

Financial Firm Bankruptcy and Contagion

Jean Helwege

University of South Carolina

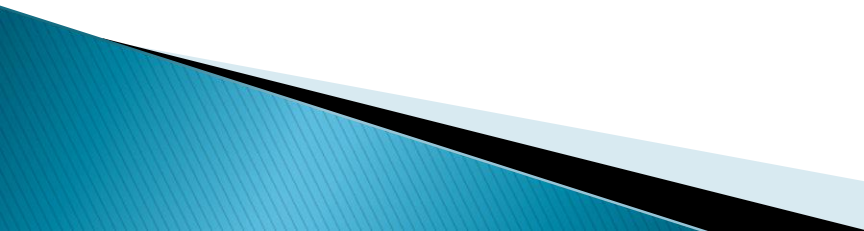
Gaiyan Zhang

University of Missouri – St. Louis

“CBS: ... Mr. Chairman, there are so many people ...who say, 'To hell with them. They made bad bets. The wages of failure on Wall Street should be failure.'

Bernanke: Let me give you an analogy....If you have a neighbor, who smokes in bed....If suppose he sets fire to his house, and you might say to yourself, you know, 'I'm not going to call the fire department. Let his house burn down. It's fine with me.' But then, of course,... what if your house is made of wood? And it's right next door to his house? What if the whole town is made of wood?....What needs to be done to make sure this doesn't happen in the future? How can we fire proof our houses?' That's where we are now. We have a fire going on.“

3/15/09 Bernanke's 60 Minutes Interview



“Commission Democrats stubbornly cling to the theory that the AIG failure demonstrates why derivatives were a principal cause of the crisis, but as every angry taxpayer knows, the company's derivatives counterparties were paid off at 100 cents on the dollar. Yet we still had a financial crisis. As University of South Carolina professor Jean Helwege has noted, ‘Had AIG never written a single CDS contract, we still would have observed the financial meltdown of Washington Mutual, Countrywide, Bear Stearns, Lehman, UBS, Merrill Lynch, Wachovia, and Indy Mac.’

The common denominator was housing, and even at AIG derivatives were merely one method of betting on mortgages. Yes, the company lost \$39 billion on derivatives tied to mortgages, but it also lost \$24 billion betting on mortgages without derivatives.”

1/28/11 Wall St. Journal editorial

- What was the impact of Lehman's failure on other financial institutions?
 - Did its problems spread like wildfire?
- What did investors learn about Lehman from the Bear Stearns deal?
- Does aid to AIG or another TBTF firm reduce the losses to shareholders of other firms?

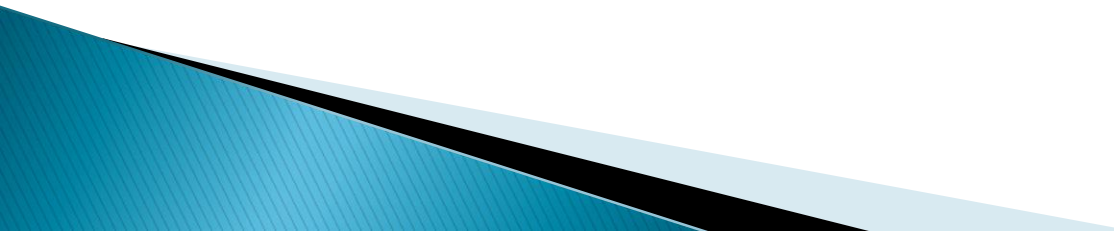
These are great questions that are nearly impossible to answer

Research Questions

In a financial crisis, why do numerous companies get into trouble one after another?

Are financial firms interconnected in a way that causes them to fall in domino fashion when one collapses?

Do the stock prices of other firms react to the failure of a financial firm because it contains relevant information for the firms that have not failed?



The Theory of Counterparty Risk

Bank contagion:

- Allen and Gale (2006), Rochet and Tirole (1996), Eisenberg and Noe (2010), Rochet (2010)

Bond contagion (and CDS pricing):

- Jarrow and Yu (2001), Davis and Lo (2001), Bai, Collin-Dufresne, Goldstein, and Helwege (2013), Benzoni, Collin-Dufresne, Goldstein and Helwege (2013)

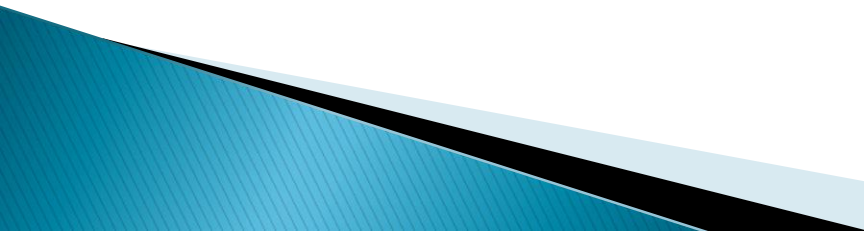
Measuring Systemic Risk:

- Acharya, Brownlees, Engle, Farazmand, and Richardson (2010), Adrian and Shin (2010), Suh (2012), Boman (2012), Acharya and Bisin (2011), Diebold and Yilmaz (2011), Billio, Lo, Getmansky and Pellizon (2010), Drehmann and Tarashev (2011)

Empirical Evidence on Counterparty Contagion

- ▶ Jorion and Zhang (2009)
 - Unsecured creditors from bankruptcy petition to find creditors.
- ▶ Hertz, Li, Officer and Rodgers (2008)
 - SEC filings to identify important customers and suppliers.
- ▶ Aragon and Strahan (2011), Jorion and Zhang (2011), Iyer and Peydro (2011), Kabir and Hassan (2005)
 - Case studies (Lehman, LTCM and a bank in India)
- ▶ Interconnectedness studies:
Furfine (2003), Upper and Worms (2004), Arora, Gandhi and Longstaff (2012), most theory papers on systemic risk, Longstaff (2008), Huang, Zhou and Zhu (2010), Yang and Zhou (2010)

Information Contagion Theory

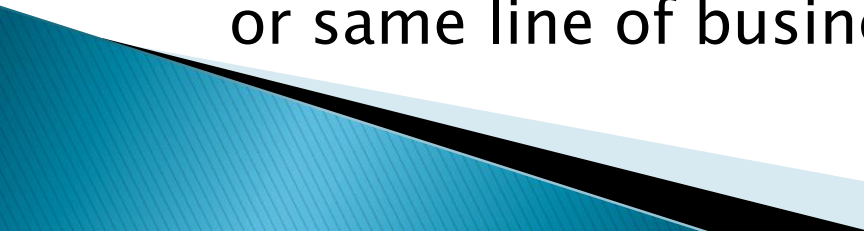
- ▶ Lang and Stulz (1992) attribute their results on stock returns after a bankruptcy announcement to information about shared cash flows
 - ▶ Veronesi (2000) shows how stock returns reflect the impact of information from dividends and external signals about economic growth
 - ▶ Benzoni, Collin-Dufresne, Goldstein and Helwege (2012) model information contagion via the updating of beliefs in the context of sovereign bond defaults
 - ▶ Pastor and Veronesi (2011) discuss the effects of uncertainty about government policy on stock returns
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Empirical Evidence on Information Contagion

- ▶ Lang and Stulz (1992) find that bankruptcy announcements usually lead to negative stock returns on firms in the same industry
 - See also Jorion and Zhang (2007), Theodoridis (2008) and Hertz and Officer (2011), Zhang (2010), Boone and Ivanov (2012)
- ▶ Benzoni et al. (2012) show that sovereign CDS premia adjust as investors update beliefs about default risk
- ▶ Financial firm results:
 - Fenn and Cole (1994), Aharony and Swary (1983, 1996), Prokopczuk (2008), Egginton, Liebenberg and Liebenberg (2009), Wall and Peterson (1990)

Analytical Framework

Identify financial firms that have failed or come close to failure and examine the impact of news on other firms' stock prices (event study):

1. Counterparty contagion implies that counterparties of troubled firms will exhibit the most negative reactions to the news.
 - a. Tie the reaction to the size of the potential loss.
 2. Information contagion should affect firms for which the information is relevant.
 - a. Look at industry peers operating in the same location or same line of business
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Data

▶ Bankrupt Firms:

- Bankruptcydata.com: 1981 – 2010 (Includes Lehman)
- Epiq Systems Debtor Matrix: Lehman and American Home Mortgage (AHM)

▶ Distressed Firms:

- Follow Gilson (1989) and examine firms in bottom of stock return distribution over last three years
 - Identify distress date a la Hertz, Li, Officer and Rodgers (2008)
 - Investigate effects of earnings announcements and events in last crisis (using St. Louis Fed timeline)

▶ Select firms in 6000 range of CRSP SIC codes

More Data

- ▶ Affected Firms:
 - Counterparties and creditors
 - Largest unsecured creditors from bankruptcy petitions
 - Usually 20 creditors and only available from late 1990s on
 - All unsecured creditors for Lehman from Epiq
 - Counterparty data for AIG from Congressional testimony
 - Industry peers using 4 digit SIC code
 - Location of business from Compustat
 - Lines of business from Compustat and BusinessWeek
- ▶ Stock returns from CRSP
- ▶ Assets from Compustat

Summary Statistics on Bankruptcies and Distressed Firms

Year	Bankruptcies	Distress	Year	Bankruptcies	Distress
1981	1	0	1996	0	0
1982	0	1	1997	3	0
1983	0	0	1998	7	1
1984	0	2	1999	4	3
1985	0	0	2000	6	6
1986	1	0	2001	6	7
1987	0	4	2002	6	16
1988	4	4	2003	3	7
1989	8	4	2004	1	4
1990	10	6	2005	3	3
1991	7	9	2006	2	3
1992	2	5	2007	7	15
1993	4	1	2008	10	28
1994	1	3	2009	25	12
1995	3	2	2010	18	3
			Total	142	149

Summary Statistics on Bankruptcies and Distressed Firms

	Industry	Bankruptcy	Distress
<i>Depository Institutions</i>			
Commercial Banks	6020	34	47
Federally Chartered Thrifts	6035	11	17
Other Thrifts	6036	8	10
<i>Non-depository Credit (Finance Companies)</i>			
Government-sponsored Enterprises	6111	0	5
Personal Finance Companies	6141	10	2
Mortgage Bankers	6162	11	4
<i>Securities Firms</i>			
Investment Banks	6211	8	5
Investment Advice	6282	2	3
<i>Insurance Companies</i>			
Life Insurers	6311	4	14
Property and Casualty Insurers	6331	9	8
<i>Insurance Agents</i>			
	6411	3	3
<i>Real Estate</i>			
Real Estate Operators	6510	2	0
Commercial Property Operators	6512	2	1
Apartment Building Operators	6513	1	0
Real Estate Dealers	6532	3	0
Land Developers	6552	3	0
<i>Financial Holding Companies</i>			
Real Estate Investment Trusts (REITs)	6798	16	18
Miscellaneous Financial Holding Companies	6799	1	2

Summary Statistics on Bankruptcies and Distressed Firms

Panel D: Number of Firms in Real Estate

	Number	Percentage
Bankrupt firms	94	66.20%
Distressed firms	83	55.70%

Panel E: Total Assets of Troubled Firms (\$ millions)

	N	Mean	Min	Median	Max
Bankrupt firms	142	12231	0	1066	691063
Distressed firms	149	73243	3382	11701	1706787

Counterparty Risk Tests

- ▶ Counterparty contagion requires exposure
 - Look at unsecured creditors listed in bankruptcy court documents and AIG's counterparties
 - Scale by assets and equity
 - If counterparty is bank, insurer, pension fund, then regulations on diversification will limit exposure
 - For banks, loans to one borrower cannot exceed 15% of capital
 - Capital is typically less than 10% of assets → loans $\leq 1.5\%$ assets
- ▶ Counterparties and bankruptcy announcements
 - Look for negative impact of announcement that is larger for firms with larger exposures

Debt Owed to Creditors

Aggregate debt amount per bankruptcy (\$mm)

	N	Total	Mean	Median	Max	Min
All Bankruptcies	88	256,459	2,914.3	77.6	157,917	0.1
With Trustee Creditors	41	226,648	5,528.0	143.1	155,000	0.2
With Non-Trustee Creditors	87	29,812	342.7	40.1	3,730	0.0
With Financial Firm Creditors	79	27,197	344.3	14.9	3,515	0.0

Amount owed on unsecured claims made by financial institutions

	No. Of Event- Creditor Obs.	Total	Mean	Median	Max	Min
Bankrupt Companies	509	27197	53.4	3.7	1988	0.0
Commercial Banks	72	548	7.6	2.5	79	0.0
Other Financial Companies	437	26649	61.0	4.0	1988	0.0

Trustees

- ▶ Trustees represent investors in a bankruptcy filing
 - Bond trustees have large claims, often the largest
 - Example: WAMU Top 13 creditors are bond trustees
- ▶ Trustee claims are aggregate for group, which if split into individual claims would not be large enough for top 20
 - Specific evidence on size from disclosures of Lehman exposure in DJ data (see Jorion and Zhang (2011))
 - Han and Zhou (2009) and Massimo, Yasuda and Zhang (2010) provide data on bondholder dispersion that suggest each claim represents the aggregation of about 100 bondholders' claims

Debt Owed to Creditors

Claims made by publicly-listed unsecured creditors

	N	Total	Mean	Median	Max	Min
Bankrupt Companies	242	11216	46.3	1.0	1935	0.0
Commercial Banks	21	28	1.3	0.4	8	0.0
Other Financial Companies	221	11189	50.6	1.1	1935	0.0

Claims as a fraction of total assets of publicly-listed creditors

	N	Mean	Median	Max	Min	% (<1.5%)
Bankrupt Companies	242	0.05	0.002	1.31	0.0	100
Commercial Banks	21	0.13	0.002	1.31	0.0	100
Other Financial Companies	221	0.04	0.002	1.27	0.0	100
Commercial Bank Creditors	71	0.03	0.004	1.27	0.0	100

Claims as a fraction of market value of equity of publicly-listed creditors

	N	Mean	Median	Max	Min	% (<15%)
Bankrupt Companies	242	0.24	0.012	12.30	0.0	100
Commercial Banks	21	0.14	0.006	1.045	0.0	100
Other Financial Companies	221	0.25	0.014	12.30	0.0	100

Counterparty Contagion and Creditor Stock Returns

Day	Creditor Portfolio CAR (N=62)		Financial Creditor Portfolio CAR (N=50)		Bankruptcy After 2007 (N=34)	
	Mean	%<0	Mean	%<0	Mean	%<0
-5	0.33	46.8	0.52	50.0	0.44	44.1
-4	-0.27	60.3	-0.28	52.2	-0.55	64.5
-3	0.02	49.2	-0.01	57.1	-0.02	44.1
-2	-0.04	52.5	0.47	49.0	0.02	57.6
-1	-0.48	61.7	-0.50	59.2	-0.54	63.6
0	-0.25	53.2	-0.91	56.0	-0.33	50.0
1	-0.13	53.3	0.09	50.0	-0.12	48.5
2	-0.23	60.7	-0.29	68.0	-0.24	66.7
3	-0.26	58.1	-0.28	54.0	-0.17	47.1
4	0.11	48.3	0.10	52.1	0.24	42.4
5	-0.34	66.7	-0.94	73.9	-0.62	70.9
0, 1	-0.37	53.2	-0.82	56.0	-0.44	50.0
-1, 1	-0.83	58.1	-1.31	56.0	-0.96	50.0
-2, 2	-1.09	64.5	-1.14	58.0	-1.17	64.7
-5, 5	-1.46	61.3	-1.92	70.0	-1.75	58.8

Regression Explaining Creditor Group Returns

	All	2007-10	All	2007-10
	Exposure /Assets		Exposure/Equity	
Constant	5.24	11.35	4.17	9.52
Exposure (assets or equity)	-0.06	-0.06	-0.20	-0.20
Size of bankrupt firm	-0.25	-0.52	-0.18	-0.36
Size of creditor firm	0.11	-0.12	0.01	-0.23
Derivatives Claim	-4.13	-3.35	-4.15	-3.49
Derivatives Claim * Exposure	-1.37	-1.43	-1.10	-1.17
Leverage	-4.34	-4.14	-2.83	-2.48
Volatility	-1.11	-1.27	-0.78	-0.85
Equity correlation	1.13	1.50	1.13	0.82
Commercial Bank Creditor	3.43	6.28	3.05	5.50
Recession	0.93	0.21	0.78	-0.33

Cascades of Bankruptcies

- ▶ If counterparty contagion is extreme, the failure of one financial institution will bring down its creditors and those bankruptcies will in turn cause the collapse of other financial institutions
- ▶ We know counterparties of 90 firms
 - These 90 firms have 287 publicly traded creditors
 - Some firms are creditors in more than one of our Ch. 11 cases
 - Of the 287 creditors, 10 file for bankruptcy (or fail) after one of the 90 firms gets into trouble
 - Several of the 10 are creditors of AHM (an early mortgage failure in the subprime crisis)
 - Did AHM cause the failure of WAMU, Lehman and Bear Stearns?

Information Contagion

- ▶ Information effects spread through the financial markets and causes changes in security prices
- ▶ But what information?
 - Lang and Stulz (1992) look at firms in the same industry
 - Look at firms in same industry and same market (state)
 - Cole and White (2011) find severe problems in real estate
 - Real estate is regional or trendy:
 - If Florida real estate tanks, likely to be bad news for other vacation spots
 - If NY commercial real estate bubble bursts, bad news for LA too

Bankruptcy Filings and Information Contagion

Day	All Industry Portfolio		Same State		Same Business (RE)		Same State and Business (RE)	
	N=142		N=96		N=89		N=57	
	Mean	% <0	Mean	% <0	Mean	% <0	Mean	% <0
-5	-0.04	54.3	-0.04	50.0	-0.19	54.7	-0.35	58.2
-4	-0.43	49.3	-0.44	56.7	-0.51	52.9	-0.28	54.7
-3	-0.29	51.4	0.08	52.2	0.04	44.6	0.58	52.7
-2	0.38	42.6	-0.46	57.0	0.19	41.9	-0.12	55.4
-1	0.03	51.1	-0.44	52.6	0.00	53.4	0.07	49.1
0	-0.15	54.9	-0.29	57.3	-0.69	59.6	-0.35	56.1
1	0.19	48.2	-0.36	59.1	0.02	53.5	-0.20	53.7
2	-0.27	53.0	-0.08	48.9	-0.73	59.5	-0.65	51.0
3	-0.24	54.3	0.36	46.2	-0.07	53.5	0.48	44.4
4	0.02	51.8	-0.35	60.2	-0.55	64.2	-0.72	58.8
5	0.38	40.3	0.04	48.9	-0.07	48.2	-0.04	50.9
0, 1	0.04	45.1	-0.64	56.3	-0.67	57.3	-0.54	54.4
-1, 1	0.07	44.4	-1.07	60.4	-0.67	58.4	-0.47	47.4
-2, 2	0.18	43.7	-1.59	54.2	-1.13	53.9	-1.15	54.4
-5, 5	-0.41	53.5	-1.91	58.3	-2.39	53.9	-1.41	52.6

Information Contagion and Distressed Firms

Day	All Industry Portfolio		Same State Portfolio		Same Business Portfolio		Same State and Business (RE)	
	N=149		N=84		N=82		N=38	
	Mean	% <0	Mean	% <0	Mean	% <0	Mean	% <0
-5	0.00	47.9	0.29	51.3	0.47	48.7	0.27	54.3
-4	-0.15	53.1	0.32	53.7	0.24	56.3	-0.03	67.6
-3	0.09	51.8	0.21	48.1	0.42	46.8	0.11	44.4
-2	-0.12	60.3	-0.56	62.2	-0.41	65.8	-0.40	70.3
-1	-0.27	54.2	-0.27	58.5	-0.36	52.5	-0.15	57.9
0	-0.63	66.4	-1.37	69.0	-2.04	76.8	-2.84	73.7
1	0.24	54.4	0.05	57.8	0.99	56.1	-0.03	60.5
2	-0.40	61.8	-0.78	55.6	-0.78	61.3	-1.11	64.9
3	-0.09	49.7	-0.25	56.1	0.13	50.0	-0.61	62.2
4	0.14	50.0	-0.50	59.8	0.57	45.0	-0.38	62.2
5	-0.04	50.4	-0.74	66.7	-0.07	60.3	-1.67	74.3
0, 1	-0.39	62.4	-1.30	62.4	-1.05	68.3	-2.86	63.2
-1, 1	-0.65	57.0	-1.56	57.6	-1.41	59.8	-3.01	52.6
-2, 2	-1.15	65.8	-2.85	69.4	-2.56	70.7	-4.48	68.4
-5, 5	-1.20	69.8	-3.46	69.4	-0.86	68.3	-6.67	73.7

Information Contagion and Distressed Firms

	Same Business N=82		Same State and Same Business N=38		2007-2010 Same Business N=44		2007-2010 Same State and Business N=20	
Day	Mean (%)	% <0	Mean (%)	% <0	Mean (%)	% <0	Mean (%)	% <0
-5	0.47	48.7	0.27	54.3	0.79	47.6	0.42	55.6
-4	0.24	56.3	-0.03	67.6	0.56	55.8	0.82	52.6
-3	0.42	46.8	0.11	44.4	0.51	42.9	0.28	38.9
-2	-0.41	65.8	-0.40	70.3	-0.35	65.1	-0.76	73.7
-1	-0.36	52.5	-0.15	57.9	-1.24	55.8	-0.08	50.0
0	-2.04	76.8	-2.84	73.7	-3.00	79.5	-4.61	65.0
1	0.99	56.1	-0.03	60.5	1.49	50.0	0.39	60.0
2	-0.78	61.3	-1.11	64.9	-1.18	55.8	-1.41	57.9
3	0.13	50.0	-0.61	62.2	-0.07	52.4	-0.85	73.7
4	0.57	45.0	-0.38	62.2	0.89	42.9	-1.38	68.4
5	-0.07	60.3	-1.67	74.3	-0.27	61.9	-2.91	78.9
0,1	-1.05	68.3	-2.86	63.2	-1.51	70.5	-4.22	60.0
-1,1	-1.41	59.8	-3.01	52.6	-2.72	61.4	-4.30	50.0
-2,2	-2.56	70.7	-4.48	68.4	-4.22	72.7	-6.36	70.0
-5,5	-0.86	68.3	-6.67	73.7	-1.91	70.5	-9.84	75.0

Regression of Industry Peer Returns

	Bankruptcy Sample			Distress Sample		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	3.17	4.34	1.53	2.15	1.85	2.39
Same State	-2.13			-1.85		
Same Business		-1.36			-2.38	
Same State and Business			-1.94			-3.16
Correlation	-4.95	0.51	-6.98	-2.73	-5.19	-3.45
Size	0.18	-0.24	0.21	0.17	0.21	0.30
Volatility	0.04	-0.20	0.19	0.30	-0.48	-0.55
Rating	-0.24	-0.07	-0.15	-0.30*	0.02	-0.28
Herfindahl	7.30	-4.48	7.34	-0.60	-5.36	-2.35
Recession indicator	-2.09	-1.05	-2.20	-0.37	-1.21	0.43

Debt Owed to Lehman Creditors

	No. of claims	Mean	Median	Max	Min	Total
All claims above \$1 million	6,560	81.5	4.8	73,162	1.0	534,359
Claims made by trustees	678	510.8	4.9	73,162	1.0	346,288
Other claims	5,882	32.0	4.8	19,058	1.0	188,071

Claims owed to public creditors:	163	347.1	19.3	15,800	0.5	54,147
<i>By type of creditor</i>						
Nonfinancial creditors	53	64.9	6.4	920	0.7	3,439
Financial creditors	110	492.3	34.0	15,800	0.5	50,707
<i>By type of claim</i>						
Derivatives	38	162.9	7.9	2,500	1.0	6,190
Equity	5	11.8	5.8	32	1.0	59
Unsecured debt	80	79.5	15.5	920	0.5	6,356
Bonds and derivatives	40	1,258.9	127.0	15,800	1.2	41,542

Debt Owed to Lehman Creditors

	No.	Mean	Median	Max	Min	% (<1.5%)	t
Claim/assets (%) for public creditors:	163	1.8	0.1	90.4	0.0	87.2	0.4
<i>By type of creditor</i>							
Nonfinancial creditors	53	4.2	0.1	90.4	0.0	75.5	1.4
Financial creditors	110	0.5	0.2	13.8	0.0	93.2	5.9
<i>By type of claim</i>							
Derivatives	38	1.3	0.1	13.8	0.0	81.6	0.4
Equity	5	0.6	0.2	2.0	0.1	80.0	2.5
Unsecured debt	80	2.7	0.2	90.4	0.0	86.3	0.9
Bonds and derivatives	40	0.2	0.1	1.8	0.0	97.0	21.9

Debt Owed to Lehman Creditors

	No.	Mean	Median	Max	Min	% (<15%)	t
Claim/equity (%) for public creditors:	163	4.8	0.9	83.6	0.0	93.6	9.7
<i>By type of creditor</i>							
Nonfinancial creditors	53	5.1	0.1	83.6	0.0	92.5	5.0
Financial creditors	110	4.7	1.1	75.7	0.0	94.2	8.5
<i>By type of claim</i>							
Derivatives	38	4.4	0.2	60.8	0.0	92.1	5.5
Equity	5	1.0	0.4	3.0	0.1	100.0	26.4
Unsecured debt	80	5.0	0.9	83.6	0.0	93.8	6.4
Bonds and derivatives	40	5.3	1.0	75.7	0.0	93.9	4.2

Derivatives and Guarantees

- ▶ Some of the claims in the bankruptcy documents are classified as contingent (derivatives and guarantees)
 - Guarantees by the parent on bonds issued by the subsidiary lead to claims for the face value of the sub's bond even when the sub has not defaulted (could default in a few days)
- ▶ Cameron (2011) states that derivative claims tend to be overstated because they are affected by the bid-ask spread and creditors do not net the claims
 - Claim is for replacement cost of a leg
 - If an I-bank has both legs of a CDS contract with Lehman, it calculates the replacement cost of each leg, making sure to consider the effects of dealer bid-ask spreads.
 - Then I-bank files a claim that represents the cost of replacing both legs, but net exposure is zero.

Debt Owed to AIG Counterparties

	No. of claims	Mean	Median	Max	Min	Total
Payments to financial firm creditors:	51	1,731	900	7,000	0	88,300
CDS	20	915	500	4,100	200	18,300
Maiden Lane III (CDO)	15	1,787	900	6,900	0	26,800
Securities lending	16	2,700	2,050	7,000	200	43,200
Payments to public financial companies	39	2,054	1,000	7,000	0	80,100
CDS	15	1,020	400	4,100	200	15,300
Maiden Lane III (CDO)	11	2,200	900	6,900	0	24,200
Securities lending	13	3,123	2,300	7,000	400	40,600

Payments as a percent of total assets by industry	Number of claimants	Mean	Median	Max	Min
6020	12	0.21	0.18	0.70	0.02
6199	1	0.11	0.11	0.11	0.11
6211	4	0.51	0.41	1.19	0.03
6282	1	0.24	0.24	0.24	0.24
6311	1	0.07	0.07	0.07	0.07
All	19	0.26	0.17	1.19	0.02

Counterparty Contagion Among Lehman Creditors

	All Creditors		Financial Creditors		Creditors with High Exposure/Assets		Creditors with High Exposure/Equity	
Day	Mean	% <0	Mean	% <0	Mean	% <0	Mean	% <0
-2	-0.16	50.0	-0.08	50.0	-0.26	50.0	-0.30	50.0
-1	-0.35	66.7	-0.73	83.3	-0.63	83.3	-0.71	83.3
0	-0.77	100.0	-0.98	100.0	-0.94	100.0	-1.09	100.0
1	-0.47	66.7	-0.47	66.7	-0.93	66.7	-0.89	66.7
2	-0.40	83.3	-0.46	83.3	-0.56	83.3	-0.88	83.3
0, 1	-1.24	83.3	-1.45	83.3	-1.87	83.3	-1.97	83.3
-1, 1	-1.59	100.0	-2.18	100.0	-2.50	100.0	-2.68	100.0
-2, 2	-2.16	83.3	-2.72	100.0	-3.31	100.0	-3.87	100.0

Counterparty Contagion for AIG Creditors

Day	6 Significant Negative Events before Bailout		Distress Day		Creditors with High Exposure/Assets		Creditors with High Exposure/Equity	
	Mean	% <0	Mean	% <0	Mean	% <0	Mean	% <0
-2	-0.63	66.7	-2.27	92.9	-0.78	66.7	-0.81	66.7
-1	-0.28	66.7	-0.53	57.1	-0.18	50.0	-0.35	50.0
0	-1.89	100.0	-3.94	85.7	-2.14	100.0	-2.31	100.0
1	-0.45	66.7	-2.32	57.1	-0.61	83.3	-0.72	100.0
2	-0.99	66.7	-3.90	78.6	-0.76	66.7	-0.90	83.3
0, 1	-2.34	100.0	-6.26	85.7	-2.75	100.0	-3.02	100.0
-1, 1	-2.62	100.0	-6.79	64.3	-2.93	100.0	-3.37	100.0
-2, 2	-4.24	100.0	-12.96	78.6	-4.47	100.0	-5.08	100.0

Conclusion

- ▶ Counterparty contagion leads to significant negative valuation effects on creditors of bankrupt firms
 - Small effects could reflect TBTF policy, but same for Lehman & AIG
- ▶ Only a handful of firms fail as a result of a financial firm's troubles
 - Domino effects stop at two at most
- ▶ Financial creditors are diversified, so worst effects of counterparty risk are found among industrial firms
- ▶ Information contagion leads to significant negative valuation effects on industry peers
 - But only for firms for which information is relevant
 - Effects are also small
- ▶ Policy response in crisis is more effective if not targeted at specific counterparties but at markets in general