THE EFFECTIVENEE OF SUPERVISORY SANCTIONS IN BANKING

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Abstract

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"He who spares the rod hates his son.
But he who loves him urgently instructs him"
(Proverbs, 13.24)

1. Introduction

Banking is one of the most heavily regulated industries worldwide and in each country there is an authority (usually, Central Banks) with the task of supervising bank activities and intermediaries. From the late 1980s onwards, a great effort of harmonizing worldwide banking regulation has been made with the Basel Committee on Banking Supervision reforms**.** The banking and financial crisis from 2007 onwards has clearly showed the new establishing framework of regulation and supervisions did not work well: regulators, academics and practitioners have been working together and debating to identify factors beyond the crisis.

Causes of the financial crisis can be traced in one of the following two cases:" bad regulation" and "bad supervision". Bad regulation cases may fall for one of the following theoretical events. First, there may have been a lack of regulation at the time of the crisis in some parts of financial systems, as intermediaries (e.g. investment banks), sectors (e.g. shadow banking), products (e.g. some securitized securities), supervision activities (e.g. resolution procedures, systemic risks) and countries (e.g. in the US, the Basel 2 reform was not yet applied, while it was in other banking systems). The second possible case is that the regulation existing at the time of the crisis was inaccurate (e.g. generating unintended effects, as procyclicality). From 2007, there is a vast number of academic papers (???) and reports (Turner, Likannen, ???) that analyzed the causes of the crisis, identify the lack of regulation and proposed new solutions

On the other side, financial crisis may also be due to a bad supervision and there may be various theoretical cases. First, different Governments and supervisory authorities may have applied the same regulation framework in a different manner in their countries (as shown, e.g. by the differences security instruments recognized as Tier I and Tier II capital instruments across Europe).

Second, supervisory authorities in some countries may have been not careful in controlling banks (as suggested by the advocates of the Banking Union). In final, supervisory authorities may have ineffective type of sanctions to punish illegal and banks behaviors.

From the crisis eruption, a huge effort has been devoted in identifying and solves "bad regulation cases". There have been a great discussion on how improve the regulation framework (e.g. the Basel 2.5 and Basel 3 reforms), but surprisingly there is a minor attention toward the bad supervision cases, e.g. assessing the behavior of supervisory authorities and the types of sanction available. Regulatory sanctions play a critical role in promoting the objectives pursued by the rules of prudential supervision and regulatory information. In the same light, the Basel 2 Pillar II emphasizes the role of on-site inspections highlighting how they are able to: identify any weaknesses or inefficiencies in banking managerial processes, administration and internal control, verify the effectiveness and the quality of internal controls, ensure that communications provided by the intermediaries for the purpose of supervision is accurate and reliable (Basel Committee on Banking supervision, 2006). Therefore, the on-site inspections and sanctions are essential tools used by supervisory authorities to ensure the stability of the financial system (Quintyn and Taylor, 2002). A handful of papers have assessed the effectiveness of regulation. Some papers focus on the structure of supervision: specifically, La Porta et al. (2006) consider the degree of independence and authority of supervisors in the exercise of its control over intermediaries; and Noy (2004) focus on the degree of corruption and political freedom of the government authorities. Other papers assess the effectiveness of supervisions by looking at various banking market indicators, as Barth et al., 2008 that has collected data by surveys. Surprisingly, there is a very small number of papers (Delis and Staikouras., 2010; and Delis et al., 2013) assessing the causes and the effects of sanctions on banks. Delis and Staikouras (2010) assess the role of enforcement outputs (on-site audits and sanctions) in controlling bank risk by focusing on 16 countries and using data at the country level. The authors show an inverted U-shaped relationship between on-site audits and bank risk, while the relationship

between sanctions and risk appears to be linear and negative. In a more recent paper, Delis et al., (2013) use data at individual bank level to assess the impact of enforcement actions on bank capital, risk, and performance focusing on the US. The authors collected all formal enforcement actions enacted by the FDIC, OCC, and FRB between 2000 and 2010 and show that different sanctions produce different effects. For instance, sanctions targeting internal control and risk management weaknesses are well-timed and restrain increases in the risk-weighted assets ratio without impairing bank fundamentals; sanctions against institution-affiliated parties do not seem to affect bank behavior.

The limited empirical evidence on the effects of legal enforcement leads us to address the following two research questions: why do supervisory authorities sanction banks? And is the sanction effecting in changing the bank sanctioned banking behaviors. We find that ….

Our paper focuses on the Italian banking system. The Italian banking system is one of the most important in Europe: in 2012, Italy is the fourth largest banking market for total loans with 2.47 Euro trillions (after Germany, France and UK, respectively), for total assets with 4.22 Euro trillions (after UK, Germany and France, respectively) and for number of employees (after Germany, UK, and France, respectively)[1]. More interestingly, Bank of Italy (responsible for supervising Italian banks) is one of the oldest banking supervisors that has been traditionally very active and severe in controlling Italian banks with on-site inspections: e.g. Bank of Italy has two independent department for off-site and on-site inspections, the number of on-site inspections between 2005 and 2012 was 304 (i.e. almost 20% of Italian banks supervised by Bank of Italy), 300? Banks have been formally sanctioned, and 3,588 persons in banks (among Board of directors, Top Managers, and Chief Executive Officers) have been personally sanctioned.

The remainder of the paper is organized as follows. In section 2, we review previous papers and develop our research hypotheses. Next, we describe our variable (section 3), data

[1] Source of data: European Banking Federation (EBF), Banking Sector Statistics Database 2012

(section 4) and econometric approach (section 5). We discuss our results in section 6 and section 7 concludes

2. Literature Review and hypothesis

2.1 Off-site surveillance systems and on-site inspections

Banking supervision aims to ensure banks' compliance with the regulations and consists of various specific tools, such as remote controls (off-site surveillance systems) and spot checks (on-site inspections).

Off-site surveillance systems are conducted regularly by the supervisory authorities with the aim of: 1) ensuring that intermediaries comply with the prudential rules and the operating limits in time; 2) monitoring, with a preventive view, the evolution of business management; 3) verifying the effectiveness of interventions for the removal of deficiencies or abnormalities promoted by the banking management (Bank of Italy, 2008). Off-site surveillance systems are based on public corporate documents and supervision communications (i.e. financial, regulatory reporting mandatory, mandatory disclosures relating to the detention of significant shareholdings, etc.).

On-site inspections are performed on the basis of an annual plan for inspections and are based on confidential banking information and documents collected during the inspection by supervisors. Supervisors provide for three different types of inspections: 1) investigation wide-spectrum; 2) targeted/thematic; 3) follow-up. The former focuses on the analysis of the overall business, with specific reference to the risks relevant to the supervisory authority. Targeted inspections relate to specific areas of activity, areas of risk or operational or technical aspects. Finally, the follow-up inspections verify the effectiveness of corrective action initiative promoted by the intermediary or solicited by the authority. Once the inspection is drawn up, a summary report (with indication of findings and observations) is delivered to the top management of the bank for the

appropriate counter-arguments and subsequent interventions. In cases where it is required by law, shall be notified to interested persons a process of assessment relating to the presence of administrative offenses punishable (Bank of Italy, 2013). The framework of prudential supervision has been strengthened also in the perspective of Basle II since the 3 pillars (capital adequacy, prudential supervision and transparency towards the market) induce banks to take a more cautious behavior towards risk-taking (including others, Beck, Demirgucx-Kunt and Levine, 2006; Demirgucx-Kunt, Detragiache and Tressel, 2008).

2.2 The relationship between risk-taking and supervisory activity

Various papers (QUALI) analyze the relationship bank risk-taking, supervisory activity and sanctions of the supervisory authority is limited, although it is crucial to ensure a high degree of compliance of the banking system (Mishkin, 2000; Black, 2001). In contrast, there are various studies analyzing the relationship banking regulation (in the form of capital adequacy and disclosure requirements) and banking fragility are numerous (among others, Hyytinen and Takalo, 2002; Chen and Hasan, 2006; Demirgucx-Kunt, Detragiache and Tressel, 2008). However, they neglect the event of sanctions provided by the authorities and the impact on the supervised party. In this context, the few existing studies focus on U.S. banks and the supervisory reports issued annually by the Fed as a result of on-site inspections. The American supervisory banking system, in fact, provides the off-site monitoring systems based mainly on balance sheet data (call reports) prepared periodically by the banks and the annual on-site exams. During an on-site visit to exam regulators bank's offices and evaluate its financial soundness and compliance with laws, its system of internal control and its quality of management and at the end of the inspection is given a rating (CAMEL - Capital, Asset Quality, Management, Earning). A first analysis carried out by the U.S. General Accounting (U.S. GAO, 1991) on a sample of 72 formal enforcement actions such as sanctions for the benefit of

confirmation on the level of bank capital. A subsequent study (Peek and Rosengren, 1995) suggests instead that the actions imposed on banks of New England during the period 1989-1993 by the FDIC and the OCC had an impact of reduction of bank loans rather than increases in bank capital.

Cole and Gunther (1998) empirically test the different predictive ability of the on-site inspection on U.S. bank failures compared to off site inspections; the authors find that the probability of default is anticipated by the financial ratios (used in off-site exams) rather than by CAMEL rating. However, the same authors argue that the reliability of accounting data (from which you can go back to a system of early warning off site) is affected by the presence of frequent on-site exams.

Bergern and Davis (1998) argues that the outcome of an on-site examination transmitted to the market can be divided into three types: auditing information, refer to the accuracy and truthfulness of accounting information; regulatory disciplines information, relating to the compliance of the bank to the supervisory disciplines; private information, refer to the overall condition of the bank (not encoded in the records); the analysis reveals that the information contained in CAMEL ratings also incorporate private information, can generate a change in share market prices. Subsequently, the theoretical studies of Milne (2002) and Furfine (2001) show that the threat of sanctions is forcing banks to reduce their exposure to credit risk.

Recently, Delis and Staikouras (2011) verify the relationship between regulation, supervisory effectiveness and bank risk using a sample of banks relating to seventeen countries over the period 1998-2008; the risk of the bank is measured with the non-performing loan ratio (NPLs/Loans) and the Z-score, the research shows the existence of a negative relationship between sanctions and risk of the bank and an inverted U-shaped relationship between on-site audits and bank risk. Finally, the study by Delis et al. (2013) investigates the effects of the 14 possible types of sanctions imposed on U.S. banks by the three supervisors (FIDC , OCC , FRB) using quarterly data for the period 2000-2010. The analysis considers the 4 years before and after the sanction and

examines the characteristics of the bank in terms of capital (risk-based capital ratio, Tier 1 risk-based capital ratio, Tier 2 risk-based capital ratio) and bank risk and profitability (risk - weighted assets ratio, ROA , volatility of ROA and Z- score). The results confirm that high levels of bank risk make it more likely sanctions related to bank safety and soundness reduce the risk-weighted asset ratio but extend the volatility of ROA and the risk of insolvency probably because they are paid late. On the contrary, the sanctions related to internal control and risk management reduce the risk-weighted assets ratio without impairing bank fundamentals.

The present work focuses on the final results of the supervisory inspections, unlike previous studies based on the CAMEL rating (Cole and Gunther, 1998; Berger and Davis, 1998), empirical verification is based only on the banks sanctioned by the authority. It is not available to us the data on individual inspections or any opinion expressed, as well as the proposed corrective actions which are not followed sanctions. For example, in 2011 about 740 169 supervised banks have been the subject of an on-site inspection, among these, only 65 have received a penalty, while the others have been the subject of recommendations without any financial penalty against corporate officers (Bank of Italy, 2011; Bank of Italy, 2012).

Based on the previous studies, the empirical analysis aims to test the following hypotheses:

Hypothesis 1 (H1): riskier banks are more likely to be fined by authorities.

Hypothesis 2 (H2) in the aftermath of the penalty, the risk exposure of the bank sanctioned is reduced.

3. Data

Data have been collected from various sources. First, we collected accounting and financial data from individual bank balance sheet data from the Italian Banking Association (ABI) database.

Second, data about enforcement sanctions have been collected by hand from the Bank of Italy supervisory bulletins: over the period 2005-2012, we found that 3,588 persons (i.e. Board of directors, Top Managers, and Chief Executive Officers) were sanctioned in banks. Sanctions have been imposed, usually (though not exclusively) by inspections, a supervisory banking tool that provides to collect information and data on the results of intermediaries (Bank of Italy, 2013). We also collected from the Bank of Italy supervisory bulletins data about banks that have been forced to liquidation. Third, we also collected data from Da Bank of Italy sono estratti anche i dati relativi alla distribuzione regionale delle filiali delle banche e delle direzioni generali, nonché i dati concernenti le operazioni di M&A tra banche. The third type of data is that of the regional GDP, obtained from ISTAT for the years 2005-2011.

The descriptive statistics reported in Table 2 show for the sample of banks (2005-2011 period), a total of 302 sanctions. The sanctions related to "deficiencies in organizational and internal control" reported 214 banks, and it's more frequently case. Sanctions related to credit risk (S1 and S2) are the most numerous, with 186 and 93 cases. The sanctions related to other reason are few in number. In detail are sanctioned 286 CEO, with average sanction amount of 16,100 euros per person. The Board of Directors sanctioned are 284 with an average sanction amount of 114.210 euros for each Board. The Board of Auditors sanctioned are on the whole 255, with a average fine amount of 29.140 euros per Board. The other descriptive statistics are properly reported in the Table 1.

< INSERT HERE TABLE 1 >

Table 1 – Descriptive statistics

Variable	N	Mean	SD	Min	Median	Max
SA (if SA > 0)	302	-				
S1 (if S1 > 0)	214	-				
S2 (if S2 > 0)	186	-				
S3 (if S3 > 0)	93	-				

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S4 (if S4 > 0)	26	-				
S5 (if S5 > 0)	17	-				
S6 (if S6 > 0)	18	-				
S7 (if S7 > 0)	11	-				
S8 (if S8 > 0)	10	-				
CEO (only if sanctioned)	286	1.007	0.083	1.000	1.000	2.000
n. BoD (only if sanctioned)	284	10.197	2.949	4.000	10.000	22.000
n. BoA (only if sanctioned)	255	3.075	0.692	1.000	3.000	11.000
SamCEO (only if sanctioned)*	286	16.829	42.029	1.000	7.500	526.000
SamBoD (only if sanctioned) *	284	114.210	190.612	7.500	58.500	2389.000
SamBoA (only if sanctioned) *	257	29.140	45.810	1.500	18.000	573.000
MA (if MA > 0)	52	-				
CAL (if CAL > 0)	9	-				
CR1	4676	0.025	0.023	0.000	0.019	0.122
CR2	4676	0.005	0.007	0.000	0.003	0.036
CR3	4573	0.001	0.003	0.000	0.000	0.023
CR4	4676	0.024	0.021	0.000	0.018	0.109
CR	4573	0.056	0.041	0.000	0.048	0.216
MR	4021	0.141	0.117	0.000	0.119	0.566
LR	3982	0.57	2.268	0.035	0.162	19.496
Default Rate	3849	0.015	0.016	0.000	0.011	0.098
ROA	4676	0.006	0.011	-0.053	0.007	0.034
Capital Ratio	4676	0.118	0.067	0.025	0.104	0.52
TA (ln)	4676	13.115	1.758	8.158	12.842	19.878
GDP	4688	0.000	0.025	-0.069	-0.007	0.07

Note: all variables are winsorized at the bottom and top 1**%** levels. * Thousands of Euros.

4. Variables

This section illustrates the variable used in the empirical analysis. First, we describe supervisory variables, then we summarize bank-level indicators and, in final, we report our macroeconomics variables. All variable used in the econometric model, except for dummy variable, are build in a standardized way as $\chi_{ikt} - \overline{\chi_{kt}}$ where χ_{ikt} is the value for the variable χ for the year t of observation, the region k-th and the i-th bank and $\overline{\chi_{kt}}$ represents the average of the variable with reference to the year t to the k-th region. The standardization approach takes into consideration the operations of the bank in terms of branches at regional level. The banks that have branches in one

region are defined as regional banks and the value $\overline{\chi_{kt}}$ is calculated taking into account the average of the variable for the year *t* for the specific region k. For banks that operate in two or more regions, the value $\overline{\chi_{kt}}$ is calculated as the average value of the variable refers to the entire banking system in year *t*.

4.1 Supervisory variables

Supervisory activity data have been hand-collected from the Bank of Italy Supervision Monthly Bulletin between 2005 and 2012.

We classified the sanction is various dummy variables that takes value equal 1, if a bank received a sanction in year *t*, and 0 otherwise. We create a variable for each of the following eight types of sanction according to the Bank of Italy classification (Fonte). Specifically, we consider: 1) all deficiencies in organization and internal controls (labeled as "*generic organizational failure", S_1*); 2) faults (in organization, internal controls and management) related to lending: e.g. inaccurateness of the credit process and analysis of borrowers' creditworthiness (*credit risk failure, S_2*); 3) lack of reporting of impaired loans and loan loss provisions to the Supervisory Authority (*omitted credit risk disclosure, S_3*); 4) all cases of inaccurate or missing reports (*reporting and disclosure failure, S_4*). There are various type of event in this class as: a) inaccurate or missing reports of a big loans to the Supervisory Board; b) inaccurate or missing report to the Central Credit Register of any loans; b) any late communications to the Supervisory Authority; d) deficiencies in the process of reporting and control of consolidated reports; 5) inaccurate or missing communication to customers of regulation (*customer disclosure failure, S_5*); 6) violation of the regulation on risk concentration; non-compliance with the Minimum Capital Requirement; violation of the rules on risk mitigation techniques (*supervisory requirement failure, S_6*); 7) deficiencies regarding the

management and control of other types of risk as liquidity, operational and market risks (*liquidity, operational and market risk, S_7*); 8) all other residual sanctions (*other sanctions, S_7*)

For each sanction, we also collected data in three dimensions: the organizational unit sanctioned, the number of people sanctioned components each organizational unit, the total amount of the sanction. Regarding the organizational unit, the sanctioned unit can be: a) the Chief Financial Officer (CFO) or the Managing Director (MD); b) the Board of Directors (BOD); and c) the Board of Auditors (BOA). We build a dummy variable for each unit that take the value 1 if the specific organizational unit has been sanctioned, and 0 otherwise. The other two sanction dimensions refer to the number of people sanctioned and size and the total amount in Euro of the sanction.

In order to assess the effect of sanctions, we also collected two other variables related to sanctioned banks that mergers and those that are forced to be liquidated (labeled as "Compulsory Administrative Liquidation", i.e. an extraordinary measure taken by the Bank of Italy for liquidating insolvent banks). Specifically, we have two variables: MA (Merger and Acquisition) taking value 1 if the bank was merged or acquired, and 0 otherwise: CAL (Compulsory Administrative Liquidation) taking value 1 if the bank was forced to be liquidated), and 0 otherwise.

All variables are described in the Table 1.

4.2. Bank-level and macroeconomic variables

Data about accounting and financial information have been selected from the Italian Banking Association database.

First, we calculated various variables to account for credit risk according to severity of the losses. Specifically, we build the ratio between non-performing loans and Total Assets (CR1); the ratio between past due loans in arrears by 6 months and total assets (CR2); the ratio between restructured loans and total assets (CR3); the ratio between doubtful assets plus substandard loans

over total assets (CR4). In final, we also make a variable to account for the overall credit risk, i.e. the ratio between total problem loans (i.e. the sum of non-performing loans, past due loans in arrears by 6 months, restructured loans, and doubtful assets plus substandard loans) to total assets (CR). As robustness check, we also use as a measure of credit risk, i.e. the ratio of new non performing loans produced in year t and the amount of gross performing loans at year t-1. The relevance of default rate is due the fact that it measures only the new NPLs produced during the year, by neutralizing the effects of securitization, a sudden change in the amount of the loan portfolio and the serial correlation problems.

Following Fiordelisi (XXX), we also considers some variables related to Liquidity Risk and Market Risk. Specifically, SPIEGARE COME SONO CALCOLARE. We also include various control variables related bank profitability (Return on Assets, ROA), size (Total Assets) and capitalization (Capital Ratio, i.e. ???).

In order to consider the different impact of bank operational area, we consider the regional GDP (obtained by weighting the ISTAT regional GDP by the number of branches in each i-th bank region). This is represented by the following formula:

$$\text{GDP Growth}_i = \sum_{j=1}^{z} \text{Regional GDP}_j \times \frac{\text{Regional branches}_{ij}}{\text{Total branches}_i} \quad (1)$$

where the GDP Growth of i-th bank is equal to the regional GDP of the j-th region weighted by bank branches in the same region.

5. Econometric approach

In order to answer our research questions, we need to adopt two different empirical strategies to assess the causes and the consequence of the sanctions.

5.1 Methods: assessing causes of sanctions

5.2. Methods: assessing consequences of sanctions

We analyze the impact that supervisory sanctions have an on various indicators of bank stability and risk. Our assumption is that each bank choses the level of stability (and consequently, assumes a desired level of risks), which fits best its features. Therefore, we start testing if the supervisory sanctions have a direct impact on the level of stability chosen by each bank. In a frictionless world, banks will maintain their stability at chosen level. However, banks' stability isn't fully under control of banks management and, when it is driven away from the chosen level by external shocks (as sanctions), banks will try to bring their soundness back to the chosen level. In this framework, the banks soundness can be modeled as a weighted average of the chosen level of stability and the past distance to default. We can then write it as:

$$Z_{it} = \gamma Z_{it}^{*} + (1-\gamma) Z_{it-1} + \varepsilon_{it} \qquad (2)$$

Where Z_{it}^{*} is the desired level of stability, Z_{it} is the distance to default at time t and γ is the average speed at which banks will bring back the stability on the desired level. Therefore the smaller the γ, the more rigid the banks level of stability is and the longer it takes for a bank to achieve its target level after an external shock to bank stability.

In this paper, we also test if supervisory sanctions can affect the speed of adjustment γ. Following Berger et al. (2008) and Oztekin and Flannery (2012), our econometric approach is is developed in two steps. First, we define the optimal level of stability as a function of banks and

country futures among which we also have the supervisory style. Specifically, we write the desired level of stability as:

$$Z_{ijt}^{*} = \beta^{X} X_{it-1} + \beta^{c} C_{jt-1} + \tau_t \qquad (3)$$

Where X_{it-1} is a vector of bank characteristics and C_{jt-1} are regional variables. Plugging (2) into (1) and rearranging, we obtain:

$$Z_{ijt} - Z_{ijt-1} = \gamma\left(\beta^{X} X_{it-1} + \beta^{c} C_{jt-1} + \tau_t - Z_{ijt-1}\right) + \varepsilon_{ijt} \qquad (4)$$

We estimate (4) using Arellano Bond (1991), the direct effect will be given by the coefficient on the supervisory style variables β^{c}, however as outlined in Oztekin and Flannery (2012) it is plausible that banks characteristics partially reflect the supervisory sanctions, which in turn determine the speed of adjustment to the target level of stability.

In order to test if the supervisory sanctions have an impact on the speed of adjustment, we use the coefficient estimated in the first step to calculate Z_{it}^{*}. Next, we subtract the actual level of stability from the calculated desired level of soundness to have a proxy for the deviation of each bank from its desired level of stability which we name GAP_{it}, finally letting the adjustment speed be a function of banks and country characteristics we can rewrite (2) as. Follows:

$$Z_{it} - Z_{it-1} = \rho_{ijt}(GAP_{it}) + \varepsilon_{ijt} \qquad (5)$$

Where ρ_{ijt} is the following:

$$\rho_{ijt} = \Lambda Q_{ijt-1} = \gamma_0 + \Lambda^{X} X_{it-1} + \Lambda^{C} C_{jt-1} \qquad (6)$$

In final, we estimate Λ using OLS form (6):

$$Z_{ijt} - Z_{ijt-1} = \Lambda Q_{ijt-1}(GAP_{it}) + \varepsilon_{ijt} \qquad (7)$$

The coefficients' vector Λ^C will give us an estimation of the impact of the supervisory style on the speed of adjustment.

6. Empirical results

First of all, we run a univariate analysis of the data by comparing sanctioned banks' risk with non-sanctioned bank. As shown in table 3, our results show how the sanctioned-banks always provide a greater degree of credit risk than the other, regardless of the measure (default rate or other degrees of credit risk). The relation is significant at the 1%. With a 5% significance level sanctioned banks have a higher market risk, while liquidity risk not reports statistical significance.

Table 3 – T-test of risk measure between sanctioned and not sanctioned bank

		N.Obs	Mean	Sd. Error	Degree of freedom	t-stat	$H_0 = \mu_1-\mu_2 = 0$ $H_1 = \mu_1-\mu_2 <> 0$
Default Rate	Not sanctioned Banks	3,622	0.0144	0.0002	3,847	-6.7559	Reject H_0
	Sanctioned Banks	277	0.0217	0.0012			
CR1	Non sanctioned Banks	4,406	0. 0239	0. 0003	4,674	- 10.9285	Reject H_0
	Sanctioned Banks	270	0.0395	0. 0016			
CR2	Non sanctioned Banks	4,406	0. 0052	0. 0001	4,674	-6.3698	Reject H_0
	Sanctioned Banks	270	0. 0080	0. 0005			
CR3	Non sanctioned Banks	4,308	0. 0012	0. 0000	4,571	-3.5388	Reject H_0
	Sanctioned Banks	265	0.0020	0.0003			
CR4	Non sanctioned Banks	4,406	0. 0232	0. 0003	4,674	-7.5399	Reject H_0
	Sanctioned Banks	270	0. 0332	0. 0015			
CR	Non sanctioned Banks	4,308	0.0544	0.0006	4,571	- 11.6865	Reject H_0

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	Sanctioned Banks	265	0.0841	0.0030			
LR	Non sanctioned Banks	3749	0.5606	0.0364	3,980	-1.0670	Not Reject H_0
	Sanctioned Banks	233	0.7240	0.1840			
MR	Non sanctioned Banks	3788	0.1401	0.0019	4,019	-2.2089	Reject H_0
	Sanctioned Banks	233	0.1575	0.0076			

COMMENTO LOGIT

5. Robustness check and others results

6. Conclusion

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Variables	Symbol	Description
Credit risk 1	CR1	CR1 is calculated as the ratio between the risk-monitored loans and loans to borrowers in legal bankruptcy over total assets.
Credit risk 2	CR2	CR2 is calculated as the ratio between past due loans in arrears by 6 months or more and total assets.
Credit risk 3	CR3	CR3 is calculated as the ratio between restructured loans and total assets.
Credit risk 4	CR4	CR4 is calculated as the ratio between the sum of bankrupt and quasi-bankrupt assets, doubtful assets, and substandard loans over total assets.
Credit risk overall	CR	CR is calculated as: (risk-monitored loans + loans to borrowers in legal bankruptcy + past due loans in arrears by 6 months or more + restructured loans + bankrupt and quasi-bankrupt assets + doubtful assets + substandard loans)/ total assets.
Default Rate	DR	
Liquidity risk	LIQ	LR is calculated as cash and due from banks over total demand deposits.
Market risk	MR	MR is calculated as: (government bonds + local government bonds + short-term corporate bonds+corporate bonds) /(total assets - tangible fixed assets - intangible fixed assets).
Bank-control variables		

Bank asset size	TA	BAS is the natural logarithm of the total assets.
Capital Ratio	CAP	Equity/Total Assets
Return on assets	ROA	Before Tax Profit / total assets