

The Impact of Deposit Insurance on Bank Funding and Lending During the 2008 Global Financial Crisis

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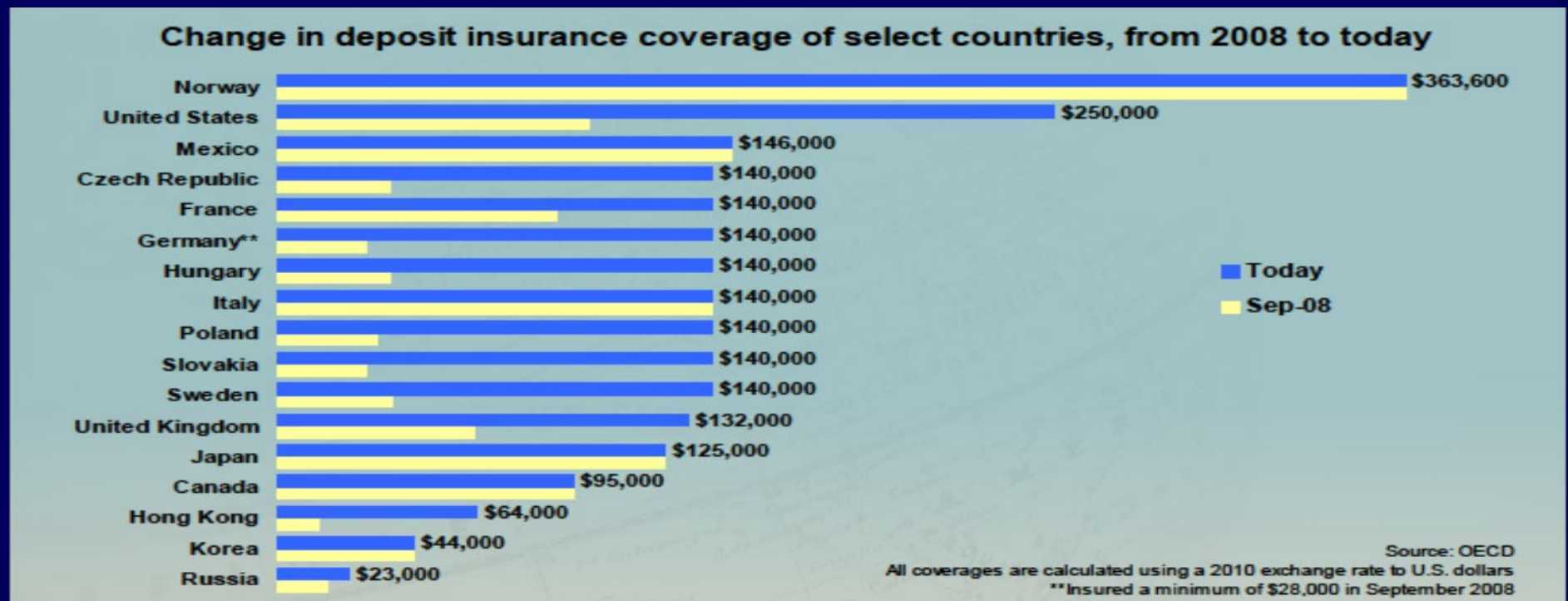
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Motivation

- During the 2008 global financial crisis, bank risk was elevated substantially around the world.
- Banks faced challenges to retain deposits, a major and safe funding source, as depositors worry about bank risk. Another funding source, the interbank loan market was frozen and borrowing costs skyrocketed due to the concern of contagion among banks.
- Constrained by funding sources, some banks tightened their lending to corporations (e.g., Ivashina and Scharfstein, 2010) and charged higher interest rates than before (e.g., Kwan, 2010; Santos, 2011).
- Banks rebalance their portfolio and withdraw funding in host countries back in favor of domestic borrowers (flight home effect, Giannetti and Laeven, 2011).

Motivation

- In response to the global financial crisis, a number of countries substantially increased the coverage of their financial safety nets (Deposit Insurance in particular) in order to restore confidence and to avert potential contagious runs on their banking sectors.



Motivation

Although Deposit Insurance is gaining in popularity among policymakers, its desirability is debated by many researchers.

Theoretical Arguments on Deposit Insurance

- “Moral Hazard Problem”: DI scheme reduces depositors’ incentive to monitor banks (market discipline) and it has been criticized for contributing to banks’ excessive risk-taking behaviors (*Merton, 1977, Bhattacharya and Thakor, 1993; etc.*)
- “Stabilization effect”: Deposit Insurance (DI) is designed to protect depositors against bank failures, removing uncertainty, panic, and inefficient bank runs and liquidation of profitable projects, as well as orderly payment during a crisis (*Diamond and Dybvig, 1983*).

Motivation

- Empirical studies focus on the “moral hazard” impact of deposit insurance coverage on banks’ risk-taking behaviors
 - The adoption of DI leads to higher risk-taking (*Kane, 1989, Wheelock, 1992, Wheelock and Wilson, 1995, Demirguc-Kunt and Detragiache, 2002, Laeven, 2002, Ioannidou and Penas, 2010*).
 - Market discipline is reduced after DI (*Martinez-Peria and Schnukler, 2002; Demirguc-Kunt and Huizinga, 2004; Distinguin, Kouassi and Tarazi, 2011*).
- Different effect during the normal time and crisis
 - *Anginer, Demirguc-Kunt, and Zhu (2014)*
 - *Liu, Zhang and Fang (2016)*
- But there is rare study on the benefits of deposit insurance in terms of retaining deposits, loans and fund flows during the crisis.

The Focus

- Our study is to provide some empirical evidence on the impact of deposit insurance on global bank funding and lending during the 2008 financial crisis.
- In particular, how the explicit deposit insurance affects
 - 1: Banks' deposit funding
 - 2: Banks' total lending to corporations
 - 3: Banks' foreign lending flow ('flight-to-home' effect)
 - 4: Bank-to-corporation loan rate

Preview of findings

- During the financial crisis, on average for global banks, we observe a significant:
 - Decrease in deposits growth rate
 - Decrease in banks' total lending amount
 - Increase in banks' flight home effect (i.e. reduction in lending to other countries)
 - Increase in bank-to-corporation loan rate
- However, deposit insurance plays a stabilization role in mitigating the negative outcomes for global banks and corporations during the 2008 crisis.

Panel Data Structure

- Our study is based on a panel data covering 530 large global banks in 56 countries over 2004-2009.
- Deposit insurance data is from www.iadi.org and World Bank.
- Bank financial data is from BankScope.
- Macroeconomic factors are from World Development Indicator (WDI) and Barth et al., (2006, 2008).
- Bank loan data is from Dealscan.
- Corporate financial data is from Global Compustat.

Deposit insurance by some countries (2007)

	Explicit	Risk-adj premium	Coinsurance	Full coverage	Government established	Risk minimizing	Ex-ante+Ex-post funding
AUSTRALIA	0	0	0	0	0	0	0
AUSTRIA	1	0	0	0	0	0	0
BELGIUM	1	0	0	0	1	0	0
CANADA	1	1	0	0	1	1	1
CHILE	1	0	1	0	0	0	0
CHINA	0	0	0	0	0	0	0
CYPRUS	1	0	0	0	1	0	1
FINLAND	1	1	0	0	1	0	0
FRANCE	1	1	0	0	1	1	1
GERMANY	1	0	0	0	1	0	1
GREECE	1	1	0	0	1	0	1
HONG KONG	1	1	0	0	0	0	0
HUNGARY	1	1	0	0	1	0	1
INDIA	1	0	0	0	1	0	0

Deposit insurance by some countries (2007)

	Explicit	Risk-adj premium	Coinsurance	Full coverage	Government established	Risk minimizing	Ex-ante+Ex-post funding
IRELAND	1	0	0	0	1	0	1
ISRAEL	0	0	0	0	0	0	0
KOREA	1	0	0	0	1	1	0
NORWAY	1	1	0	0	1	1	0
PERU	1	1	0	0	1	0	0
PHILIPPINES	1	0	0	0	1	0	0
POLAND	1	0	0	0	1	0	1
PORTUGAL	1	1	0	0	1	0	0
RUSSIAN FEDERATION	1	0	0	0	1	0	0
SINGAPORE	1	1	0	0	1	0	1
SPAIN	1	0	0	0	0	0	0
SRI LANKA	1	1	0	0	0	0	0
SWEDEN	1	1	0	0	1	0	0
TURKEY	1	1	0	1	1	1	0
UNITED KINGDOM	1	0	0	0	1	0	1
USA	1	1	0	0	1	1	1

Control Variables

- Bank characteristics: Bank Asset, Loan loss provision, liquidity, ROA, Non-interest income, Loan growth.
- Country characteristics: Financial conglomerate restriction, Financial statement transparency, Bank concentration, Foreign presence, Information sharing, Creditor rights, Property rights, Sovereign rating, GDP growth, Inflation, GDP per capital.
- Loan characteristics: Loan size, Loan maturity, Collateral, Relationship lending.
- Borrower characteristics: Firm size, Leverage, Profitability, Tangibility, Z-core, Earnings volatility, Market to book.

Part 1: The Effects of DI on Banks' Deposit Funding

Deposit growth: annual percentage change of total deposits

$$\begin{aligned} & \text{(Deposit growth}_{i,j,t}\text{)} \\ & = \alpha + \beta_1 DI_{i,t-1} + \beta_2 DI_{i,t-1} \times \text{Crisis} + \beta_3 \text{Crisis} + \lambda_1 \text{Bank characteristics}_{i,j,t-1} \\ & + \lambda_2 \text{Country factors}_{j,t-1} + \varepsilon_{i,t} \end{aligned}$$

The Impact of DI on Bank Deposits During the Crisis

VARIABLES	(1) Deposit growth	(2) Δ (Deposit growth)
Explicit	-0.063*** [-2.961]	0.155*** [8.561]
Explicit *Crisis	0.121*** [4.393]	
Crisis	-0.152*** [-5.536]	
Observations	5,689	1,015
Adjusted R-squared	0.143	0.173
Clustered standard errors	Country	Country

- Explicit=0, crisis reduces banks' deposit growth rates by 15.2%.
- Explicit=1, crisis lead to a combined 3% deduction in deposit growth rate .
- DI provides a stabilizing effect on deposit funding, i.e., helping banks retain deposit funds during the crisis.

Part 2: The Effects of DI on Banks' Lending

- 2.1. Banks' total lending to corporations
- 2.2. Banks' foreign lending
- 2.3. Corporations' cost of borrowing

2.1. Banks' lending flow to corporations

Credit availability: Bank-to-Corporation Loan Amount

$$\text{Log}(\text{Credit availability}_{i,t}) = \alpha + \beta_1 \text{DI}_{i,t-1} + \beta_2 \text{DI}_{i,t-1} \times \text{Crisis} + \beta_3 \text{Crisis} + \lambda \text{Control}_{i,t-1} + \varepsilon_{i,t}$$

The Impact of DI on Bank to Corporations Loan Amount

VARIABLES	Log(Total lending amount)	Log(Total number of loans)	Log(Total lending amount)	Log(Total number of loans)
Explicit	0.303*** [6.568]	0.020 [0.886]	-0.038 [-0.970]	0.001 [0.037]
Explicit *Crisis2007- 2009	0.150** [2.405]	0.057* [1.833]	0.238*** [5.441]	0.081*** [3.672]
Crisis2007-2009	-0.060*** [-3.226]	-0.129*** [-4.243]	-0.113*** [-8.833]	-0.157*** [-24.312]
Observations	163,885	163,885	163,885	163,885
Adjusted R-squared	0.367	0.064	0.741	0.588
Country Fixed	Y	Y	N	N
Bank Fixed	N	N	Y	Y

The Impact of DI on Bank to Corporations Loan Amount (Change regression)

$\% \Delta$ Total lending amount = [Mean (Monthly dollar lending volume of loans issued between Aug'07 and Dec'09)/Mean (Monthly dollar lending volume of loans issued between Jan'04 and Jul'07)-1]

VARIABLES	(1) % Δ (Total lending amount)	(2) % Δ (Total number of loans)
Explicit	0.258*** [3.427]	0.283** [2.208]

- On average, the change in lending to corporations in a given bank is negative during the crisis period.
- However, we find a relatively smaller reduction of lending flow for banks in a country with explicit deposit insurance.

2.2. Banks' foreign lending (flight home effect)

Banks' Foreign Lending:

*Share to foreign country*_Loan amount: A bank's total dollar amount of foreign loans / total dollar amount of all loans

$$\text{Share to foreign country}_{i,t} = \alpha + \beta_1 \text{DI}_{i,t-1} + \beta_2 \text{DI}_{i,t-1} \times \text{Crisis} + \beta_3 \text{Crisis} + \lambda \text{Control}_{i,t-1} + \varepsilon_{i,t}$$

The Impact of DI on Banks' Foreign Lending

VARIABLES	(1) Share to foreign country_loan amount	(2) Share to foreign country_loan amount	(3) Share to foreign country_# loans	(4) Share to foreign country_# loans
Explicit	0.066*** [8.662]	0.073*** [9.944]	0.019*** [2.583]	0.025*** [3.689]
Explicit Deposit Insurance*Crisis2 007-2009	0.029*** [2.829]	0.034*** [3.386]	0.052*** [6.301]	0.053*** [7.015]
Crisis2007-2009	-0.017***	-0.014***	-0.009***	-0.007***
Observations	163,885	163,885	163,885	163,885
Adjusted R-squared	0.364	0.403	0.664	0.708
Country Fixed	Y	Y	N	N
Bank Fixed	N	N	Y	Y

The Impact of DI on Banks' Foreign Lending (change regression)

VARIABLES	(1) % Δ Share to foreign country_loan amount	(2) % Δ Share to foreign country_# loans
Explicit	1.257* [1.876]	0.433*** [2.784]

- Flight home effect: during crisis, banks reduce lending to foreign corporations.
- Banks' flight home effect is mitigated for a bank of a country with explicit deposit insurance.

2.3. Corporations' cost of borrowing

Bank to corporation loan spread: AISD

$$\begin{aligned} (\text{Log(AISD)})_{i,j,t} = & \alpha + \beta_1 DI_{i,t-1} + \beta_2 DI_{i,t-1} \times \text{Crisis} + \beta_3 \text{Crisis} + \lambda_1 \text{Loan characteristics}_{i,j,t-1} \\ & + \lambda_2 \text{Country factors}_{j,t-1} + \varepsilon_{i,t} \end{aligned}$$

The Impact of DI on Bank to Corporation Loan Spreads

VARIABLES	Log(AISD)
Explicit	0.335** [2.336]
Explicit *Crisis	-0.414*** [-3.981]
Crisis	0.661*** [6.388]
Observations	9,804
Adjusted R-squared	0.550
Loan type	Y
Loan purpose	Y

- Bank-to-corporation loan costs are on average higher during the crisis.
- Loan spread increase is smaller for banks in countries with DI.

Deposit Insurance Design Features

(1) Risk-adj Insurance Premium: The premium payments by member banks are risk-adjusted for the member bank's asset portfolio.

(2) Coinsurance: Depositors will have to bear a small share of the losses in case of bank failure.

(3) Full coverage: If deposit insurance covers the full losses of the depositors.

- moral hazard is most relevant to unlimited deposit insurance coverage, which explains why full coverage is rare
- the advantages of full coverage might outweigh the disadvantages during a crisis

Deposit Insurance Design Features

(4) Government-established deposit insurance: If the deposit insurance is a government-legislated system

- Deposit insurers' ability to meet their claims is more credible if they are backed by the legal authority of the government rather than by private deposit DI.

(5) “Risk-minimizing” arrangements: If DI is a comprehensive risk-minimizer system rather than a simpler pay box system

- Narrow “pay box” arrangements only reimburse depositors
- More comprehensive “risk-minimizing” schemes limit losses in the deposit insurance fund via direct intervention and supervision of member institutions, as well as resolution of failed banks

(6) Dual sources of deposit insurance funding: If the deposit insurance system has a dual-funding basis (ex-ante and ex-post).

The Impact of DI Design on Bank Deposits During the Crisis

DI variable	Risk-adj. premium	Coinsurance	Full coverage	Risk minimizing	Government established	Ex-ante + Ex-post
DI	-0.018 (-1.508)	0.021 (0.633)	0.005 (0.191)	-0.087*** (-6.852)	-0.062*** (-5.384)	-0.068*** (-5.754)
DI*Crisis	0.050*** (4.269)	-0.051 (-1.169)	-0.052 (-1.095)	0.075*** (6.785)	0.130*** (9.271)	0.071*** (6.458)
Crisis	-0.063*** (-6.187)	-0.031*** (-5.156)	-0.031*** (-5.427)	-0.079*** (-8.376)	-0.141*** (-10.585)	-0.078*** (-8.211)
Adjusted R-squared	0.064	0.058	0.061	0.073	0.075	0.070

The Impact of DI Design on Bank to Corporations Loan Amount

DI variable	Risk-adj. premium	Coinsurance	Full coverage	Risk minimizing	Gov. established	Ex-ante + Ex-post
DI	1.456*** [19.719]	1.103*** [3.664]	0.162 [1.041]	-0.414*** [-5.585]	-1.326*** [-17.432]	0.634*** [9.126]
DI*Crisis	1.094*** [11.551]	-0.623 [-1.233]	1.574*** [6.330]	1.203*** [12.567]	-0.063 [-0.507]	1.536*** [16.124]
Crisis	-2.168*** [-15.858]	-1.555*** [-11.979]	-1.573*** [-12.142]	-2.133*** [-15.572]	-1.431*** [-8.484]	-2.489*** [-17.993]
Adjusted R- squared	0.375	0.376	0.483	0.483	0.488	0.486

The Impact of DI Design on Banks' Foreign Lending

DI variable	Risk-adj. premium	Coinsurance	Full coverage	Risk minimizin g	Gov. established	Ex-ante + Ex-post
DI	-0.205*** [-3.414]	0.936*** [3.959]	0.441*** [3.581]	-1.174*** [-20.243]	-0.655*** [-10.836]	-0.225*** [-4.034]
DI*Crisis	0.501*** [6.508]	-0.425 [-1.064]	-0.012 [-0.059]	0.851*** [11.363]	0.600*** [6.040]	0.442*** [5.768]
Crisis	-1.380*** [-12.533]	-1.094*** [-10.802]	-1.089*** [-10.757]	-1.493*** [-14.060]	-1.597*** [-11.981]	-1.351*** [-12.226]
Adjusted R- squared	0.097	0.096	0.096	0.116	0.101	0.097

The Impact of DI Design on Bank to Corporation Loan Spreads

DI variable	Risk-adj. premium	Coinsurance	Full coverage	Risk minimizing	Gov. established	Ex-ante + Ex-post
DI	0.110 [0.803]	-0.913*** [-7.467]	0.093** [2.045]	0.156 [1.182]	0.292*** [4.202]	0.205** [2.465]
DI*Crisis	-0.180* [-1.925]	0.297 [1.140]	0.285*** [4.435]	-0.092* [-1.653]	0.001 [0.014]	-0.171** [-2.553]
Crisis	0.293*** [3.324]	0.160*** [4.647]	0.188*** [24.495]	0.260*** [5.460]	0.185** [2.171]	0.337*** [5.171]
Adjusted R-squared	0.375	0.376	0.483	0.483	0.488	0.486

Conclusion

- The presence of deposit insurance is an important policy for bank regulation and financial stability. However, empirical evidence has been mixed regarding its effect on banking sectors.
- We provide supportive evidence that DI helps banks retain deposit funding, alleviate the decline of corporate loan availability, mitigate the ‘flight-to-home’ effect during the 2008 financial crisis and lessen the increase of loan cost.
- Overall, DI plays a stabilization role in the crisis. The effect is more pronounced for certain designs ((risk-adjusted premium, risk-minimizing, government established and dual funding source).
- Banks in countries with full coverage deposit insurance have a higher loan rate. This could reflect a higher premium required for full coverage DI, which in turn, is passed on to borrowers.
- Costs and benefits of deposit insurance should be weighted in order to promote the country’s financial stability and economic growth.