

Economics 210c/236a  
Fall 2011

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# LECTURE 7

## The Effects of Credit Contractions



October 12, 2011

# I. OVERVIEW AND GENERAL ISSUES

## Overview and General Issues

- A. Gertler & Gilchrist's motivation: The need for a credit channel
- B. The gap between the costs of internal and external finance
- C. Changes in the importance of financial market imperfections
- D. A special class of firms: Financial institutions
- E. The importance of general equilibrium considerations
- F. The credit channel of monetary transmission
- G. Some terminology: The bank credit channel, the broad credit channel, and the bank capital channel

## II. GERTLER AND GILCHRIST, “MONETARY POLICY, BUSINESS CYCLES, AND THE BEHAVIOR OF SMALL MANUFACTURING FIRMS”

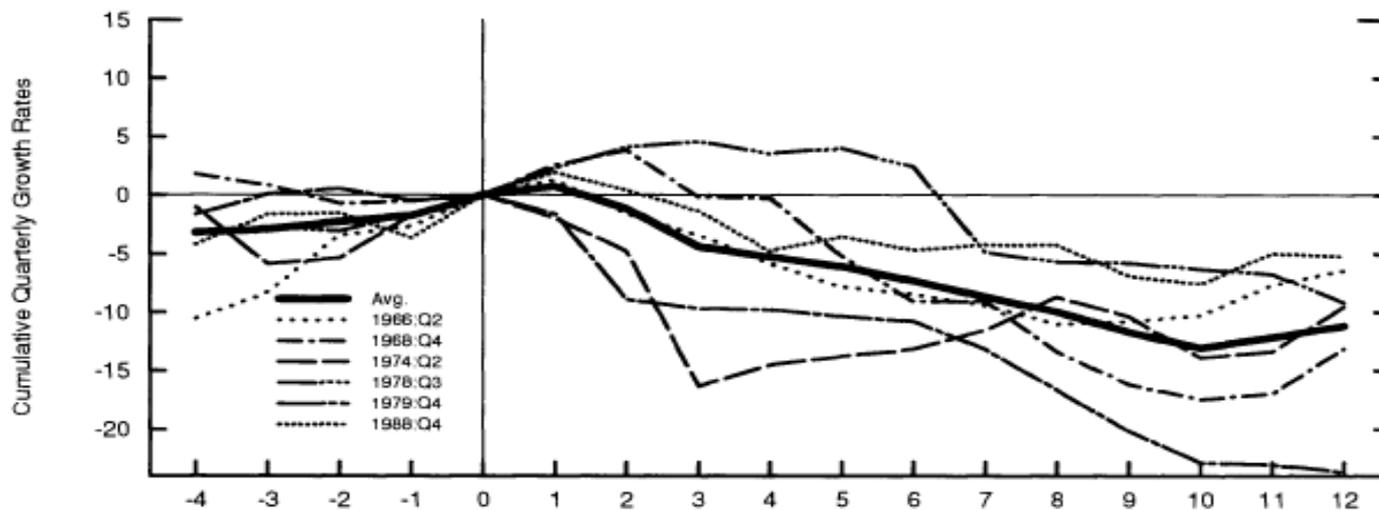
**TABLE II**  
**COMPOSITION OF DEBT FINANCE BY ASSET SIZE, 1986:4**

Type of debt as percentage of total	Asset size (in millions of dollars)				
	All	< 50	50–250	250–1000	> 1000
Short-term debt	0.16	0.29	0.18	0.14	0.13
Bank loans	0.08	0.25	0.15	0.09	0.04
Comm. paper	0.05	0.00	0.00	0.03	0.07
Other	0.02	0.04	0.02	0.02	0.02
Long-term debt	0.84	0.71	0.82	0.86	0.87
Bank loans	0.22	0.43	0.40	0.31	0.14
Other	0.62	0.28	0.42	0.56	0.73
% of bank loans	0.30	0.68	0.55	0.40	0.17

From: Gertler and Gilchrist, “Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms”

# Changes in Sales Around Romer Dates

## Small Firms



## Large Firms

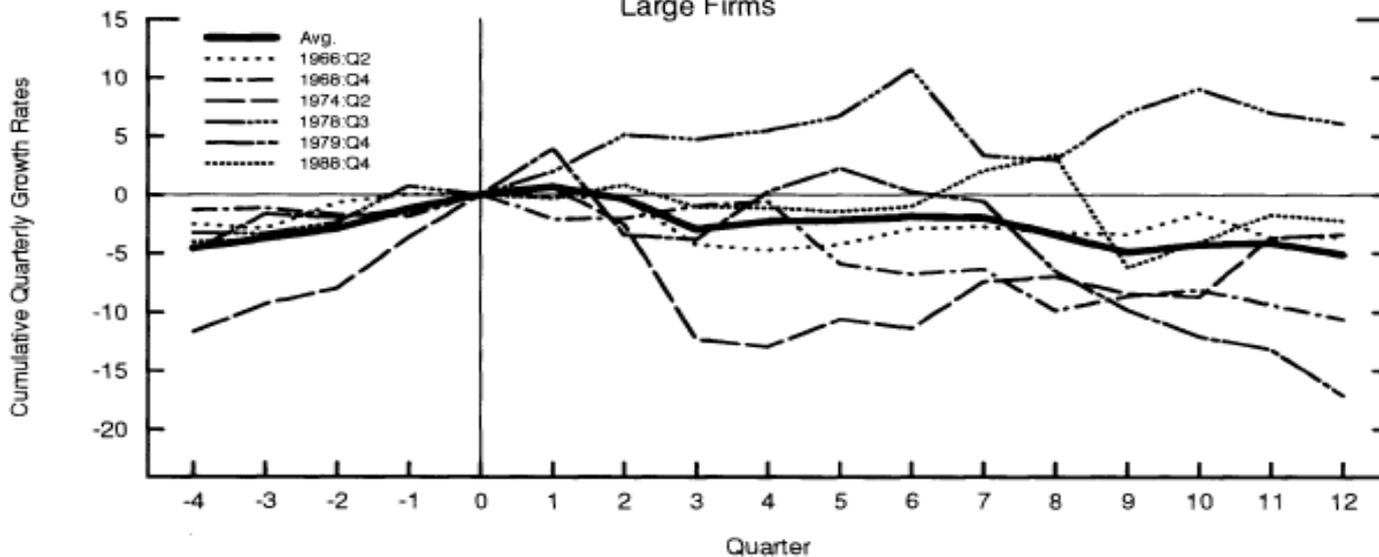
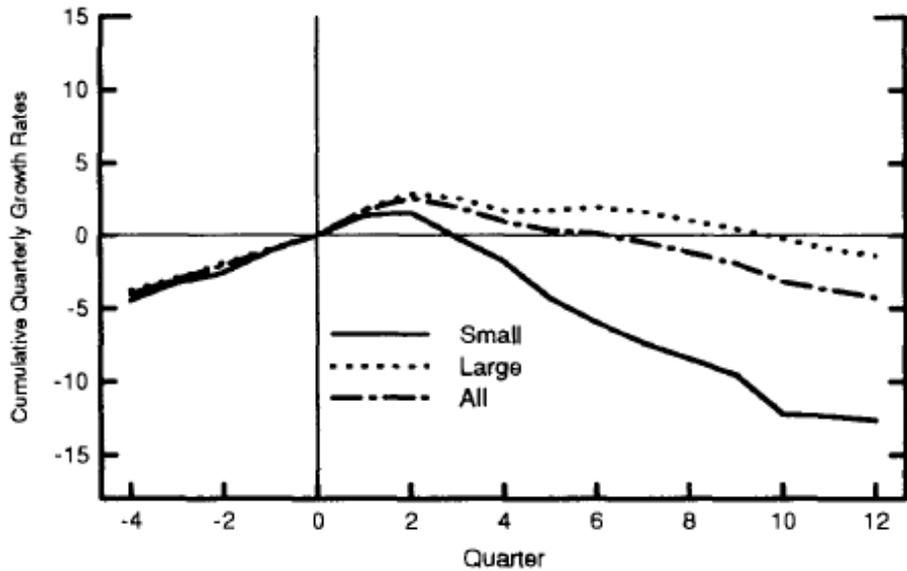


FIGURE II

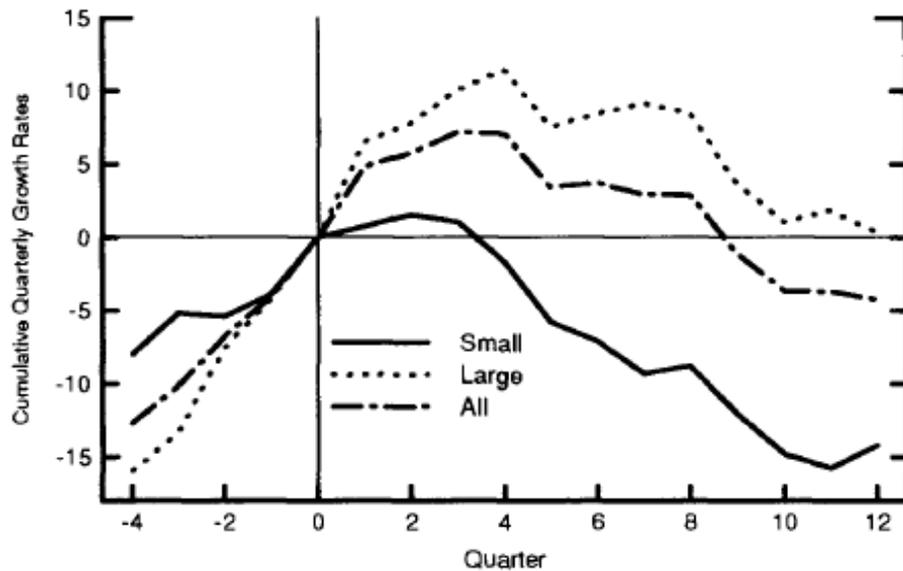
All series are shown as log deviations from their values at Romer dates.

From: Gertler and Gilchrist

### Inventories



### Short-Term Debt



### Short-Term Bank Loans

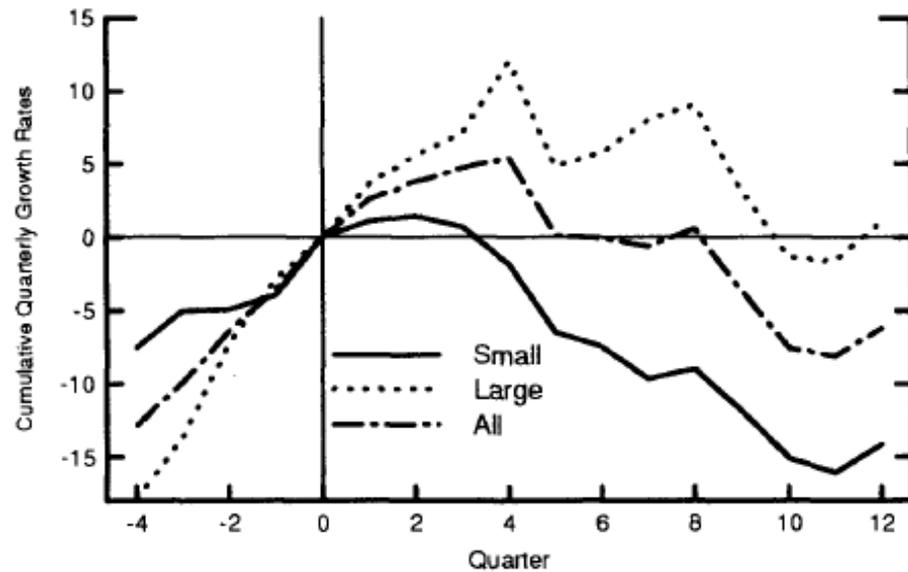
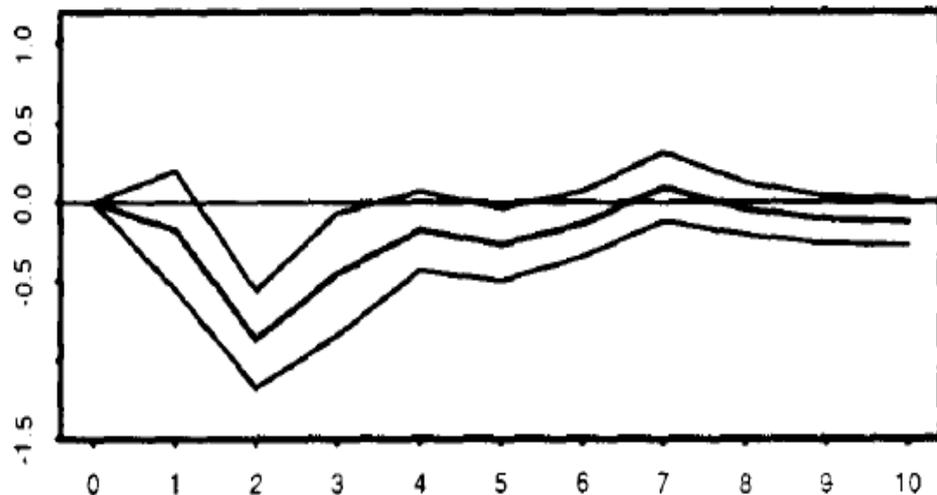


FIGURE III

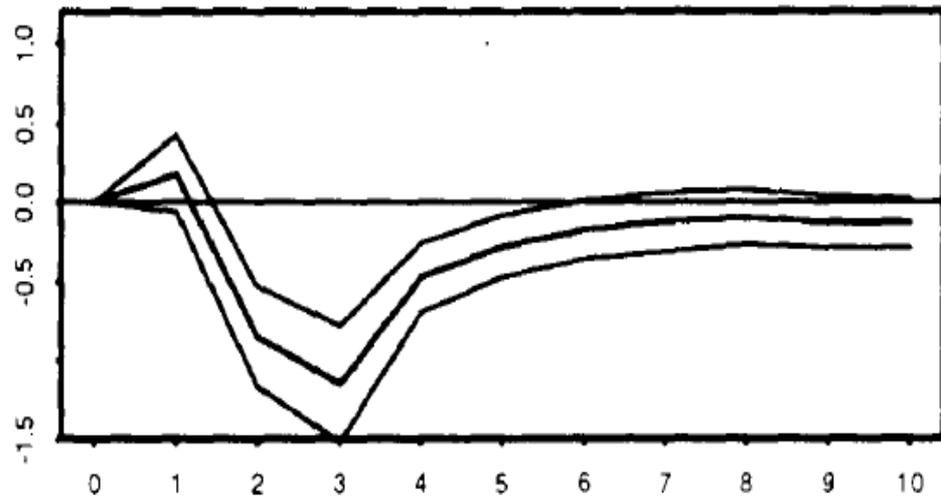
The Average Deviation from Trend Around Romer Dates  
All series are shown as log deviations from their values at Romer dates.

From: Gertler and Gilchrist

Sales-Small, Low-High



Inv-Small, Low-High



I/S-Small, Low-High

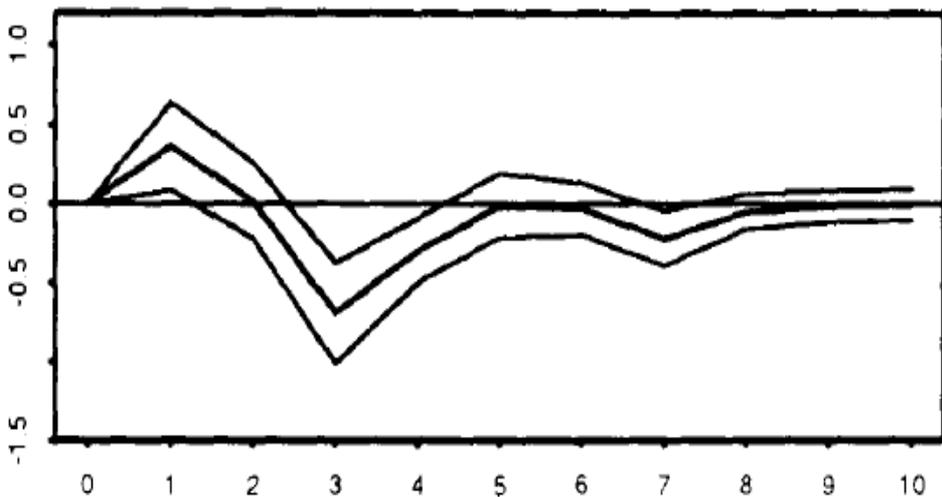


FIGURE VI

Asymmetric Interest Rate Effect

Each figure reports the cumulative response of the quarterly growth rate to a 1 percent rise in the Funds rate. Solid Line = Low Growth. Dashed Line = High Growth. One standard error bands also included.

From: Gertler and Gilchrist

III. CALOMIRIS AND HUBBARD, “INTERNAL FINANCE AND INVESTMENT: EVIDENCE FROM THE UNDISTRIBUTED PROFITS TAX OF 1936-37”

## Calomiris and Hubbard – Issues

- Is there a difference in cost between external and internal finance?
- Is it caused by asymmetric information or by entrenched managers?
- Does the existence of a spread cause investment to depend on cash flow?

**TABLE 1** Retained Earnings as a Percentage of After-Tax Profits for Corporations with Positive Income, 1931–40

	Under 50	50–100	100–250	250–500	500–1,000	1,000–5,000	5,000–10,000	10,000–50,000	Over 50,000	All Classes
1931	57.3	47.8	39.1	32.1	26.4	21.5	13.9	11.1	3.7*	9.6
1932	39.9	31.5	31.6	28.8	26.1	20.8	12.6	7.6	8.9*	4.3
1933	64.0	66.5	61.4	61.3	56.5	47.1	39.4	22.2	2.5*	24.0
1934	53.7†	57.1	52.6	45.5	34.9	25.8	28.5	3.5	13.9	19.7
1935	56.4	52.0	48.5	44.5	34.7	28.2	20.5	8.0	19.8	23.0
1936	35.8	28.4	23.8	22.7	25.8	25.9	22.3	15.6	4.9	15.1
1937	30.4	29.4	24.1	22.8	23.2	22.2	20.7	16.0	8.3	15.1
1938	50.6	54.8	48.3	39.3	37.8	29.5	23.7	16.8	7.3	19.2
1939	62.0	63.1	55.6	46.1	44.6	37.8	33.9	24.2	18.3	28.8
1940	62.2	59.2	56.4	51.2	50.1	44.3	39.0	30.1	22.3	33.2
Average	51.1	48.1	44.1	39.4	36.0	30.3	25.5	15.5	8.0	19.2

SOURCE.—Butters and Lintner (1945, p. 66).

NOTE.—Asset size classes are in thousands of dollars.

\* Indicates an excess of dividends over net profits after taxes.

† This item represents nonfinancial corporations only, because of the abnormal dividends paid by financial corporations of this size in 1934.

From: Calomiris and Hubbard, “Internal Finance and Investment”

## Calomiris and Hubbard – Estimating the Cost of External Finance

- Baseline case (no other taxes): If a firm uses both internal and external finance and faces a marginal tax rate of  $\tau$  on retained earnings, we can infer that the shadow cost of external funds to the firm is  $1/(1 - \tau)$ .
- Calomiris and Hubbard's analysis accounting for taxes, etc.:

Consider an experiment in which a firm increases dividend payments by one dollar, while raising an additional dollar of equity. The effect on firm value is given by

$$(1 - v) + q(1 - c)[u(y) + u'(y)(y - 1)] - (1 + s).$$

**TABLE 2**      **Corporations Subject to Surtax on Undistributed Profits, 1937**

Net Income Class (\$000s)	Returns with Net Income (\$)	No Surtax (%)	7% Rate (%)	12% Rate (%)	17% Rate (%)	22% Rate (%)	27% Rate (%)
Under 5	119,805	19.2	80.8	.0	.0	.0	.0
5-10	18,611	34.7	39.4	8.9	10.4	6.6	.0
10-15	9,150	38.0	32.4	5.6	6.1	7.4	10.7
15-20	5,697	40.0	27.4	7.5	8.3	4.7	12.1
20-25	3,879	39.8	24.1	7.7	11.2	5.4	11.8
25-50	9,282	40.5	18.0	8.7	13.1	8.6	11.1
50-100	6,046	39.8	13.7	9.9	15.7	9.9	10.9
100-250	4,620	38.8	13.0	9.6	15.8	11.8	11.1
250-500	1,819	38.3	13.2	9.2	16.7	13.0	9.6
500-1,000	1,071	36.4	13.8	13.8	17.6	10.2	8.1
1,000-5,000	974	42.2	15.1	11.8	16.5	9.4	4.9
Over 5,000	240	43.3	15.8	17.5	16.7	5.0	1.7

SOURCE.—Figures are derived from U.S. Internal Revenue Service (1937).

NOTE.—Classifications are by highest surtax rate paid.

From: Calomiris and Hubbard, "Internal Finance and Investment"

**TABLE 4**      **Characteristics of Firms, by Surtax Margin**

	Type A	Type B	Type C	All Firms
<b>A. Ratio of dividends to after-tax profits:</b>				
1935:*				
Mean	1.796	.516	.284	1.061
Median	.705	.512	.051	.530
SD	9.932	.461	.404	6.809
<i>N</i>	124	78	64	266
1936:†				
Mean	.950	.696	.463	.759
Median	.888	.689	.478	.731
SD	.629	.303	.374	.532
<i>N</i>	127	80	65	272
1937:‡				
Mean	1.449	.999	.547	1.102
Median	.855	.747	.516	.762
SD	4.852	1.165	.448	3.392
<i>N</i>	124	79	63	266
<b>B. Total assets:</b>				
1936:				
Mean	119,584	43,344	32,664	76,229
Median	22,622	13,833	6,426	15,393
SD	277,456	115,040	72,687	205,969
<i>N</i>	127	80	66	273
<b>C. Pretax profit divided by book value of net worth:</b>				
1936:				
Mean	.126	.161	.130	.137
Median	.099	.124	.100	.108
SD	.095	.106	.094	.099
<i>N</i>	127	80	66	273

From: Calomiris and Hubbard, "Internal Finance and Investment"

**TABLE 6**      **Tests of Differences in Medians across Firm Types**

	Median		<i>t</i> -Statistic for Difference in Medians of Types A and C
	Type A	Type C	
Dividends/aftertax profits, 1935	.705 (.074)	.051 (.012)	8.7
Total assets, 1936	22,622 (3,962)	6,426 (581)	4.0
Net operating profits/sales, 1935	.097 (.005)	.063 (.008)	3.6
Net operating profits/sales, 1936	.119 (.006)	.090 (.005)	3.7
Change in net operating profits, 1935–36/total assets 1935	.029 (.0002)	.046 (.058)	0.3
Change in ratio of market-to-book value, 1935–36	.228 (.050)	.365 (.050)	2.0
Debt/market value of equity, 1935	.068 (.009)	.177 (.041)	2.6
Debt/book value of equity, 1935	.109 (.019)	.209 (.034)	2.5

NOTE.—Standard errors are in parentheses.

From: Calomiris and Hubbard, "Internal Finance and Investment"

## Calomiris and Hubbard – Specification

$$(2) (I/K)_{it} = a_i + bQ_{it} + c(CF/K)_{it} + e_{it}.$$

$$(2') (I/K)_i = a_0 + a_B D_{Bi} + a_C D_{Ci} + b_0 Q_i + b_B Q_i D_{Bi} + b_C Q_i D_{Ci} + c_0 (CF/K)_i + c_B (CF/K)_i D_{Bi} + c_C (CF/K)_i D_{Ci} + e_i,$$

where  $D_B$  and  $D_C$  are dummies for Type B and Type C firms.

**TABLE 8**      **Fixed Capital Investment Regressions, 1936**

	Regressions	
	(1)	(2)
<b>A. Summary statistics:</b>		
Dependent variable	$I_{1936}/K_{1935}$	$I_{1936}/K_{1935}$
Number of observations	244	244
Adjusted $R^2$	.063	.217
<b>B. Coefficients:</b>		
Constant	-.019 (.022)	.015 (.021)
Type B	...	-.037 (.036)
Type C	...	-.112 (.051)
$Q_{1935}$	.044 (.016)	.024 (.011)
$Q_{1935} \times \text{type B}$	...	.024 (.019)
$Q_{1935} \times \text{type C}$	...	.039 (.051)
$[(CF_{1935} + CF_{1936})/K_{1935}]$	.018 (.016)	-.004 (.014)
$[(CF_{1935} + CF_{1936})/K_{1935}] \times \text{type B}$	...	.003 (.018)
$[(CF_{1935} + CF_{1936})/K_{1935}] \times \text{type C}$	...	.248 (.100)

NOTE.—Heteroscedasticity-consistent standard errors are presented in parentheses.

From: Calomiris and Hubbard, "Internal Finance and Investment"

IV. PEEK AND ROSENGREN, "COLLATERAL DAMAGE:  
EFFECTS OF THE JAPANESE BANK CRISIS ON REAL  
ACTIVITY IN THE UNITED STATES

## Peek and Rosengren's natural experiment:

- Financial crisis in Japan causes trouble for banks in U.S. related to Japanese banks (such as U.S. branches of Japanese banks).
- Decline in loans by U.S. branches of Japanese banks are almost surely caused by a decline in loan supply not loan demand.

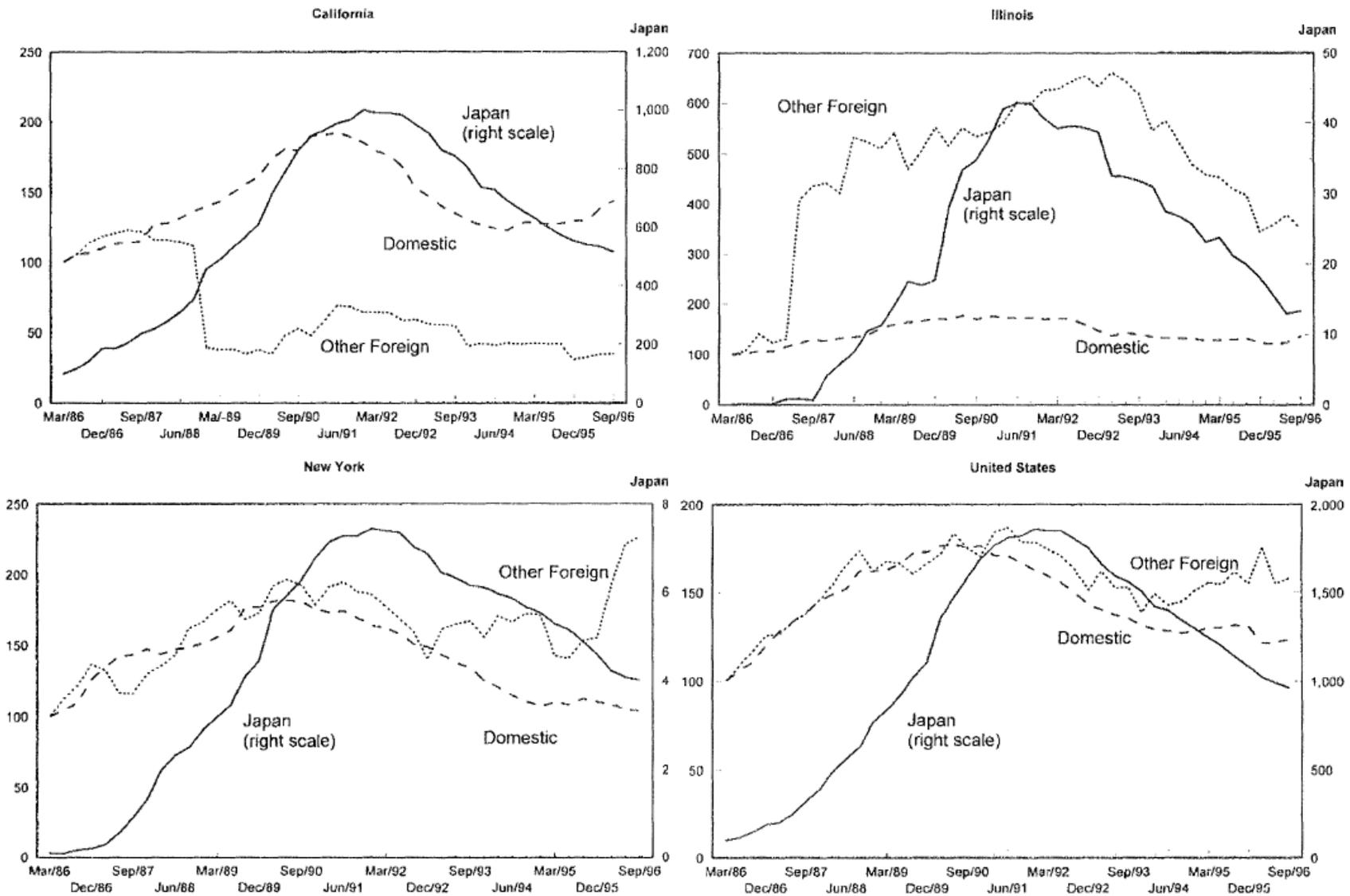


FIGURE 1. COMMERCIAL REAL ESTATE LOANS

Notes: Data are indexed, with March 1986 = 100. For Illinois and New York, the right-hand-side scale is in thousands.

# Transmission of Japanese Shocks to U.S. Commercial Real Estate Lending

- Panel data on all domestically-owned commercial banks headquartered in one of the three states and Japanese bank branches.
- Data are semiannual.
- Dependent variable is change in total commercial real estate loans/beginning period assets held by bank in that state.

# Testing Whether Conditions at a Japanese Parent Bank Affect Lending

$$(1) \quad \frac{\Delta Loans_{i,j,t}}{Assets_{i,j,t-1}} = \beta_0 + \beta_1 \mathbf{JPARENT}_{i,j,t-1} \\ + \beta_2 \mathbf{JAPAN}_{i,j,t-1} \\ + \beta_3 \mathbf{US}_{i,j,t-1} + \varepsilon_{i,j,t}.$$

TABLE 1—COMMERCIAL REAL ESTATE LENDING BY U.S. COMMERCIAL BANKS AND U.S. BRANCHES OF JAPANESE BANKS,  
SEMIANNUAL OBSERVATIONS, 1989:1 TO 1996:2  
ESTIMATION METHOD: VARIANCE COMPONENTS

	Combined states <sup>a</sup>	New York <sup>b</sup>	California <sup>b</sup>	Illinois <sup>b</sup>
Risk-based capital ratio at Japanese parent	0.335** (0.113)	0.302* (0.120)	0.168 (0.235)	0.617* (0.251)
Nonperforming loan ratio at Japanese parent	-0.840** (0.132)	-0.489** (0.141)	-1.437** (0.274)	-0.456 (0.252)
Nonperforming loans availability dummy	-0.432 (0.529)	-0.539 (0.622)	0.144 (1.130)	-1.012 (0.852)
Japanese dummy	-1.593 (1.117)	-2.087 (1.236)	0.898 (2.314)	-5.209* (2.285)
Japanese foreign direct investment growth	0.025** (0.006)	0.017* (0.008)	0.026* (0.013)	0.038** (0.009)
U.S. risk-based capital ratio	0.007 (0.020)	-0.046 (0.031)	0.045 (0.032)	-0.029 (0.034)
U.S. nonperforming commercial real estate loan ratio	-0.414** (0.047)	-0.438** (0.075)	-0.476** (0.087)	-0.266** (0.063)
Log (assets)	-0.142 (0.082)	-0.055 (0.095)	-0.334* (0.169)	-0.132 (0.104)
U.S. loans-to-assets ratio	0.007 (0.006)	0.002 (0.008)	0.019 (0.015)	0.009 (0.009)
Sum of squared residuals	16,108	2,671	10,704	2,495
Standard error of the regression	2.991	2.241	3.970	2.092
$R^2$	0.309	0.310	0.348	0.174
Hausman test $p$ -value	1.000	1.000	0.999	0.265
Number of observations	2,026	607	764	655

Note: Coefficient standard errors are in parentheses.

# Real Effects of Declines in Japanese Commercial Real Estate Lending

- Data are now state level.
- Data are still semiannual.
- Dependent variable is semiannual change in construction in the state.

## Testing Whether Lending Shocks Affect Real Construction Activity

$$(2) \quad \mathit{CONSTR}_j = \alpha_0 + \alpha_1 \mathbf{BANK}_j \\ + \alpha_2 \mathbf{STATE}_j + \alpha_3 \mathbf{NATIONAL} + \eta_j.$$

# Methodology

- Instrument for change in commercial real estate loans by Japanese banks with measures of health of parent bank.
- Also uses change in land prices in Japan.

TABLE 3—COMMERCIAL REAL ESTATE LENDING BY  
JAPANESE AND NON-JAPANESE BANKS  
ESTIMATION METHOD: ORDINARY LEAST SQUARES,  
1989:2 TO 1996:2

	Japanese lending	Non- Japanese lending
<i>Excluded exogenous variables</i>		
Risk-based capital ratio		
Japanese parent <sub>-1</sub>	81.882* (32.783)	117.631 (67.489)
Risk-based capital ratio		
Japanese parent <sub>-2</sub>	99.297** (29.363)	-103.071 (66.242)
Nonperforming loan ratio at		
Japanese parent <sub>-1</sub>	17.170 (30.247)	-177.435 (169.992)
Nonperforming loan ratio at		
Japanese parent <sub>-2</sub>	-33.842 (25.599)	247.687 (194.375)
Nonperforming loans		
availability dummy <sub>-1</sub>	-14.081 (63.272)	603.579 (424.340)
Nonperforming loans		
availability dummy <sub>-2</sub>	-86.744 (57.784)	-660.400 (468.004)
Change in land prices <sub>-1</sub>	-4.921 (2.647)	-3.554 (7.565)
Change in land prices <sub>-2</sub>	9.114** (2.773)	7.029 (8.295)

TABLE 3—*Continued.*

	Japanese lending	Non- Japanese lending
Growth in real personal income per capita <sub>-1</sub>	-2.764 (2.102)	13.956 (9.145)
Growth in real personal income per capita <sub>-2</sub>	-4.930* (2.047)	14.276 (7.588)
Mortgage rate <sub>-1</sub>	2.115 (11.180)	86.885 (70.030)
Mortgage rate <sub>-2</sub>	11.546 (10.606)	-65.487 (45.082)
Inflation rate <sub>-1</sub>	2.218 (5.513)	-38.043 (34.576)
Inflation rate <sub>-2</sub>	-11.236 (7.435)	-2.430 (34.574)
Consumer confidence index <sub>-1</sub>	-3.452** (0.933)	2.474 (5.120)
Consumer confidence index <sub>-2</sub>	-3.419** (1.004)	1.733 (5.019)
$R^2$	0.648	0.431
Sum of squared residuals	2,186,730	55,789,200
Standard error of the regression	81.901	413.682
Partial $R^2$ for excluded exogenous variables	0.368	0.056
$F$ -statistic for set of excluded exogenous variables	41.75**	1.09
$n$	375	375

TABLE 4—THE DETERMINANTS OF REAL ESTATE CONSTRUCTION CONTRACTS AND EMPLOYMENT GROWTH  
ESTIMATION METHOD: TWO-STAGE LEAST SQUARES, 1989:2 TO 1996:2

	Number of construction projects	Square feet of construction projects	Real value of construction projects	State construction employment growth
Change in commercial real estate loans by Japanese banks	0.005** (0.002)	0.015** (0.005)	1.113** (0.365)	0.007** (0.002)
Nonperforming commercial real estate loan ratio <sub>-1</sub>	0.048 (0.124)	0.148 (0.368)	28.254 (22.278)	-0.316 (0.165)
Nonperforming commercial real estate loan ratio <sub>-2</sub>	-0.077 (0.118)	-0.321 (0.355)	-38.976 (24.017)	0.331 (0.172)
Vacancy rate <sub>-1</sub>	0.013 (0.072)	-0.035 (0.248)	-1.186 (16.776)	0.076 (0.084)
Vacancy rate <sub>-2</sub>	-0.126 (0.075)	-0.387 (0.233)	-28.328 (18.492)	0.118 (0.082)
Unemployment rate <sub>-1</sub>	0.576* (0.257)	1.776* (0.707)	61.486 (53.028)	-0.190 (0.327)
Unemployment rate <sub>-2</sub>	0.003 (0.218)	-0.450 (0.593)	-48.808 (46.296)	1.171** (0.275)
...				

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	Number of construction projects	Square feet of construction projects	Real value of construction projects	State construction employment growth
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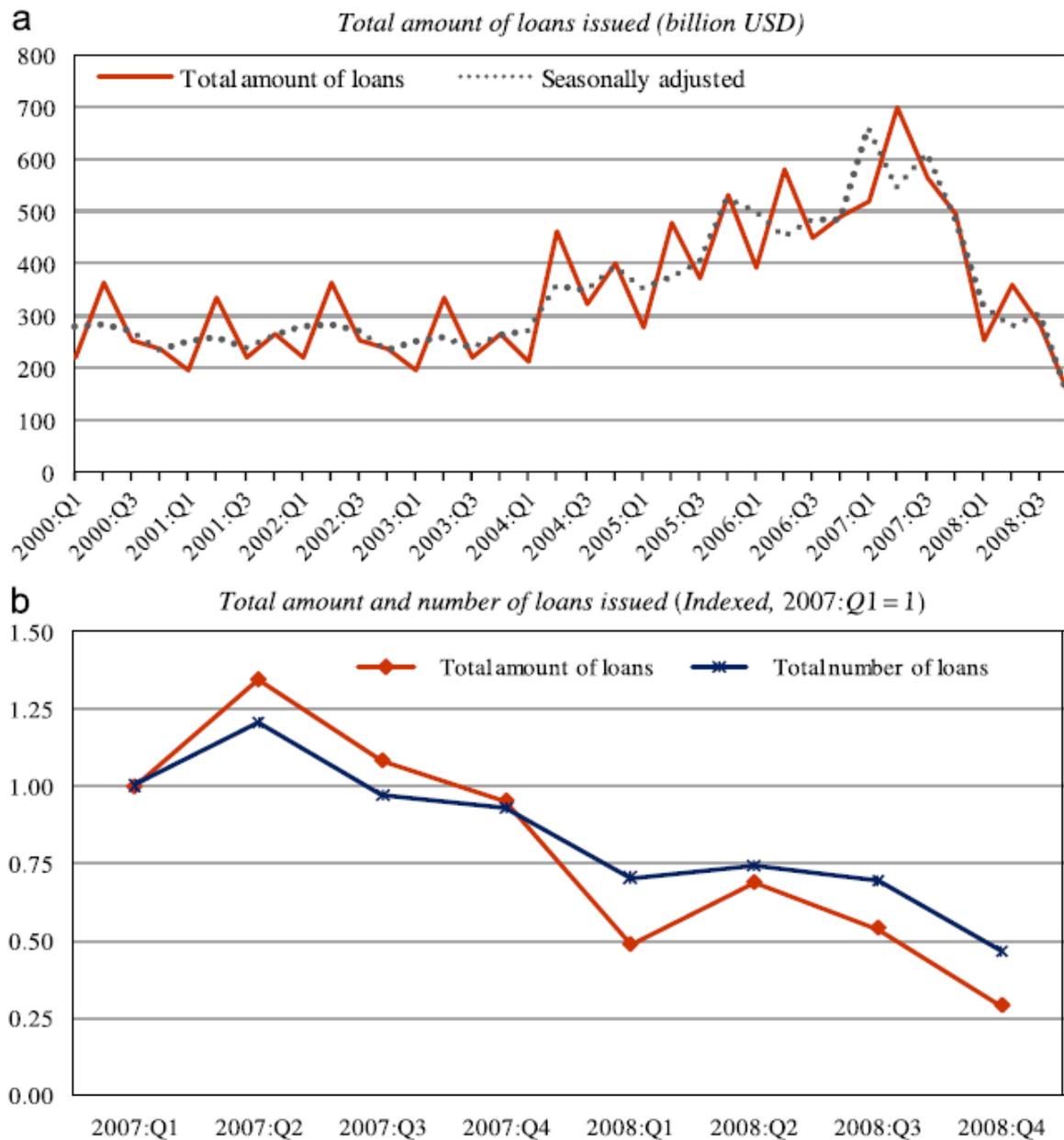
## Interpreting the coefficient:

The 1.113 in column (3) implies that a decline in loans by Japanese banks in a state of \$100 lowers the real value of construction projects in that state by \$111.30.

# V. IVASHINA AND SCHARFSTEIN, “BANK LENDING DURING THE FINANCIAL CRISIS OF 2008”

# Data

- DealScan database of large bank loans
- Most are syndicated loans originated by one or more banks.
- Measure of the flow of new lending
- Ends up aggregating by financial institution (so 38 observations)



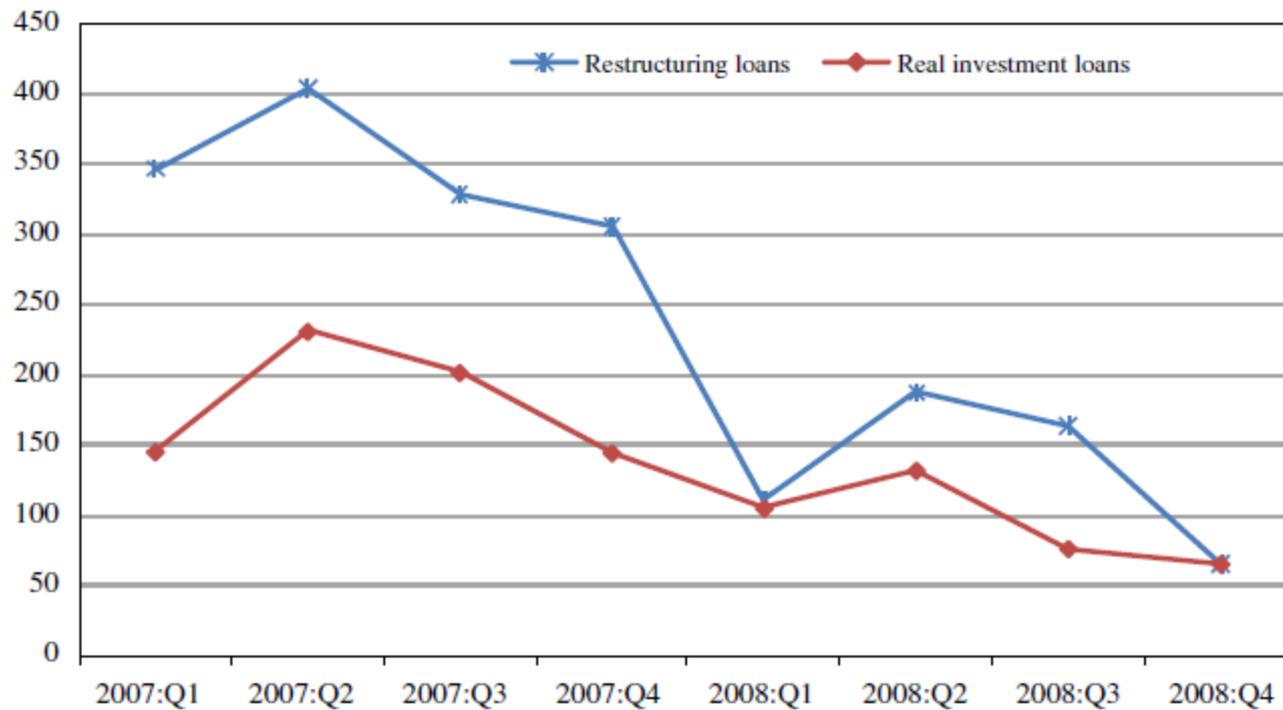
**Fig. 1.** Total loan issuance, U.S. corporate loans. The graph is compiled from the DealScan database of loan originations. Panel A: Total amount of loans issued (billion USD); Panel B: Total amount and number of loans issued (Indexed, 2007:Q1 = 1).

**Table 1**

Total loan issuance by loan purpose, U.S. corporate loans (billion USD).

Compiled from the DealScan database of loan originations.

	Corp. purposes	Work. capital	CP backup	LBO/M&A	Recap.	Debtor-in-poss.	Exit financing	Project finance	Real estate	Other	Total
2005:Q1	137.57	36.88	19.57	41.03	21.49	5.61	7.08	0.22	8.75	0.55	278.73
2005:Q2	246.84	55.47	46.54	63.44	40.50	1.36	9.35	1.48	13.13	2.83	480.94
2005:Q3	177.23	49.78	26.88	56.28	36.14	2.03	5.05	1.19	14.90	2.58	372.07
2005:Q4	228.76	73.21	23.64	140.83	25.20	1.68	19.73	0.21	15.17	4.45	532.87
2006:Q1	76.71	56.29	11.09	209.94	17.52	4.21	5.68	0.83	12.33	0.37	394.98
2006:Q2	149.82	59.05	25.23	288.40	39.98	0.29	4.89	1.10	13.92	1.20	583.86
2006:Q3	89.29	46.91	16.90	238.97	17.08	1.46	11.47	12.79	13.06	0.74	448.67
2006:Q4	135.34	38.70	23.80	233.90	29.20	1.19	10.72	1.54	15.53	0.96	490.88
2007:Q1	106.46	39.08	3.24	329.34	17.73	1.73	3.83	4.14	14.68	0.00	520.22
2007:Q2	177.73	53.64	10.75	357.14	47.25	0.00	19.78	15.27	19.96	0.00	701.53
2007:Q3	163.25	38.71	17.38	300.91	28.09	0.58	0.81	2.04	12.69	0.00	564.47
2007:Q4	110.36	34.35	17.96	295.90	10.50	0.84	10.79	2.04	11.29	2.36	496.37
2008:Q1	65.66	39.62	2.24	109.38	2.34	1.57	16.46	6.51	9.31	0.47	253.57
2008:Q2	105.82	26.33	3.00	184.84	2.93	1.23	5.65	14.41	12.57	1.73	358.49
2008:Q3	59.89	16.49	4.08	160.43	4.01	3.70	12.04	10.26	9.50	1.03	281.44
2008:Q4	51.45	14.06	0.92	64.35	1.45	2.14	3.20	6.49	4.53	1.66	150.24



**Fig. 2.** Real investment loans vs. restructuring loans (billion USD). The graph is compiled from the DealScan database of loan originations. Real investment loans are defined as those that are intended for general corporate purposes, capital expenditure, or working capital. Restructuring loans are defined as those that are intended for leveraged buyouts, mergers and acquisitions, or share repurchases.

**Table 2**

Revolving lines drawdowns, U.S. corporate loans (billion USD).

Compiled from SEC filings and Reuters.

Date drawn	Company	Credit rating (12/31/08)	Amount drawn (\$MM)	Credit line (\$MM)	Maturity	Spread (Undrawn/Drawn)	Lead bank	Comment (SEC filings)
8/25/2008	Delta Air Lines	BB- /Ba2	1,000	1,000	2012	50/L+200	JPM	Simply put, we have taken this action to increase our cash balance as we approach the closing of the merger. We believe this will provide us with the utmost in flexibility—at minimal cost—as we prepare for this critical transition. Shrinking liquidity in the commercial paper market. The Company believes that these actions were necessary to preserve its access to capital due to Lehman Brothers' level of participation in the Company's debt facilities and the uncertainty surrounding both that firm and the financial markets in general.
Sep-2008	Marriott	BBB+ /Baa2	908	2,500	2012	8/L+35	Citi	
9/15/2008	FairPoint Communications	BB+ /Ba3	200	200	2014	37.5/L+275	Lehman	
9/30/2008	Duke Energy	A- /Baa2	1,000	3,200	2012	9/L+40	Wachovia JPM	In light of the uncertain market environment, we made this proactive financial decision to increase our liquidity and cash position and to bridge our access to the debt capital markets. Duke spokesman: "We had about \$1 billion in cash or cash equivalent, so we decided as a conservative measure to go for the other billion. The financial companies are having a very tough time right now."
9/30/2008	Gannett Co.	BBB- /Ba2	1,200	3,400	2012	7/L+25	BofA	(A)s a prudent liquidity measure in light of the ongoing credit market dislocations.

# What would make a bank more vulnerable to run and so more likely to contract lending?

- Raise many funds by short-term debt instead of deposits.
- Share credit lines with Lehman Brothers.

**Table 3**

Summary statistics.

Deposits and assets correspond to the Call Reports figures as of the end of 2007. %Revolving lines with Lehman is percentage of all credit lines originated before the end of 2007 that had Lehman Brothers as part of the lending syndicate. Pre-crisis, Crisis I, and Crisis II are respectively defined as periods August 2006 through July 2007, August 2007 through July 2008, and August 2008 through November 2008. The dependent variable is in percentage changes; e.g.,  $\% \Delta$  Total number of loans (Crisis II vs. Crisis I) =  $[\text{Mean (Monthly number of loans issued between Aug'08 and Nov'08)} / \text{Mean (Monthly number of loans issued between Aug'07 and Jul'08)} - 1]$ . (Lead bank) indicates variables calculated using only loans where the bank is the lead arranger; based on pro-rata credit and estimated retained share of the loans. All the other variables just count the total number of loans with the bank participation. Real investment loans are defined as those that are intended for general corporate purposes, capital expenditure, or working capital.

	Obs.	P25	P50	P75	Mean	SD
Deposits/Assets	38	0.26	0.56	0.65	0.45	0.25
% Revolving lines with Lehman	37	0.03	0.04	0.06	0.06	0.06

**Table 4**

Change in lending and deposits.

Deposits and assets correspond to the Call Reports figures as of the end of 2007. Pre-crisis, Crisis I, and Crisis II are respectively defined as periods August 2006 through July 2007, August 2007 through July 2008, and August 2008 through November 2008. The dependent variable is in percentage changes; e.g., %Δ Total number of loans (Aug'08–Nov'08 vs. Aug'07–Jul'08)=[Mean (Monthly number of loans issued between Aug'08 and Nov'08)/Mean (Monthly number of loans issued between Aug'07 and Jul'08) – 1]. (Lead bank) indicates variables calculated using only loans where the bank is the lead arranger; based on pro-rata credit and estimated retained share of the loans. All the other variables just count the total number of loans with the bank participation. Real investment loans are defined as those that are intended for general corporate purposes, capital expenditure, or working capital. Robust standard errors are reported in brackets. \*\*\*, \*\*, \* indicate statistical significance at 1%, 5%, and 10%, respectively.

	(1) %Δ Total number of loans Crisis II vs. Crisis I	(2) %Δ Total number of loans Crisis II vs. Pre- crisis	(3) %Δ Total number of loans (lead bank) Crisis II vs. Crisis I	(4) %Δ Total number of loans (lead bank) Crisis II vs. Pre-crisis	(5) %Δ Total amount of loans (lead bank) Crisis II vs. Crisis I	(6) %Δ Total amount of loans (lead bank) Crisis II vs. Pre-crisis
<i>Panel A: All loans</i>						
Deposits/ Assets	0.22*	0.42***	0.56**	0.91***	0.27	0.81**
	[0.11]	[0.11]	[0.22]	[0.26]	[0.21]	[0.30]
Constant	-0.57***	-0.79***	-0.60***	-0.83***	-0.62***	-0.86***
	[0.06]	[0.04]	[0.10]	[0.08]	[0.12]	[0.08]
Observations	38	38	38	38	38	38
R-squared	0.11	0.24	0.18	0.22	0.05	0.14
<i>Panel B: Real investment loans</i>						
Deposits/ Assets	0.32*	0.50***	0.79*	1.44***	0.17	0.98***
	[0.19]	[0.16]	[0.41]	[0.41]	[0.28]	[0.32]
Constant	-0.51***	-0.72***	-0.49**	-0.81***	-0.52***	-0.75***
	[0.10]	[0.07]	[0.20]	[0.13]	[0.15]	[0.14]
Observations	38	38	38	38	38	38
R-squared	0.11	0.21	0.10	0.14	0.01	0.06

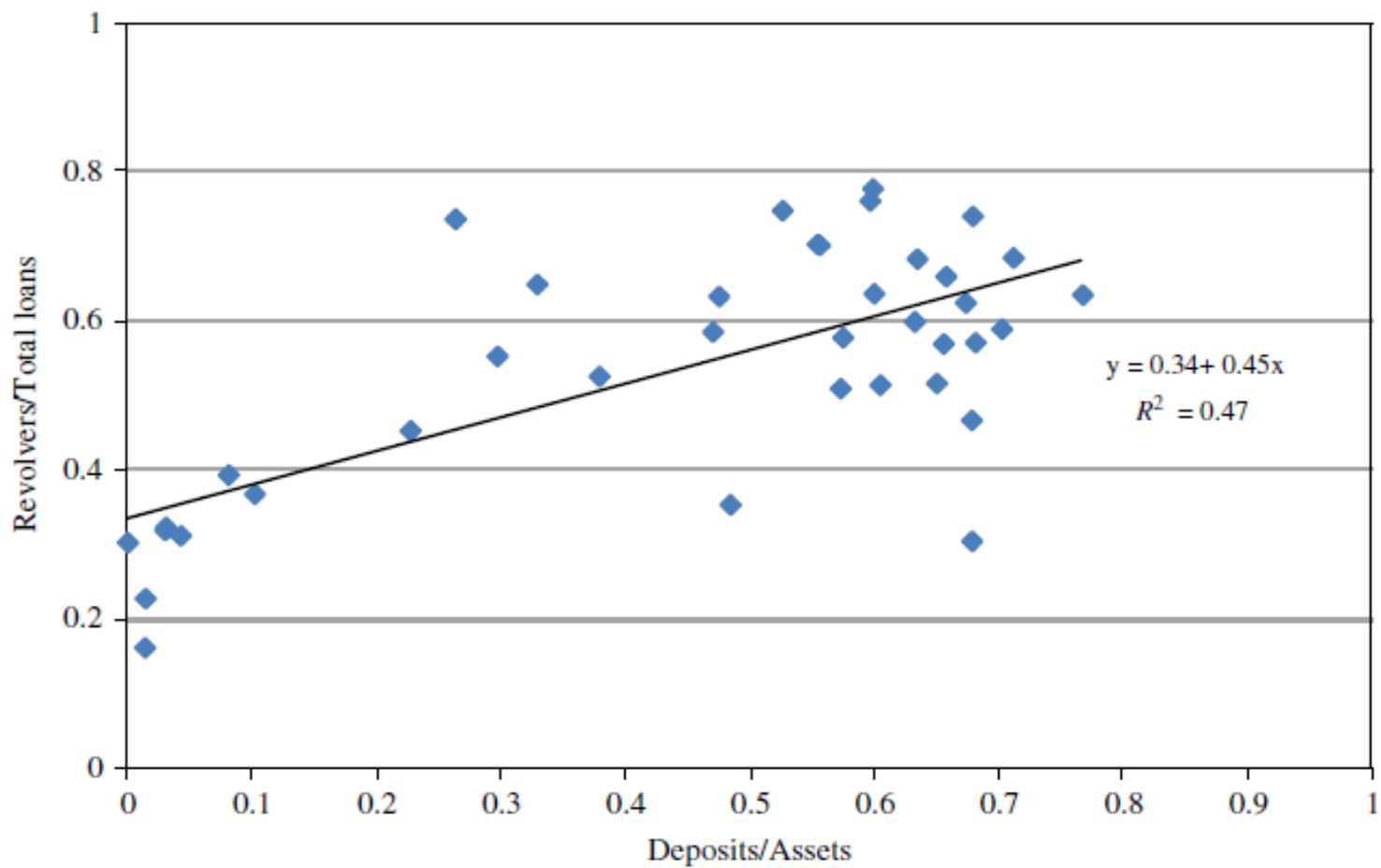


Fig. 6. Relation between Deposits/Assets and Revolvers/Total loans.

**Table 5**

Relationship between drawdowns and banks' exposure to Lehman on revolvers co-syndications.

The table is constructed using drawdowns on revolving lines reported in SEC filings by a subsample of publicly traded manufacturing firms (one-digit SIC codes 2 and 3). We map each borrower to the lead lenders; we then compute an average for each bank (37 observations). The reported numbers correspond to the averages across banks. Firms' and banks' assets are computed as of the end of 2007 (calendar year). % Revolving lines with Lehman is percentage of all credit lines originated before the end of 2007 that had Lehman Brothers as part of the lending syndicate. We only count those loans where Lehman was one of the key lenders. In Panel B the analysis is at the firm level (443 firms). In specifications (1) and (2), for each borrower we only count the lender with the highest exposure to Lehman (one lender per borrower). Specifications (3) and (4) allow for multiple (bank x firm) matches. Standard errors are clustered at the bank level and are reported in brackets. \*\*\*, \*\*, \* indicate statistical significance at 1%, 5%, and 10%, respectively.

<i>Panel A: Used revolving lines by bank</i>												
			(1) Used Balance (2008:Q4)		(2) Used Change (2008:Q4 vs.2007:Q4)		(3) Used Change (2008:Q4 vs.2007:Q4)		(4) Unused Balance (2007:Q4)		(5) Used Change (2008:Q4 vs.2007:Q4)	
% Revolving lines with Lehman			Million USD		Million USD		% of RL limit		% of RL limit		% Bank's assets	
	Quartile	Obs.	Mean	Mean	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low	1	9	147.60	130.51	56.41	115.00	1.16	7.71	85.46	6.91	0.00	0.17
	2	9	113.53	2.00	37.16	33.60	3.80	3.91	83.47	8.20	0.09	0.11
	3	10	150.34	83.20	61.93	75.77	5.99	5.36	84.80	5.70	0.11	0.23
High	4	9	254.61	234.65	174.04	237.46	6.83	7.33	86.92	4.66	0.22	0.27
<b>(High-Low)</b>			<b>107.00*</b>		<b>117.63*</b>		<b>5.67**</b>		<b>1.47</b>		<b>0.22***</b>	
Correlation with:												
% Revolving lines with Lehman			0.65***		0.64***		0.29*		0.04		0.44***	
% Term loans with Lehman			0.37**		0.39**		0.11		0.06		0.21	

**Table 6**

Change in lending and revolvers overhang.

Deposits and assets correspond to the Call Reports figures as of the end of 2007. %Revolving lines with Lehman is percentage of all credit lines originated before the end of 2007 that had Lehman Brothers as part of the lending syndicate. We only count those loans where Lehman was one of the key lenders. Pre-crisis, Crisis I, and Crisis II are respectively defined as periods August 2006 through July 2007, August 2007 through July 2008, and August 2008 through November 2008. The dependent variable is in percentage changes; e.g.,  $\% \Delta$  Total number of loans (Aug'08–Nov'08 vs. Aug'07–Jul'08) =  $[\text{Mean (Monthly number of loans issued between Aug'08 and Nov'08)} / \text{Mean (Monthly number of loans issued between Aug'07 and Jul'08)} - 1]$ . (Lead bank) indicates variables calculated using only loans where the bank is the lead arranger; based on pro-rata credit and estimated retained share of the loans. All the other variables just count the total number of loans with the bank participation. Real investment loans are defined as those that are intended for general corporate purposes, capital expenditure, or working capital. Robust standard errors are reported in brackets. \*\*\*, \*\*, \* indicate statistical significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	% $\Delta$ Total number of loans Crisis II vs. Crisis I	% $\Delta$ Total number of loans Crisis II vs. Pre-crisis	% $\Delta$ Total number of loans (lead bank) Crisis II vs. Crisis I	% $\Delta$ Total number of loans (lead bank) Crisis II vs. Pre-crisis	% $\Delta$ Total amount of loans (lead bank) Crisis II vs. Crisis I	% $\Delta$ Total amount of loans (lead bank) Crisis II vs. Pre-crisis
<i>Panel A: All loans</i>						
Deposits/Assets	0.01 [0.10]	0.28** [0.11]	0.42* [0.24]	0.77*** [0.28]	-0.08 [0.23]	0.74* [0.41]
% Revolving lines with Lehman	-1.31** [0.50]	-0.93*** [0.30]	-1.58** [0.60]	-1.28** [0.53]	-2.21*** [0.67]	-0.38 [1.11]
Constant	-0.39*** [0.06]	-0.66*** [0.05]	-0.44*** [0.13]	-0.69*** [0.11]	-0.32** [0.16]	-0.81*** [0.19]
Observations	37	37	37	37	37	37
R-squared	0.26	0.26	0.27	0.23	0.17	0.13
<i>Panel B: Real investment loans</i>						
Deposits/Assets	0.01 [0.18]	0.29 [0.19]	0.49 [0.46]	1.30** [0.48]	-0.06 [0.33]	0.86** [0.38]
% Revolving lines with Lehman	-1.61** [0.66]	-1.17** [0.50]	-1.44 [1.25]	-0.73 [1.09]	-0.99 [1.28]	-0.46 [1.08]
Constant	-0.25** [0.11]	-0.54*** [0.10]	-0.25 [0.25]	-0.68*** [0.20]	-0.34* [0.20]	-0.66*** [0.19]
Observations	37	37	37	37	37	37
R-squared	0.21	0.22	0.09	0.12	0.02	0.05