratio has been higher before the crisis and has impacted positively on profitability; not well-defined effects are expected during the crisis. This state of uncertainty derives from bank's ineffectiveness to significantly influence on these two balance sheet aggregates, given that this strategy would mean changing the shape of business model;
- **Cost_Income**: calculated as ratio between operating costs (which include administrative costs, staff expenses, and property costs) and gross revenues, this ratio is a measure of efficiency: a lower level of this ratio has an expected positive effect on bank profitability. We expect lower ratios after the boost of the crisis, due to banks' effort to maintain/increase profitability.
- **NetLoans_TA**: the ratio Net Loans to Total Assets measures the weight of loans (net of reserves) on total assets. It shows bank's traditional approach towards lending activities. We expect a strong increase pre-crisis (because lending is, usually, the activity with the higher return), and a positive effect on profitability. Post-crisis, a decrease both for the reduction of loans and for the high increase of the reserves for impaired loans is expected, and a negative impact on profitability;
- **Loans_growth**: this ratio compares the current year gross loans as a percentage of the previous year one. The growth, and its impact on profitability, is expected positive and significant before the crisis, while negative and insignificant later on.
- **Exp_emp**: the natural logarithm of personnel expenses to employees is another proxy for efficiency and measures the average cost for employee (without difference between staff positions and fixed or variable remuneration). We expect a fast

slowdown of the ratio post-crisis both for staff cuts and a decrease of their wages (especially due to a strong decrease of bonus systems); this should determine a positive effect of this ratio on bank profits;

- **NII_NOI**: the ratio Net Interest Income (NII) to Net Operating Income (NOI) is a measure that allows us to identify the primary business line of a bank. The higher the ratio, the most important is traditional lending and borrowing activities. We expect a positive effect on bank's profitability even if this effect should be offset because of non-recurring items in income statement;
- **SelfFin_Eq**: this ratio (Self Financing to Equity) is a measure of bank's capacity to self-finance without issuing bonds or shares on the market or increasing interest bearing liabilities. It's the one's complement of pay-out ratio. It largely depends on shareholders' decisions, but also on regulation (for example, in January 2015 European Central Bank issued a recommendation to banks "to base their dividend policies on conservative and prudent assumptions to cover their current capital requirements and prepare to meet more demanding capital standards" - Recommendation ECB/2015/2 on dividend distribution policies);
- **TA**: in order to prevent heteroskedasticity problems, we use the natural logarithm of bank assets to control for bank size. The increase in the bank size brings two opposite effects: on the one hand the opportunity to exploit scale and scope economies and on the other hand the costs associated with bureaucracy and complexity. Hence, the expected sign is undetermined.

As lending is a higher risk-return and interest based activity, lending activities are strictly related with economic cycle, and during a crisis period we expect that banks with a higher ratio also present a higher NPL/Loans ratio (see below) and a lower profitability.

Our set of external indicators includes different coincident and lagged country-specific variables that are likely to influence the bank profitability; undoubtedly, the strength of competition in the banking sector, the soundness of the surrounding economic environment and other external factor impact on the costs and revenues of a bank, on the quality of its assets and hence on its financial stability.

To capture the fluctuations of the economic cycle we use the real GDP growth for each country under investigation. Previous studies have found a positive relation between this variable and the profitability of the banking sector; improved market conditions are associated with a better quality of the loans portfolio and with an increase of net interest

margin. The growth of credit demand raises interest rates, while liquidity abundance on the market reduces funding costs for banks; naturally, the worsening of economic conditions brings to an opposite result, compressing the banks' profit margins. Changes in GDP growth can also have a lagged effect over bank profitability; for example, the credit channel reacts with a slow pace to downturns in economic conditions. Moreover, the banks could choose for an *evergreening* strategy (also known as "zombie lending" – Caballero, 2008) in order to delay loan loss provisions. Hence, we include lagged versions of real GDP growth in our regressions in order to capture this effect.

The choice to select countries that are part of the Euro Area allows us to have a homogeneous environment with regard to monetary policy; however, there are still differences in the level of inflation and interest rates. To deal with this source of heterogeneity we use the national HICP index observed in each country; inflation influences different items in the bank balance sheets, like assets value, funding costs and interest rates on loans. However, in existing literature there is no clear evidence about the final effect of inflation on bank profitability; the expected sign of the coefficient in our regressions is therefore indeterminate.

The traditional theories about the effect of competition on firm profitability have been applied to the banking sector leading to different approaches. Among them we find the Structure - Conduct - Performance hypotheses, the Efficient - Structure hypotheses, the Expense Preference hypotheses, the Galbraith - Caves Risk-avoidance hypotheses (for a review of literature about these topics see Rasiyah, 2010). Usually a higher degree of market concentration is associated with the opportunity of extracting oligopolistic rents through collusive behaviours. However, a concentrated banking market can be the result of a fierce competition between intermediaries: this could lead to compress their profit margins, for example in the traditional activity of borrowing and lending, reducing bank profitability. As a result, the expected effect of concentration on profitability is uncertain. It's worth observing that is difficult to find an uncontroversial measure of market concentration; previous studies have used a wide set of indicators (i.e. the market share of the first 3-5 players, the Lerner Index, etc.). In our paper we use the Herfindahl Hirschman Index (HHI) of total assets for each country, which is the measure of market concentration used by European Central Bank.

In addition, we try to control for the "competition" between banks and financial markets. To do this, we use a measure of relative importance of capital markets for the economy of a country, built as the ratio of market capitalization over GDP (MktCap_GDP). Where

financial markets are underdeveloped, there is room for the banking system to exploit its bargaining power towards the customers, for example in credit supply: in this sense, poor financial markets fails in counterbalancing a concentrated banking market. On the contrary, efficient markets can compete with the banking sector in providing financial resources to borrowers and opportunities to investors. At the same time, banks could expand their business lines toward financial consulting and trading services, raising their non-interest incomes; as a result, the expected effect of financial market development over bank profits is undetermined. Since a relevant share of market capitalization is attributable to large listed banks, we prevent endogeneity problems using a lagged version of this variable.

There is wide evidence about the negative impact of the financial crisis started in late 2006 on the banking sector profitability; however, it is quite difficult to determine the starting point of the crisis in modelling an econometric analysis. In effect, what really counts is not the beginning of the crisis, but the moment from which the bank balance sheets have been affected by the crisis. We use a dummy (D_Crisis) taking the value of 1 for 2009 and subsequent years and the value of 0 since 2005 to 2008; this choice is confirmed by the observation of the mean and median values of our profitability measures over time, that drop in 2009 balance sheets.

We aim to control for market discipline effects introducing a specific dummy for banks that are traded over financial markets (D_Listed). Being listed implies a great transparency and a more strict supervisory screening; this can lower the bank riskiness as perceived by investors and depositors, with a positive effect on profitability.

In order to account for banks systemic importance we use a dummy (D_BigBank) inspired by the regulatory framework of the ECB; in particular, it identifies banks whose total assets exceed 30 billion Euros. Until now, the systemic importance of a bank has led the market to consider it as “too big to fail”, lowering its perceived riskiness; therefore we expect positive coefficients for this dummy in our regressions, in particular for NIM that is more directly affected by funding costs.

Our model controls for bank specialization through three dummies that identify commercial (D_Comm), cooperatives (D_Coop) and savings banks (D_Sav); this allows us to focus on the impact of a mutualistic nature on profitability before and during the crisis. Cooperatives and saving banks usually provide credit lines to small and medium enterprises and therefore are considered more close to the local economy; we expect that this commitment can lower bank profitability, due to the difficulty to enforce flight to quality strategies.

Since Euro Area includes economically troubled nations (Weigand, 2015) that have experimented a severe increase in their perceived riskiness during the crisis, we introduce a specific dummy (D_PIGS) for Portugal, Ireland, Italy, Greece and Spain. Traditionally in these countries the banking sector has obtained high levels of profitability; we expect a negative sign for the coefficient associated to the dummy in particular for NIM regression, since this variable is more directly influenced by the interest rates level.

Results

Estimation results are presented in Tables 4-6. One of the most important independent variables (NPLs_Loans) has a large number of missing values in our dataset; therefore we run two different sets of econometric tests including or not this explanatory variable.

As expected, our tables report a positive and significant coefficient on operating profit over total assets in all the estimations, suggesting that the past operating profitability is proportional to the estimated future results of a bank.

The coefficient associated to loans to deposits ratio is always negative when significant; this occur mainly in NIM regressions. During the crisis, wider unbalances between loans and deposits have been considered as a relevant element of instability for the banks, given the falling quality of their credit portfolio and the sudden blackout of the interbank market. This situation has been reflected in a raise of risk premium to be paid to depositors and to the few lenders still present on the interbank market, with a negative effect on profitability.

Cost Income ratio, as expected, presents a negative and significant sign; this fails to be true only in subsample regressions including NPL with regard to NIM. Banks effort to improve their efficiency has granted a higher level of profitability before and during the crisis; this positive effect is clearly more evident looking at the net income (that is the final margin of the income statement and that includes operating profits and costs) than looking at the NIM.

The recent crisis has emphasised the importance of credit dynamics for the soundness of the banking system; this both from a quantitative and qualitative point of view. In line with this observation, we use three measures, to highlight the importance of lending (net loans to total assets and loans growth) and the quality of credit portfolio (NPLs over gross loans) for the banks included in our sample. Table 6 report positive and significant coefficients on net loans to total assets and NPLs in the estimation over NIM; the same coefficients in ROAA and ROAE regressions are instead widely unstable. Bank specialization in the

traditional lending activity has a positive effect on the net interest margin, also during recession; on the other side, a poor quality of the outstanding credit portfolio may reduce ROAA and ROAE that are more sensitive to loan loss provisions (LLP), but not NIM that doesn't take into account this item.

Table 4: Regression results (ROAA)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OpProf_TA	0.14*** (0.009)	0.19*** (0.017)	0.14*** (0.009)	0.19*** (0.017)	0.15*** (0.009)	0.19*** (0.017)	0.14*** (0.009)	0.20*** (0.017)	0.14*** (0.009)	0.19*** (0.017)	0.15*** (0.009)	0.20*** (0.017)
Eq_TA	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)	0.02*** (0.002)
Loan_Dep	0.00 (0.000)	-0.00 (0.000)	0.00 (0.000)	-0.00 (0.000)	0.00 (0.000)	-0.00* (0.000)	0.00 (0.000)	-0.00 (0.000)	0.00 (0.000)	-0.00 (0.000)	-0.00 (0.000)	-0.00* (0.000)
Cost_Income	-0.00*** (0.000)	-0.00*** (0.001)	-0.00*** (0.000)	-0.00*** (0.001)	-0.00*** (0.000)	-0.00*** (0.001)	-0.00*** (0.000)	-0.00*** (0.001)	-0.00*** (0.000)	-0.00*** (0.001)	-0.00*** (0.000)	-0.00*** (0.001)
NetLoans_TA	-0.00* (0.000)	-0.00 (0.001)	-0.00* (0.000)	-0.00 (0.001)	-0.00 (0.000)	-0.00 (0.001)	-0.00* (0.000)	-0.00 (0.001)	-0.00* (0.000)	-0.00 (0.001)	-0.00 (0.000)	-0.00 (0.001)
Loans_growth	0.00*** (0.000)	0.00* (0.001)	0.00*** (0.000)	0.00* (0.001)	0.00*** (0.000)	0.00 (0.001)	0.00*** (0.000)	0.00 (0.001)	0.00*** (0.000)	0.00* (0.001)	0.00*** (0.000)	0.00 (0.001)
Exp_empl	0.08*** (0.019)	0.15*** (0.035)	0.08*** (0.019)	0.15*** (0.035)	0.05** (0.020)	0.14*** (0.036)	0.07*** (0.019)	0.15*** (0.035)	0.09*** (0.019)	0.15*** (0.035)	0.04** (0.020)	0.14*** (0.035)
NII NOI	0.02 (0.046)	0.05 (0.075)	0.02 (0.046)	0.05 (0.075)	0.05 (0.047)	0.05 (0.076)	0.00 (0.046)	0.05 (0.075)	0.02 (0.046)	0.04 (0.075)	0.03 (0.047)	0.04 (0.076)
SelfFin_Eq	0.02*** (0.001)	0.02*** (0.001)	0.02*** (0.001)	0.02*** (0.001)	0.02*** (0.001)	0.02*** (0.002)	0.02*** (0.001)	0.02*** (0.002)	0.02*** (0.001)	0.02*** (0.002)	0.02*** (0.001)	0.02*** (0.002)
TA	-0.01*** (0.003)	-0.01** (0.004)	-0.01*** (0.003)	-0.01** (0.004)	-0.00 (0.003)	-0.00 (0.004)	-0.01*** (0.003)	-0.01** (0.004)	-0.01*** (0.003)	-0.01** (0.005)	-0.00 (0.003)	-0.01 (0.005)
NPLs_Loans		-0.01*** (0.002)		-0.01*** (0.002)		-0.01*** (0.002)		-0.01*** (0.002)		-0.01*** (0.002)		-0.01*** (0.002)
GDP_growth	0.01*** (0.002)	0.01*** (0.003)	0.01*** (0.002)	0.01*** (0.003)	0.01*** (0.002)	0.01*** (0.003)	0.01*** (0.002)	0.01*** (0.004)	0.01*** (0.002)	0.01** (0.003)	0.01*** (0.002)	0.01*** (0.004)
L1.GDP_growth	0.00*** (0.001)	0.01*** (0.003)	0.00*** (0.001)	0.01*** (0.003)	0.00*** (0.001)	0.01*** (0.003)	0.01*** (0.001)	0.01*** (0.003)	0.00*** (0.001)	0.01*** (0.003)	0.01*** (0.001)	0.02*** (0.003)
L2.GDP_growth	-0.00*** (0.001)	-0.01*** (0.003)	-0.00*** (0.001)	-0.01*** (0.003)	-0.00*** (0.001)	-0.01*** (0.003)	-0.00 (0.001)	-0.01*** (0.004)	-0.00*** (0.001)	-0.01*** (0.003)	-0.00 (0.001)	-0.01** (0.004)
HICP	-0.06*** (0.005)	-0.04*** (0.008)	-0.06*** (0.005)	-0.04*** (0.008)	-0.06*** (0.005)	-0.04*** (0.008)	-0.07*** (0.006)	-0.04*** (0.008)	-0.06*** (0.005)	-0.04*** (0.008)	-0.07*** (0.006)	-0.04*** (0.008)
HHI	0.64*** (0.179)	0.49** (0.249)	0.63*** (0.179)	0.49** (0.248)	0.52*** (0.184)	0.45* (0.250)	0.62*** (0.181)	0.59** (0.249)	0.64*** (0.180)	0.47* (0.249)	0.51*** (0.187)	0.55** (0.250)
L1.MktCap_GDP	0.00*** (0.000)	0.00 (0.001)	0.00*** (0.000)	0.00 (0.001)	0.00*** (0.000)	0.00 (0.001)	0.00*** (0.000)	0.00 (0.001)	0.00*** (0.000)	0.00 (0.001)	0.00*** (0.000)	0.00 (0.001)
D_Crisis	-0.10*** (0.010)	-0.28*** (0.022)	-0.10*** (0.010)	-0.28*** (0.022)	-0.10*** (0.010)	-0.27*** (0.022)	-0.09*** (0.010)	-0.24*** (0.030)	-0.10*** (0.010)	-0.28*** (0.022)	-0.09*** (0.010)	-0.23*** (0.030)
D_Listed			0.06* (0.035)	0.04 (0.035)							0.04 (0.037)	0.03 (0.039)
D_Coop					-0.01 (0.019)	0.02 (0.023)					-0.01 (0.019)	0.02 (0.023)
D_Sav					-0.10*** (0.020)	-0.05** (0.024)					-0.10*** (0.020)	-0.05** (0.024)
D_PIIIGS							0.06*** (0.015)	0.06** (0.028)			0.05*** (0.015)	0.06** (0.027)
D_BigBank									0.02 (0.031)	0.03 (0.034)	-0.03 (0.033)	0.00 (0.038)
Constant	0.07 (0.099)	0.07 (0.198)	0.09 (0.100)	0.09 (0.199)	0.12 (0.108)	0.04 (0.204)	0.12 (0.100)	-0.00 (0.203)	0.09 (0.101)	0.10 (0.201)	0.14 (0.111)	-0.03 (0.213)
Observations	18,245	6,398	18,245	6,398	18,245	6,398	18,245	6,398	18,245	6,398	18,245	6,398
Number of banks	3,152	2,114	3,152	2,114	3,152	2,114	3,152	2,114	3,152	2,114	3,152	2,114
R_Squared	0.59	0.51	0.59	0.51	0.59	0.51	0.59	0.50	0.59	0.51	0.59	0.51

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.10

Table 5: Regression results (ROAE)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OpProf_TA	1.14*** (0.101)	1.62*** (0.215)	1.14*** (0.101)	1.63*** (0.214)	1.18*** (0.100)	1.62*** (0.211)	1.14*** (0.101)	1.70*** (0.219)	1.14*** (0.101)	1.63*** (0.214)	1.19*** (0.100)	1.71*** (0.215)
Eq_TA	-0.22*** (0.017)	-0.21*** (0.024)	-0.22*** (0.017)	-0.21*** (0.024)	-0.23*** (0.017)	-0.20*** (0.023)	-0.24*** (0.017)	-0.21*** (0.024)	-0.22*** (0.017)	-0.21*** (0.024)	-0.24*** (0.017)	-0.21*** (0.023)
Loan_Dep	0.00 (0.002)	-0.00 (0.002)	0.00 (0.002)	-0.00 (0.002)	-0.00 (0.002)	-0.00 (0.002)	0.00 (0.002)	-0.00 (0.002)	0.00 (0.002)	-0.00 (0.002)	-0.00 (0.002)	-0.00* (0.002)
Cost_Income	-0.02*** (0.005)	-0.03*** (0.009)	-0.02*** (0.005)	-0.03*** (0.009)	-0.02*** (0.009)	-0.04*** (0.005)	-0.02*** (0.009)	-0.03*** (0.005)	-0.02*** (0.009)	-0.04*** (0.009)	-0.02*** (0.005)	-0.03*** (0.009)
NetLoans_TA	-0.01*** (0.005)	-0.01 (0.007)	-0.01** (0.005)	-0.01 (0.007)	-0.01 (0.005)	-0.01 (0.007)	-0.01*** (0.005)	-0.01* (0.008)	-0.01** (0.005)	-0.01 (0.008)	-0.01 (0.005)	-0.01 (0.008)
Loans_growth	0.03*** (0.004)	0.02** (0.009)	0.03*** (0.004)	0.02** (0.009)	0.03*** (0.004)	0.02** (0.009)	0.03*** (0.004)	0.02** (0.009)	0.03*** (0.004)	0.02** (0.009)	0.03*** (0.004)	0.02* (0.009)
Exp_empl	1.38*** (0.229)	1.87*** (0.465)	1.39*** (0.228)	1.91*** (0.460)	0.67*** (0.237)	1.46*** (0.465)	1.28*** (0.231)	1.87*** (0.465)	1.38*** (0.229)	1.90*** (0.462)	0.60** (0.237)	1.48*** (0.455)
NII_NOI	-0.36 (0.537)	-0.82 (0.979)	-0.31 (0.539)	-0.82 (0.976)	0.44 (0.539)	0.00 (0.975)	-0.57 (0.541)	-0.83 (0.979)	-0.38 (0.536)	-0.91 (0.975)	0.25 (0.544)	-0.07 (0.970)
SelfFin_Eq	0.29*** (0.018)	0.33*** (0.032)	0.29*** (0.018)	0.32*** (0.031)	0.29*** (0.018)	0.33*** (0.032)	0.29*** (0.018)	0.32*** (0.032)	0.29*** (0.018)	0.32*** (0.032)	0.29*** (0.018)	0.32*** (0.032)
TA	-0.09** (0.037)	-0.06 (0.055)	-0.11*** (0.038)	-0.09 (0.059)	-0.04 (0.040)	-0.07 (0.058)	-0.10*** (0.037)	-0.06 (0.056)	-0.12*** (0.039)	-0.10 (0.064)	-0.06 (0.042)	-0.11* (0.065)
NPLs_Loans		-0.10*** (0.020)		-0.10*** (0.020)		-0.11*** (0.020)		-0.10*** (0.021)		-0.10*** (0.020)		-0.11*** (0.021)
GDP_growth	0.13*** (0.019)	0.12*** (0.041)	0.13*** (0.019)	0.12*** (0.041)	0.14*** (0.019)	0.15*** (0.041)	0.17*** (0.021)	0.17*** (0.048)	0.13*** (0.019)	0.12*** (0.041)	0.18*** (0.021)	0.20*** (0.046)
L1.GDP_growth	0.07*** (0.015)	0.12*** (0.032)	0.07*** (0.015)	0.12*** (0.032)	0.07*** (0.015)	0.12*** (0.033)	0.10*** (0.017)	0.16*** (0.039)	0.07*** (0.015)	0.11*** (0.032)	0.10*** (0.017)	0.16*** (0.038)
L2.GDP_growth	-0.00 (0.014)	-0.15*** (0.038)	-0.00 (0.014)	-0.15*** (0.038)	0.00 (0.014)	-0.13*** (0.037)	0.02 (0.015)	-0.10** (0.046)	-0.00 (0.014)	-0.15*** (0.038)	0.02 (0.015)	-0.09* (0.044)
HICP	-0.76*** (0.060)	-0.41*** (0.102)	-0.76*** (0.060)	-0.41*** (0.102)	-0.77*** (0.061)	-0.39*** (0.103)	-0.86*** (0.065)	-0.46*** (0.100)	-0.76*** (0.060)	-0.41*** (0.101)	-0.85*** (0.066)	-0.45*** (0.102)
HHI	11.00*** (2.353)	7.71** (3.414)	10.83*** (2.358)	7.70** (3.408)	7.06*** (2.351)	4.43 (3.475)	10.70*** (2.352)	8.79*** (3.334)	10.72*** (2.358)	7.18** (3.402)	6.81*** (2.363)	5.20 (3.362)
L1.MktCap_GDP	0.01*** (0.003)	0.01* (0.008)	0.01*** (0.003)	0.01* (0.007)	0.01*** (0.003)	0.01* (0.007)	0.01*** (0.003)	0.02** (0.008)	0.01*** (0.003)	0.01* (0.007)	0.01*** (0.003)	0.02** (0.007)
D_Crisis	-0.84*** (0.114)	-2.30*** (0.285)	-0.83*** (0.115)	-2.27*** (0.283)	-0.81*** (0.114)	-2.20*** (0.284)	-0.68*** (0.120)	-1.87*** (0.387)	-0.83*** (0.115)	-2.28*** (0.287)	-0.68*** (0.120)	-1.70*** (0.376)
D_Listed			0.76* (0.460)	0.61 (0.540)						0.08 (0.485)	0.03 (0.485)	0.03 (0.587)
D_Coop					-1.11*** (0.240)	-0.94*** (0.287)				-1.12*** (0.241)	-0.98*** (0.287)	-0.98*** (0.287)
D_Sav					-2.42*** (0.259)	-1.69*** (0.329)				-2.37*** (0.261)	-1.70*** (0.330)	-1.70*** (0.330)
D_PIIGS							0.80*** (0.180)	0.62* (0.367)		0.65*** (0.179)	0.71** (0.352)	0.71** (0.352)
D_BigBank									0.75 (0.459)	0.54 (0.513)	0.12 (0.487)	0.44 (0.556)
Constant	2.56** (1.255)	3.03 (2.690)	2.73** (1.268)	3.23 (2.730)	5.47*** (1.354)	5.33* (2.731)	3.14** (1.264)	2.18 (2.670)	3.05** (1.285)	3.53 (2.703)	6.04*** (1.381)	4.85* (2.723)
Observations	18,243	6,396	18,243	6,396	18,243	6,396	18,243	6,396	18,243	6,396	18,243	6,396
Number of banks	3,152	2,113	3,152	2,113	3,152	2,113	3,152	2,113	3,152	2,113	3,152	2,113
R_Squared	0.55	0.48	0.55	0.49	0.54	0.50	0.55	0.49	0.55	0.49	0.54	0.49

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.10

Table 6: Regression results (NIM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OpProf_TA	0.12*** (0.009)	0.16*** (0.016)	0.12*** (0.009)	0.16*** (0.016)	0.12*** (0.009)	0.16*** (0.016)	0.12*** (0.009)	0.15*** (0.016)	0.12*** (0.009)	0.16*** (0.016)	0.12*** (0.009)	0.15*** (0.016)
Eq_TA	0.02*** (0.003)	0.02*** (0.004)	0.02*** (0.003)	0.02*** (0.004)	0.02*** (0.003)	0.02*** (0.004)	0.02*** (0.003)	0.02*** (0.004)	0.02*** (0.003)	0.02*** (0.004)	0.02*** (0.003)	0.02*** (0.004)
Loan_Dep	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)	-0.00*** (0.000)
Cost_Income	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)	-0.00*** (0.001)
NetLoans_TA	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.01*** (0.001)
Loans_growth	0.00*** (0.000)	0.00*** (0.001)	0.00*** (0.000)	0.00*** (0.001)	0.00*** (0.000)	0.00*** (0.001)	0.00*** (0.000)	0.00*** (0.001)	0.00*** (0.000)	0.00*** (0.001)	0.00*** (0.000)	0.00*** (0.001)
Exp_empl	-0.22*** (0.027)	-0.17*** (0.050)	-0.22*** (0.027)	-0.16*** (0.049)	-0.22*** (0.028)	-0.21*** (0.050)	-0.24*** (0.027)	-0.15*** (0.050)	-0.22*** (0.027)	-0.17*** (0.049)	-0.22*** (0.028)	-0.19*** (0.050)
NII_NOI	1.15*** (0.058)	1.05*** (0.087)	1.16*** (0.058)	1.06*** (0.087)	1.14*** (0.059)	1.10*** (0.089)	1.13*** (0.058)	1.05*** (0.087)	1.15*** (0.058)	1.04*** (0.087)	1.12*** (0.059)	1.10*** (0.090)
SelfFin_Eq	0.00*** (0.001)	-0.00*** (0.002)	0.00*** (0.001)	-0.00*** (0.002)	0.00*** (0.001)	-0.00*** (0.002)	0.00*** (0.001)	-0.00*** (0.002)	0.00*** (0.001)	-0.00*** (0.002)	0.00*** (0.001)	-0.00*** (0.002)
TA	-0.15*** (0.006)	-0.11*** (0.007)	-0.16*** (0.006)	-0.12*** (0.007)	-0.15*** (0.007)	-0.12*** (0.007)	-0.15*** (0.006)	-0.11*** (0.007)	-0.17*** (0.007)	-0.12*** (0.008)	-0.17*** (0.007)	-0.13*** (0.009)
NPLs_Loans		0.02*** (0.002)		0.02*** (0.002)		0.02*** (0.002)		0.02*** (0.002)		0.02*** (0.002)		0.02*** (0.002)
GDP_growth	-0.01*** (0.002)	-0.01*** (0.003)	-0.01*** (0.002)	-0.01*** (0.003)	-0.01*** (0.002)	-0.01*** (0.003)	-0.01*** (0.002)	-0.02*** (0.004)	-0.01*** (0.002)	-0.01*** (0.003)	-0.01*** (0.002)	-0.01*** (0.004)
L1.GDP_growth	-0.01*** (0.001)	0.01*** (0.002)	-0.01*** (0.001)	0.01*** (0.002)	-0.01*** (0.001)	0.01*** (0.002)	-0.01*** (0.001)	0.01*** (0.003)	-0.01*** (0.001)	0.01*** (0.002)	-0.01*** (0.001)	0.01*** (0.003)
L2.GDP_growth	-0.02*** (0.001)	-0.02*** (0.003)	-0.02*** (0.001)	-0.02*** (0.003)	-0.02*** (0.001)	-0.02*** (0.003)	-0.02*** (0.001)	-0.02*** (0.003)	-0.02*** (0.001)	-0.02*** (0.003)	-0.02*** (0.001)	-0.02*** (0.003)
HICP	-0.03*** (0.005)	0.01*** (0.006)	-0.03*** (0.004)	0.01*** (0.006)	-0.03*** (0.004)	0.01*** (0.006)	-0.03*** (0.004)	0.01*** (0.006)	-0.03*** (0.004)	0.01*** (0.006)	-0.03*** (0.004)	0.01*** (0.006)
HHI	-1.00*** (0.303)	-1.08*** (0.482)	-1.07*** (0.305)	-1.13*** (0.490)	-0.96*** (0.309)	-1.55*** (0.495)	-1.14*** (0.302)	-1.10*** (0.480)	-1.10*** (0.301)	-1.10*** (0.487)	-1.18*** (0.308)	-1.66*** (0.498)
L1.MktCap_GDP	-0.00* (0.000)	-0.00*** (0.001)	-0.00* (0.000)	-0.00*** (0.001)	-0.00* (0.000)	-0.00*** (0.001)	-0.00* (0.000)	-0.00*** (0.001)	-0.00* (0.000)	-0.00*** (0.001)	-0.00* (0.000)	-0.00*** (0.001)
D_Crisis	-0.23*** (0.012)	-0.75*** (0.031)	-0.22*** (0.012)	-0.74*** (0.031)	-0.23*** (0.012)	-0.73*** (0.031)	-0.21*** (0.012)	-0.79*** (0.040)	-0.22*** (0.012)	-0.74*** (0.031)	-0.20*** (0.012)	-0.77*** (0.040)
D_Listed			0.34*** (0.071)	0.24*** (0.075)						0.26*** (0.069)	0.16*** (0.077)	
D_Coop					0.04 (0.038)	-0.14*** (0.043)				0.04 (0.038)	-0.14*** (0.042)	
D_Sav					0.01 (0.040)	-0.18*** (0.044)				0.06 (0.041)	-0.17*** (0.044)	
D_PIIGS							0.16*** (0.028)	-0.09** (0.040)			0.15*** (0.028)	-0.09** (0.040)
D_BigBank									0.35*** (0.064)	0.19*** (0.067)	0.26*** (0.064)	0.13** (0.065)
Constant	4.39*** (0.151)	4.15*** (0.249)	4.48*** (0.152)	4.23*** (0.250)	4.31*** (0.164)	4.47*** (0.252)	4.46*** (0.152)	4.17*** (0.247)	4.59*** (0.156)	4.29*** (0.258)	4.60*** (0.170)	4.63*** (0.256)
Observations	18,242	6,397	18,242	6,397	18,242	6,397	18,242	6,397	18,242	6,397	18,242	6,397
Number of banks	3,152	2,114	3,152	2,114	3,152	2,114	3,152	2,114	3,152	2,114	3,152	2,114
R_Squared	0.50	0.57	0.50	0.57	0.50	0.57	0.50	0.57	0.50	0.57	0.50	0.58

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.10

Loan growth has a positive and mainly significant sign over all our regressions; the attitude to increase credit should be considered a good health indicator of a bank. However, recent studies (Foos et al., 2010) have demonstrated that an abnormal credit growth can generate more LLP and a reduction of the overall bank profitability.

Coefficients on expenses for employee have a negative sign in NIM regression and positive sign in ROAA and ROAE tables and are always significant. Since we control for cost income ratio of the banks, we can consider this variable as a proxy for the need for more skilled employees; the more complex is the product diversification, the more trained must be the staff. A wider and more sophisticated set of products and services will require a high expense for employee and will benefit ROAA and ROAE, but not necessarily NIM

(this can also be true due to the limited impact that a loan officer has on the results of a rating-scoring automated model).

Table 6 report a positive and significant coefficient on net interest income over net operating income in NIM estimation; we find mixed results in ROAA and ROAE regressions. Specialization in traditional banking activity has positively contributed to NIM level of the banks included in our sample, giving them the ability to wisely select and retain their customer before and during the crisis. ROAA and ROAE, however, are influenced by a wide set of items in income statement (LLP, Tax rate, etc.) that have reduced the significance of NII_NOI as an explanatory variable.

Self-financing has a positive and mainly significant coefficient in our regressions; this has been true particularly for ROAA and ROAE. The ability to become more independent from external financing has positively contributed to profitability; this effect has been reinforced by the fact that a bank with a higher level of equity can grant lower risk premium to lenders and shareholders.

Tables report a negative – where significant – coefficient on total assets in all the estimations; larger banks have experimented a lower profitability in the period under examination. This should be explained by different point of views. On the one hand, immediately after the beginning of the financial crisis, the blackout of the interbank market has penalized much more the borrowers than the lenders (usually represented by institutions with a high ability to collect money on the market, i.e. small local banks). On the other hand, market discipline and supervisory authorities have requested larger banks to accelerate the impairment process on their credit portfolios, generating LLPs that have negatively affected their net income.

Equity over total assets has positive and significant coefficient in NIM and ROAA regressions; it has negative and significant coefficients in ROAE table. Banks with a lower leverage are perceived as more stable by the market and can pay lower risk premium; this has a positive effect on NIM and net income. The results obtained in ROAE regressions can be explained considering that in this profitability measure the equity represents the denominator; a higher level of equity, *coeteris paribus*, reduces the expected level of ROAE.

With regard to macroeconomic conditions, Tables 4 and 5 report significant and mainly positive coefficients on GDP growth (coincident and lagged versions) over ROAA and ROAE estimation; we find negative coefficient in NIM regressions, with some positive signs in lagged GDP growth in our subsample including NPLs. As expected, good

macroeconomic conditions positively impact over bank profitability as measured by ROAA and ROAE; NIM case is trickier. GDP growth is usually associated with the improvement of economic conditions; this leads to the expansion of credit volumes and, hence, to a soaring competition between banks, pushing downward interest incomes on loans. During economic downturns, flight to quality strategies drive the banking system to a wiser selection of borrowers, reducing volumes and pushing upwards interest rates on loans in order to account for increased risks. On the other side, interests on deposits have a lower elasticity; in this sense the final negative effect of GDP growth on NIM is coherent with the results of our analysis.

Tables report mainly negative and significant coefficients on HICP; this result may suggest that banks faced relevant problems in transferring inflation to prices (i.e. interest rates). It must be noted that during the period under investigation, HICP has experienced a high volatility, even reaching negative values.

HHI has positive and significant coefficient in ROAA and ROAE regressions; in NIM table it has a negative and significant coefficients. Literature postulates a positive effect of market concentration on bank profitability, due to the opportunity to extract oligopolistic rents. In our sample we consider countries with a moderate level of banking market concentration; this feature can affect sign and significance of our coefficients. Estimation results could be instead coherent with a different interpretation: in modern banking systems, market concentration can stimulate a more pronounced business lines diversification. This leads to the expansion of value added services, with a positive effect on ROAA and ROAE, but not necessarily on NIM.

This interpretation is in line with the coefficients associated to market capitalization over GDP, which are positive and significant in ROAA and ROAE regression, but negative in NIM table. A higher development of financial markets can be used by the banking system to increase profitability through the supply of diversified and high value-added advisory services; naturally, this strategy fails in improving the financial results of traditional banking activity, measured by NIM.

As expected, the dummy that identifies the crisis period has a negative and significant coefficient in all the regressions; the economic downturn has adversely impacted on all our profitability measures.

Tables report positive coefficients on listed banks dummy; statistical significance is more frequent in NIM table. Being listed in a stock market implies a greater transparency and a more marked supervisory screening; this can lower the bank riskiness as perceived by

investors and depositors. The consequent drop in the funding costs is a market effect that directly improves NIM; this is not necessarily true for other profitability measures, which rely on income statement elements more affected by management choices or by non-recurring items.

Similar results are found with regard to Big Banks dummy; in this case, the systemic importance of a bank should have led the market to consider them as “too big to fail”, lowering its perceived riskiness and, consequently, its funding costs. Moreover, these banks have been the natural counterparts of standard and non-standard monetary policy operations activated by the ECB during the crisis, allowing them to reduce the effects of liquidity shocks.

Tables report negative coefficients on our two specialization dummies in almost all the regressions; statistical significance is more frequent in ROAE table, while in NIM and ROAE we find mixed results. In particular, considering NIM table, we find negative and significant coefficients when we account for the credit portfolio quality through NPLs. The overall results are consistent with the typical attitude of this type of banks, which favours long lasting relationship instead of short-term profitability; the wide time span of the crisis and the frequent small and medium enterprises bankruptcy have exacerbated these results.

Finally, tables report mainly positive and significant coefficients on PIIGS dummy; this indicates that, *coeteris paribus*, banks located in these countries succeeded in obtaining a higher profitability during the period under investigation. However in NIM regressions we observe that the coefficient changes its sign in the subsample that takes into account credit portfolio quality; greater profitability at NIM level shown by PIIGS banks is likely to be explained by the riskiness of the outstanding credit portfolio. This effect doesn't occur in ROAA and ROAE regressions, where the coefficients associated to PIIGS dummy are always positive.

Conclusions

The new regulatory framework introduced by Basel III has strengthened the importance of bank profitability; this both to promote self-financing and to ease capital increases. In effect the success of these strategies relies on banks ability to generate profits in order to retain a major part of them or attract new investors. We need to bear in mind that beside the traditional dynamics related to competition and the costs linked to the compliance to the new regulatory frameworks, also the “long wave” of NPLs and LLPs deriving from the

recent economic downturn are likely to affect bank profitability still in the future. Improving efficiency and finding a sound competitive positioning will be fundamental to deal with these problems, maintaining a sufficient profitability in order to meet capital requirements and be attractive on capital markets.

In our work we explore the determinants of banking profitability using data from commercial, saving and cooperative banks in Euro Area countries from 2005 to 2013. Compared to previous literature our work improves the dataset characteristics in several ways. Firstly, choosing an area that shares a common currency, banking regulatory framework and monetary policy allows us to limit the adverse influence of heterogeneity factors. Secondly, our dataset is homogeneous in terms of accounting standards, since all the balance sheets have been redacted under IFRS. Thirdly, compared to previous studies, we consider a wider time span before and during the crisis period, improving the possibility to capture the medium-term effects of financial and economic downturn on banking sector profitability.

Our findings confirm the results of previous papers with regard to the traditional determinants of bank profitability. As expected, higher operating profits and lower cost income ratios have a positive effect over ROAA and ROAE, while for NIM a relevant role is played by the specialization in traditional banking activity (net interest income over net operating income). Empirical results indicate that higher capital resources (high self-financing and low leverage) promote profitability; this outcome explains the concerns of the authorities about regulatory capital adequacy of the banking system. On the contrary, dimension *per se* (as measured by total assets), shows a negative impact over bank profitability in the period under investigation.

In recent years, lending policies have been taken to the forefront of academic and political debate, due to the primary role that credit expansion has played in the crisis. Our results confirm that rigorous behaviours in granting credit to borrowers improve bank profitability. High loans to deposits ratio makes the bank more sensitive to interbank shocks, with negative effect on bank profits. At the same time, a greater level of net loans over total assets seems to improve profitability with a positive effect on NIM, but not necessarily on ROAA and ROAE (which takes directly into account LLPs). Moreover, we find that loans growth can improve bank profits; naturally, this growth must be conscious on a risk-based approach.

With regard to macroeconomic and competitive conditions, the results suggest mixed effects over bank profitability; this has been probably due to the abnormal length and

pervasiveness of the crisis and to the extreme values reached by some of the variables during the same period. GDP growth and market concentration have a positive and significant impact over ROAA and ROAE; however, HHI shows a negative coefficient in NIM regressions. These results seem to indicate that in highly developed countries banking market concentration could stimulate product and service diversification, with positive effects on ROAA and ROAE and negative results in NIM. This assumption is furthermore confirmed where capital markets are more developed; in effect market capitalization over GDP promotes bank profitability in all our regressions.

Quite surprisingly, expenses for employee are associated with positive coefficients in our regressions; however this result seems to be consistent with the expected positive relationship between profitability and well-trained staff. This means that improving profitability doesn't necessarily mean cutting costs; dynamic environments require skilled, flexible and eclectic people.

Being a listed company shows positive effects over NIM, while we find weak evidence over ROAA and ROAE. Market discipline should have exerted a pressure over the top management in order to anticipate the assessment process over their balance sheets, with mixed effect over net results. NIM is more directly influenced by funding costs and bargaining power in credit supply; in this case, being listed can reduce the risk premium to be paid to investors and improve the negotiating power towards borrowers. These results seem to be reinforced by evidences about "Big Banks" dummies: market discipline, stronger regulatory control and the common opinion about their "too big to fail" nature may contribute to lower funding costs for these banks. However, this statement could need to be reviewed after the enforcement of the European Single Resolution Mechanism, which is likely to flatten differences in expected risks of default between bigger and smaller banks. Saving e Cooperative banks are associated to lower profitability levels in our dataset; being strongly close to the territory makes banks more sensitive to local shocks. Their endogenous mutualistic nature emphasizes the commitment to local environment, leading these banks to act as a social security cushion, especially during harsh times. PIIGS countries show generally positive coefficients in the regressions; however, this result could be revised in a risk-return approach, as the outcomes of the crisis suggest. Our results confirm largely the impact and significance of traditional variables on bank profitability as observed in previous literature; moreover it's reaffirmed the riskiness of the limited geographical and revenue diversification that are typical of mutualistic banks.

However we find a discontinuity between different profitability measures, which often have been used in literature to provide reciprocal robustness checks to regressions: in effect NIM show results that are sometimes really different from ROAA and ROAE. This fact may raise concerns about the impact of non-recurring elements in banks income statements on traditional profitability measures and hence may open a debate about the best key performance indicator.

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