REGULATION AND BANK DEFICIENCY: EVIDENCE FROM EUROPE

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ABSTRACT

This paper investigates the impact of bank regulation on default risk for a sample of six major European countries over 2003-2008. In the first stage of the analysis, we used a descriptive study for the determination of factors that contributed to the bank vulnerability. We measure banking fragility by using two ex-ante variables Zscore and rating to indicate future risk, and we use public intervention as an ex-post variable for bank failure. In the second stage, we used Logit regression models to assess several types of regulation on bank failure. Our results show that strengthening capital restrictions and supervision can improve bank solvency. While, market discipline and restricting bank activities can result in higher bank insolvency.

JEL: G21, C35

KEYWORDS: Bank Regulation , Basel Committee, CAMEL Model, Z score, Logit Regression

INTRODUCTION

If the role of banks in economic growth is well established, however, their behavior is source of systemic risk. Regulators intervened through many reforms to eliminate or at least reduce this risk. Basel II imposed a minimum level of capital that reflects the risks (the ratio McDenough) and is also equipped with two additional pillars: banking supervision and market discipline. However, the "subprime" crisis revealed the failure of almost all control modes (rating agencies, accounting standards and prudential rules). This failure demonstrates a deficiency in the control system and a lack of rigor in the measures taken by regulators. This has raised the interest of researchers to examine the relationship between prudential regulation and banking fragility. Demirguc-Kunt & Detragiache (2010) have found a weakly relationship between BCP compliance and bank soundness proxied by the Z factor. Barth et al. (2001, 2004) used a previous survey of dataset to analyze the impact of a combination of regulation and supervision on bank stability. Using bank level data, Fonseca & Gonzalez (2010) found that regulation, supervision and institutions influence the bank risk.

Studies on the risk failure of European banks remained limited with respect to the empirical literature on the U.S. or emerging market. This finding is mainly due to the low number of bank failures in Europe. Most of these studies focus on the cause of bank distress in Europe (Cihak & Poghsyan (2009) using CAMEL variables) or the impact of regulation on bank risk (Agoraki et al. (2011)). Our research analyzes the role of regulation on bank failure by including financial and regulatory variables. The bank distress is taken in the large sense to include banks that have experienced serious financial difficulties.

This paper proceeds as follows. Section 2 presents a brief overview of literature. Section 3 presents database and methodology. Section 4 presents results. Section 5 concludes.

LITERATURE REVIEW

Banks are financial institutions that collect deposits and provide credit. These operations enable them to perform the functions of financing, monitoring borrowers and reducing transaction costs. Given the role played by banks, any failure generates a dysfunction of banking system and of real economy (Laeven &

Valencia (2010)). Furthermore, the frequency, the extent of losses and the severity of banking crises highlights the need to detect and prevent the bank failure. Banking instability has become a major polity concern.

The empirical literature has focused on predictive measure to identify bank default risk and avoid systemic risk. These early warning models estimate the probability of bank failure at a given time horizon. These studies use either country-level data (Barth et al., 2004; Beck et al. 2006; Demirguc-Kunt et al. (2008)) or bank-level data (Lanine & Vennet (2006)). The use of individual data provides better estimates and avoids the loss of information that may be important. We divided predictive methods of bank failure into two types namely: the implicit method and explicit method.

The Implicit Method

Early warning models are used to assess the soundness of individual banks. Among the measures used, we quote Z-scores (Cihak, 2007) or financial strength ratings (Demirguc-Kunt et al. (2008)). Rating is used by some studies, like Gaganis et al. (2006) and Ioannidis et al. (2010), to predict individual bank failures. Based on accounting ratios, rating is considered as an accurate indicator of bank soundness. However, others (Reinhart (2001), Rojas-Suarez (2001)) have highlighted the irrelevance of rating agencies in anticipating emerging markets' crises. First, they have sometimes difficulties to dispose confidential information from banks. Second, the rating agencies are paid by the issuers of securities they rate, which pose a structural conflict of interest and illegal insider trading. Finally, in order to improve the predictive power of this indicator, the accounting data must be supplemented by market data.

Z-score indicator has been gaining popularity as a measure of bank soundness (Demirguc-Kunt et al. (2008), Cihak & Hesse (2007); Cubillas et al. (2012)). We can measure insolvency risk with Z-score. Cihak (2007) defined Zscore as the probability that the value of its assets becomes lower than the value of its debts. A higher Zscore implies a lower default probability. Despite its universality and its simplicity, Cihak (2007) has criticized Zscore especially since it is based on accounting data. The Zscore is modeled as follow:

$$\text{Zscore} = \frac{\lambda + R_A}{\sigma_A} \tag{1}$$

With $\lambda = \frac{Equitycapital}{Assets}$; R_A the return on assets and σ_A is the standard deviation of R_A.

The explicit model

By using the logistic model, Demirguc-Kunt & Detragiache (2010) measured the probability of a systemic crisis. They note (P_{it}^*) the probability in country i at time t, modeled as follows:

$$\begin{cases} P_{it} = 1 \; if \; P_{it}^* > C \\ P_{it} = 0 \; if \; P_{it}^* \leq C \end{cases} \tag{2}$$

Where $P_{it}^* = \beta' X_{it} + \varepsilon_{it}$, X_{it} is the matrix of independent variables, C is the critical value of the probability of a crisis. The sign of the estimated coefficients of each exogenous variable explains its impact on the probability of crisis.

METHODOLOGY AND DATA

The article published by Ioannidis, Pasioura & Zopounidis (2010) using financial and regulated data, inspires our methodology. This study focuses on the role of banking regulation on the probability of default.

We use the large definition of bank failure given by Demirguc-Kunt et al. (2000), which includes the measures of emergency.

Sample

The database contains the five major European countries; namely, Germany, France, Italy, Spain and the United Kingdom; and Greece. In addition, selected countries (except Greece) represent 72% of GDP (Eurostat) of the entire European Union. This choice is also motivated by the financial dominance of these countries compared to other member states. The five countries alone contribute about 80% of the total assets of all European banks (Fitch-IBCA, Bankscope). We extracted distressed banks and accounting data from 'Bureau Van Dijk' Bankscope database. For consistency, we used unconsolidated commercial banks and we excluded banks that do not provide all information on the variables used by the model for six years (2003-2008). We used annual balance sheets and statements of income expressed in millions of U.S. dollars. To carry out our empirical study, we preferred to use individual rather than aggregated data. Individual data provide better estimators, do not lose information that may be important and provide higher degree of freedom. The final sample is composed of 152 commercial banks from six countries of Europe in activity between 2003 and 2008.Table 1 details our sample.

Table 1: Distribution of the Sample by Countries

Country	Number of Banks	Number of Selected Banks	Sample Representativeness
France	55	28	0.51
Germany	38	29	0.76
Greece	15	12	0.8
Italy	25	20	0.8
Spain	18	13	0.72
UK	65	50	0.77
Total	217	152	0.76

This table shows the sample distribution by country.

We used the survey data of Barth et al. (2004, 2008) to compute proxies for the two pillars of Basle II (capital regulation and supervision) and regulations on activities restrictions.

Variables

There is common agreement among credit agencies, researchers and bank regulators that the CAMEL indicators are useful to classify banks in terms of their financial vulnerability. We follow the same approach by using the five acronyms of CAMEL (Capital, Asset Quality, Management Quality, Earning and Liquidity) model to evaluate bank soundness. We combine these indicators with regulatory variables to study the role of regulatory tools on bank distress. We also use macroeconomic variables to take into account differences between European Union countries; bank size affects; bank soundness in term of diversification (Dietsch & Petey 2004), credit risk and performance. The size of banks varies from one country to another. It is the lowest in Greece (25 billion U.S. dollars) and the highest in the UK (215 billion U.S. dollars). We measure bank size using logarithm of total assets.

CAMEL Indicators

The choice of the level of equity is a very important decision in bank management. In fact, bank equity is considered as a scarce and expensive source of funding. Myers & Majluf, (1984) have shown the reluctance of banks to increase their capital in order to avoid the risk of dilution of shareholders. So, shareholders demand higher yields in return for the risk they have to bear. However, bank regulators found that higher level of capital makes the bank more resilient to shocks and serves to protect depositors, creditors and

investors (Le Bras & Andrews (2004)). We follow Cihak & Poghsyan (2009) by using the ratio of total equity to total assets because of practical and conceptual reasons. The practical reason is that Tier1 ratio is not provided for the European banks. The conceptual one concern the weights for risk weighted assets that are not objective. We expect a negative relationship between the ratio of equity and the probability of bank distress.

Empirical studies (Cihak & Poghosyan (2009)) suggest that bad asset quality increase the probability of bank distress. We follow Ioannidis et al. (2010) by using loan loss provisions to net interest revenue ratio as a measure of asset quality. Bad quality assets indicate a greater exposure to credit risk and higher probability of bank failure.

Managerial quality is approximated by efficiency or cost to income ratio. Lower values of costs show bad managerial quality and higher probability of distress. Performance is closely linked to risk and bank capital. Non-performing banks have an incentive to choose risky projects to increase their profitability while respecting the constraints of capital. We proxy, profitability by the return on average equity ratio and we expect that it has a negative effect on the bank insolvency.

Liquidity shocks play a key role in the current crisis. Shin et al. (2005) have defined illiquidity risk as the probability of a default generated by a run. They emphasize that "liquidity buffers may play a role similar to capital buffers". Therefore, liquidity risk was integrated in the new regulations (Basel III). We measure liquidity by the ratio of liquid assets to deposits and short-term funding. Based on the previous literature, we expect higher liquidity to be correlated with lower probability of bank distress.

Regulatory Variables

Banking regulation does not necessarily mean an improvement in bank stability. Most studies use country level data to investigate the influence of prudential regulation of the banking fragility. Barth, al. (2004, 2008); Cihak & Tieman (2008) found that regulation and supervision depend on institutional development of the countries. In addition to the CAMEL variables, we follow Ioannidis, and al. (2010) by including regulatory indicators such as the three pillars, namely capital requirements, supervisory monitoring, market discipline of Basle II and restrictions on bank activities. We detail these 1.) Capital requirement: the relationship between capital regulation and bank failure has received special attention from banks, researchers and regulators (Basle I, II and III). Empirical studies have found a controversy between capital and bank failures. On one side: some studies (Berger & Bouwman (2010); Gaganis et al. (2006)) have found a negative relationship with bank failure. These studies argue that higher stringent capital requirements are associated with more probability of survival in case of banking crisis. On the other side, those who argue that higher capital requirement increases bank risk (Koehn & Santomero (1980)).We use CAPR index to measure capital requirement constructed from the sum of responses to nine questions developed by Barth et al. (2008). This index (CAPR) ranges from 0 to 9 and increases with the degree of restriction. It is expected that higher stringent capital requirements reduce the probability of bank failure. 2.) Supervisory monitoring: It is to measure the power of supervisory agencies to take preventive measures and punish banks not meeting the regulations. This power is proxies by an index computed from the survey data of Barth et al. (2004, 2008) that takes values ranging from 0 to 14. Higher value of this index shows a greater supervisory power. Based on Fernandez & Gonzalez (2005) study, we expect higher power of supervisory monitoring to be correlated with lower probabilities of distress. 3) Market discipline: Basel Committee has included market discipline in the third pillar of Basle II. Several studies (Gropp & Vesala (2004), Nier & Baumann (2006)) argue that market discipline reduces the risk of insolvency and improves banking stability. We follow Cihak (2007) study by using subordinated debt, which refers to market-based incentive schema. Investors in subordinated debt have an incentive to increase their monitoring and discipline banks for greater risk taking by demanding higher yields. We expect that strength of market discipline reduce the probability of bank distress. And 4.) Restrictions on bank activities: Restrict banking activities allows the

regulator to better control this sector and to readily identify potential vulnerability. Large researchers seem to have agreed with the view that lowering the restrictions of bank activities leads to more exposure to risk due to moral hazard and provide the possibility to increase and shift risk (Agoraki et al. (2011), Fernandez & Gonzalez (2005)). However, Barth et al. (2001, 2008) indicate that restricting bank activities increase the probability of banking crises. We construct the index (RESTACT) from the survey data of Barth et al. (2004, 2008) by considering whether securities, insurance, real estate activities and ownership of non-financial firms are unrestricted, permitted, restricted or prohibited. With respect to the theoretical reasons for restricting bank activities (difficulties to control banks, increased risk exposure), we suppose that stricter restriction on bank activities reduce bank insolvency.

Econometric Model

The logit regression shown below is used to examine the link between regulatory policies and the probability of default. This regression uses Risk = [Z-score, Rating, Intervention] as dependent variables. We consider state intervention as an emergency measure and the sign of bank default.

$$\mathrm{RISK}_i = \beta_0 + \sum_{k=1}^{K} \beta_k X_{i,k,t} + \sum_{k\prime}^{K\prime} \beta_{k\prime} REG_{i,k\prime} + \sum_{k\prime\prime}^{K\prime\prime} \beta_{k\prime\prime} C_{k\prime\prime,i} + \varepsilon_{i,t} \quad (3)$$

Where i = (1, 2, ……, 151) banks and t = 2003-2008. $X_{k,i,t}$ represent CAMEL variables of the bank i at time t. The vector $REG_{i,k\prime}$ presents regulatory variables of the bank i. we include C_i as control variables to capture macro economic variables (Inflation and GDP per capita) and the bank size measured by log(Assets). The coefficient β show the direction of correlation between the various measures of default probability with the financial and regulatory policies. $\varepsilon_{i,t}$ is the random error term.

EMPIRICAL RESULTS

This section presents descriptive statistics and the estimation results on the effect of bank regulation on banking distress.

Table 2 presents the descriptive statistics of CAMEL variables and shows a sharp drop in overall performance of European banks except Spain, whose decline is limited. We also see deterioration in asset quality for British and Greek banks. From Table 3, one can see that these two countries have experienced the greatest percentage of failed banks. The Table 4 shows the importance of the variables capital, asset quality, interbank liquidity and profitability in bank failure.

Table 2 shows the evolution of CAMEL variables. CAP represent capital ratio of banks. DOT is the ratio of the loan loss provision and indicates asset quality. COUT represents management quality. ROE is the return on equity ratio as a proxy of profitability. LIQ represents liquidity. INTERBC represents interbank liquidity.

Table 2: Evolution of CAMEL Variables (2007-2008)

Variables	Germany	Spain	France	UK	Greece	Italy
CAP	6.24	-1.18	-5.43	-14.61	-9.27	-7.53
DOT	52.47	16.54	37.67	154.25	109.78	69.52
COUT	5.62	1.17	4.23	7.19	25.9	8.23
ROE	-149.9	-2.62	-171.25	-161.87	-195.15	-98.64
LIQ	-7.35	-29.27	-7.26	-6.04	-22.25	22.86
INTERBC	-11.7	-19.3	-10.25	-21.88	-56.29	-32.06

This table shows evolution of CAMEL variables.

Table 3: Distribution of Failed Banks by Country

Countries	Number of Failures	Number of Banks	%
France	4	28	14. 3
Germany	1	29	3.4
Greece	5	12	41.6
Italy	0	20	0
Spain	0	13	0
United Kingdom	12	50	24

This table shows distribution of failed banks by country.

Table 4: Descriptive Analysis

Variables	NDEF			DEF		
	Mean	**Min**	**Max**	**Mean**	**Min**	**Max**
CAP	9.19	0.38	98.80	6.20	-1.86	73.30
DOT	17.62	-341.19	597.76	21.57	-32.50	83.28
CROISCR	22.55	-100	1673.8	39.06	-25.5	1818.8
COUT	66.77	2.50	466.73	64.28	22.47	227.66
ROE	6.90	-109.38	106.38	5.93	-224.72	44.19
LIQ	40.22	0.02	286.21	38.63	0.02	389.73
INTERB	165.62	0.00	980.00	120.13	4.31	992.99
LNTA	15.73	10.20	21.86	17.89	11.95	21.82
LEVIER	18.36	1.63	264.95	31.55	-53.83	259.57
TPIB	1.99	-1.20	5.90	2.60	-0.40	5.90
INFLATION	2.13	1.00	4.22	2.31	1.00	3.88
DSUB	26.71	0.00	82.61	42.32	1.31	820.17

This table shows descriptive analysis.

Table 4 shows descriptive statistics of financial variables by default. CAP represent capital ratio of banks. Asset quality is represented by DOT, CROISCR and COUT for management quality. ROE is used as a proxy of profitability. LIQ and INTERBC are two variables of liquidity; LNTA (size); Levier is debt on equity; TPIB is GDP growth rate ; DSUB subordinated debt.

We report regulatory variables in Table 5, and we establish a link with the number of bankruptcy by country. We note that Spanish banking system has remained immune to failure given a more effective regulatory oversight. This implies that supervision have a significant impact on banking risk failure.

Table 5: Regulatory Variables by Country

Pays	Restrictions on Activities	Equity Requirement	Supervision	Market Discipline
France	9	8	8	8
Germany	7	6	8	8
Greece	8	3	10	7
Italy	12		7	6
Spain	7	7	11	7
UK	4	6	8	

This table shows regulatory variables by country.

The next step is to report empirical results of our logit models that are presented in Table 6, 7 and 8.

Our results suggest that higher stringent equity requirements reduce banking risk default measured by rating, Z-score and intervention. This result confirms the statements of Barth et al. (2004) and Admati et al. (2010). We also find negative correlation between the level of bank capitalization and the risk of bank distress. Lanine & Vennet (2006), similarly, Berger & Bowman (2010) stated that better capitalized banks have less probability default.

Table 6: Zscore

$Z_{it} = \beta_{it} + \beta_1 CAP_{it} + \beta_2 DOT_{it} + \beta_3 COUT_{it} + \beta_4 ROE_{it} + \beta_s LIQ_{it} + \beta_6 INTERB_{it} + \beta_7 LNTA_{it} + \beta_8 LEVIER_{it} + \beta_9 TPIB_{it} + \beta_{10} INFLATION_{it} + \beta_{11} CAPR_i + \beta_{12} SPOWER_i + \beta_{13} ACTREST_i + \beta_{14} DSUB_i + \varepsilon_{it}$.

Variables	Z1	Z2	Z3	Z4	Z5
CAP	-0.572***	-0.597***	-0.887***	-0.892***	-0.199
DOT	0.007	0.008	-0.006	-0.006	-0.023
COUT	0.006	0.010	0.023	0.022*	-0.017
ROE	-0.082***	-.0826***	-0.124***	-0.121***	-0.158***
LIQ	-0.020	-0.057**	-0.056***	-0.0521**	-0.028
INTERB	0.002	0.004**	0.005***	0.005**	0.006**
LNTA	-0.375*	-0.384	-0.460**	-0.467**	-0.799**
LEVIER	-0.009	0.006	-0.013	-0.013	0.066
TPIB	-0.081	-0.140	0.011	0.001	0.080
INFLATION	0.188	0.024	0.282	0.120	-0.083
CAPR		-0.102	-2.489**	-2.048*	-4.191**
SPOWER			-5.395**	-4.340*	-7.780**
ACTREST				-0.254	-0.242
DSUB					0.139**
_cons	4.967	5.973	65.709***	56.594**	95.327**

*This table shows Zscore regression results. ***, **, * indicate significance at the 1,5 and 10 percent levels respectively)*

The dependent variables are bank's z-score. CAP represent capital ratio of banks. Asset quality is represented by DOT, COUT is a measure for management quality. ROE is used as a proxy of profitability. LIQ and INTERBC are two variables of liquidity; LNTA is the size measured as logarithm of total asset; Levier is debt on equity; TPIB is GDP growth rate. Regulatory indicators (CAP: capital requirement, SPOWER: supervisory monitoring, ACTREST: activity restriction, DSUB: subordinated debt) are employed to analyze their influence on probability of distress.

Table 6 presents the results of the various estimates of Zscore. Results provide significant impact of capital requirement on risk. With regard to the second pillar of Basle II, we also found significant evidence in favor of supervision hypothesis. It seems to have a negative effect on the probability of bankruptcy. This is consistent to studies that say higher state supervision results in lower risk of insolvency, measured by Z-score (Agoraki et al. 2011).

The relationship indicates that default risk is negatively related to bank size. This means that the large banks have a lower probability of bankruptcy because of "too big to fail" phenomenon. The estimates from the logit model of the relationship between the rating and the explanatory variables are presented below in the Table 7. We also found a negative impact of capital requirement on probability of bankruptcy. This result is in accordance with the hypothesis and justifies the first pillar of Basle II and III. Supervision however does not influence the probability of failure as measured by the rating.

In Table 8, we show the relationship between default risk measured by intervention and regulatory variables. The results also show the negative impact of capital requirement (first pillar of Basle II) and can be justified by the reduction of moral hazard problem. This proves the robustness towards capital regulation.

The results outlined in Table 8 show that supervision is associated with lower default risk. This is consistent with our assumption and the aim of supervisory authorities. Such monitoring includes corrective measures in order to prevent banks to take excessive risks.

The dependent variables are bank's rating. CAP represent capital ratio of banks. Asset quality is represented by DOT, COUT is a measure for management quality. ROE is used as a proxy of profitability. LIQ and INTERBC are two variables of liquidity; LNTA is the size measured as logarithm of total asset; Levier is debt on equity; TPIB is GDP growth rate. Regulatory indicators (CAP: capital requirement, SPOWER: supervisory monitoring, ACTREST: activity restriction, DSUB: subordinated debt) are employed to analyze their influence on probability of distress.

Table 7: Rating

$Rat_{it} = \beta_{it} + \beta_1 CAP_{it} + \beta_2 DOT_{it} + \beta_3 COUT_{it} + \beta_4 ROE_{it} + \beta_5 LIQ_{it} + \beta_6 INTERB_{it} + \beta_7 LNTA_{it} + \beta_8 LEVIER_{it} + \beta_9 TPIB_{it} + \beta_{10} INFLATION_{it} + \beta_{11} CAPR_i + \beta_{12} SPOWER_i + \beta_{13} ACTREST_i + \beta_{14} DSUB_i + \varepsilon_{it}$.

Variable	Rat1	Rat2	Rat3	Rat4	Rat5
CAP	-0.031**	-0.015	-0.015	-0.020	-0.113**
DOT	-0.001	-0.004	-0.004	-0.004	-0.007
COUT	0.004	0.002	0.002	0.002	-0.006
ROE	-0.035***	-.038***	-0.038***	-0.037***	-0.060***
LIQ	0.001	0.002	0.002	0.003	-0.007
INTERB	-0.001**	-0.001*	-0.001*	-0.001*	-0.001
LNTA	-0.244***	-0.092	-0.092	-0.092	-0.164**
LEVIER	0.008	0.002	0.002	0.002	-0.018
TPIB	0.042	-0.001	-0.001	-0.011	0.088
INFLATION	0.218*	0.089	0.089	0.080	0.025
CAPR		-0.362***	-0.363***	-0.341***	-0.291***
SPOWER			-0.002	0.030	0.063
ACTREST				-0.064	0.188*
DETSUB_FP					0.015
_cons	2.982***	3.377***	3.387**	3.432**	3.931**
N	597	503	503	503	335

*This table shows rating regression results. ***p<0.01, **p<0.05, *p<0.1 (where ***, **, * indicate significance at the 1,5 and 10 percent levels respectively)*

The dependent variables are Intervention. CAP represent capital ratio of banks. Asset quality is represented by DOT, COUT is a measure for management quality. ROE is used as a proxy of profitability. LIQ and INTERBC are two variables of liquidity; LNTA is the size measured as logarithm of total asset; Levier is debt on equity; TPIB is GDP growth rate. Regulatory indicators (CAP: capital requirement, SPOWER: supervisory monitoring, ACTREST: activity restriction, DSUB: subordinated debt) are employed to analyze their influence on probability of distress.

Table 8 : Intervention

$Interv_{it} = \beta_{it} + \beta_1 CAP_{it} + \beta_2 DOT_{it} + \beta_3 COUT_{it} + \beta_4 ROE_{it} + \beta_5 LIQ_{it} + \beta_6 INTERB_{it} + \beta_7 LNTA_{it} + \beta_8 LEVIER_{it} + \beta_9 TPIB_{it} + \beta_{10} INFLATION_{it} + \beta_{11} CAPR_i + \beta_{12} SPOWER_i + \beta_{13} ACTREST_i + \beta_{14} DSUB_i + \varepsilon_{it}$.

Variable	Interv1	Interv2	Interv3	Interv4	Interv5
CAP	-0.612***	-0.501***	-0.505***	-0.387**	-0.276
DOT	-0.003	-0.005	-0.005	-0.006	-0.006
COUT	0.0239***	0.023***	0.022***	0.017*	0.019*
ROE	-0.018	-0.007	-0.008	-0.009	0.004
LIQ	0.009	0.024***	0.022***	0.009	0.001
INTERB	-0.002*	-0.001	-0.001	-0.001	-0.003
lnta	0.443***	0.753***	0.766***	0.799***	0.724***
levier	-0.118***	-0.122***	-0.126***	-0.124***	-0.133***
tpib	0.262**	0.016	0.021	0.069	0.009
inflation	0.247	-0.161	-0.064	-0.142	-0.119
capr		-1.025***	-1.055***	-1.183***	-1.189***
spower			-0.201	-0.589*	-0.773*
actrest				0.746***	0.589**
detsub_fp					0.053***
_cons	-6.155***	-4.877*	-3.158	-4.989	-2.478
N	601	507	507	507	339

*This table shows intervention regression results. ***p<0.01, **p<0.05, *p<0.1*

The third pillar of Basle II relative to market discipline measured by subordinated debt shows a positive and significant correlation with the default probability. Higher level in subordinated debt is associated with a greater risk-taking. Banks act recklessly when they increase their share of subordinated debt hoping for a higher profitability. This finding can be explained by 'too big to fail" approach which influences the measures of market discipline and the probability of bankruptcy of large banks issuing subordinated debt. Bank size is also positively related to default risk (1% significance) when dependent variable is ex-post.

This result is explained by the support provided by governments to large banks, which gives banks incentives to take excessive risks generating a higher probability of failure.

Furthermore, stricter restrictions on bank activities increase insolvency risk. This finding is in line with the studies of Barth et al. (2008) and Angkinand (2009). This suggests that allowing banks to provide a large range of activities increase economies of scale and the franchise value of banks. Therefore, Diversification of activities provides banks with hedge against market uncertainties. This is in line with the view that more diversified large banks display a lower default risk.

CONCLUSION

Using a sample of 152 commercial banks from six countries of Europe in activity between 2003 and 2008, we study the role of regulatory policies in reducing vulnerability bank. It was found that the regulation of banks has two implications. First, regulation imposes restrictions on capital adequacy to reduce bank risk taking. Second, regulation implement a monitoring system based on a form of control to allow inspectors to check whether the banks meet regulatory requirements. It is clear that the role of capital adequacy ratio in banking regulation is important to absorb losses against loan default. However, the problem of the capital requirement during the subprime crisis is rather in the weighting of assets against the risks. Risk weighting asset calculation is not perfect, with low risk weights for loans to public services. We need a simple capital adequacy ratio that is easy to measure, to control and to understand.

Furthermore, incentives for banks to increase their profitability are greater than those of regulators and result in excessive risk exposures to banking system. Some regulatory measures that aim to reduce banking instability become means to boost bank vulnerability. Our findings show that restrictions on bank activities increase bank distress by introducing subordinated debt in the Tier 2 and do not improve the stability of banks. In fact, subordinated debts play both the role of sensitivity to market risk and an indicator of market discipline. The results show a highly significant relationship between subordinated debts and the risk of failure. In other words, these debts as part of Tier 2 contribute to the increased risk of bank failure. This result demonstrates a significant sensitivity to market risk and market discipline failure. However, as a final remark it should be emphasized that alternative measures, such as rating and Z-score are not very strong. In fact, empirical results have pointed the relevance of ex-post measure.

Our investigation should be taken with caution. In fact, capital requirement cannot alone ensure banking stability. Banks are able to circumvent this restriction by taking excessive risks, especially as banks benefit from explicit and implicit guarantees encouraging them to take excessive risks. Therefore, strengthening the power of supervision and transparency requirements provides a counterweight against excessive risk-taking by banks.

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