

# Changing Market Perceptions of Who is 'Too Big to Fail' During the Financial Crisis of 2007-2008

Discussant's Remarks

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# Organization of Remarks

Quick Overview

Big Picture Issues

Specific Comments

TBTF Going Forward

# Big Picture Issues

What have we learned?

Why examine 10 events in isolation?

What are the net effects on TBTF?

Violations of underlying assumptions in event study methodology?

Why these ten events?

## ... Big Picture Issues

What are the connections to the model?

Contamination?

Competing hypotheses?

TBTF, TCTL, TITF?

**Table 3: Equity Return Model Fitting Results During Crisis.**

Application of four factor Fama-French equity return model where the factors are the excess market return, the size factor, SMB, the book to market factor, HML, and the momentum factor, UMD, respectively, during various points of the crisis. This is equation 10 in the text:

$$(\text{Excess Stock Return})_{i,t} = \alpha_i + \beta_{i1}(\text{Rm} - \text{Rf})_t + \beta_{i2}(\text{SMB})_t + \beta_{i3}(\text{HML})_t + \beta_{i4}(\text{UMD})_t + \mu_{i,t}$$

In the Pooled row, the model is fit to all firms on a pooled basis, clustering standard errors on firm, from the beginning of the observation period for event 1 through the last event day of the final event. In the remaining rows the firms are fit individually and aggregated for each 100 trading day observation period (typically immediately preceding the event) similar to the approach in Collin-Dufresne, Goldstein, and Martin (2001) - see footnote 12. Thus, the adjusted R<sup>2</sup> column is actually R<sup>2</sup> for the pooled model (adjusted R<sup>2</sup> is not valid for robust standard errors - see p.136 of Baum (2006)) and average firm adjusted R<sup>2</sup> for each event observation period.

Model	Obs Period		Fama-French Factors										adj.R <sup>2</sup>
	Pre	Post	Rm-Rf	p-val	SMB	p-val	HML	p-val	UMD	p-val	cons	p-val	
Pooled			1.436	0.0000	-0.313	0.0494	0.554	0.0184	-1.063	0.0000	-0.002	0.0003	0.2104
Event 1	100	0	1.238	0.0000	-0.074	0.3627	0.560	0.0000	-0.611	0.0000	-0.001	0.0030	0.4880
Event 2	100	0	1.344	0.0000	-0.166	0.0601	0.689	0.0000	-0.845	0.0000	-0.001	0.0229	0.5136
Event 3	50	50	1.531	0.0000	-0.230	0.0048	0.913	0.0001	-1.086	0.0000	-0.000	0.3058	0.5432
Event 4	100	0	1.546	0.0000	-0.252	0.0009	0.969	0.0001	-1.120	0.0000	-0.000	0.7349	0.5677
Event 5	100	0	1.503	0.0000	-0.396	0.0002	0.995	0.0000	-1.183	0.0000	0.000	0.1238	0.5362
Event 6	100	0	1.474	0.0000	-0.358	0.0033	0.991	0.0042	-1.243	0.0000	0.001	0.0548	0.5342
Event 7	50	50	1.254	0.0000	0.487	0.0011	0.663	0.1350	1.078	0.0000	0.002	0.0061	0.4853
Event 8	100	0	1.141	0.0000	0.020	0.8940	0.937	0.0132	-1.295	0.0000	-0.000	0.6166	0.5237
Event 9	100	0	1.068	0.0000	-0.360	0.0181	0.494	0.0012	-1.169	0.0000	-0.001	0.0169	0.5311
Event 10	100	0	0.962	0.0000	-0.126	0.3359	0.236	0.1446	-1.233	0.0000	-0.002	0.0586	0.5094

- Event 1: Rescue of IKB DeutscheBank (July 27 - August 3, 2007)
- Event 2: Federal Reserve Encourages Discount Window Borrowing (August 17-24, 2007)
- Event 3: The Bailout of Northern Rock (September 13-19, 2007)
- Event 4: Introduction of Federal Reserve Term Auction Facility (December 12-20, 2007)
- Event 5: The Purchase of Countrywide by Bank of America (January 7-11, 2008)
- Event 6: The Monoline Insurance Crisis (January 15-18, 2008)
- Event 7: Federal Reserve Support of Bear Stearns (March 10-17, 2008)
- Event 8: Explicit US Support of Fannie Mae and Freddie Mac (July 9-14, 2008)
- Event 9: Conservatorship of Fannie Mae and Freddie Mac (August 18-September 8, 2008)
- Event 10: Lakman, Merrill, Reserve MMP, AIG (September 9-17, 2008)

**Table 4: CDS Return Model Fitting Results During Crisis.**

Application of CDS return model (equation 11) during various points of the crisis. CDX is the Markit CDX index return, CMT refers to constant maturity US Treasury and the TED spread is the difference between the three month LIBOR (London Interbank Offered Rate) and the three month US Treasury bill rate. The CMT curve measures, Level, Slope, and Curvature are defined as Level, 5 year rate; Slope, the difference between the 10 year and 2 year rates; and Curvature, twice the 5 year rate minus the sum of the 10 year and 2 year rates.

$$(\text{CDS return})_{i,t} = \alpha_i + \beta_{i1}(\text{CDX Index return})_t + \beta_{i2}(\text{CDX Index return})_{t-1} + \beta_{i3}(\Delta\text{CMT Level})_t + \beta_{i4}(\Delta\text{CMT Slope})_t + \beta_{i5}(\Delta\text{CMT Curvature})_t + \beta_{i6}(\Delta\text{TED Spread})_t + \mu_{i,t}$$

In the Pooled row, the model is fit to all firms on a pooled basis, clustering standard errors on firm, from the beginning of the observation period for event 1 through the last event day of the final event. In the remaining rows the firms are fit individually and aggregated for each 100 trading day observation period (with pre and post event breakout displayed) similar to the approach in Collin-Dufresne, Goldstein, and Martin (2001) - see footnote 12. Thus, the adjusted R<sup>2</sup> column is actually R<sup>2</sup> for the pooled model (adjusted R<sup>2</sup> is not valid for robust standard errors see p.136 of Baum (2006)) and average firm adjusted R<sup>2</sup> for each event observation period.

Model	Obs Per		CDX Index Return				Constant Maturity Treasury					Liquidity		cons	p-val	adj.R <sup>2</sup>	
	Pre	Post	Cur	p-val	Lag	p-val	$\Delta$ Level	p-val	$\Delta$ Slope	p-val	$\Delta$ Curv	p-val	$\Delta$ TED				p-val
Pooled			1.392	0.0000	0.848	0.0000	-0.750	0.0327	-0.466	0.1395	1.733	0.0160	-0.169	0.4164	-0.000	0.0029	0.0977
Event 1	100	0	0.735	0.0000	0.332	0.0000	0.118	0.0085	0.120	0.0177	-0.105	0.1190	0.017	0.7260	-0.000	0.0079	0.4168
Event 2	100	0	0.493	0.0000	0.392	0.0000	0.624	0.0005	-0.861	0.0006	-0.367	0.2389	-0.532	0.0007	-0.000	0.0093	0.4259
Event 3	50	50	0.923	0.0000	0.513	0.0000	0.221	0.0374	-1.238	0.0001	0.212	0.5696	-0.155	0.0046	-0.000	0.0243	0.3050
Event 4	100	0	1.018	0.0000	0.565	0.0000	0.423	0.0025	-0.776	0.0011	-0.076	0.8533	-0.187	0.0016	-0.000	0.8214	0.3298
Event 5	100	0	1.497	0.0000	0.623	0.0001	-0.282	0.0126	-0.927	0.0004	0.588	0.0625	-0.102	0.0220	-0.000	0.6465	0.3056
Event 6	100	0	1.689	0.0000	0.489	0.0000	-0.339	0.0026	-0.607	0.0069	0.089	0.8142	-0.148	0.0038	-0.000	0.3804	0.2891
Event 7	50	50	1.130	0.0000	0.600	0.0000	-0.535	0.0592	-1.395	0.0018	1.779	0.0259	-0.160	0.4477	0.000	0.1073	0.4488
Event 8	100	0	1.057	0.0000	0.627	0.0000	-0.874	0.0370	-0.777	0.0025	2.441	0.0155	0.226	0.2473	-0.000	0.0541	0.4064
Event 9	100	0	1.265	0.0000	0.724	0.0000	-2.153	0.0571	-1.483	0.0004	3.471	0.0325	-0.758	0.0742	-0.000	0.0250	0.3282
Event 10	100	0	1.575	0.0000	0.787	0.0002	-2.244	0.0516	-1.742	0.0003	3.379	0.0389	-0.558	0.1317	-0.000	0.0207	0.2752

# Result 1: 'Too Big To Fail' is an Extension of Deposit Insurance for the Largest Banks

In response to the bailout of IKB Deutschebank (July 27 - August 3, 2007) only the largest U.S. banks displayed actual and abnormal positive debt return premiums:

Industry/Firm	Equity Returns (bp)			Debt Returns (bp)			One Yr CDS Level (bp)
	Actual	CAR	p-val	Actual	CAR	p-val	
Market Return	-325.4			-50.9			
<b>Banks</b>							
Bank of America	-59.7	384.8**	0.007	19.6	74.2**	0.000	11.5
Citigroup	-338.6	199.5	0.255	33.0	99.1**	0.000	13.5
JP Morgan Chase	-108.5	547.9**	0.002	39.1	111.7**	0.000	21.6
Wachovia	-659.7	-159.8	0.357	34.7	97.9**	0.000	14.1
Washington Mutual	-1113.2	-389.9	0.121	-136.5	-0.2	0.995	22.3
Wells Fargo	-260.5	275.5	0.055	11.9	60.2**	0.000	20.2
Westpac	-380.8	-61.4	0.793	-27.3	-10.4*	0.021	7.9

\* and \*\* refer to statistical significance at the 5% and 1% levels, respectively

## Result 2: 'Too Big To Fail' is an Extension of Implicit Government Guarantees for the GSEs

In response to the bailout of Bear Stearns (March 10-17, 2008) only the two GSEs displayed actual and abnormal positive debt return premiums with strong significance:

Industry/Firm	Equity Returns (bp)			Debt Returns (bp)			One Yr CDS Level (bp)
	Actual	CAR	p-val	Actual	CAR	p-val	
Market Return	-186.9			-37.6			
<b>Banks</b>							
Bank of America	-217.0	444.8	0.092	-83.4	-53.9	0.330	86.7
Citigroup	-1099.5	-309.0	0.371	-141.7	-88.8	0.258	137.3
JP Morgan Chase	727.1	1439.1**	0.000	-121.0	-93.0	0.074	84.4
Wachovia	-599.7	365.8	0.405	152.0	211.8*	0.048	239.0
Washington Mutual	-1376.8	-173.3	0.871	-169.9	-73.0	0.804	1098.6
Wells Fargo	233.5	951.1*	0.017	-51.8	-19.4	0.740	86.2
Westpac	513.2	812.7	0.117	-76.5	-44.5	0.404	52.6
<b>Surety &amp; GSE</b>							
AMBAC	-1308.3	-3179.1	0.213	-854.0	-756.9	0.313	1997.6
Fannie Mae	-250.6	879.5	0.383	78.5	100.1**	0.001	55.6
Freddie Mac	611.7	1895.9	0.076	88.3	113.5**	0.000	58.2
MBIA	-996.9	486.1	0.813	-747.8	-641.8	0.314	1942.8
MGIC Investment	-486.1	636.2	0.597	-21.6	56.3	0.838	1299.8
PMI	-1456.7	-329.7	0.769	-97.8	-4.4	0.988	1248.2
Radian	-1866.6	-611.6	0.666	-457.8	-425.9	0.173	1852.1

\* and \*\* refer to statistical significance at the 5% and 1% levels, respectively



## Result 3: Radian Appeared to be 'Too Big To Fail'

In response to the explicit support of Fannie Mae and Freddie Mac (U.S. Treasury Secretary Paulson's Bazooka - July 9-14, 2008) investors embedded a strong expectation of future support to the debt of Radian as well:

Industry/Firm	Equity Returns (bp)			Debt Returns (bp)			One Yr CDS Level (bp)
	Actual	CAR	p-val	Actual	CAR	p-val	
Market Return Surety & GSE	-285.7			9.8			
AMBAC	-2502.3	8436.0**	0.001	92.9	1.2	0.998	1988.1
Fannie Mae	-4479.7	-2070.3**	0.007	147.3	133.6**	0.000	44.3
Freddie Mac	-4719.4	-2446.8**	0.002	153.1	138.8**	0.000	43.6
MBIA	-1620.1	5180.5**	0.000	485.5	560.9	0.335	2132.4
MGIC Investment	-4761.7	-1132.7	0.224	-171.8	-244.0	0.218	1294.8
PMI	-2681.6	1090.4	0.245	196.6	156.6	0.508	1794.2
Radian	-4738.6	-1389.6	0.397	1399.9	1400.4**	0.008	4228.1

\* and \*\* refer to statistical significance at the 5% and 1% levels, respectively

## Result 4: The Remaining Broker Dealers were not 'Too Big To Fail'; Government Programs to Intervene in Markets Did Not Lead to 'Too Big To Fail' Expectations

In response to the Bear Stearns rescue (March 10-17, 2008) and the introduction of the PDCF, there was no positive abnormal debt return for other broker dealers:

Industry/Firm	Equity Returns (bp)			Debt Returns (bp)			One Yr CDS Level (bp)
	Actual	CAR	p-val	Actual	CAR	p-val	
Market Return	-285.7			9.8			
<b>Broker Dealers</b>							
Bear Stearns	-9314.3	-9269.6**	0.000	56.5	85.3	0.619	791.7
Goldman Sachs	-570.0	65.8	0.869	-46.0	12.0	0.874	171.4
Lehman Brothers	-3154.9	-2307.0**	0.003	-455.5	-357.0*	0.018	381.6
Merrill Lynch	-891.8	-85.7	0.869	-198.1	-119.8	0.262	304.0
Morgan Stanley	-877.5	-144.5	0.765	-203.0	-143.9	0.132	299.8

The introduction of the TAF (December 12-20, 2007) did not lead to positive abnormal debt returns for the banks:

Industry/Firm	Equity Returns (bp)			Debt Returns (bp)			One Yr CDS Level (bp)
	Actual	CAR	p-val	Actual	CAR	p-val	
Market Return	-133.9			0.3			
<b>Banks</b>							
Bank of America	-734.2	-192.7	0.323	-4.0	-18.9	0.601	19.4
Citigroup	-1013.4	-73.9	0.795	6.1	-6.0	0.887	34.9
JP Morgan Chase	-576.8	2.3	0.993	-15.1	-33.7	0.395	24.0
Wachovia	-792.8	-67.7	0.819	-81.6	-85.0	0.056	36.8
Washington Mutual	-1586.5	32.3	0.957	-226.1	-234.3	0.214	358.7
Wells Fargo	-139.0	578.3	0.077	-54.5	-69.4	0.079	34.0
Westpac	-724.4	-571.6	0.123	5.7	14.9	0.513	15.8

## Result 5: Lehman's Demise was not a Surprise to Investors but AIG's Rescue Was

Behavior of Lehman, Merrill Lynch, and AIG in the events leading to the fateful days of September 15-16, 2008:

Industry/Firm	Equity Returns (bp)			Debt Returns (bp)			One Yr CDS Level (bp)
	Actual	CAR	p-val	Actual	CAR	p-val	
<b>Bear Stearns Rescue</b>							
<b>March 10-17, 2008</b>							
Market Return	-133.9			0.3			
Lehman Brothers	-3154.9	-2307.0**	0.003	-455.5	-357.0*	0.018	381.6
Merrill Lynch	-891.8	-85.7	0.869	-198.1	-119.8	0.262	304.0
AIG	-722.8	98.0	0.856	-223.0	-165.5	0.068	220.9
<b>GSE Explicit Support</b>							
<b>July 9-14, 2008</b>							
Market Return	-285.7			9.8			
Lehman Brothers	-4433.8	-3029.2**	0.000	-401.2	-477.8**	0.001	495.2
Merrill Lynch	-2104.9	-44.0	0.900	-224.6	-248.4*	0.011	328.1
AIG	-1772.5	-157.3	0.673	-34.5	-84.2	0.224	248.5
<b>GSE Conservatorship</b>							
<b>Aug 18-Sep 8, 2008</b>							
Market Return	-273.0			-18.8			
Lehman Brothers	-1257.6	-788.8	0.620	-107.1	31.3	0.891	727.0
Merrill Lynch	484.5	695.4	0.407	-66.5	10.4	0.955	401.7
AIG	-13.1	182.2	0.864	-534.4	-405.2**	0.002	370.0