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# EVIDENCE OF DIFFERENCES IN THE EFFECTIVENESS OF SAFETY-NET MANAGEMENT IN EUROPEAN UNION COUNTRIES

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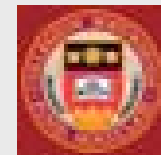
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# 1. Motivation

- **Risk-shifting** occurs when particular bank stakeholders are not adequately compensated for the risks to which they are exposed.
- EU directives and Basel agreements divide cross-country **accountability for preventing, detecting, and resolving bank insolvencies** in a politically convenient, but economically arbitrary way:
  - The **host country** supervises and insures banking entities that operate within its borders
  - Basel arrangements make **home-country** officials responsible for supervising the accounts of the **consolidated** multinational organization to which a host-country subsidiary would report.
  - No formal cross-country liability or sanction is generated by supervisory misfeasance or malfeasance.

- This paper focuses on banks' ability to extract hard-to-observe safety-net benefits by increasing their leverage or volatility.
- We produce evidence **that EU regulators can use to assess their taxpayers' exposures to loss from partner countries.**
- Our method estimates how well, on average, markets and regulators in individual countries manage to control deposit-institution risk-shifting during any sample period. We produce evidence that cross-border activity in EU banking has been responding to these differences in recent years: foreign subs and multinational parents extract more benefits than purely domestic banks.
- Although I won't stress this aspect of our paper today, we also investigate whether and how much safety-net control differs between **stockholder-owned banks and mutual banks** (savings and cooperative banks).

## 2. Risk-Shifting Opportunities Provided by the Safety Nets

- All EU **safety nets include depositor guarantees**. By engaging in regulation-induced innovation and exerting lobby pressure, a country's banking industry can and (we find) do keep these guarantees from being fully priced.
- No reason to expect industry clout or safety-net benefits to be the same in all countries
- The costs and benefits a country receives from its safety net depend on **how much market discipline the net displaces and how successfully safety-net managers substitute for the market discipline they displace**: dangerous gaps exist in managers' in vision, tools, and incentives

- The result is that **an increase in a bank's overall risk exposure can almost always increase the value of the safety-net benefits it receives.** This creates an incentive to search out and to exploit weaknesses (i.e., loopholes) in risk-control arrangements.
- The **per-period flow of safety-net benefits that a particular bank enjoys can be defined as a “fair” insurance premium (IPP)** expressed per euro of a bank's deposits.

- Merton (1977, 1978) shows that **the IPP increases both with a bank's leverage and with the volatility of its returns**. In Merton's model, leverage is measured as the ratio of the market value (D) of deposits and other debt to the market value of a bank's assets (V). Volatility is defined as the standard deviation of the return on bank assets ( $\sigma_V$ ).
- **Reframing the Merton model** to endogenize the debt-to-asset ratio, B/V, and conceiving of it as a locus of potential market-equilibrium points, **we get:**

$$B/V = \alpha_0 + \alpha_1 \sigma_V + \varepsilon_2 \quad (2)$$

$$IPP = \beta_0 + \beta_1 \sigma_V + \varepsilon_3 \quad (3)$$

- Equation (2) expresses the hypothesis that in each round of action and response, outside monitoring constrains banks to choose points that lie on a locus of mutually acceptable leverage and volatility pairs.
- We focus on bank changes in  $\sigma_V$  and regulator and market disciplinary responses to them.

- Given the external discipline a bank faces, **the sign of  $\beta_1$  in equation indicates whether a bank's covenanted contracting environment allows increases in asset volatility to increase the value of its safety-net guarantees.** Empirically, the total derivative  $\beta_1$  must be nonpositive for risk-shifting incentives in a given country to be fully neutralized.
- **A negative  $\alpha_1$  only implies that risk-sensitive capital regulation and complementary market discipline partially constrain realizable safety-net benefits.**

- Thus, for market and regulatory pressure consistently to discipline -- and potentially to neutralize -- incremental risk-shifting incentives, two conditions must be met:
  - Capital must increase with volatility:  $\alpha_1 < 0$ ,
  - Guarantee value must not rise with volatility:  $\beta_1 \leq 0$ .

### 3. Input data

- The database consists of **bank-level info from Bankscope database**. Because **commercial banks** are stockholder-owned, regression inputs can be calculated from data on bank stock prices recorded on Bankscope. Gaps in coverage exist. These are worse in some countries than others.
- However, **savings banks and credit cooperative banks are mutual institutions**:
  - i) values for  $E$ ,  $B/V$  and  $\sigma_V$  must be calculated entirely from book values.
  - li) at mutuals, risk-taking incentives are blunted because owners and managers cannot divide potential gains from risk-shifting by writing easily enforceable side contracts.
  - lii) mutual institutions do not pay dividends. We treat the reported value of “distributed profits” (contributions to social works and social funds) as a rough counterpart.

**TABLE 1**  
**SAMPLE SIZE (NUMBER OF OBSERVATIONS)**  
**DISAGGREGATED BY COUNTRY AND INSTITUTIONAL TYPE**

	<i>ALL</i>	<i>COMMERCIAL BANKS</i>	<i>SAVINGS AND COOPERATIVE BANKS</i>
<i>Austria</i>	<i>1589</i>	<i>555</i>	<i>1034</i>
<i>Belgium</i>	<i>1848</i>	<i>1308</i>	<i>540</i>
<i>Denmark</i>	<i>1002</i>	<i>669</i>	<i>333</i>
<i>Finland</i>	<i>146</i>	<i>118</i>	<i>28</i>
<i>Luxembourg</i>	<i>1058</i>	<i>1024</i>	<i>34</i>
<i>Netherlands</i>	<i>551</i>	<i>517</i>	<i>34</i>
<i>Portugal</i>	<i>374</i>	<i>317</i>	<i>57</i>
<i>Sweden</i>	<i>501</i>	<i>160</i>	<i>341</i>
<i>Greece</i>	<i>290</i>	<i>281</i>	<i>9</i>
<i>Ireland</i>	<i>353</i>	<i>340</i>	<i>13</i>
<i>United Kingdom</i>	<i>1809</i>	<i>1757</i>	<i>52</i>
<i>Spain</i>	<i>1961</i>	<i>1095</i>	<i>866</i>
<i>France</i>	<i>2626</i>	<i>2045</i>	<i>581</i>
<i>Italy</i>	<i>3963</i>	<i>819</i>	<i>3144</i>
<i>Germany</i>	<i>14068</i>	<i>2099</i>	<i>11969</i>
<b><i>TOTAL</i></b>	<b><i>32139</i></b>	<b><i>13104</i></b>	<b><i>19035</i></b>

- At commercial banks, B/V ranges from a low of 83 percent in Spain to a high of 94 percent in Luxembourg.
- The mean volatility of returns varies from a low of 1.30 percent in Italy to a high of 3.22 percent in the United Kingdom. Most importantly, the mean value of safety-net benefits vary from 13 basis points per Euro in Luxembourg to 28 basis points in Denmark.

- To provide proxies for market-value data for mutual institutions, **we experiment with two alternatives:**
  - the first employs book values for E, B/V, and  $\sigma_V$  ;
  - the second generates synthetic market-value data by using the model and parameters estimated for commercial banks.
- [• In most cases, **the second procedure greatly lowers the values of safety-net benefits and volatility at mutual firms.** One might interpret this as evidence that, on average in most EU countries, more outside discipline is exerted on commercial banks than on savings institutions.]

## 4. Regression results

- No matter how high or low the mean value of safety-net benefits might be in a given country, **the policy problem is to control risk-shifting at the margin. The nonequilibrium, dialectical interpretation we impose on this game makes it advisable to estimate equation (2) and (3) in first-difference form.**
- Regressions investigate how well increases in volatility are disciplined in each country.
- Using a fixed-effects specification for individual institutions chartered in each country, Tables 4 and 5 estimate leverage and fair-premium equations for commercial banks and savings institutions separately.
- Because input data are regression output, economic significance requires  $p=1\%$  or less.

- For commercial banks,  $\alpha_1$  is significantly negative at better than one percent, except in Austria, Netherlands, Sweden, and Italy. In the ten other countries, capital discipline significantly restrains risk. However, for all countries excepting Austria, Finland and France we cannot reject the hypothesis that safety-net subsidies exist (Table 4).
- [ • With the exception of Sweden, the values of  $\alpha_1$  and  $\beta_1$  found for mutual institutions in Table 5 using Model I do not differ much from those reported for banks in Table 4. When Model II is used to adjust accounting data,  $\alpha_1$  typically becomes more negative, but  $\beta_1$  usually becomes more positive. ]

**TABLE 4**  
**SINGLE-EQUATION ESTIMATES OF THE EFFECTIVENESS OF SAFETY-NET CONTROLS**  
**FOR COMMERCIAL BANKS IN FOURTEEN EU COUNTRIES**

Panel data fixed-effects regressions relating changes in a bank's leverage, ( $\Delta B/V$ ), and changes in its fair deposit insurance premium,  $\Delta IPP$ , to the riskiness of its assets,  $\Delta\sigma_V$ .  $B$  is the face value of bank's debt, including deposits.  $V$  is the market value of bank assets. The second and third columns report the value of  $\alpha_1$  and  $\beta_1$ , respectively.

<b>Country</b>	$\Delta(B/V)$	$\Delta IPP$
<b>Austria</b>		
$\Delta\sigma_V$	0.000 (0.24)	0.001* (2.25)
<b>Belgium</b>		
$\Delta\sigma_V$	-0.004** (-4.33)	0.009** (7.07)
<b>Denmark</b>		
$\Delta\sigma_V$	-0.005** (-7.39)	0.022** (12.69)
<b>Finland</b>		
$\Delta\sigma_V$	-0.011** (-21.87)	0.003 (1.79)
<b>Luxembourg</b>		
$\Delta\sigma_V$	-0.004** (-7.69)	0.012** (11.71)
<b>Netherlands</b>		
$\Delta\sigma_V$	-0.003 (-1.67)	0.024** (11.02)
<b>Portugal</b>		
$\Delta\sigma_V$	-0.006** (-5.31)	0.007** (4.59)
<b>Sweden</b>		
$\Delta\sigma_V$	-0.004 (-1.75)	0.045** (6.16)

<b>Ireland</b>		
$\Delta\sigma_V$	-0.025** (-7.00)	0.029** (10.58)
<b>United Kingdom</b>		
$\Delta\sigma_V$	-0.003** (-5.99)	0.004** (9.09)
<b>Spain</b>		
$\Delta\sigma_V$	-0.006** (-7.48)	0.002** (3.18)
<b>France</b>		
$\Delta\sigma_V$	-0.004** (-13.37)	0.001 (1.92)
<b>Italy</b>		
$\Delta\sigma_V$	-0.002* (2.55)	0.005** (3.04)
<b>Germany</b>		
$\Delta\sigma_V$	-0.003** (-7.38)	0.002** (2.73)
* Statistically significant at 5% level ** Statistically significant at 1% level		

# Regression experiments explore the robustness of our interpretation of alpha and beta

- Table 6 provides evidence that **during the sample period** troubled commercial banks found it difficult to expand their access to safety-net subsidies
- Table 9 shows that weakness in a country's control system tends to lessen as its deposit insurance system ages ("learning by doing").
- Table 15 shows that safety-net subsidies are harder to control in smaller countries
- Table 17 shows that "country-champion banks" receive stronger capital discipline, but still **extract greater subsidies at the margin.**

## 5. Policy implications

- **Contestability theories of market structure stress the importance of entry and exit costs.**
- **Nationalistic, Mercy, and Nonescalation Norms generate incentives for national governments to protect domestic institutions from entry by foreign competitors and to resist the exit of important domestic enterprises by bailing them out when they become insolvent.**
  - Recent episodes: In countries like the Netherlands where three large institutions dominate banking markets and foreign entry was until recently discouraged, too-big-to-fail benefits can be substantial.
  - Cross-country issue is whether economic shocks could force taxpayers in low- $\beta_1$  countries to pay for weaknesses in oversight exerted on institutions operating in high-  $\beta_1$  countries.

Table 18

<i>Foreign subsidiaries</i>		
	$\Delta(B/V)$	$\Delta IPP$
$\Delta \sigma_V$	-0.011** (4.54)	0.009** (7.04)
<i>Observations</i>	1156	1156
$R^2$	0.362	0.540
<i>Parent banks</i>		
	$\Delta(B/V)$	$\Delta IPP$
$\Delta \sigma_V$	-0.008** (-3.27)	0.006** (6.96)
<i>Observations</i>	3327	3327
$R^2$	0.402	0.527
<i>Purely domestic banks</i>		
	$\Delta(B/V)$	$\Delta IPP$
$\Delta \sigma_V$	-0.003** (-11.04)	0.003** (16.25)
<i>Observations</i>	27656	27656
$R^2$	0.379	0.456
* Statistically significant at 5% level		
** Statistically significant at 1% level		

- Some of the countries with a high-safety net subsidy (e.g., Sweden) have already suffered sectoral crises, but several (e.g., Netherlands) have not. In any case, **it is dangerous for the EU either to permit banks to move their headquarters from a low safety-net subsidy country to a high-safety net subsidy country or to allow banks from low-risk control country and high-safety net subsidy countries** to exploit the single-license framework to expand their footings in low-safety net subsidy country.
- Table 19 shows that, vis-à-vis estimated safety-net benefits, **acquisition activity appears to move both uphill and downhill.** Banks from high-safety net subsidy and low-risk control countries have both initiated and received the lion's share of cross-border merger and acquisition activity.

**Table 19**

**ESTIMATED TRANSITION PROBABILITIES FOR CROSS-BORDER MERGER AND ACQUISITION ACTIVITY WITHIN AND ACROSS FAIR INSURANCE PREMIUM AND  $\beta_1$  CLASSES DURING 1993-2004**

<b>FROM/TO</b>	<b>High IPP</b>	<b>Medium IPP</b>	<b>Low IPP</b>
<b>High IPP</b>	29.41	11.76	2.94
<b>Medium IPP</b>	17.65	8.82	5.88
<b>Low IPP</b>	14.71	5.88	2.94

<b>FROM/TO</b>	<b>High <math>\beta_1</math></b>	<b>Medium <math>\beta_1</math></b>	<b>Low <math>\beta_1</math></b>
<b>High <math>\beta_1</math></b>	20.59	2.94	2.94
<b>Medium <math>\beta_1</math></b>	2.94	2.94	5.88
<b>Low <math>\beta_1</math></b>	29.41	14.71	17.65

Source: Thomson Financial and European Central Bank for Merger and Acquisitions data.

Interpretation: Think of “High to High” as “bad to bad” and “High to Low” as “good to bad”

- From a global perspective, **entry of banks from or into high-premium or low-control home countries can generate undesirable efficiency**, redistributional, and stabilization effects.
- **EU authorities will have to confront the coordination issues** that these effects raise. These issues are becoming more important because the pace of M&A in the EU financial sector is increasing.