



UNIVERSITY OF EDINBURGH  
Business School

# **Better Safe than Sorry? CEO Inside Debt and Risk-taking in Bank Acquisitions**

**Abhishek Srivastav**

**Seth Armitage**

**Jens Hagendorff**

*University of Edinburgh*

FDIC/JFSR 13<sup>th</sup> Annual Bank Research Conference

# Inside Debt

- Deferred compensation and pension plans
- Key characteristics:
  - Accrues over the CEO's tenure and only released upon retirement,
  - contingent on the firm remaining solvent
  - Turns CEOs into an unsecured firm creditor
- Ties a CEO's personal wealth to the wealth of creditors
- Research on CEO compensation has not explored the role of inside debt on specific bank policy choices. This is mainly due to a lack of data on the value of inside debt, before 2006.
  - In this paper, we examine the effect of inside debt on the risk implications of bank M&A.

# Inside Debt – Some Examples

	<b>CEO</b>	<b>Age</b>	<b>Inside Debt (000s)</b>	<b>Equity-based Compensation (Inside Equity, 000s)</b>	<b>Inside Debt/ Inside Equity</b>
Bank of New York Mellon	Thomas Renyi	60	21,806.08	49,917.00	0.436
Suntrust Bank	James Wells, III	59	20,805.88	6,685.38	3.112
Keycorp	Henry Meyer, III	57	24,011.41	31,796.86	0.755
US Bancorp	Richard Davis	53	15,740.96	21,806.75	0.722

- Around 85% of bank CEOs hold some amount of inside debt
- Average amount of inside debt held is \$6.7 million
- Average (median) Equity-based compensation/Inside debt ratio is 1.14 (0.40)

# Inside Debt: Implications for Firm Risk

- Why focus on inside debt?
  - Equity-based CEO compensation causes risky bank policies (DeYoung et al., 2013; Fahlenbrach and Stulz, 2011; Minnick et al., 2011)
  - Policy discussions: Need to understand how to design appropriate risk-taking incentives for bank executives (Federal Reserve, 2010)
- Empirical Evidence
  - For non-banks: Sundaram and Yermack (2007); Wei and Yermack (2011); Cassell et al. (2012); Phan (2013).
  - For banks: larger CEO inside debt holdings before the crisis are associated with lower bank default risk during the crisis (Bennett et al., 2012)

# Questions Addressed in this Paper

- Do CEO inside debt holdings affect bank risk-taking?
- Previous work shows inside debt is associated with reduction in default risk (Bennett et al., 2012; Sundaram and Yermack, 2007)
  - But *how* such risk reductions occur remains unexplored
  - Does inside debt lower safety net subsidies?
  - Do the associations between inside debt and bank risk imply causality?
- Our identification strategy focuses on risk changes around bank M&A
  - M&A may act as a device for shareholders to engage in excessive risk-taking as shareholders seek to benefit from government guarantees (Benston et al., 1995; Penas and Unal. 2004; Carbo-Valverde et al., 2012; etc.)

# Inside Debt in the Banking Industry

- Inside debt in the banking industry matters:
  - Bank capital structure and the shareholder-oriented corporate governance
  - Banking offers a unique setting to observe a different type of risk shifting that aims to maximize the value of the safety-net to shareholders.
  - Does inside debt constrain risk-shifting to the safety-net?
  
- Bank M&A as a mechanism to engage in risk-shifting to the financial safety-net (Benston et al., 1995; Carbo-Valverde et al., 2012)

# The Paper in a Nutshell

- Higher CEO inside debt is associated with a reduced likelihood that CEOs engage in an acquisition.
- Bank risk is reduced after an acquisition if CEO wealth is more sensitive to inside debt
- Higher CEO inside debt holdings reduce both
  - asset risk and
  - leverage risk following M&A
- Acquisitions pursued by CEOs with higher inside debt relative to inside equity are associated with a reduction in the value of the safety-net to bank shareholders.
  - CEO inside debt also reduces the propensity of bank CEOs to engage in risk shifting to the financial safety-net via M&A.

# Contributions

- We contribute to the literature studying CEO pay and bank risk-taking (DeYoung et al., 2013; Fahlenbrach and Stulz, 2011; etc.) by providing evidence of bank CEOs pursuing risk reducing policies as a result of higher inside debt holdings
  - Establish a direct causal link between inside debt and a bank policy through which CEOs affect bank risk
  
- We are the first to directly measure the implications of CEO pay for the value of the safety-net for bank shareholders.
  
- Our paper contributes to an emerging literature on the impact of inside debt on firm behavior (Sundaram and Yermack, 2007; Cassell et al., 2012; Phan, 2014) by focusing on banking industry where risk-taking incentives are particularly strong

# Sample

- Thomson Financial Mergers and Acquisitions: all acquisitions announced by listed Bank Holding Companies (BHCs), between 2006 and 2012
- Deal Size  $\geq$  \$10 million
- Excl. self-tenders, leveraged buyouts, and recapitalizations
- Conditions imposed on Sample:
  - Removed deal withdrawn, banks where no data on independent variables
  - Adjusted for multiple deals within one year (Furfine and Rosen, 2011)
- **Final Sample:** 117 deals

# Main Variables

- **Bank risk:** Measured via the Merton distance-to-default (DD) model. Captures default risk as the number of standard deviations that the market value of assets is above the default point (MV of Assets < BV of Liabilities)

$$\text{Distance-to-Default (DD)} = \frac{\ln (V_{A,t} / L_t) + (r - 0.5 \sigma_{A,t}^2)T}{\sigma_{A,t}T}$$

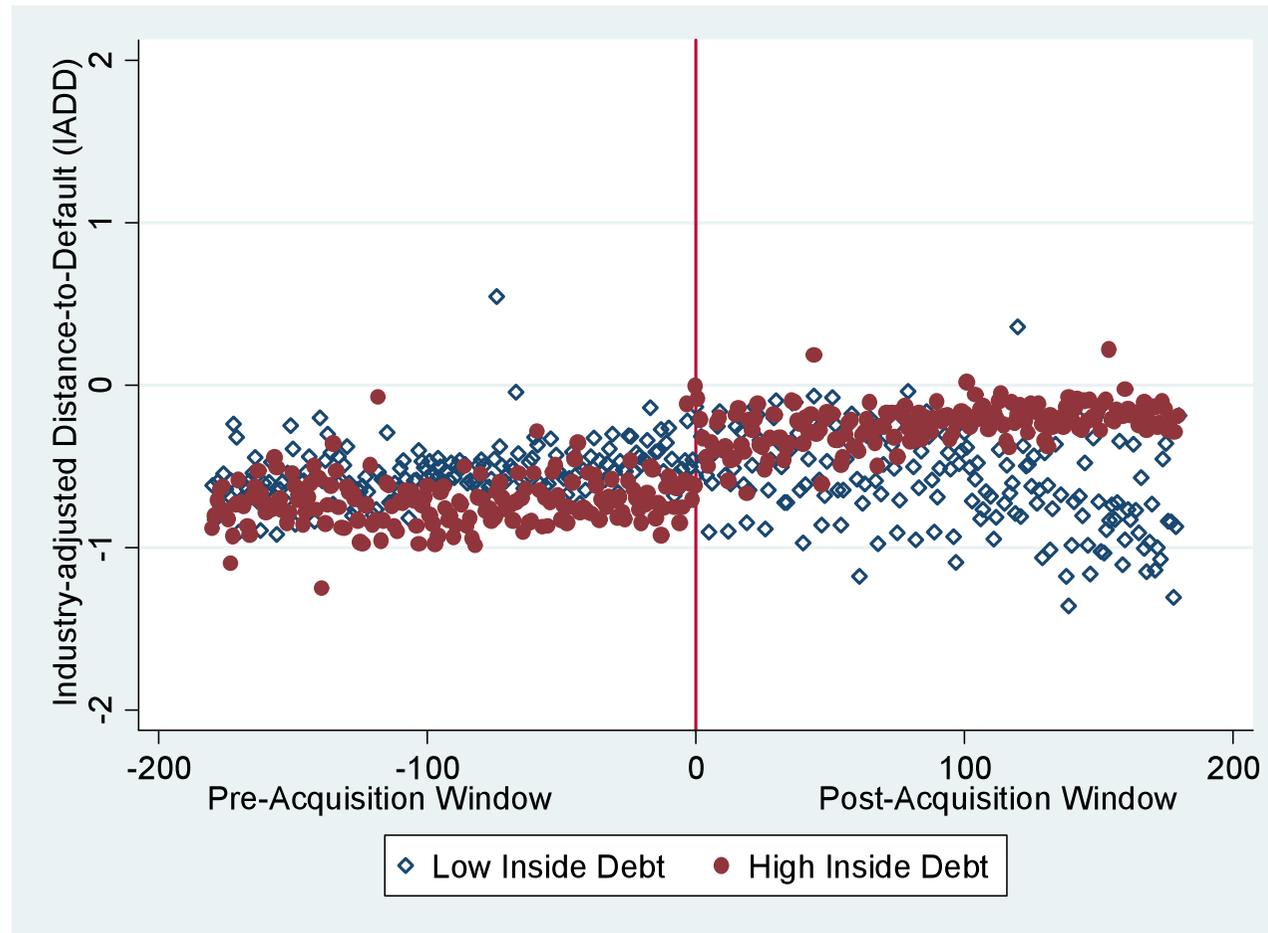
$$\text{Industry-adjusted DD } (\Delta\text{IADD}) = \Delta\text{DD of Acquirer} - \Delta\text{DD of Benchmark Index}$$

- **Inside debt:** Marginal change in CEO inside debt to CEO inside equity scaled by the marginal change in firm debt / equity (Wei and Yermack, 2011; Cassel et. al 2012)

$$\text{CEO relative debt-to-equity} = \frac{\Delta\text{CEO Inside Debt} / \Delta\text{CEO Equity-based compensation}}{\Delta\text{Bank Debt} / \Delta\text{Bank Equity}}$$

# Preliminary Evidence

Changes in bank's default risk around an acquisition, segmented by High/Low inside debt



# Model

$$\Delta\text{ADD}_{i,t} = \alpha_i + \beta_1 \text{INSIDE DEBT}_{t-1} + \beta_2 \text{DEAL ATTRIBUTES}_t + \sum \beta_i \text{CONTROLS}_{t-1}$$

- DEAL ATTRIBUTES: Method of Financing; Public/Private Target; Relative Deal Size; Diversifying Acquisition
- BANK-SPECIFIC CONTROLS: Bank Size; Profitability; Charter Value; Leverage; High pre-merger risk;
- CORPORATE GOVERNANCE VARIABLES: Board Size; Board Independence; Duality (CEO=Chairman?)
  
- Endogeneous self-selection?
  - Non-random sample: Banks self-select whether to pursue acquisitions or not
  - Control for potential bias by using Heckman's Two-stage model

# Inside Debt: Regressions on Acquisition Likelihood

Heckman's First-Stage	(1)	(2)	(3)	(4)	(5)
<b>CEO relative debt-to-equity ratio</b>	<b>-1.619*</b>	<b>-2.108**</b>	<b>-2.181**</b>	<b>-2.172**</b>	<b>-2.127**</b>
	<b>(0.945)</b>	<b>(1.009)</b>	<b>(1.008)</b>	<b>(1.026)</b>	<b>(1.053)</b>
CEO Vega/Delta	0.941***	1.030***	0.898***	0.930***	0.883***
	(0.244)	(0.260)	(0.257)	(0.261)	(0.269)
Bank Size		-0.006	0.019	0.011	0.036
		(0.065)	(0.068)	(0.067)	(0.083)
Profitability		0.188	1.653	3.252	4.343
		(6.663)	(6.454)	(6.982)	(7.048)
Charter Value		-0.307*	-0.418**	-0.481***	-0.444**
		(0.162)	(0.183)	(0.184)	(0.188)
Leverage		-0.270	-0.140	-0.058	-0.031
		(0.238)	(0.241)	(0.252)	(0.253)
Loan Loss Provisions			-32.965***	-33.211***	-36.244***
			(11.644)	(12.341)	(13.844)
Excess Returns				0.637***	0.620**
				(0.232)	(0.248)
Liquidity			1.410**	1.491**	1.298**
			(0.581)	(0.588)	(0.635)
Asset Growth					0.339
					(0.633)
Other Controls*	No	Yes	Yes	Yes	Yes
Corporate Governance Variables	No	No	No	No	Yes
Observations	562	562	562	562	553
Pseudo Adj. R <sup>2</sup>	0.113	0.135	0.165	0.174	0.177

# Inside Debt: Regressions on $\Delta$ Default Risk

	OLS estimates			Heckman's Second-stage estimates	
	(1)	(2)	(3)	(4)	(5)
<b>CEO relative debt-to-equity ratio</b>	<b>2.729**</b> <b>(1.192)</b>	<b>2.105**</b> <b>(0.817)</b>	<b>2.471***</b> <b>(0.840)</b>	<b>4.298***</b> <b>(1.186)</b>	<b>6.431***</b> <b>(1.701)</b>
CEO Vega/Delta	-0.158 (0.296)	-0.268 (0.288)	-0.151 (0.393)	-0.957** (0.409)	-1.398** (0.544)
Bank Size		-0.009 (0.044)	0.011 (0.079)	0.026 (0.091)	0.051 (0.080)
Profitability		-0.926 (20.308)	-14.254 (23.815)	-19.366 (22.601)	-36.263 (22.952)
Charter Value		0.301 (0.243)	0.304 (0.272)	0.782** (0.311)	0.757** (0.329)
Leverage		-0.113 (0.439)	-0.023 (0.559)	0.161 (0.529)	0.149 (0.567)
High Premerger Risk		1.604*** (0.296)	1.594*** (0.342)	1.474*** (0.304)	1.414*** (0.335)
LAMBDA				-0.962** (0.455)	-1.605** (0.616)
Other Controls*	No	Yes	Yes	Yes	Yes
Deal-specific Controls	No	No	Yes	No	Yes
Corporate Governance Controls	No	No	Yes	No	Yes
Observations	117	111	100	109	98
Adjusted R-squared	0.207	0.391	0.388	0.396	0.419

# Inside Debt: Channels of risk-reduction

- Bank acquisitions may affect leverage and asset risk  
(Demsetz and Strahan, 1997; Benston et al., 1995)

	Leverage Risk		Asset Risk	
	$\Delta\text{Eq/RWA}$	$\Delta\text{sub.Debt/RWA}$	$\Delta\text{Asset Volatility}$	$\Delta\text{RWA/TA}$
	(1)	(2)	(3)	(4)
<b>CEO relative debt-to-equity ratio</b>	<b>6.347**</b>	<b>-2.858***</b>	<b>-6.607*</b>	<b>-12.730*</b>
	<b>(3.121)</b>	<b>(0.884)</b>	<b>(3.632)</b>	<b>(7.583)</b>
CEO Vega/Delta	-0.253	0.389	2.242**	1.384
	(1.059)	(0.312)	(0.943)	(2.790)
High Premerger Risk	0.176	0.081	0.218	1.393
	(0.554)	(0.194)	(0.625)	(1.289)
LAMBDA	0.592	0.603**	2.365**	-0.394
	(1.194)	(0.290)	(1.001)	(3.424)
Bank-Specific Controls	Yes	Yes	Yes	Yes
CEO Age and Tenure	Yes	Yes	Yes	Yes
Deal-specific Controls	Yes	Yes	Yes	Yes
Corporate Governance Controls	Yes	Yes	Yes	Yes
Macroeconomic Control and Year FE	Yes	Yes	Yes	Yes
Observations	117	111	100	109
Adjusted R-squared	0.207	0.391	0.388	0.396

# Inside Debt, M&A and Risk-shifting to the Safety-net

- Apart from default risk, another important issue is the taxpayer loss exposures in the event of bank default
- We test whether inside debt decreases the value of safety-net subsidies afforded to bank shareholders following an acquisition
- **Measuring the value of safety-net:** Access to the safety-net acts as a put option on the value of bank assets, underwritten by taxpayers (Merton, 1977).



The value of this put option, % of bank debt is:

$$\text{Insurance Premium per \$ of bank debt (IPP)} = N(y + \sigma_A \sqrt{T}) - ((1 - \delta)^n (V_A/B)N(y))$$

where  $y = (\ln[B/V_A(1 - \delta)^n] - \sigma_A^2 T/2) / \sigma_A \sqrt{T}$

# Inside Debt: Regressions on Safety-net Value

Panel A: Evidence of risk-shifting		$\Delta B/V$	$\Delta IPP$	
Asset Volatility		-0.447*** (0.121)		0.018*** (0.005)
Observations		117		117
Adjusted R-squared		0.064		0.098

Panel B: Determinants of $\Delta IPP$	(1)	(2)	(3)	(4)
<b>CEO relative debt-to-equity ratio</b>	<b>-0.361***</b> <b>(0.098)</b>	<b>-0.536***</b> <b>(0.134)</b>	<b>-0.613***</b> <b>(0.155)</b>	<b>-0.592**</b> <b>(0.243)</b>
CEO Vega/Delta	0.047 (0.029)	0.063** (0.031)	0.097*** (0.035)	0.052 (0.062)
Asset Volatility	0.015*** (0.005)	0.016*** (0.005)	0.015*** (0.005)	0.015*** (0.005)
Bank-Specific Controls	No	Yes	Yes	Yes
CEO Age and Tenure	No	Yes	Yes	Yes
Deal-specific Controls	No	No	Yes	No
Corporate Governance Controls	No	No	Yes	No
Heckman	No	No	No	Yes
Observations	117	111	100	98
Adjusted R-squared	0.148	0.183	0.214	0.219

# Robustness Checks

---

	Inside debt significant?
Using an alternate measure of inside debt	✓
Excluding	✓
➤ <i>Acquisitions of failing banks</i>	
➤ <i>Target banks which received TARP</i>	
➤ <i>Deals completed during crisis period (2008-09)</i>	
➤ <i>Deals where a negative deal premium was paid</i>	
Using an alternative measures of risk	✓
➤ <i>Equity-based measure of firm risk: Stock Volatility</i>	
➤ <i>Unadjusted Default Risk measure</i>	
➤ <i>Relative Default Risk measure</i>	
Using a broader definition of creditor friendly deals (multinomial logit)	✓
Endogeneity: 2SLS using an instrument for inside debt	✓

---

# Conclusions & Policy Implications

- Inside debt accomplishes two objectives simultaneously.
  - Higher inside debt encourages CEOs to pursue risk reducing (i.e. creditor-friendly acquisitions), and
  - It reduces the odds of CEOs pursuing a risk-increasing acquisition.
- CEOs with high inside debt extract benefits from the financial safety-net to a lower degree than CEOs with low inside debt.
- Our study highlights the importance of inside debt in devising compensation contracts that balance the interests of equity holders and debt holders
  - to promote prudent risk-taking at banking firms.
  - However, recent U.S. compensation guidelines fall short of explicitly endorsing inside debt (but not so in the Europe, see Liikanen Report (2012))



UNIVERSITY OF EDINBURGH  
Business School

*Thank you.*