THE ROLES OF CORPORATE GOVERNANCE IN BANK FAILURES DURING THE RECENT FINANCIAL CRISIS

Allen N. Berger
University of South Carolina
Wharton Financial Institutions Center
CentER, Tilburg University

Björn Imbierowicz
Goethe University Frankfurt

Christian Rauch
Goethe University Frankfurt

WHY DO BANKS FAIL?

- This question is asked after every crisis, hoping that an answer can help improve financial stability and/or prevent future crises.

- Most studies of bank default have focused on accounting variables, such as capital ratios, earnings, and non-performing loans, with some success.
  - (E.g., Martin, 1977; Pettway and Sinkey, 1980; Lane, Looney, and Wansley, 1986; Espahbodi, 1991; Cole and Gunther, 1995, 1998; Helwege, 1996; Schaeck, 2008; Cole and White, 2012)

- No paper to date has empirically analyzed the influence corporate governance characteristics – such as ownership structure or management structure – have on a bank's probability of default.
  - This is perhaps surprising given:
  - 1) The calls for corporate governance-based mechanisms to control bank risk taking during and after the recent financial crisis (e.g., TARP, Dodd-Frank, G20), and
  - 2) The literature showing that governance mechanisms can have a very strong influence on bank risk taking.
    - (E.g., Saunders, Strock, and Travlos, 1990; Gorton and Rosen, 1995; Anderson and Fraser, 2000; Caprio, Laeven, and Levine, 2003; Laeven and Levine, 2009; Pathan, 2009)

GOAL OF THIS PAPER

- Analyze the roles of corporate governance – including both ownership structure and management structure – in bank defaults.
  - Results are key to underpinning the recent calls for changes in corporate governance to control bank risk.
  - Results may also confirm and add to the literature on the effects of corporate governance on bank performance.

- We combine more than 10 data sets for over 4,000 commercial banks (249 default banks) over the period 2007:Q1 – 2010:Q3.

- We use a comprehensive list of five sets of explanatory variables in a multivariate logit regression model of default:
  - 1) Accounting variables;
  - 2) Corporate governance indicators, including both ownership structure and management structure;
  - 3) Measures of market competition, including the subprime mortgage exposure of the bank's competitors;
  - 4) State-level economic variables, including house price inflation;
  - 5) Information on the bank's primary federal regulator.

Literature Contribution

- General literature on bank default shows:
  - Banks' default risk increases with lower capitalization and more risky loans
  - Banks' default risk increases with lower earnings

- Literature on bank default during the recent crisis shows:
  - Torna (2010): Stronger focus on Investment Banking and Private Equity-type business increases bank PD
  - Aubuchon and Wheelock (2010): Regional economic downturn in banks' home markets increases their PD
  - Ng and Roychowdhury (2011): "Add-backs" from loan loss reserves predict bank default
  - Cole and White (2012): higher RE construction and development loans and commercial mortgages increase bank PD

- Our paper adds to this body of literature by trying to trace the root of this bank behavior: the owners' and managers' decisions on which the banks' business model is based

Literature Contribution cont.

- Our paper also adds to the body of literature focusing corporate governance and bank risk
- General consensus from pre-crisis research: higher shareholdings of officers and directors induce more bank risk taking
- Results from research related to the current crisis:
  - Erkens, Hung and Matos (2012): banks with more independent boards and greater institutional ownership have lower stock returns
  - Beltratti and Stulz (2012): banks with higher controlling shareholder ownership are riskier
  - Closely related is also Fahlenbrach and Stulz (2011) on CEO incentives and bank risk
- Our paper connects this literature with the prior literature on bank defaults
- Our results might provide more insights by looking at the "ultimate risk," default, rather than risk proxies such as Z-Score or stock returns.

MAIN EMPIRICAL FINDINGS

- Results confirm findings in the literature on accounting variables – such as the capital ratio, return on assets, nonperforming loans – help predict bank default.

- Indicators of bank ownership structure add significantly to the explanatory power of the regressions.

- One bank ownership variable is consistently and robustly significant in predicting bank default:
  - Higher shareholdings of other corporate insiders (lower-level management, such as vice presidents) increase PD.

- Most indicators of bank management structure generally do not appear to influence bank PD.

MAIN EMPIRICAL FINDINGS (CONT.)

- Bank market power, competitors' subprime loan exposure, state-level house price inflation and GDP growth, and primary federal regulator also have little or no influence on bank failure.

- Results for the exogenous variables are robust to different specifications, time periods prior to default, data subsamples, as well as a possible sample selection bias caused by the types of banks for which corporate governance data is available.

- The explanatory power of the model decreases, the longer is the lag of the independent variables.

I. Data

We merge information from more than 10 data sources:

- FDIC Failed Institutions list: bank default/FDIC conservatorship information
- EDGAR, and Mergent Bank database: corporate governance data
- FHFA data: house price inflation (state level)
- HMDA data: subprime exposure of competitors (weighted by the bank's deposits in each census tract/MSA)
- FDIC SoD data: bank's local market power (weighted by the bank's deposits in each rural county/MSA)
- Federal Reserve Bank of St. Louis FRED database: GDP (state level)
- Call reports for accounting data

We also examine some anecdotal evidence on bank defaults in the current crisis:

- FDIC Material Loss Reports, wire articles, press releases, newspaper articles: bank failure cause, bad risk management?, Cease and Desist order issued prior to failure?, was failure surprise for regulator/ supervisor?, estimated cost to the FDIC
- Kroll Ratings: LACE bank rating reports

I. Data

				Available Corporate Governance Data	
	Total	No Default	Default	No Default	Default
Number of Banks	**4,270**	**4,021**	**249**	**256**	**85**
Bank-Quarter Observations	**79,984**	**76,349**	**3,635**	**4,617**	**1,288**

- Our starting data set includes more than 4,000 US-based and -held commercial banks (no thrifts), observed over the period Q1:2007 to Q3:2010
- Of these banks, 249 defaulted during the recent financial crisis. 4,021 did not default
- Using the aforementioned data sets, we are able to obtain reliable corporate governance data for 85 out of 249 default banks, and for 256 out of 4,021 no default banks

I. Data

<u>One important remark:</u>

- We put a lot of effort into (manually) collecting the corporate governance data for the (default) banks.

- This data collection process has one consequence: We obtain corporate governance data for a larger fraction of default banks as compared to the total sample size (85 out of 249=21.8%), as in the control sample of no default banks (256 out of 4,021=6.4%)

- Another reason for this is: a larger fraction of default banks registered shares with the SEC (69.9%), as compared to the starting data sample (41.2%). We are more likely to obtain governance information for "public" banks.

This might result in a potential sample selection bias for which we control thoroughly:

1. In the regressions: by controlling for whether the bank is publicly traded.
2. By also investigating results in a (Heckman) selection model.
3. By investigating subsamples excluding bank types with a higher likelihood to publish governance data.

➔ **Results are robust.**

I. Data and anecdotal evidence on bank defaults.

The number of bank failures in the recent financial crisis by cause and the expected cost to the FDIC fund (in $ million):

Panel A	2007	2008	2009	2010:Q1-Q3	Total
General Crisis Related	- -	2 ($42)	35 ($521)	58 ($205)	95 ($768)
Liquidity Problems Only	- -	- -	1 ($12)	- -	1 ($12)
Loan Losses Only	1 ($110)	12 ($758)	51 ($703)	42 ($510)	106 ($2,081)
Liquidity Problems and Loan Losses	- -	3 ($939)	16 ($593)	3 ($501)	22 ($2,033)
Fraud	- -	1 ($0)	2 ($87)	2 ($77)	5 ($164)
Other	1 ($16)	2 ($874)	14 ($753)	3 ($48)	20 ($1,691)
Total	2 ($126)	20 ($2,613)	119 ($2,668)	108 ($1,341)	249 ($6,748)

Panel B	2007	2008	2009	2010:Q1-Q3	Total
Bad Risk Management	50.00%	5.00%	27.73%	9.26%	18.07%
Cease and Desist Order before Failure	0.00%	15.00%	8.40%	5.56%	7.63%
Failure Surprising	0.00%	35.00%	17.65%	5.56%	13.65%

I. Data

Corporate Governance Data: Definitions

- Outside Directors: directors without other direct management executive function within the bank ≡ members of the board excluding chief officers and other corporate insiders

- Chief Officers: managers with a "chief officer" position (CEO, CFO, CRO, CLO)

- Other Corporate Insiders: employees of the bank excluding chief officers and board members (lower-level management, such as vice presidents)

I. Data and anecdotal evidence on bank defaults.

Corporate Governance data: Ownership Structure

	Total	No Default	Default
Ownership Variables			
Shares Outside Directors/Shares	0.097	0.076	0.159
Shares Chief Officers/Shares	0.027	0.019	0.053
Shares Other Corp. Insiders/Shares	0.063	0.029	0.166
TARP	0.296	0.379	0.047
Public Bank	0.501	0.438	0.694
Multibank Holding Company	0.135	0.117	0.188

The descriptive results suggest that bank risk is lower when:

- Outside Directors hold less shares
- Chief Officers hold less shares
- Other Corporate Insiders hold less shares

I. Data and anecdotal evidence on bank defaults.

Corporate Governance data: Management Structure

	Total	No Default	Default
Management Variables			
Outside Directors/Board	0.884	0.886	0.879
Chief Officers/Board	0.379	0.331	0.524
Other Corporate Insiders/Board	1.563	1.560	1.571
log(Board Size)	2.487	2.550	2.297
Chairman is CEO	0.739	0.781	0.612

The descriptive results are not that clear-cut in distinguishing between default and no default banks as the ownership data. Yet, they indicate that bank risk is lower when there are

- Less Officers
- Larger boards
- the Chairman is also the CEO

II. Methodology and results of multivariate analysis

We use a comprehensive list of five sets of explanatory variables:

- ## Accounting Variables

  log(Assets), Capital Ratio, Total Loans excl. construction and development (C&D) loans/Assets, C&D Loans/Assets, Loan Concentration, Short-term Deposits/Assets, Brokered Deposits/Assets, Return on Assets, Non-performing Loans/Assets, Loan Growth, Mortgage-backed Securities (MBS)/Assets, Unused Commitments/Assets

- ## Corporate Governance Variables

  Ownership Structure and Management Structure

- ## Market Competition Variables

  Local Market Power (=HHI), Local Market Power^2, Competitors' Subprime Exposure

- ## State-Level Economic Variables

  State-Level House Price Inflation, %-Change in GDP

- ## Primary Federal Regulator Variables

  OCC, FED, FDIC (base case)

II. Methodology and results of multivariate analysis

We analyze the different variables' influence on a bank's probability of default using logit regression models, standard in the bank default literature (Martin, 1977; Campbell, Hilscher, and Szilagyi, 2008)

- Exogenous variables are lagged at different time points prior to default: **1 year and 2 years**

- One concern might be that groups (have to) adjust their ownership/ membership due to the circumstances in the financial crisis.

→ We address this by also using the exogenous variables only in **2006:Q4** as predictors of default to rule out potential dynamic effects in the crisis.

II. Methodology and results of multivariate analysis

We employ different combinations of the five sets of explanatory variables to determine:

- Which set(s) add substantial explanatory power?
- Which variables are significant?
- At what point in time prior to default do sets or individual variables have the largest explanatory power?

More specifically,

- Are there any variables other than the standard accounting variables which help explain bank defaults?
- Could corporate governance characteristics (ownership structure and/or management structure) provide additional explanations for banks' probabilities of default (PDs)?
- Do variables associated with the recent financial crisis (house price deflation, subprime exposure) explain banks' PDs?

II. Methodology and results of multivariate analysis

Full Model, including all sets of variables:	Default in 1 Year	Default in 2 Years	2006:Q4
Corporate Governance Variables			
Ownership Variables			
Shares Outside Directors/Shares	-2.734**	0.058	1.788
Shares Chief Officers/Shares	0.955	2.156	3.763
Shares Other Corp. Insiders/Shares	2.657***	2.209**	3.975***
TARP	-1.570**		
Public Bank	0.582	1.175**	1.856***
Multibank Holding Company	0.683	0.586	2.101*
Observations	4,582	4,315	268
Number of Defaults	66	67	67
McFadden's adjusted Pseudo R-squared	44.3%	28.0%	53.5%

- Bank PD increases when other corporate insiders hold more shares.
- No clear-cut result for officer and director shares regarding the PD.

II. Methodology and results of multivariate analysis

Possible explanation:

- According to Merton (1977), shareholders of banks with deposit insurance have a moral hazard incentive to take on excessive risks because of the put option to return the assets of the bank to the insurer in the event of default.

- Other Corporate Insiders have direct influences on the bank's daily operations (i.e., risk taking).

  → **Thus, they have the incentive and means to increase the risk of the bank.**

- In contrast, Outside Directors and Chief Officers are "publicly visible" and their personal reputations are at risk as well.

→ Outside Directors and Chief Officers may lose more than their equity investment, if too high risks are assumed.

→ This explanation is supported by research on principal-agency theory, showing that career and reputation concern play a major role in the decision-making of management (e.g. Holmstrom and Ricart i Costa, 1986, or Hirshleifer and Thakor, 1992)

→ Alternatively, perhaps they did not fully understand all the risks in their portfolios in the recent financial crisis (as e.g. remarked in the UBS Shareholder Report on the banks' losses), so they were unable to influence the PD very much.

II. Methodology and results of multivariate analysis

Full Model, including all sets of variables:	Default in 1 Year	Default in 2 Years	2006:Q4
Ownership Variables			
Shares Outside Directors/Shares	-2.734**	0.058	1.788
Shares Chief Officers/Shares	0.955	2.156	3.763
Shares Other Corp. Insiders/Shares	2.657***	2.209**	3.975***
TARP	-1.570**		
Public Bank	0.582	1.175**	1.856***
Multibank Holding Company	0.683	0.586	2.101*
Management Variables			
Outside Directors/Board	-1.000	-1.267	-0.443
Chief Officers/Board	-0.429	-0.011	6.196***
Other Corporate Insiders/Board	1.096	0.218	-1.009
log(Board Size)	-0.749	-0.713	0.006
Chairman is CEO	-0.664*	-0.528	-0.765

- Indicators of bank management structure do not appear to substantially influence bank PD — the individual variables are generally not statistically significant.

II. Methodology and results of multivariate analysis

Further Results:

- Results confirm findings in the literature on accounting variables – such as the capital ratio, return on assets, and nonperforming loans – help predict bank default.

Full Model, including all sets of variables:	Default in 1 Year	Default in 2 Years	2006:Q4
Accounting Variables			
log(Assets)	-0.372	-0.087	-0.279
Capital Ratio	-33.180***	3.243	-0.689
Total Loans excl. C&D/Assets	-3.134	0.579	1.375
C&D Loans/Assets	1.542	9.387***	23.391***
Loan Concentration	0.671	-0.763	4.857**
ST Deposits/Assets	-9.120***	-3.700	-0.859
Brokered Deposits/Assets	3.883**	1.829	1.055
Return on Assets	-28.714***	-18.717**	-151.455**
Non-perform. Loans/Assets	19.804***	8.453	157.627**
Loan Growth	-12.406**	0.924	5.784*
MBS/Assets	-0.825	0.203	-6.222
Unused Commitm./Assets	-3.861**	-4.554**	3.052

II. Methodology and results of multivariate analysis

- Bank market power, competitors' subprime loan exposure, GDP, house price inflation, and different primary federal regulators have little or no influence on bank failure.

	Default in		2006:Q4
	1 Year	2 Years	
Market Competition Variables			
Local Market Power	-12.001*	-5.605	-30.385*
(Local Market Power)^2	13.342	7.529	58.597**
Comps.' Subprime Exposure	-18.091***	-5.217	-24.775*
State-Level Economic Variables			
House Price Inflation	-3.510	-38.616***	-23.542
%-Change in GDP	-68.755***	8.359	38.871
Primary Federal Regulator Variables			
OCC	1.114***	0.933**	1.618**
FED	0.345	-0.009	0.138

II. Methodology and results of multivariate analysis.

Adjusted Pseudo R^2	Default in		2006:Q4
	1 Year	2 Years	
Accounting Variables Only	36.6%	19.1%	47.1%
Accounting Variables and			
Ownership and Management Structure and	40.7%	22.1%	55.1%
Market Competition or	41.0%	21.6%	54.9%
Economic Variables or	43.4%	28.3%	54.8%
Primary Federal Regulator	40.4%	21.9%	54.3%
All Variables including Corporate Governance	44.3%	28.0%	53.5%

- The explanatory power decreases, the longer the lag of the independent variables.
- Indicators of bank ownership and management structure add substantial explanatory power.

III. Robustness of Results

- All results are robust to different specifications, time periods prior to default, as well as a possible sample selection bias caused by the types of banks for which corporate governance data is available.
- We exclude SIFIs (banks with assets > $50bn. in at least 1 quarter in our observation period), MBHCs, and banks having received TARP

	I. Excluding SIFIs			**II. Excluding Multibank Holding Companies**			**III. Excluding Banks which received TARP**		
	Default in		2006:Q4	Default in		2006:Q4	Default in		2006:Q4
	1 Year	2 Years		1 Year	2 Years		1 Year	2 Years	
Ownership Variables									
Shares Outside Directors/ Shares	-2.661**	0.073	2.127	-3.613**	-0.276	-0.089	-2.874**	-0.576	0.977
Shares Chief Officers/Shares	0.864	2.090	4.024	1.156	2.726	5.434**	1.109	1.320	0.173
Shares Other Corp. Insiders/ Shares	**2.678*** **	**2.222** **	**4.073*** **	**4.102*** **	**1.925***	**3.523** **	**2.444*** **	**2.366*** **	**4.372*** **

III. Robustness of Results

- Results for indicators of ownership structure and management structure in a Heckman Selection model (selection equation is

*Corporate Governance Data available = α + β_1*ln(Assets) + β_2*(ln(Assets))^2 + β_3*Real Estate Loans + β_5*Cumulative Operating Income from 2004:Q1-2006:Q4 + β_5*Agricultural Loans + β_6*Commercial Loans + β_7*Individual Loans+ β_8*Public Bank + β_9*Multibank Holding Company + β_{10}*OCC + β_{11}*FED)*

Full Model, including all sets of variables:

	V. Heckman Selection Model 2nd Stage		
	Default in		2006:Q4
	1 Year	2 Years	
Ownership Variables			
Shares Outside Directors/Shares	-1.286***	-0.077	0.671
Shares Chief Officers/Shares	0.107	0.937	1.820
Shares Other Corp. Insiders/Shares	**0.871***	**0.885****	**2.023****
TARP	-0.710**		
Public Bank	1.265***	0.358	-0.063
Multibank Holding Company	0.200	0.239	0.870
Management Variables			
Outside Directors/Board	-0.111	-0.591	-0.064
Chief Officers/Board	-0.130	0.041	3.368***
Other Corporate Insiders/Board	0.378	0.100	-0.808
log(Board Size)	-0.481***	-0.223	0.108
Chairman is CEO	-0.333*	-0.286*	-0.378
	Wald test of indep. eqns. (rho = 0):		
	63.65%	85.24%	38.80%

IV. Incentive Alignment

- Our result of higher shareholdings of other corporate insiders (direct influences on the bank's daily operations (i.e., risk taking)) increasing bank PD should especially be pronounced when their incentives are aligned with chief officers (going back to e.g. Holmstrom, 1999; Prendergast, 1999; and Agarwal and Wang, 2009)

	Base Model			Chief Officers' Holdings Threshold 5%			Chief Officers' Holdings Threshold 10%		
	Default in 1 Year	Default in 2 Years	2006:Q4	Default in 1 Year	Default in 2 Years	2006:Q4	Default in 1 Year	Default in 2 Years	2006:Q4
Ownership Variables									
Shares Other Corp. Insiders/Shares	**3.272*** **	**2.095** **	**4.165*** **						
* Low Incentive Alignment with Chief Officers				2.360*	1.649*	1.235	2.910***	0.938	0.943
* High Incentive Alignment with Chief Officers				**4.745*** **	**2.759*** **	**16.126*** **	**4.888*** **	**5.193*** **	**22.408*** **
Wald Test for Equality of Interaction Terms (p-value)				0.000	0.047	0.005	0.000	0.000	0.008

III. Conclusions

- Banks are more likely to default if they have more shareholdings of other corporate insiders. This may be driven by their incentives for risk taking.

- Our results support the recent efforts of various bank regulators to impose stricter rules on bank compensation systems:

- The amount of stock options (and/or shares) given out to lower-level managers, such as vice-presidents or department heads, should be decreased to increase bank stability.

- One first step in the right direction might also be deferred compensation, introduced in banks after the current financial crisis.