

***The effects of supervision on banking performance:  
European evidence***

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**Abstract**

The study of the relationship between banking supervision and performance continues to be a fundamental issue in the corporate governance literature, and findings of this literature are often inconclusive. The main contribution of this study is the analysis of banking supervision effects on performance in banking industry. We explore this relationship by using the generalized method of moments (GMM in system), based on a sample of the ten largest European banks of France, Germany, UK and Greece over the period 2005-2011. The empirical analysis reports the following findings: Banking supervision seems to have an impact on performance. However, the introduction of variables, capturing the specific, the macroeconomic, the institutional and the financial development indicators, dismisses this effect. These findings support the view that the implementation of such banking supervision differs greatly depending on the institutional environment and the country's politics.

*Keywords:* Banking supervision, Bank performance, Dynamic panel data and European banks.

*JEL classification:* G28, G21

## **1. Introduction**

Corporate governance has become one of the most debated subjects, especially in banking industry, as a consequence of the latest financial crisis that spread all over the world. The subprime crisis of 2007 did not only hit the US economy, but also triggered the global financial tsunami and financial market turmoil. In fact, this crisis made corporate governance a fundamental economic concept, bringing also attention to supervisory and regulatory environment, and thereby becoming the most challenging topic of worldwide research. As Leaven (2008) explained, *“When the storm passes, bank regulation will top the global policy agenda. This column presents new evidence that a bank’s private governance structure influences its reaction to bank regulation. Since governance structures differ systematically across countries, one-size-fits-all regulation may be ineffective. Bank regulations must be custom-designed and adapted as financial governance systems evolve”*<sup>1</sup>.

Despite, the fact that regulations for banks are being rewritten in response to the global financial crisis, their implementation requires complex steps depending on each country’s policies and they could have very different effects on bank performance depending on institutional environment where banks operate. Furthermore, the existing empirical evidence is inconclusive about the impact of regulatory and supervisory policies on bank performance. Demirguc-Kunt and Detragiache, 2002; Beck et al., 2006; Chortareas et al., 2012, found that banking supervisory reforms were positively associated to the performance and the stability of banks. Alternatively, powerful supervisors may exert a negative influence on bank performance. Powerful supervisors may use their powers to benefit favored constituents, attract campaign donations, and extract bribes (Shleifer and Vishny, 1998; Djankov et al., 2002; Quintyn and Taylor, 2002 and Levine, 2011). However, according to Barth et al. (2001), there is mixed evidence regarding the impact of regulatory restrictions on bank performance.

This paper contributes to the literature which investigates the incidence of the banking supervision and performance in three ways: Firstly, we use four accounting ratios (return on average equity, return on average equity, net interest margin and cost to income ratio) to explain the performance of the ten biggest banks of our sample (France, Germany, UK and

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<sup>1</sup> <http://www.voxeu.org/article/bank-governance-and-regulation>

Greece). Secondly, we investigate the correlation between banking supervisions and performance, using a dynamic system General Method of Moment (GMM) specification. Finally, we explore the impact of institutional quality, financial development, macroeconomic factors and specific indicators of banks on the performance in four European countries (France, Germany, UK and Greece) over the period 2005-2011.

Our empirical evidence suggests that the absence of specific, macroeconomic, institutional and financial development indicators in the model, makes the impact of banking supervision on the performance significant and negative on the return on average assets and return on average equity, and negative on the two others measures. The effects of the recent crisis and the weakness of financial regulatory and supervisory policies enable us to interpret our results.

The next section provides related review on the relationship between supervision and bank performance. Section 3 presents the methodology and the data sources. Section 4 discusses the major findings and Section 5 conclusions.

## **2. Related literature**

### **2.1. Supervisory policies and performance**

The existing evidence on the relationship between different types of supervisory practices, and bank performance is rather limited and most of it typically relies on standard accounting measures of bank performance (Barth et al., 2003a,b; Demirguc-Kunt et al., 2004; Barth et al. 2006, Ben Naceur et Omran, 2011; Chortareas et al., 2012).

Barth et al. (2001) assembled the first extensive cross-country database on the characteristics of the supervisory and regulatory framework. The data come from a survey of bank supervisors, and measure the presence or absence of a series of regulatory features. Furthermore, Demirguc-Kunt et al. (2008) relied on assessments of compliance with the BCPS<sup>2</sup> to study whether better banking supervision and regulation is associated with sounder

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<sup>2</sup> In 1997 a group of representatives of bank supervisors from advanced countries—the Basel Committee on Banking Supervision—issued the Core Principles for Effective Bank Supervision (BCPs), a document summarizing best practices in the field.

banks. The limitation of those studies is that survey information reflects whether laws or regulations are on the books, but not to what extent they are implemented in practice. Finally, Abiad et al. (2008) introduced a new database of financial reforms, covering 91 economies over 1973–2005. They used an index of banking supervisions composed of four components over six graded dimensions in order to measure the supervision. Closer in scope to the index constructed by Williamson and Mahar (1998) who recorded financial reforms in 34 economies over 1973–96, over six graded dimensions (credit controls, interest rate controls, entry barriers, regulations, privatization and international capital flows). In our study we will use this measure of supervision.

Studies have examined the effect of regulatory and supervisory policies on banking sector crises (Demirguc-Kunt and Detragiache, 2002; Beck et al., 2006; Chortareas et al., 2012) and banks' risk-taking behavior (Gonzalez, 2005; Laeven and Levine, 2007, 2009), and they found that banking supervisory reforms were positively associated to the performance and the stability of banks. Alternatively, powerful supervisors may exert a negative influence on bank performance. Powerful supervisors may use their powers to benefit favored constituents, attract campaign donations, and extract bribes (Shleifer and Vishny, 1998; Djankov et al., 2002; Quintyn and Taylor, 2002 and Levine, 2011). Under these circumstances, powerful supervision will be positively related to corruption and will not improve bank development, performance and stability. From different perspective Kane (1990) and Boot and Thakor (1993) focus on the agency problem between taxpayers and bank supervisors. In particular, rather than focusing on political influence, Boot and Thakor (1993) model the behavior of a self-interested bank supervisor when there is uncertainty about the supervisor's ability to monitor banks. Under these conditions, they show that supervisors may undertake socially sub-optimal actions.

However, according to Barth et al. (2001), there is mixed evidence regarding the impact of regulatory restrictions on bank performance. In the some way, Barth et al. (2004) provide empirical evidence on the impact of specific regulatory and supervisory practices on bank development, performance and stability using survey data for a sample of 107 countries. The results suggest that there is no statistically significant relationship between capital stringency, official supervisory power, bank performance and stability. However, they find that regulatory and supervisory practices that force accurate information disclosure, empower

private sector monitoring of banks, and foster incentives for private agents to exert corporate control work best to promote bank performance and stability. Specifically, in a cross-country setting they show that regulatory and supervisory regimes with these features have suffered fewer crises in the past two decades, have lower non-performing loans, and have deeper credit markets.

Moreover, the impact of macroeconomic factors on bank performance has also been discussed in the literature. Revel (1979) was the first to suggest that the effect of inflation on bank profitability depends on whether operating expenses increase at a higher rate than inflation. Perry (1992) adds that the impact of inflation on bank profitability depends on whether inflation is fully anticipated. This implies that if inflation is totally anticipated then revenues increase faster than costs, improving in this way profitability. Most of the studies on the impact of inflation on profitability find a positive and significant relationship (Claessens et al., 2001, Bourke, 1989, Molyneux and Thornton, 1992, Athanasoglou et al., 2006, and Pasiouras and Kosmidou, 2007). Then, GDP growth is also considered as a macro determinant of bank performance and allows for controlling business cycle fluctuations (Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997). According to Bernanke and Gertler (1989), during recessions the quality of loans declines and therefore companies borrow at higher margins, therefore a negative relationship between spread and economic growth is to be expected. Claeys and Vennet (2008) find that prevailing business cycle conditions affect net interest margins. In the Western European countries, higher economic growth is associated with higher margins, whereas in the Central Eastern European countries no link is found. The positive relationship between growth and net interest margin is also found in Schwaiger and Liebig (2008), Claessens et al. (2001) and Flamini et al. (2009). Nevertheless, a negative relationship is found in Demirguc-Kunt et al. (2004) while Dietrich et al. (2010) confirm the countercyclicality of interest margins. Using profitability indicators (returns on assets and equity), Goddard et al. (2004), Demirguc-Kunt and Huizinga (1998), Bikker and Hu (2002), and Flamini et al. (2009) find a positive relationship with real GDP growth.

In most studies, specific variables of banks such as bank size, credit risk, capital bank ratio and equity are used as internal determinants of bank performance. Size is included to assess the existence of economies or diseconomies of scale in the banking sector. The empirical results provide conflicting evidence. Smirlock (1985), Short (1979), Bikker and Hu (2002),

Ben Naceur and Omran (2011), find a positive and significant relationship between size and bank performance. On the other hand, Kosmidou et al. (2005) find that small UK banks display higher profitability to larger ones. Kasman (2010) find that a size has a negative and statistically significant impact on the net interest margin on a panel of 431 banks in 39 countries.

Turning to the financial and institutional factors. Demirguc-Kunt and Huizingua (2001) present evidence on the impact of financial development and structure on bank performance for a large sample of countries over the 1990–97 period. They find that financial development has a significant impact on bank. In their empirical studies of bank crisis determinants. Ben Naceur and Omran (2011), using a sample of 173 banks from ten MENA countries over the 1988–2005 period, find that financial development indicators have no significant impact on net interest margins. Demirguc-Kunt and Detragiache (1998, 2002) find that countries with better institutions are less likely to experience banking crises and are less affected by moral hazard due to deposit insurance. However, in their study in 1999, Demirguc-Kunt and Huizingua find that better contract enforcement, an efficient legal system, and lack of corruption are associated with low profitability in a sample of 80 developed and developing countries. In the same vein, Demirguc-Kunt et al. (2004) examine the impact of bank regulation, market structure, and national institutions on bank interest margins and overhead cost using 1400 banks across 72 countries. They find that bank regulation become insignificant when controlling for national indicators of economic freedom or property rights protection. Institutional development explains cross-bank differences in net interest margins. In a study on 92 countries over the period 1994–2008, Dietrich et al. (2010) find that country-level governance variables are important determinants of the internet margins with significant differences between developed and developing countries.

### **3. Methodology**

#### **3.1. Data**

We use a sample of 40 banks from four European countries over the period 2005 – 2011. We collect information on the 10 largest banks (defined by total assets), following the study of La Porta et.al (2002), in France, UK, Germany and Greece. (see Appendix 1 for the sample).

The data is sourced from Bankscope (2012) for banking financial factors, Abiad et al. (2008) for banking supervision, International Country Risk Guide (ICRG) for institutional variables, Financial Structure Database (2012) for financial development variables, World Development Indicators (2012) for macroeconomic variables.

### 3.2. Empirical model

The dynamic panel data equations are specified as follows:

#### *Panel A: All countries*

$$Perf_{i,t} = a_1(Perf)_{i,t-1} + a_4(BSUP)_{i,t} + e_{i,t}$$

#### *Panel B: Country by country*

$$Perf_{i,t} = a_1(Perf)_{i,t-1} + a_2(BC)_{i,t} + a_3Ln(BS)_{i,t} + a_4(BSUP)_{i,t} + a_6(GDP)_{i,t} + a_7(INF)_{i,t} + a_8(LL)_{i,t} + e_{i,t}$$

#### *Panel C: Robustness test*

$$Perf_{i,t} = a_1(Perf)_{i,t-1} + a_2(BC)_{i,t} + a_3Ln(BS)_{i,t} + a_4(BSUP)_{i,t} + a_5(INS)_{i,t} + a_6(GDP)_{i,t} + a_7(INF)_{i,t} + a_8(LL)_{i,t} + e_{i,t}$$

Where subscripts  $i$  denotes individual banks (countries),  $t$  time period ( $t = 2005, \dots, 2011$ ) and  $Ln$  is the natural logarithmic.  $\alpha$  are the parameters to be estimated.  $\varepsilon$  is the error term.

We estimate the model by using the Generalized Method of Moment GMM-in-system method developed by Blundell and Bond (1998). This last method retains a system of two equations, the original equation as well as the transformed one. The Arellano and Bond (1991) test for autocorrelation has a null hypothesis of no autocorrelation and is applied to the differenced residuals. The test for AR (2) in first differences, detect autocorrelation in terms of levels. The validity of the instrumental variables is tested using Sargan test of over-identifying restrictions and over a test of the absence of serial correlation of the residuals. As our data contain 40 European banks, we use the method two-step GMM-in-System estimator.

### 3.3. Construction of the database

**Bank performance indicators:** The Performance (Perf) is measured by 4 alternatives. These include ROAA (return on average assets), ROAE (Return on average equity), NIM (net interest margin), CIR (Cost to income ratio). It typically relies on standard accounting measures of bank performance (Barth et al., 2003a,b; Demircuc-Kunt et al., 2004). Barth et al. (2006, Ben Naceur et Omran, 2011; Chortareas et al., 2012).

**Bank-specific characteristics:** We use several proxies for bank-specific characteristics as follows: Bank size (BS): This variable is set to be equal to the logarithm of total bank assets in millions of EU euros. Size might be an important determinant of bank performance if there are increasing returns to scale in banking. However size could have a negative impact when banks become extremely large owing to bureaucratic and other reasons. Bank capital ratio to assets (BC), following, Smirlock (1985), Short (1979), Bikker and Hu (2002) and Ben Naceur and Omran (2011).

**Banking supervisions (BSUP):** This index is has 4 components:

1. Has a country adopted a capital adequacy ratio based on the Basle standard? (0/1).
2. Is the banking supervisory agency independent from executives' influence? (0/1/2).
3. Does a banking supervisory agency conduct effective supervisions through on-site and off-site examinations? (0/1/2)
4. Does a country's banking supervisory agency cover all financial institutions without exception? (0/1)

Following Abiad et al. (2008), banking supervision is coded by these four dimensions, which are assigned a degree of reform as follows. Highly Regulated = [6], Largely Regulated = [4-5], Less Regulated = [2-3], Not Regulated = [0-1]).

We use the average if this index from 2000 to 2005 and we expect a positive impact of this variable on the performance.

**Institutional variables (INS):** Institutional quality is gaining more and more ground in explaining performance. Economists focused attention on this relationship bringing to the fore the importance of institutional factors to financial systems development (Hasan et al. 2009; Aggarwal and Goodell 2010; Huang 2010; Minea and Villieu 2010; Weill 2010). The two institutional variables used in this study are: Low and order and government stability.



**Financial development indicators (FD):** We also examine the impact of the level of financial development (FD) on the performance of the banking sector. We use a proxy for the level of financial development measured by the liquid liabilities / GDP. Following Demirgü.-Kunt and Detragiache (1998, 2002).

**Macroeconomic indicators:** We use two proxies for macro-economic environment: inflation (INF) and GDP per capita growth. Previous studies have reported a positive association between inflation and bank profitability. High inflation rates are generally associated with high loan interest rates, and therefore, high incomes. However, if inflation is not anticipated and banks are sluggish in adjusting their interest rates, there is a possibility that bank costs may increase faster than bank revenues and hence adversely affect bank profitability. The GDP per capital growth is expected to have a positive impact on bank's performance according to the well-documented literature on the association between economic growth and financial sector performance.

#### 4. Major findings

The database covers a period of over 7 years, mainly from 2005 to 2011. Summary statistics for all variables are presented in Table 1.

**Table 1: Descriptive statistics**

Variable	Obs	Mean	STD.DEV	Min	Max
ROAE	256	-2.0506	101.7601	-992.293	1098
ROAA	255	.1633647	1.721317	-12.36	8.128
CIR	246	64.28528	29.08129	2.527	321
NIM	246	1.532691	1.034823	-.005	4.313
CPI	280	107276	5.733939	100	121.1094
GDP	280	.3488814	3.019796	-6.812469	5.121722
Freedom	280	68.04643	7.235144	58.7	80.4
ICRGburqual	280	3.547618	.4598384	3	4
ICRGlaw	280	4.81696	.8865603	3.291666	5.881945
ICRGcorrupt	280	3.80803	.6668932	2.666667	4.65277
ICRGgovstab	280	9.023764	.6511193	6.791667	9.7569
Bsuper	280	2.75	.433788	2	3
Ll	280	112.8204	30.88304	73.5707	181.193

privatecre~t	280	122.3816	39.72517	73.1852	214.883
SMC	280	74.28136	36.19065	20.7917	141.456
Bankcapita~o	260	5.161539	.9550018	4.1	7
Totalassets	256	5.40e+08	6.05e+08	271900	2.59e+09

#### 4.1. The effects of banking supervisions on the performance

We estimate the model by introducing only the variable banking supervisions.

Table 2 summarize the mean results of the study of the incidence of banking supervision on the four variables, which measure the performance.

**Table 2:**

Banking Supervision and Profitability of European Banks				
	ROAE	ROAA	CIR	NIM
Lag	0.000 (0.59)	0.880 (48.22)***	0.097 (17.73)***	0.695 (29.44)***
B super	-10.074 (41.94)***	-0.044 (4.23)***	19.103 (29.20)***	0.074 (2.86)***
<i>N</i>	216	214	205	207
<i>Wald Test</i>	3362.61	4740.01	1100.54	3176.72
<i>P-value Wald</i>	0.0000	0.0000	0.0000	0.0000
<i>Sargan Test</i>	29.2724	21.6011	24.9932	21.5564
<i>P-value Sargan</i>	0.1451	0.2502	0.1251	0.2523
<i>AR (2)</i>	-0.7284	0.2089	-1.3835	-1.6530
<i>P-value AR(2)</i>	0.4663	0.8345	0.1665	0.0983

Wald  $\chi^2$  statistics: the test is a way of testing the significance of particular explanatory variables in a statistical model. The numbers in parentheses are the absolute values of t-statistics.

AR (2): Arellano and Bond test of null of zero second-order serial correlation, distributed N (0, 1) under null. Sargan test: is a statistical test used to check for over-identifying restrictions in a statistical model. Estimations were performed using GMM dynamic model estimation in system.

□ t-Statistics are in parentheses and significance at the 10%.

□□ t-Statistics are in parentheses and significance at the 5%.

□□□ t-Statistics are in parentheses and significance at the 1%.

Results show that the model is statically significant and the banking supervision is powerful in the explication of the profitability of banks. Banking supervision has a negative effect on the ROAE and the ROAA, it can be explain by the weakness of financial reforms during the recent global crisis. For this reason Leaven (2011) announced that “*Regulations for banks are being rewritten in response to the global financial crisis*’’. Also, Barth et al (2012) and Levine (2011) indicate that the crisis does not only reflect unsustainable global macroeconomic imbalances, the proliferation of toxic financial instruments, euphoric financiers, and unclear lines of regulatory authority. These factors played a role, but only a partial role. Rather, failures in the governance of financial regulation helped cause the crisis by producing and maintaining bad policies, i.e., policies that encouraged financial markets to take excessive risk and divert society’s savings toward socially unproductive ends.

#### **4.2. The effects of banking supervision, macroeconomic factors, bank specific indicators and liquid liability on performance in each European countries**

Tables 3, 4, 5 and 6 summarize the results of the effects of banking supervision and liquid liability on the performance of banks in France, Germany, UK and Greece.

**Table 3: Banking supervision and performance of French banks**

Banking Supervision and Profitability of European Banks: France				
	ROAE	ROAA	CIR	NIM
Lag	0.132 (6.49)***	0.508 (4.01)***	0.425 (2.42)**	0.236 (0.52)
Bank capital to assets ratio (%)	9.547 (0.50)	0.871 (1.67)*	9.373 (0.49)	0.511 (2.43)**
Size	106.825 (3.20)***	-1.405 (0.99)	48.715 (2.53)**	-0.104 (0.14)
LL	3.195 (1.37)	0.016 (0.29)	-2.203 (0.60)	0.016 (0.57)

CPI	-12.144 (1.89)*	0.002 (0.02)	5.352 (0.84)	0.024 (0.57)
GDP	2.910 (5.86)***	0.047 (1.20)	1.886 (0.97)	0.010 (0.31)
B super	-390.240 (2.16)**	7.611 (1.04)	-451.055 (3.12)***	-1.055 (0.22)
<i>N</i>	43	41	43	43
<i>Wald Test</i>	5723.22	598.50	1208.13	2464.64
<i>P-value Wald</i>	0.0000	0.0000	0.0000	0.0000
<i>Sargan Test</i>	1.432663	2.386766	2.109773	5.224711
<i>P-value Sargan</i>	0.9999	0.9985	0.9992	0.9500
<i>AR (2)</i>	.57745	-1.1112	-1.0782	-.99977
<i>P-value AR(2)</i>	0.5636	0.2665	0.2809	0.3174

**Table 4: Banking supervision and performance of German banks**

Banking Supervision and Profitability of European Banks: Germany

	ROAE	ROAA	CIR	NIM
Lag	0.568 (4.09)***	0.282 (2.84)***	-0.370 (1.07)	-0.070 (0.07)
Bank capital to assets ratio (%)	45.629 (0.24)	2.322 (2.19)**	-155.396 (3.25)***	0.144 (0.20)
Size	-34.114 (0.72)	-0.330 (1.10)	-112.432 (1.15)	0.127 (0.61)
LL	6.420 (1.80)*	0.091 (3.43)***	-4.768 (2.27)**	0.013 (0.73)
CPI	-16.085 (1.49)	-0.271 (2.62)***	13.460 (2.85)***	-0.020 (0.47)
GDP	7.231 (0.55)	0.226 (3.08)***	-15.738 (2.71)***	0.021 (0.36)
B super	476.992 (1.27)	4.623 (3.94)***	731.632 (1.09)	-0.548 (0.43)

<i>N</i>	53	53	49	53
<i>Wald Test</i>	380.51	644.03	371.40	372.60
<i>P-value Wald</i>	0.0000	0.0000	0.0000	0.0000
<i>Sargan Test</i>	3.067691	3.223749	6.25838	4.053933
<i>P-value Sargan</i>	1.0000	1.0000	0.9950	0.9997
<i>AR (2)</i>	-1.2627	.61763	1.0029	.17589
<i>P-value AR(2)</i>	0.2067	0.5368	0.3159	0.8604

**Table 5: Banking supervision and performance of UK banks**

Banking Supervision and Profitability of European Banks: UK				
	ROAE	ROAA	CIR	NIM
Lag	-0.102 (2.03)**	1.773 (1.79)*	0.080 (1.50)	0.563 (1.50)
Bank capital to assets ratio (%)	41.615 (0.60)	1.005 (2.13)**	-12.479 (2.40)**	-0.128 (2.02)**
Size	-12.818 (0.30)	-0.271 (0.74)	19.787 (1.97)**	-0.711 (3.26)***
LL	0.968 (0.21)	0.106 (2.13)**	-1.715 (2.16)**	-0.020 (3.05)***
CPI	-5.248 (0.39)	-0.292 (2.73)***	5.366 (1.99)**	0.082 (2.31)**
GDP	-6.036 (0.22)	0.181 (2.60)***	-4.378 (2.54)**	-0.007 (0.35)
B super	167.064 (0.38)	5.088 (1.66)*	-198.818 (2.18)**	3.176 (2.22)**
<i>N</i>	46	46	41	38
<i>Wald Test</i>	3688.60	75.59	2095.56	2464.64
<i>P-value Wald</i>	0.0000	0.0000	0.0000	0.0000
<i>Sargan Test</i>	1.235268	1.073671	1.093989	.0159504
<i>P-value Sargan</i>	1.0000	1.0000	1.0000	1.0000
<i>AR (2)</i>	.80106	-.04894	.82815	-1.1221
<i>P-value AR(2)</i>	0.4231	0.9610	0.4076	0.2618

**Table 6: Banking supervision and performance of Greece banks**

**Banking Supervision and Profitability of European Banks: Greece**

	ROAE	ROAA	CIR	NIM
Lag	0.563 (1.50)	0.192 (0.61)	-0.183 (3.06)***	1.575 (2.37)**
Bank capital to assets ratio (%)	-0.128 (2.02)**	0.009 (0.11)	-3.184 (1.86)*	0.139 (2.46)**
Size	-0.711 (3.26)***	-0.287 (0.44)	-12.768 (1.29)	-0.047 (0.61)
LL	-0.020 (3.05)***	0.477 (4.18)***	0.398 (0.96)	0.006 (0.33)
CPI	0.082 (2.31)**	-0.116 (2.31)**	0.261 (0.38)	0.090 (3.23)***
GDP	-0.007 (0.35)	1.278 (3.77)***	0.301 (0.14)	0.089 (2.63)***
B super	3.176 (2.22)**	0.000	115.621 (0.94)	-6.197 (2.03)**
<i>N</i>	38	57	57	57
<i>Wald Test</i>	22.20	571.70	1954.97	651.02
<i>P-value Wald</i>	0.0023	0.0000	0.0000	0.0000
<i>Sargan Test</i>	3.252169		2.498054	2.34086
<i>P-value Sargan</i>	0.9999		1.0000	1.0000
<i>AR (2)</i>			-0.82745	-0.27725
<i>P-value AR(2)</i>			0.4080	0.7816

Wald  $\chi^2$  statistics: the test is a way of testing the significance of particular explanatory variables in a statistical model. The numbers in parentheses are the absolute values of t-statistics.

AR (2): Arellano and Bond test of null of zero second-order serial correlation, distributed N (0, 1) under null. Sargan test: is a statistical test used to check for over-identifying restrictions in a statistical model. Estimations were performed using GMM dynamic model estimation in system.

- t-Statistics are in parentheses and significance at the 10%.
- t-Statistics are in parentheses and significance at the 5%.
- t-Statistics are in parentheses and significance at the 1%.

As seen from Table 3, the liquid liability is not significant in the explication of the

performance. Furthermore, the banking supervisions have negative and significant impact only on the banks' ROAE and CIR.

The liquid liability variable is statically significant on the banks' ROAE, ROAA and CIR of banks of Germany. Banking supervisions are not statically significant in the explication of the performance, only positive with the ROAA. (see Table 4).

The banking supervisions have a statically and significant effects on the ROAA and NIM of UK banks, also the liquid liability is a significant variable in the explication of the performance of UK banks. The biggest UK banks are owned and controlled by the government, May this is a reason for the incidence of banking supervision on the performance. (Table 5)

Greece is the most effected European country by the recent crisis and its banking system need to be re-structured, it suffers the fragility of its economic, political and social system. Results show that the coefficient of supervision is positively related to the ROAE and negatively to the NIM. (Table 6).

The existing empirical evidence on the relationship between official supervision and performance provides mixed results (Barth et al., 2004, 2007; Pasiouras, 2008; Pasiouras et al., 2009). Indeed it represents a point of heated debate between the proponents of the "public interest view" and those of "private interest view" (e.g., see Beck et al., 2006). Governments with powerful supervisors may use this power to improve the corporate governance of banks and reduce corruption in bank lending which in turn improves the efficient operation of banks (Stigler, 1971; Beck et al., 2006). The relationship between bank performance and official supervision, however, turns negative when re-estimating the model for a different sample. A possible explanation could be that enhancing the power of supervisors in less developed financial systems may reflect excessive government involvement, which may result in a decrease in the integrity of bank lending with adverse implications on the efficiency of credit allocation (Barth et al., 2004; Beck et al., 2006).

#### **4.3. The effects of banking supervision, institutional quality, macroeconomic factors, bank specific indicators and liquid liability on performance**

Table 7 represents statistics of the of banking supervision, institutional quality, macroeconomic factors, bank specific indicators and liquid liability on performance measured by ROAE, ROAA, CIR and NIM.

**Table 7:**

Banking Supervision and Profitability of European Banks

	ROAE	ROAA	CIR	NIM
Lag	-0.039 (0.54)	0.293 (16.60)***	-0.549 (22.07)***	0.620 (10.73)***
Bank capital to assets ratio	12.499 (3.67)***	0.420 (10.17)***	-1.952 (1.07)	0.065 (4.22)***
Size	84.376 (4.96)***	-0.139 (1.36)	-0.669 (0.16)	-0.253 (3.98)***
CPI	-13.489 (10.82)***	-0.284 (15.42)***	0.490 (1.89)*	0.026 (7.56)***
GDP	3.974 (5.48)***	0.136 (16.69)***	-0.848 (3.56)***	0.003 (0.66)
B super	179.216 (1.10)		-124.044 (0.28)	0.251 (0.51)
Icrglaw	-216.873 (1.88)*	2.067 (6.01)***	278.014 (1.07)	0.283 (1.02)
Icrggovstab	-11.351 (0.99)	1.294 (7.36)***	-96.148 (1.71)*	0.093 (0.97)
LL	3.318 (7.47)***	0.074 (11.31)***	0.225 (1.18)	-0.009 (5.37)***
<i>N</i>	199	197	190	191
<i>Wald Test</i>	419.91	1520.26	2084.56	3483.23
<i>P-value Wald</i>	0.0000	0.0000	0.0000	0.0000
<i>Sargan Test</i>	18.61459	25.56217	23.3293	26.2552
<i>P-value Sargan</i>	0.2892	0.0605	0.1052	0.0505
<i>AR (2)</i>	.75326	1.6963	-1.9705	-1.2208
<i>P-value AR(2)</i>	0.4513	0.0898	0.0488	0.2222



Wald  $\chi^2$  statistics: the test is a way of testing the significance of particular explanatory variables in a statistical model. The numbers in parentheses are the absolute values of t-statistics.

AR (2): Arellano and Bond test of null of zero second-order serial correlation, distributed  $N(0, 1)$  under null. Sargan test: is a statistical test used to check for over-identifying restrictions in a statistical model. Estimations were performed using GMM dynamic model estimation in system.

□ t-Statistics are in parentheses and significance at the 10%.

□□ t-Statistics are in parentheses and significance at the 5%.

□□□ t-Statistics are in parentheses and significance at the 1%.

The empirical results of this study show that bank-specific characteristics, in particular Bank capital to assets ratio, have a positive and significant impact on banks' ROAE, ROAA and NIM. Results for macroeconomic indicators, show a significant and negative effect of inflation on the ROAE and ROAA and a positive impact on the CIR and NIM, the incidence of institutional quality indicators on bank performance has statically significant and positive coefficient only for ROAA and a negative impact on the ROAE and CIR. Furthermore, the liquid liability variable is statically significant, and has a positive effect on the banks' ROAE, ROAA and negative one on the NIM.

The regulatory and supervisory variables seem to have no impact on bank performance as the results suggest that coefficients are not statically significant. We can conclude that the presence of the financial crisis in those countries (may incorporated in the macroeconomic factors and the financial indicators), that substitute the impact of supervisory policies during the period 2005 - 2011. Our results are in the same sense as Boot and Thakor (1993), Shleifer and Vishny, 1998; Djankov et al., 2002; Quintyn and Taylor, 2002 and Levine, 2011). They find that banking regulatory and supervisory reforms did not have impact on profitability and stability of banks, Boot and Thakor (1993) explained that by the behavior of a self-interested bank supervisor when there is uncertainty about the supervisor's ability to monitor banks. Under these conditions, they show that supervisors may undertake socially sub-optimal actions. Levine (2011) explained the systemic failure of financial regulation by the absence of an informed, expertly staffed, and independent institution that evaluates financial regulation and he proposed a new institution to address this defect, which he labeled the "Sentinel," to act as the public's sentry over financial policies and to help compel financial regulators to act in the public interest, regardless of their private interests.

## **5. Conclusions**

This paper contributed to the existing literature by empirically examining the impact of supervisory policies on bank performance. We focused on a sample of banks operating in four European countries over the period 2005–2011. We used the method two-step GMM-in-System estimator and we also considered performance measures calculated from traditional accounting ratios, namely return on average assets, return on average equity net interest margin and cost-to-income. The use those four types of performance measures enhances the robustness of our analysis.

The results of this study suggest that the presence of the variables, capturing the macroeconomic factors and the financial development indicators in our model, makes the banking supervision statically no significant in the explication of the performance. However, the absence of all those indicators shows a negative and a significant incidence of banking supervision on the performance, which could be interpreted by the weakness of financial regulatory and supervisory policies. We conclude also, that the measure of supervision used by Abiad et.al (2008) was not powerful, in our case because we use an average of 6 years, may we need new measure of supervisions, which take in consideration effects of the recent crisis and reflect the new financial reforms.

Recent research suggests that several initial steps could be taken to reduce significantly the banking crises. Countries could, among other things, develop and improve legal systems and information disclosure (Demirguc-Kunt and Detragiache, 1997, 1998); impose rate ceilings on bank deposits (Hellmann, Murdoch, and Stiglitz, 1998); establish limits either on the rate at which banks can expand credit or on the rate of increase in their exposure to certain sectors, such as real estate (Caprio et al, 1994 and Barth et al, 1997); require greater diversification of bank portfolios (Caprio and Wilson, 1997) and the proposal of a project of a new institution by Levine (2011), labelled the “Sentinel,” to act as the public’s sentry over financial policies and to help compel financial regulators to act in the public interest, regardless of their private interests.

## Appendix

### Appendix 1: The sample of 40 European banks

Bank name	Country
BNP Paribas	France
Crédit Agricole Group	France
Société Générale	France
BPCE Group	France
Groupe Caisse d'Epargne	France
Crédit Mutuel	France
Natixis	France
Groupe Banques Populaires	France
Dexia Crédit Local SA	France
Crédit Industriel et Commercial - CIC	France
Deutsche Bank AG	Germany
Commerzbank AG	Germany
KfW Bankengruppe	Germany
DZ Bank AG-Deutsche Zentral-Genossenschaftsbank	Germany
UniCredit Bank AG	Germany
Landesbank Baden-Wuerttemberg	Germany
Sparkassen-Finanzgruppe Hessen-Thuringen	Germany
Hypo Real Estate Holding AG	Germany
Norddeutsche Landesbank Girozentrale NORD/LB	Germany
Eurohypo AG	Germany
HSBC Holdings Plc	UK
Barclays Bank Plc	UK
Royal Bank of Scotland Group Plc	UK
Lloyds Banking Group Plc	UK
HBOS Plc	UK
Halifax Plc	UK
LCH Clearent Group Limited	UK
Standard Chartered Bank	UK
National Westminster Bank Plc - NatWest	UK
Bank of England	UK
National Bank of Greece SA	Greece
Eurobank Ergasias SA	Greece

Alpha Bank AE	Greece
Piraeus Bank SA	Greece
Agricultural Bank of Greece	Greece
Marfin Egnatia Bank SA	Greece
Emporiki Bank of Greece SA	Greece
Millennium Bank SA	Greece
Proton Bank S.A.	Greece
Attica Bank SA-Bank of Attica SA	Greece

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