Bank Regulation and Market Discipline Around the World

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Motivation of Hosono, Iwaki Tsuru(2005), "Bank Regulation and Market Discipline Around the World" (HIT(2005))

- Bank failures (banking crises) can create "negative externalities" by having systematic and disruptive effects on the financial system and the real economy.

- The role of bank regulation and supervision = to prevent the excessive risk-taking by banks (the existence of "negative externalities may well provide a rationale for public control and intervention.)

- Another rationale of bank regulation: the "representative hypothesis" (Dewatripont and Tirole (1994)) → regulatory authorities are supposed to act as a representative monitor for small depositors that have little incentive or ability to monitor a bank due to informational and free-rider problems.

- However, frequent banking crises around the world over the past two decades question the effectiveness of bank regulation and supervision.

Motivation 2: The role of market discipline

- Growing emphasis on “market discipline” by policy makers and academics to supplement bank regulation and thus to maintain the safety and soundness of banking system (e.g. Basel II).

- Market discipline in the banking sector = “a situation in which private sector agents including depositors, creditors and stockholders face costs that are increasing in the risks undertaken by banks and take action on the basis of these costs” (Martinez Peria and Schmukler (2001)).

- For example, “uninsured depositors, who are exposed to bank risk taking, may penalize riskier banks by requiring higher interest rates or by withdrawing their deposits” (Martinez Peria and Schmukler (2001).

- Existing research has focused mainly on the effectiveness of “market discipline” in the US and some other countries, by estimating depositor’s sensitivity to bank risk (= the impact of bank insolvency risk on interest rate or deposit growth).

- There is, however, little research on “market influence” (whether market pressures change bank risk taking or not) beyond the analysis on “market monitoring” (Bliss and Flannery (2001)).

Motivation 3: The relationship between bank regulation (institutions) and market discipline

- It is also not yet well understood under what conditions market discipline works well.

- One important exception: Demirgüç-Kunt and Huizinga (2003)

  By examining the effects of deposit insurance designs on depositor discipline, they found:

  (1) Explicit deposit insurance reduced depositor's sensitivity to bank risk.

  (2) The more it did as its coverage was broader.

  (Data: 1990-1997, 30 countries for the effect on interest rates and 51 countries for that on deposit growth).

- Then, how should we understand the relationship between other banking regulatory actions and depositor discipline?

- Our paper theoretically examines the relationship between various bank regulations and depositor discipline and then provide new cross-country evidence on it using a larger sample set (a panel of about 1,7000 bank-year data during 1992-2002 across 60 countries from Bank Scope)

A Theoretical model of depositor discipline (P 4 - 9): Two mechanisms affecting depositor's behavior

- Two factors affecting depositor's behavior:

(1) The ex-ante likelihood of the depositor's bank insolvency

(2) The extent of ex-post deposit protection in the case of the bank insolvency

- The mechanism of "regulatory discipline" ← (1)

  Bank regulations → controlling bank risk → higher bank stability → lower depositors' sensitivity to bank risk → weaker market discipline (but strong regulatory discipline)

- The mechanism of "regulatory shield" ← (2)

  Some regulation and safety-nets (explicit deposit insurance, bail-out (forbearance) policies) → shielding depositors from bank insolvency risk and losses → lower depositors' sensitivity to bank risk → weaker market discipline (probably coupled with weaker regulatory discipline)

Empirical methodology

(1) Estimation method: Pooled OLS

(2) Dependent variable: deposit interest rate (interest payments to depositors / total deposits in the real term)

(3) Explanatory variable: (with a one-year lag excluding Institutional variables)

- Bank risk variables: Liquidity (liquid assets / total assets), Profit (operating income / total assets), Equity (equity / total assets) (-)
- Institutional variables (+ or -)
- Institutional variables ✕ bank risk variables (+ or -)

- OVERHEAD (overhead costs / total assets)
- MATURITY (customer and short-term funding / total interest bearing liabilities)
- ASEETSIZE (log (total assets / GDP))
- Macroeconomic variables (inflation rate, growth rate of real per capita GDP, real government bill rate)

(3) Robustness check

- To deal with endogeneity problems, we also use the predicted value of Liquidity and the predicted value of deposit growth (Risky banks may want to have more liquidity assets and interest rates and deposit growth should be simultaneously determined.)
- Other problems: “a gamble for resurrection” (collecting deposits by raising deposit interest rates), the effect of regulation on interest rates

Institutional variables (P 37-41)

1. Bank regulation and supervision (Source: Barth, Caprio and Levine (2004))
- CAPREG (capital regulatory index)
- ACTREG (bank activity regulation index)
- ENTRYREQ (entry into banking requirements)
- MORALHAZARD (deposit insurance index)
- SPOWER (official supervisory power)
- PMONITOR (private monitoring index)
- GOVBANK (government bank share)

2. Legal quality (Source: LLSV(1997), Knack and Keefer (1995))
- CONTRACT (contract enforcement)
- FPROP (property rights)

3. The effect of institutional variables: An example

$$\alpha \times \text{LIquidity} + \beta \times (\text{Liquidity} \times \text{MORALHAZARD})$$
$$= (\alpha + \beta \times \text{MORALHAZARD}) \times \text{Liquidity}$$

"Depositor's sensitivity to bank risk" $= \alpha + \beta \times$ MORALHAZARD (in the absolute term)

Thus, if α and β are negative and positive respectively, generous deposit insurance is likely to reduce depositor's sensitivity to bank risk.

Empirical results (P 42)

A. ACTREG

	Liquidity	Profit	Equity	Predicted value of Liquidity
Constant	0.072 ***	0.075 ***	0.068 ***	0.056 ***
	(.000)	(.000)	(.000)	(.000)
Bank risk	-0.043 ***	-0.296 ***	-0.012	-0.225 ***
	(.000)	(.000)	(.558)	(.000)
OVERHEAD	-0.008	0.078 *	-0.018	-0.323 ***
	(.575)	(.081)	(.487)	(.000)
MATURITY	-0.020 ***	-0.022 ***	-0.023 ***	0.007 *
	(.000)	(.000)	(.000)	(.074)
ASSETSIZE	0.001 ***	0.001 ***	0.001 ***	-0.001 ***
	(.000)	(.000)	(.000)	(.000)
GOVERNMENT RATE	0.362 ***	0.358 ***	0.357 ***	0.275 ***
	(.000)	(.000)	(.000)	(.000)
INFLATION	-0.562 ***	-0.571 ***	-0.573 ***	-0.517 ***
	(.000)	(.000)	(.000)	(.000)
GROWTH	0.061 **	0.064 **	0.062 **	-0.952 ***
	(.028)	(.015)	(.016)	(.000)
DEPOSIT GROWTH (Predicted value)				0.851 ***
				(.000)
ACTREG	-0.002 ***	-0.003 ***	-0.002 ***	-0.003 ***
	(.000)	(.000)	(.000)	(.001)
Bank risk x ACTREG	0.003 ***	0.023 ***	0.003	0.012 **
	(.001)	(.000)	(.339)	(.020)
No. of obs.	16617	17124	17123	6598
Adj. R-square	0.67	0.67	0.67	0.73
F value	331.2 ***	371.9 ***	329.2 ***	290.6

B. CAPREG

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	-0.038 ***	-0.264	-0.066 *	0.083 ***
	(.007)	(.185)	(.093)	(.009)
CAPREG	-0.001 **	-0.001	-0.001	0.006 ***
	(.047)	(.409)	(.262)	(.000)
Bank risk x CAPREG	0.006 **	0.040	0.015 **	-0.030 ***
	(.012)	(.255)	(.014)	(.000)
No. of obs.	9988	10035	10035	3580
Adj. R-square	0.74	0.73	0.73	0.85
F value	1102.1 ***	875.1 ***	950.5 ***	281.5 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.
Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.
P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

Empirical results 2 (P 43)

C. ENTRYREQ

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	-0.004	0.192	0.104	-0.472 ***
	(.719)	(.215)	(.243)	(.000)
ENTRYREQ	-0.001 **	-0.0001	-0.0001	-0.013 ***
	(.012)	(.860)	(.908)	(.000)
Bank risk x	-0.001	-0.032 **	-0.014	0.052 ***
ENTRYREQ	(.529)	(.017)	(.181)	(.000)
No. of obs.	16490	16997	16997	6542
Adj. R-square	0.67	0.66	0.66	0.73
F value	324.3 ***	328.9 ***	340.3	272.2 ***

D. MORALHAZARD

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	-0.022 ***	-0.127 ***	0.005	-0.096 ***
	(.000)	(.000)	(.696)	(.000)
MORALHAZARD	-0.004 ***	-0.004 ***	-0.004 ***	-0.002 **
	(.000)	(.000)	(.000)	(.041)
Bank risk x	0.009 ***	0.043 ***	0.014 ***	0.001
MORALHAZARD	(.000)	(.000)	(.002)	(.817)
No. of obs.	17240	17743	17741	6813
Adj. R-square	0.61	0.61	0.61	0.62
F value	295.6 ***	314.3 ***	304.8 ***	528.1 ***

E. SPOWER

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	-0.086 ***	-0.485 ***	-0.041 *	-0.380 ***
	(.000)	(.000)	(.095)	(.000)
SPOWER	-0.004 ***	-0.004 ***	-0.003 ***	-0.005 ***
	(.000)	(.000)	(.000)	(.000)
Bank risk x	0.006 ***	0.033 ***	0.006 **	0.024 ***
SPOWER	(.000)	(.000)	(.021)	(.000)
No. of obs.	16561	17068	17067	6598
Adj. R-square	0.66	0.66	0.66	0.73
F value	359.7 ***	381.4 ***	379.9 ***	253.2 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.
Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.
P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

Empirical results 3 (P 44)

Table 5. Deposit Interest Rate, Market Discipline, and Institutions

F. PMONITOR

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	0.008	-0.511 ***	-0.141	0.079
	(.717)	(.002)	(.175)	(.357)
PMONITOR	-0.007 ***	-0.010 ***	-0.009 ***	0.0002
	(.000)	(.000)	(.000)	(.931)
Bank risk x	-0.004	0.071 ***	0.026 *	-0.016
PMONITOR	(.205)	(.005)	(.096)	(.254)
No. of obs.	9223	9261	9261	3710
Adj. R-square	0.87	0.87	0.87	0.89
F value	1017.5 ***	853.8 ***	889.7 ***	465.9 ***

G. GOVBANK

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	-0.009 ***	-0.021	0.037 ***	-0.084 ***
	(.000)	(.142)	(.004)	(.000)
GOVBANK	0.0004 ***	0.0005 ***	0.0004 ***	0.000
	(.000)	(.000)	(.000)	(.211)
Bank risk x	-0.0002	-0.005 ***	-0.001	0.002 **
GOVBANK	(.179)	(.000)	(.102)	(.041)
No. of obs.	14294	14788	14787	5757
Adj. R-square	0.73	0.73	0.73	0.82
F value	341.6 ***	324.9 ***	347.0 ***	271.4 ***

H. CONTRACT

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	-0.103 ***	-0.527 ***	-0.095 **	-0.307 ***
	(.000)	(.000)	(.018)	(.000)
CONTRACT	-0.016 ***	-0.015 ***	-0.012 ***	-0.018 ***
	(.000)	(.000)	(.000)	(.000)
Bank risk x	0.029 ***	0.149 ***	0.043 ***	0.078 ***
CONTRACT	(.000)	(.000)	(.001)	(.000)
No. of obs.	16113	16620	16619	6486
Adj. R-square	0.62	0.62	0.61	0.74
F value	751.8 ***	778.8 ***	732.3 ***	298.3 ***

I. FPROP

	Liquidity	Profit	Equity	Predicted value of Liquidity
Bank risk	-0.120 ***	-0.604 ***	-0.076	-0.287 ***
	(.000)	(.000)	(.242)	(.000)
FPROP	-0.016 ***	-0.016 ***	-0.012 ***	-0.013 ***
	(.000)	(.000)	(.000)	(.000)
Bank risk x	0.024 ***	0.120 ***	0.023 *	0.044 ***
FPROP	(.000)	(.000)	(.069)	(.000)
No. of obs.	16787	17294	17292	6723
Adj. R-square	0.59	0.59	0.59	0.73
F value	724.2 ***	735.6 ***	702.6 ***	292.5 ***

***,**,* indicate statistical significance levels of 1,5 and 10 percent,respectively.
Dependent variable is the ratio of interest expense to interest-paying debt, deflated by GDP deflator.
P-values are in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.

Main findings and policy implications

- Strict regulations on bank activities (ACTREG) and powerful supervisory authorities (SPOWER) tend to decrease the deposit interest rate and its sensitivity to bank risk.

- Explicit deposit insurance that is funded or whose membership is voluntary tend to lower market discipline (the predicted value of Liquidity ✕Institution: significantly positive).

- However, the evidence on the effect of a strict capital regulation, a severe entry requirement and a large presence of government-owned banks on market discipline is mixed.

- A higher legal qualities (CONTRACT, FPROP) tend to reduce deposit interest rates and market discipline (It may be that countries in a well developed legal system tends to effectively control bank risk or to reduce depositors' restitution or verification costs in the wake of bank insolvency (see a theoretical part of the paper (P 4-9).

- If some regulation reduces market discipline through the route of "regulatory shield" and weakens "regulatory discipline" (or in a country with weak "regulatory discipline), such regulation should be reexamined (According to BCL(2004), strict regulations on banking activities is likely to increase the possibility of banking crises and their analysis hints the route of "regulatory shield" in the case of this regulation.)