Appendix to "Is Size Everything?"

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A. Methodology for Constructing GL and SMB' Factors, and Test Portfolios

Data for the SMB, book-to-market (HML), Market minus risk free rate ($Mktrf$), robust minus weak profitability ($PROF$), and momentum (MOM) factors are from Kenneth French's website.[1] Since we want to identify SIFI effects separately from the effects of standard size factors, we create a version of SMB (denoted SMB') that is orthogonal to $TSIZE$ by construction.[2] To construct SMB', we apply the Fama-French methodology to firms below the 84th percentile. In other words, small firms are those below the 42nd percentile while large firms are those between the 42nd and 84th percentiles. Creating six size-by-BM groups, as above, SMB' is the average returns of the three small size bins minus the average returns of the three large size bins. Over the full sample, SMB' has a correlation of 0.86 with SMB, and a correlation of just -.04 with $SIFI$. Additional factors used are the excess returns on a corporate bond index ($CORP$), the excess returns on 10 year USA Government bonds (GOV) and the Baa-Aaa corporate bond spread ($DISTRESS$).[3]

To construct GL, we need the portfolio returns and the weights applied to these returns. To replicate the portfolios, we follow Gandhi and Lustig (2015) and start with all firms in CRSP with SIC codes that begin with 60, value weighting returns for firms with more than one common stock issue, dropping non-US firms and suspended, inactive, or delisted stocks.[4] In January of each year, we construct ten size sorted portfolios based on deciles of market capitalization in January. We then calculate value weighted returns for each portfolio, using the size in January for value weighting in each subsequent month of the year. Finally, we apply the weights reported in Gandhi and Lustig (2015) to the value weighted returns of each portfolio to replicate GL.

The 30 test portfolios are constructed from the six size deciles (as described in the text) and five BM bins, constructed following Fama and French (1993). The 30 portfolios are obtained from taking the intersection of these size and BM partitions. Within each portfolio we calculate a size-weighted return for each month, then calculate an excess return by subtracting the risk free rate.[5] We provide summary statistics on the number of firms in each portfolio and the size of the average firm in each portfolio in the online appendix.

For sector-level analysis, we create test portfolios using only non-finance firms, only finance firms or firms in particular financial sectors such as banking. As before, we define a firm to be financial if SIC or NAICS identify it as finance. To obtain disjoint partitions, we define non-financial firms to be those that neither SIC nor NAICS consider to be finance. The size and BM percentiles are calculated using these restricted samples. Banks are identified using SIC codes starting with 60, 61, or 62, or NAICS codes beginning with 522 or 523. We define nonbank financial firms as those which SIC or NAICS categorize as finance, but which neither SIC nor NAICS categorize as banks. We define insurance companies following Antill, Hou and Sarkar (2014), as firms whose SIC codes begin with 63 or 64, or whose NAICS codes begin with 524. For each subsample, we construct 30 BM and size sorted portfolios.

References

Antill, Samuel, David Hou, and Asani Sarkar, "Components of U.S. Financial Sector Growth: 1950-2013," *Economic Policy Review*, 2014, *20* (2).

Fama, Eugene F. and Kenneth R. French, "Common risk factors in the returns on stocks and bonds," *Journal of Financial Economics*, 1993, *33* (1), pp. 3–56.

Gandhi, Priyank and Hanno Lustig, "Size Anomalies in U.S. Bank Stock Returns," *The Journal of Finance, Forthcoming*, 2015, *70* (2), 1540–6261.

[1] See `http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html`. We thank Kenneth French for use of the data.

[2] We use SAS code that replicates the Fama French factors and portfolios, obtained from WRDS.

[3] Data for $CORP$ and GOV is from Global Financial Data where $CORP$ and GOV are called the Dow Jones Corporate Bond Return Index and the USA 10-year Government Bond Total Return Index, respectively. Data for $DISTRESS$ is from the FRED database of the St. Louis Fed.

[4] We thank the authors for generously providing us with their code for creating the bank portfolios.

[5] We use the one month Treasury bill rate from Ibbotson Associates as the risk-free rate, downloaded from Kenneth French's website.

B. Section 4 of Paper

Table B.1: Loadings on SIFI Factors, Financial and Non-financial Portfolios Separately

This table shows OLS estimates for loadings on SIFI factors $COMP$, IC and $TSIZE$ of financial (left panel) and non-financial (right panel) portfolios sorted by size (reading top to bottom, rows correspond to the 20th, 40th, 60th, 80th, and 90th percentiles of the size distribution) and book-to-market (reading left to right, columns correspond to the 20th, 40th, 60th, and 80th percentiles of the book-to-market distribution). In Panel A, we use the SIFI1 model. In Panels B-D we use the SIFI4 specification. This panel also reports loadings on LEV and LIQ. In Panel E we add $COMP$ to the SIFI4 model. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively. Standard errors are adjusted for heteroskedasticity and autocorrelation using Newey West (1987) with a maximum of 3 lags. The sample starts from July 1963 in Panel A, January 1970 in Panels B-D and July 1986 in Panel E, and ends in 2006 in all cases.

	Finance Portfolios					Nonfinance Portfolios				
	Low	2	3	4	High	Low	2	3	4	High
Panel A: Loadings on TSIZE Factor										
Smallest	-.08	.24***	-.02	.11*	.08	.00	.07**	.09***	.09***	.05**
2	-.05	.14*	.15***	.13***	.12	.10***	.13***	.13***	.10***	.07**
3	.15**	.13	.19***	.15**	.20*	.06	.10***	.09***	.13***	.10***
4	.07	.19***	.15**	.11	.05	.04	.08***	.09***	.07**	.14***
5	.15*	.38***	.27***	.35***	.47***	.04	.08***	.07***	.09***	.03
Largest	-.29***	-.33***	-.22***	-.31**	-.51***	-.03	-.02	-.11**	.03	-.08
Panel B: Loadings on Interconnectedness Factor (Controlling for IC, LIQ, LEV, GL)										
Smallest	-.02	-.05	.01	.00	-.01	-.01	-.01	.01	-.01	.00
2	-.07	.01	-.03	.01	.00	.01	.01	.02	.05***	.03
3	.00	-.06	-.01	.00	-.08	.02	.02	.02	.04**	.04
4	-.05	.02	-.01	-.05	-.13**	.00	.02	.03*	.03*	.03
5	.04	-.03	-.08**	-.06	-.10	-.02	.00	.03	.05***	.02
Largest	.07	-.04	-.09**	-.11**	-.07	.03*	.01	.06**	.04	-.08

Table B.1: Loadings on $SIFI$ Factors, Financial and Non-financial Portfolios Separately (Continued)

Panel C: Loadings on Liquidity Factor (Controlling for IC, LIQ, LEV, GL)										
Smallest	-.01	-.02	-.04	-.10**	-.09*	-.01	.01	.06***	.03	.00
2	-.10	-.02	-.07	-.03	-.08	.02	.05	.05*	.03	.06**
3	.02	-.01	-.05	.01	.04	-.01	.02	.04	.03	.00
4	.01	-.11**	-.08*	-.07	-.01	.02	.01	.04	.04	.12***
5	-.12	-.17**	-.04	-.04	.01	-.01	.01	.03	.02	-.01
Largest	-.10*	.05	-.13*	-.01	.14	.02	-.04	-.08**	-.03	.06
Panel D: Loadings on Leverage Factor (Controlling for IC, LIQ, LEV, GL)										
Smallest	.03	.03	.02	.11*	.13**	-.01	.04*	.01	.02	.05**
2	.01	.09	.06	.04	.08	-.03	-.03	-.02	.00	-.04*
3	.05	.07	.10	.11**	.19***	-.05**	.00	-.03	-.01	-.01
4	.10**	.23***	.30***	.24***	.18**	-.02	-.03	-.03*	-.03	-.06*
5	.24***	.31***	.26***	.39***	.18*	-.03	.00	-.04	-.03	-.02
Largest	.14**	.28***	.45***	.29***	.19*	.01	-.04	-.07***	-.09**	-.08*
Panel E: Loadings on Complex Factor (controlling for IC, LIQ, LEV, COMP, GL)										
Smallest	.02	-.03	-.10**	-.06	-.16**	.05	.01	.02	.01	-.01
2	-.16	-.08*	-.09*	-.06	-.15**	.06	-.07*	-.04	-.03	.01
3	-.03	-.05	-.06	-.13**	-.25***	.04	-.04	.02	-.01	.05
4	.02	-.04	-.10*	-.19***	-.39***	.03	.01	.04	.04	.01
5	.00	-.08	-.13	-.16**	-.20**	-.02	-.02	-.04	.04	.03
Largest	.06	-.02	-.14*	-.30***	-.28**	.02	.02	.06	.03	.05

Table B.2: Cross-Section Results: Adding Factors Simultaneously

This table shows estimates of the price of risk for the $TSIZE$ factor, as well as non-size factors based on complexity $COMP$, interconnectedness IC, leverage LEV, and liquidity LIQ. We first estimate 60 month rolling time series regressions of 30 size and book-to-market sorted portfolio excess returns on these factors in a first stage regression using the SIFI1 specification for the first 3 rows, the SIFI4 specification for rows except complex, and SIFI4+COMP for the last 3 rows. Then, in each month, we regress the 30 portfolio returns on that month's estimates of factor loadings in a cross sectional regression. The first and second stages are estimated by OLS. We present the time-series averages of these coefficients, along with the standard t-statistic and the Shanken (1992) errors-in-variables corrected t-statistics. The sample is from 1963m7 to 2006 in the first 3 rows, and 1986 to 2006 for the last 3 rows. The sample in the remaining rows is from 1970 to 2006.

	Cons	TSIZE	Liquidity	Inter	Leverage	Complex
Price of Risk	0.99	0.82				
T-Stat	(4.61)	(2.86)				
Shanken T-Stat	(4.36)	(2.43)				
Price of Risk	1.06	0.73	-0.1			
T-Stat	(4.28)	(2.55)	(-0.27)			
Shanken T-Stat	(3.95)	(2.11)	(-0.22)			
Price of Risk	1.06	0.69	0	0.53		
T-Stat	(4.15)	(2.46)	(-0.01)	(1.01)		
Shanken T-Stat	(3.88)	(2.04)	(-0.01)	(0.85)		
Price of Risk	1.17	0.61	-0.13	0.81	-0.14	
T-Stat	(4.63)	(2.1)	(-0.35)	(1.58)	(-0.27)	
Shanken T-Stat	(4.27)	(1.74)	(-0.29)	(1.31)	(-0.22)	
Price of Risk	1.62	0.14	0.21	0.54	-1.37	-1.34
T-Stat	(5.43)	(0.39)	(0.47)	(0.89)	(-2.35)	(-2.34)
Shanken T-Stat	(4.8)	(0.31)	(0.38)	(0.72)	(-1.76)	(-1.85)

Table B.3: Time Series Loadings for $TSIZE$ with 3% Cutoff

This table shows OLS estimates for loadings on the $TSIZE^3$ factor, which is constructed identically to $TSIZE$ but using a 3% cutoff rather than an 8% cutoff. The test portfolios are sorted by size (reading top to bottom, rows correspond to the 20th, 40th, 60th, 80th, and 90th percentiles of the size distribution) and book-to-market (reading left to right, columns correspond to the 20th, 40th, 60th, and 80th percentiles of the book-to-market distribution). In Panel A, we use the SIFI1 model. In Panel B, use the SIFI4 specification. In panel C we add the Complexity factor $COMP$ to the SIFI4 model. In all cases, we replace $TSIZE$ with $TSIZE^3$ in the models. Standard errors are adjusted for heteroskedasticity and autocorrelation using Newey West (1987) with a maximum of 3 lags. The sample is from 1963m7 through 2006 in Panel A, 1970 through 2006 in Panel B, and 1986-2006 in Panel C.

	Low	2	3	4	High
Panel A: Loadings on $TSIZE^3$ Factor, Baseline					
Smallest	.01	.03*	-.01	.02	.01
2	.06**	.00	-.01	.02	.02
3	.03	.01	.01	.02	.01
4	.02	.04	.00	.02	.02
5	.06***	.01	.02	.01	.03
Largest	-.06***	-.03	-.02	-.05*	.04
Panel B: Loadings on $TSIZE^3$ Factor, All except Complex					
Smallest	.03	.04**	.01	.03	.03
2	.08***	.00	.00	.04	.04
3	.05*	.02	.01	.03*	.04
4	.04*	.05*	.01	.02	.03
5	.06***	.02	.03	.01	.05
Largest	-.06**	-.03	-.03	-.05*	.02
Panel C: Loadings on $TSIZE^3$ Factor, All with Complex					
Smallest	.04	.08***	.02	.05	.06*
2	.11***	.06	.00	.08*	.07*
3	.07*	.07	.05	.06	.10*
4	.06	.10***	.03	.08*	.09*
5	.06**	.00	.03	-.02	.09**
Largest	-.09***	-.09**	-.12***	-.01	-.01

Table B.4: Time Series Loadings for $TSIZE$ with 4% Cutoff

This table shows OLS estimates for loadings on the $TSIZE^4$ factor, which is constructed identically to $TSIZE$ but using a 4% cutoff rather than an 8% cutoff. The test portfolios are sorted by size (reading top to bottom, rows correspond to the 20th, 40th, 60th, 80th, and 90th percentiles of the size distribution) and book-to-market (reading left to right, columns correspond to the 20th, 40th, 60th, and 80th percentiles of the book-to-market distribution). In Panel A, we use the SIFI1 model. In Panel B, use the SIFI4 specification. In panel C we add the Complexity factor $COMP$ to the SIFI4 model. In all cases, we replace $TSIZE$ with $TSIZE^4$ in the models. Standard errors are adjusted for heteroskedasticity and autocorrelation using Newey West (1987) with a maximum of 3 lags. The sample is from 1963m7 through 2006 in Panel A, 1970 through 2006 in Panel B, and 1986-2006 in Panel C.

	Low	2	3	4	High
Panel A: Loadings on $TSIZE^4$ Factor, Baseline					
Smallest	-.01	.06***	.04**	.08***	.05***
2	.07***	.07***	.09***	.07***	.08***
3	.05*	.08***	.06***	.07***	.08***
4	.03	.07***	.05***	.07***	.07***
5	.05**	.08***	.08***	.06***	.06
Largest	-.05***	-.01	-.08***	-.03	.00
Panel B: Loadings on $TSIZE^4$ Factor, All except Complex					
Smallest	-.01	.11***	.07***	.10***	.07***
2	.11***	.11***	.11***	.12***	.08***
3	.07**	.10***	.09***	.10***	.12***
4	.06**	.09***	.07***	.08***	.11***
5	.06**	.09***	.11***	.07***	.08
Largest	-.06***	-.02	-.09***	-.03	-.03
Panel C: Loadings on $TSIZE^4$ Factor, All with Complex					
Smallest	-.02	.11***	.09**	.12***	.09**
2	.15***	.16***	.16***	.18***	.11*
3	.07	.11**	.14***	.15***	.17**
4	.04	.13***	.11***	.15***	.18***
5	.04	.13***	.13***	.09*	.09
Largest	-.08**	-.04	-.11**	-.02	-.04

Table B.5: Time Series Loadings for $TSIZE$ using Book Value of Equity BVE

This table shows OLS estimates for loadings on the $TSIZE^{BVE}$ factor, which is constructed identically to $TSIZE$ but using BVE rather than MVE. The test portfolios are sorted by size (reading top to bottom, rows correspond to the 20th, 40th, 60th, 80th, and 90th percentiles of the size distribution) and book-to-market (reading left to right, columns correspond to the 20th, 40th, 60th, and 80th percentiles of the book-to-market distribution). In Panel A, we use the SIFI1 model. In Panel B, use the SIFI4 specification. In panel C we add the Complexity factor $COMP$ to the SIFI4 model. In all cases, we replace $TSIZE$ with $TSIZE^{BVE}$ in the models. Standard errors are adjusted for heteroskedasticity and autocorrelation using Newey West (1987) with a maximum of 3 lags. The sample is from 1963m7 through 2006 in Panel A, 1970 through 2006 in Panel B, and 1986-2006 in Panel C.

	Low	2	3	4	High
Panel A: Loadings on $TSIZE^{BVE}$					
Smallest	.03	.08***	.10***	.08***	.05**
2	.05*	.10***	.08***	.05**	.06**
3	.08***	.07**	.09***	.05**	.09***
4	.04*	.05**	.06***	.08***	.15***
5	.03	.04**	.05**	.07***	.03
Largest	.01	-.06**	-.09***	-.04*	-.07
Panel B: Loadings on $TSIZE^{BVE}$ (controlling for IC, LIQ, LEV, GL)					
Smallest	.00	.10***	.12***	.12***	.08***
2	.06	.14***	.11***	.07**	.08**
3	.09**	.11***	.13***	.06*	.13***
4	.05	.08**	.07**	.08**	.21***
5	.05*	.05**	.05	.07***	.06
Largest	.01	-.04	-.12***	-.04	-.15**
Panel C: Loadings on Interconnectedness Factor					
Smallest	-.02	.00	.01	.00	.01
2	.02	.03	.03	.04*	.02
3	.03	.03*	.02	.02	.04
4	.00	.02	.02	.01	.01
5	-.01	.00	.00	.01	-.01
Largest	.03*	.00	.04*	.01	-.12**
Panel D: Loadings on Liquidity Factor					
Smallest	.00	-.01	.05**	-.01	-.01
2	.01	.04	.02	.01	.04*
3	-.01	.00	.02	.03	.02
4	.01	.01	.01	.04	.08***
5	-.02	-.03	-.02	.02	.02
Largest	.01	-.05*	-.09**	-.04	.08
Panel E: Loadings on Leverage Factor					
Smallest	.01	.03	.02	.04**	.06***
2	-.04	-.02	.00	.00	-.02
3	-.04	.00	.00	.00	.03
4	-.01	.00	.00	.02	.02
5	-.01	.02	.07***	.03	.03
Largest	.02	.03	.01	.00	-.08

Table B.6: Book Value Equity-based $TSIZE$ Risk in the Cross-Section of Returns

This table shows estimates of the price of risk for the Book Value Equity based factor$TSIZE^{BVE}$ by itself, and when paired with the interconnectedness IC factor. In addition, we report the price of leverage LEV and liquidity LIQ factors, paired with $TSIZE$. We first estimate 60 month rolling time series regressions of 30 size and book-to-market sorted portfolio excess returns on these factors in a first stage regression. Then, in each month, we regress the 30 portfolio returns on that month's estimates of factor loadings in a cross sectional regression. The first and second stages are estimated by OLS. We present the time-series averages of these coefficients, along with the standard t-statistic and the Shanken (1992) errors-in-variables corrected t-statistics. The sample is from 1963m7 to 2006 in the first 3 rows, and from 1970 to 2006 for the remaining rows.

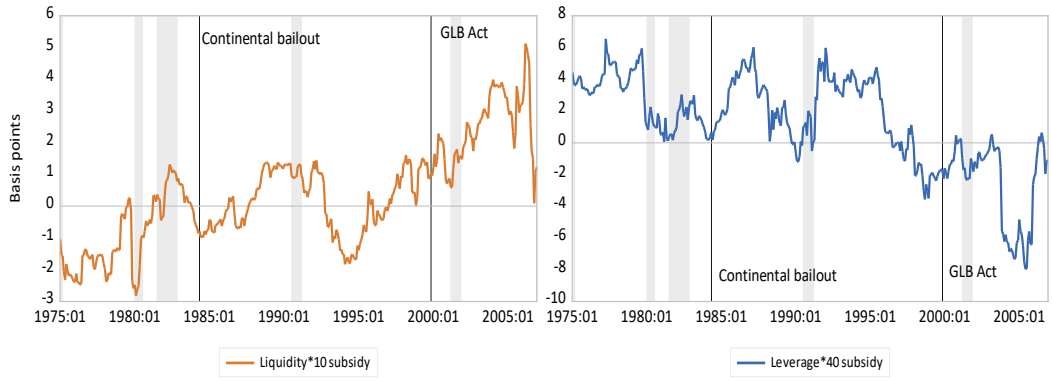
	α	$TSIZE^{BVE}$	LIQ	IC	LEV
Price of Risk	0.79	0.60			
T-Stat	(3.79)	(1.77)			
Shanken T-Stat	(3.64)	(1.54)			
Price of Risk	0.90	0.71	0.10		
T-Stat	(3.74)	(2.30)	(0.28)		
Shanken T-Stat	(3.45)	(1.92)	(0.24)		
Price of Risk	0.88	0.91		0.36	
T-Stat	(3.68)	(3.07)		(0.73)	
Shanken T-Stat	(3.39)	(2.53)		(0.60)	
Price of Risk	1.04	0.75			0.22
T-Stat	(4.37)	(2.51)			(0.46)
Shanken T-Stat	(4.04)	(2.08)			(0.36)

C. Section 5 of Paper

Figure C.1: Subsidies Implied by LIQ and LEV Factor Loadings from 60-month Rolling Regressions

The figure shows subsidies implied by LIQ and LEV factors for 1975-2006 (Panel A) and 2007-2013 (Panel B) estimated from rolling 60-month regressions using the SIFI3 specification. Subsidies are in basis points for LIQ and unitless for LEV. The red vertical lines correspond to the Continental Bailout (May 1984), the Gramm-Leach-Bliley Act (November 1999), the Lehman bankruptcy (September 2008), and the Dodd Frank Act (July 2010). The grey shaded areas are NBER recession periods.

Panel A: Subsidies Implied by LEV and LIQ Loadings: 1975-2006



Panel B: Subsidies Implied by LEV and LIQ Loadings: 2007-2013

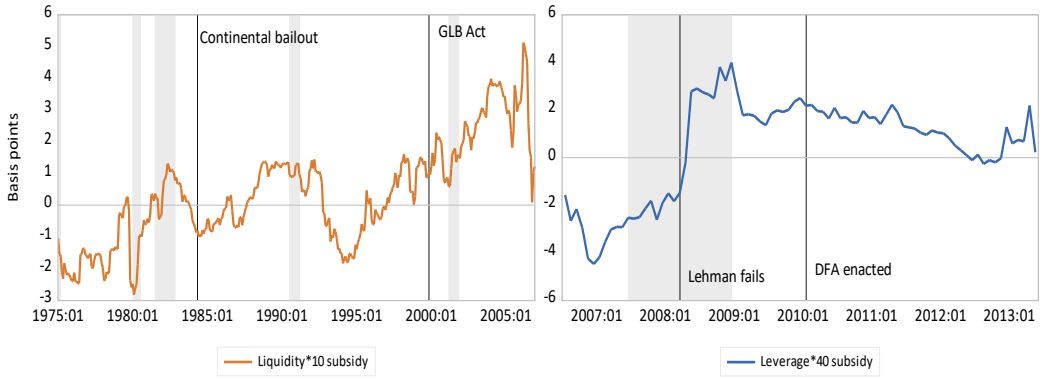


Figure C.2: Share of Firms Leaving $TSIZE$ Factor: 1-Year and 5-Year Rebalancing

The top panel shows the percent of firms in the largest 8% size bin $L8$ and the next-largest 8% size bin $NL8$ of financial firms constituting the $TSIZE$ factor that exit from one year to the next. The bottom panel shows the percent of firms in $L8$ and $NL8$ in year $t-5$ that left in year t. The red lines correspond to the Continental Bailout (May 1984), the Lehman bankruptcy (September 2008), and the DFA implementation (July 2010).

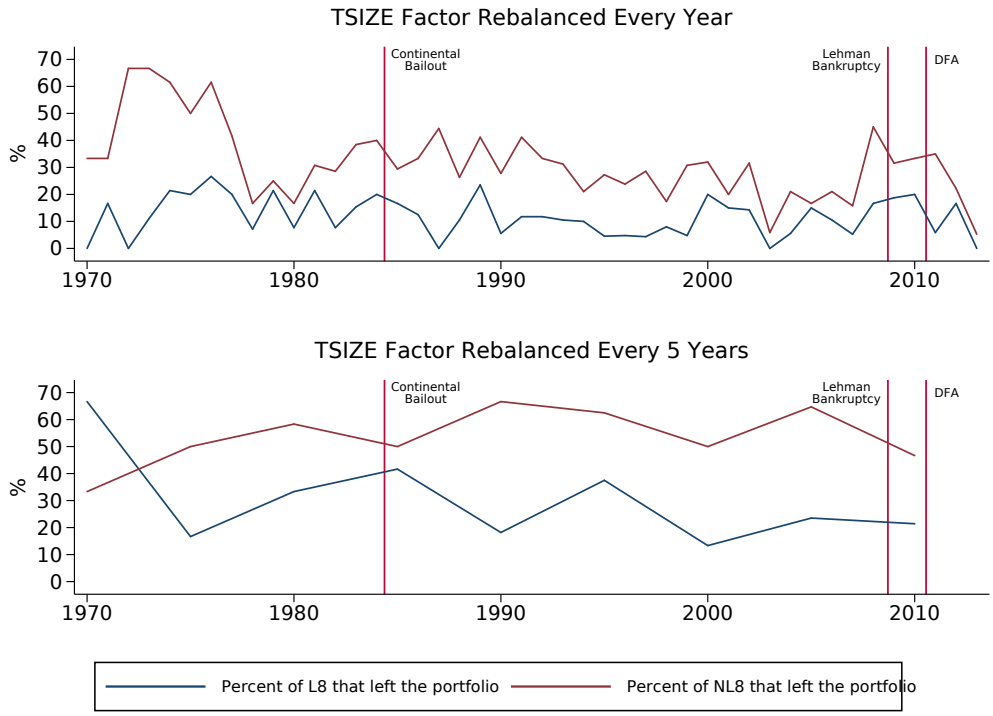


Figure C.3: Subsidies Implied by $SIFI$ Loadings: Factors Rebalanced 5 Years

The figure shows subsidies implied by SIFI factors for 2007-2013 estimated from rolling 60-month regressions using the SIFI4 specification for complexity and SIFI3 for the remaining factors, when the factors are rebalanced every 5 years rather than yearly. The red vertical lines correspond to the the Lehman bankruptcy (September 2008), and the Dodd Frank Act (July 2010). The grey shaded areas are NBER recession periods.

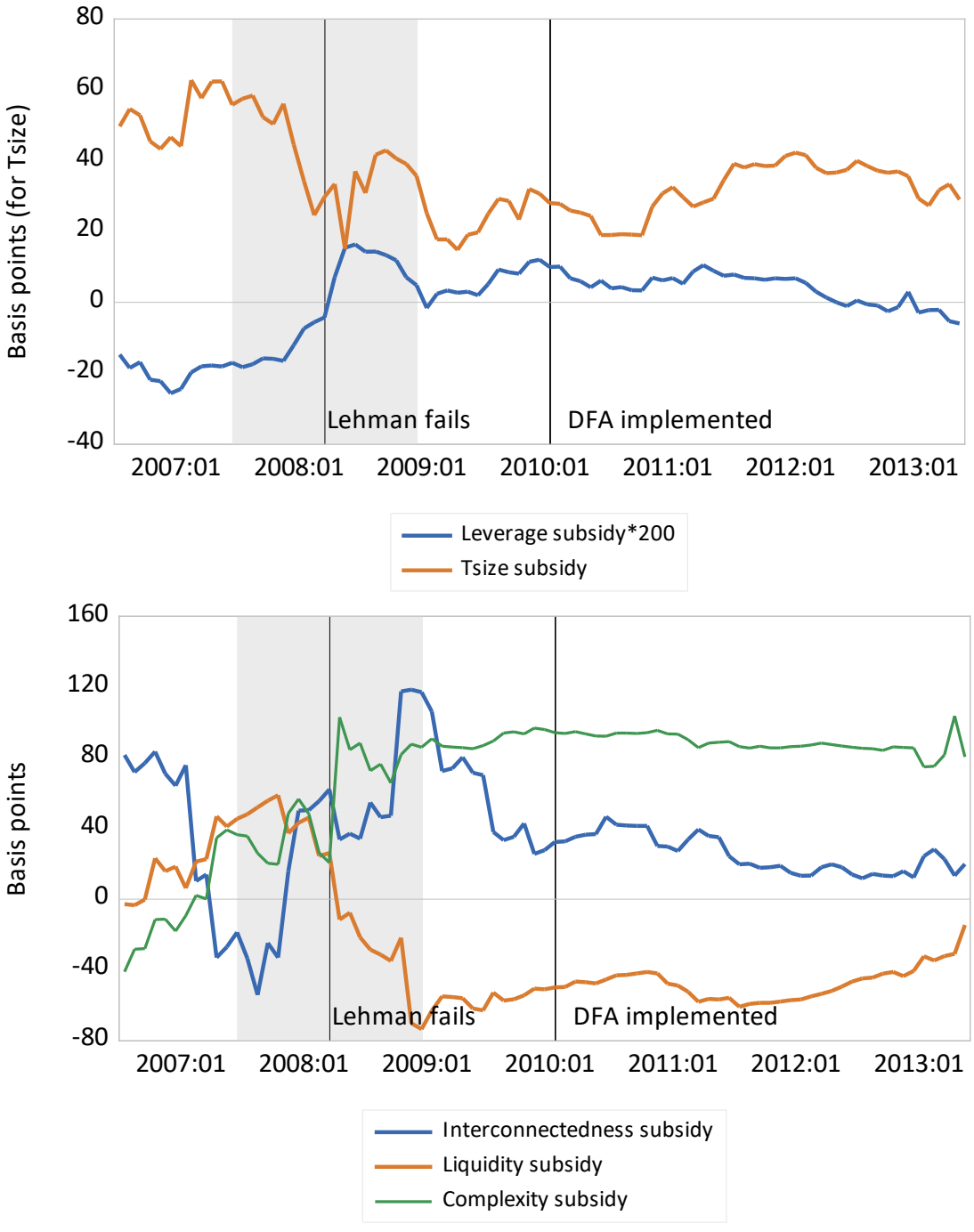


Table C.1: Probability of Government Support for Firms in the $TSIZE$ Factor

This table reports the level of extremely high government support in the largest 8% (denoted $L8$) and the next largest 8% (denoted $NL8$) of financial firms that constitute the $TSIZE$ factor. Panel A of the table reports the overall share of commercial banks and the share of banks that ever had a Fitch's Support Rating floor (SRF) of at least A- (indicating a firm with extremely high probability of government support) for the $L8$ and $NL8$ groups of financial firms. The last two columns show estimates and T-statistics from regressing the shares on $L8$ and time fixed effects. The sample is from 1963 to 2013. Panel B shows results from a linear probability model for the probability that a firm ever receives a SRF of at least A- , estimated by pooled OLS with monthly fixed effects and standard errors clustered by firm:

$$GSUP_{it} = \alpha + \beta_t + \delta L8_{it} + \gamma MarketCap_{it} + \epsilon_{it}$$

where, for month t, $GSUP_{i,t}$, a dummy variable equal to 1 if bank i ever had a rating of A- or higher and $MarketCap_{i,t}$, the market capitalization (in trillions \$). The sample consists of 163 rating observations for 21 publicly traded US banks that are in the largest 16% of financial firms and have SRFs from Fitch between March 16 2007 and 2013.

Panel A: Share of Firms that are Banks or have Highest Government Support

	In $L8$ Group		In $NL8$ Group		Regression On $L8$ Dummy	
	Mean	SD	Mean	SD	Coefficient	T-stat
Share of Banks	0.25	0.44	0.24	0.43	0.01	0.21
Ever Rated $>= A-$	0.84	0.37	0.19	0.39	0.62	4.69

Panel B: Estimating Probability of Firms with Highest Government Support

	Coefficient	Standard Error	Tstat	P
L8	0.43	0.18	2.31	0.03
MarketCap	2.32	1.21	1.91	0.07
Constant	0.05	0.14	0.34	0.74

Table C.2: $TSIZE$ Factor Loadings Around Fitch Support Ratings Changes, Including Size and BM

This table shows changes in $TSIZE$ loadings of a bank around changes in the Fitch Support Floor Rating from below A- to above A- (indicating a bank with extremely high probability of government support). The $TSIZE$ loadings are estimated from 60-month rolling regressions using the SIFI1 specification. $t = 0$ indicates the month of the rating change. $t\epsilon[0, x]$ is a dummy variable equal to one for the x months after the event, and $t\epsilon[-x, 0]$ is a dummy variable equal to one for the x months before the event. Size is the market capitalization of the bank. 8 U.S. banks are included using rating changes from March 2007 to June 2013. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively. T-statistics are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$t \geq 0$	-0.0992**			-0.0992***			
	(-2.25)			(-3.44)			
$t\epsilon[-4, 0)$			0.0280			0.0280	0.0379
			(0.43)			(0.65)	(0.87)
$t\epsilon[0, 4]$		-0.118**	-0.106*		-0.118***	-0.106***	-0.0966**
		(-2.12)	(-1.73)		(-3.25)	(-2.65)	(-2.37)
$t\epsilon(4, 10]$		-0.0839	-0.0727		-0.0839**	-0.0727*	-0.0557
		(-1.61)	(-1.24)		(-2.46)	(-1.90)	(-1.07)
Book-to-market							0.0189
							(0.25)
Log size							0.0819
							(1.39)
Constant	-0.0565*	-0.0565*	-0.0677	-0.0565***	-0.0565***	-0.0677**	-1.571
	(-1.77)	(-1.77)	(-1.64)	(-2.70)	(-2.70)	(-2.50)	(-1.42)
PERMNO FE	None	None	None	FE	FE	FE	FE
N	168	168	168	168	168	168	168
r2_a	0.0238	0.0196	0.0148	0.0223	0.0205	0.0170	0.0196

t statistics in parentheses

* p¡.10, ** p¡.05, *** p¡.01

Table C.3: Non-$TSIZE$ Factor Loadings Around Fitch Support Ratings Changes

This table shows changes in non-$TSIZE$ SIFI factor loadings of a bank around changes in the Fitch Support Floor Rating from below A- to above A- (indicating a bank with extremely high probability of government support). The factor loadings are estimated from 60-month rolling regressions of excess returns using the SIFI4 model or the SIFI4+$COMP$ model (when $COMP$ loadings are the dependent variable). $t = 0$ indicates the month of the rating change. $t\epsilon[0, x]$ is a dummy variable equal to one for the x months after the event, and $t\epsilon[-x, 0]$ is a dummy variable equal to one for the x months before the event. Size is the market capitalization of the bank. 14 U.S. banks are included using rating changes from March 2007 to June 2013. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively. T-statistics are in parentheses.

Changes in $COMP$ Loadings

	(1)	(2)	(3)	(4)	(5)	(6)
$t \geq 0$	0.0540**			0.0540***		
	(2.30)			(4.74)		
$t\epsilon[-4, 0)$			0.0358			0.0358**
			(1.03)			(2.13)
$t\epsilon[0, 4]$		0.0485	0.0628*		0.0485***	0.0628***
		(1.64)	(1.92)		(3.39)	(3.99)
$t\epsilon(4, 10]$		0.0586**	0.0730**		0.0586***	0.0730***
		(2.10)	(2.34)		(4.34)	(4.87)
Constant	-0.327***	-0.327***	-0.341***	-0.327***	-0.327***	-0.341***
	(-19.17)	(-19.14)	(-15.48)	(-39.56)	(-39.51)	(-32.15)
PERMNO FE	None	None	None	FE	FE	FE
N	294	294	294	294	294	294
r2_a	0.0144	0.0113	0.0115	0.0280	0.0259	0.0382

t statistics in parentheses

* p<.10, ** p<.05, *** p<.01

Changes in IC Loadings

	(1)	(2)	(3)	(4)	(5)	(6)
$t \geq 0$	0.0108			0.0108		
	(0.37)			(0.76)		
$t\epsilon[-4, 0)$			-0.0392			-0.0392*
			(-0.91)			(-1.88)
$t\epsilon[0, 4]$		0.00881	-0.00686		0.00881	-0.00686
		(0.24)	(-0.17)		(0.50)	(-0.35)
$t\epsilon(4, 10]$		0.0124	-0.00329		0.0124	-0.00329
		(0.36)	(-0.09)		(0.74)	(-0.18)
Constant	-0.103***	-0.103***	-0.0874***	-0.103***	-0.103***	-0.0874***
	(-4.89)	(-4.88)	(-3.20)	(-10.08)	(-10.06)	(-6.64)
PERMNO FE	None	None	None	FE	FE	FE
N	294	294	294	294	294	294
r2_a	-0.00296	-0.00638	-0.00699	-0.0480	-0.0516	-0.0421

t statistics in parentheses

* p<.10, ** p<.05, *** p<.01

Changes in LEV Loadings

	(1)	(2)	(3)	(4)	(5)	(6)
$t \geq 0$	0.0786**			0.0786***		
	(2.39)			(5.28)		
$t\epsilon[-4, 0)$			0.0329			0.0329
			(0.68)			(1.55)
$t\epsilon[0, 4]$		0.0329	0.0461		0.0329*	0.0461**
		(0.80)	(1.01)		(1.81)	(2.30)
$t\epsilon(4, 10]$		0.117***	0.130***		0.117***	0.130***
		(3.01)	(2.99)		(6.83)	(6.82)
Constant	0.321***	0.321***	0.308***	0.321***	0.321***	0.308***
	(13.47)	(13.52)	(10.03)	(29.83)	(30.70)	(22.86)
PERMNO FE	None	None	None	FE	FE	FE
N	294	294	294	294	294	294
r2_a	0.0158	0.0238	0.0220	0.0454	0.0987	0.103

t statistics in parentheses

* p¡.10, ** p¡.05, *** p¡.01

Changes in LIQ Loadings

	(1)	(2)	(3)	(4)	(5)	(6)
$t \geq 0$	-0.0488**			-0.0488***		
	(-1.97)			(-2.72)		
$t\epsilon[-4, 0)$			-0.101***			-0.101***
			(-2.79)			(-3.92)
$t\epsilon[0, 4]$		-0.0772**	-0.118***		-0.0772***	-0.118***
		(-2.49)	(-3.47)		(-3.46)	(-4.88)
$t\epsilon(4, 10]$		-0.0252	-0.0654**		-0.0252	-0.0654***
		(-0.86)	(-2.03)		(-1.19)	(-2.85)
Constant	-0.112***	-0.112***	-0.0713***	-0.112***	-0.112***	-0.0713***
	(-6.23)	(-6.24)	(-3.13)	(-8.60)	(-8.65)	(-4.39)
PERMNO FE	None	None	None	FE	FE	FE
N	294	294	294	294	294	294
r2_a	0.00977	0.0142	0.0367	-0.0230	-0.0105	0.0392

t statistics in parentheses

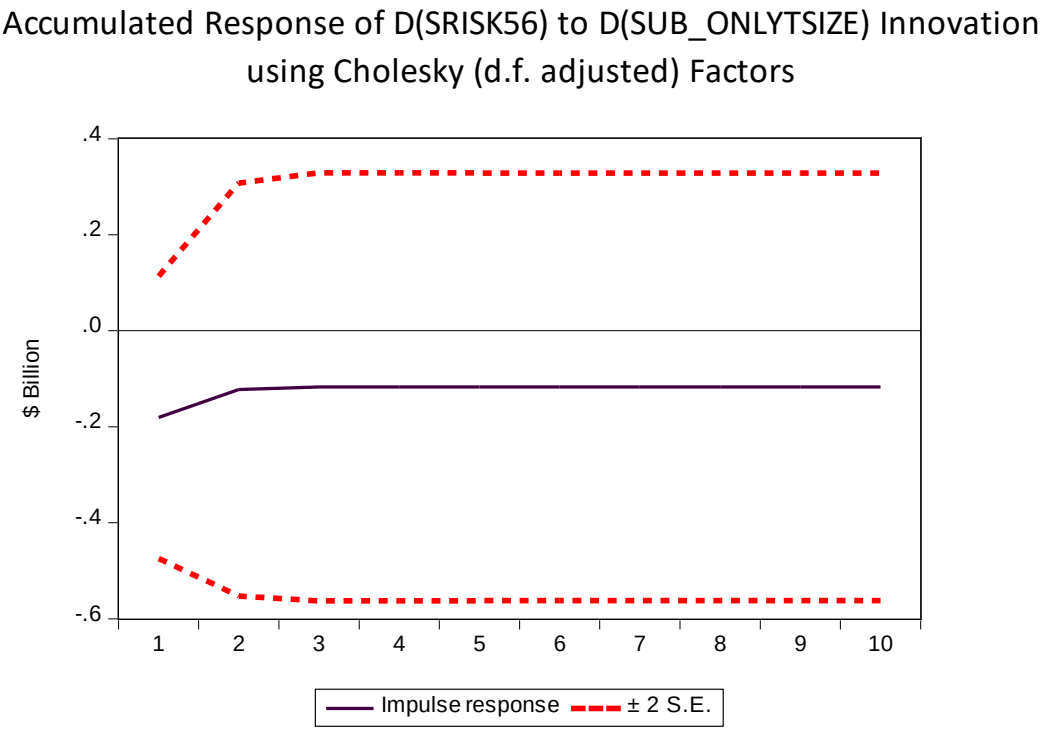
* p<.10, ** p<.05, *** p<.01

D. Section 6 of Paper

Figure D.1: Impulse Responses of SRISK and Subsidies Implied by $TSIZE$ Loadings: Pre-Crisis Period

The figure shows impulse response functions, along with 2 standard error (S.E.) bands, estimated from a VAR using changes in the average $SRISK$ and subsidies implied by $TSIZE$ loadings of financial firms in the largest size quintile (denoted $D(SRISKS56)$ and $D(Subsidy)$). The subsidy measure is Sub_size (equation 4 in the text). Lagged values of average market capitalization, leverage and correlation of equity returns with the MSCI World stock index, averaged over firms in the largest size quintile, are used as exogenous variables in the VAR. The sample is from June 2000 to June 2008.

Financial firms in Largest Size Quintile: June 2000-June 2008



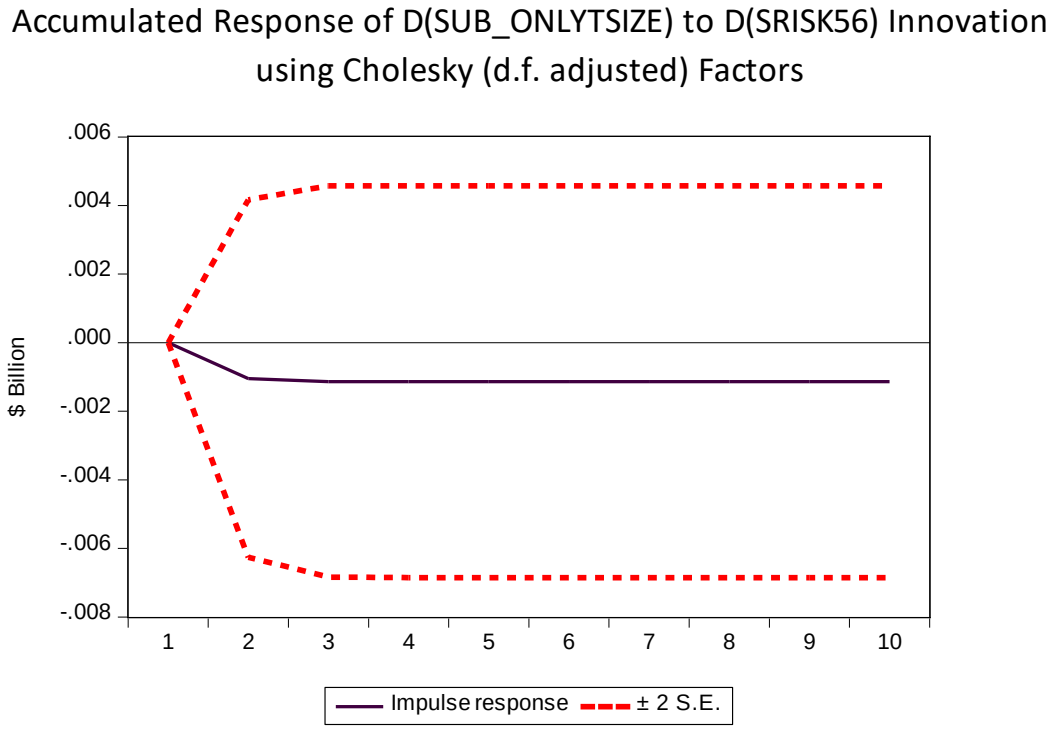


Figure D.2: Government Support in Crisis and Subsidies Predicted with Pre-Crisis LEV and LIQ Loadings

The figures show the Fed's crisis-period loans to critical institutions $CritInst$ (in \$100 million) and liquidity facilities $LiqFac$ (in \$ billion), and the Treasury's TARP loans $Tarp$ (in \$10 billion). The out-of-sample forecasts of subsidies are from VARs with pre-crisis loadings of LEV or LIQ, in addition to either AV (left) or $SRISK$ (right). The pre-crisis period is October 2000 to July 2007 for $SRISK$ and 2002Q3 to 2007Q3 for AV. The prediction period is December 2007 to November 2011 for Fed loans and November 2008 to December 2009 for TARP loans. *Peak support* is December 2008.

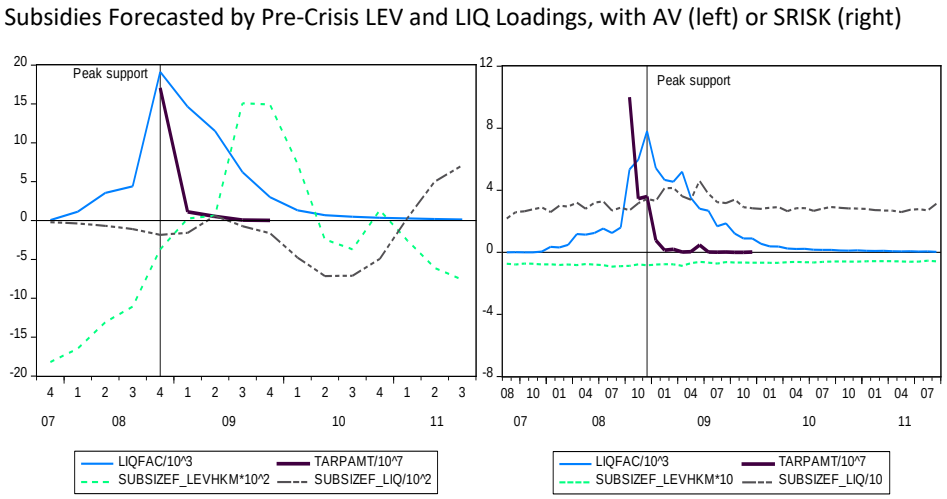


Table D.1: Predicting Government Suport in Crisis with Out-of-Sample Forecasts of $COMP$ and IC Loadings

This table shows a regression of changes in crisis-period government support ΔG on changes in out-of-sample forecasts of subsidies implied by $COMP$ or IC loadings $Subsizef$ and by $TSIZE$. The forecasts are obtained from estimating over a pre-crisis period a VAR that includes changes in $Loading6(5)$ and $Y6(5)$, where $Loading5(6)$ and $Y5(6)$ are the average $COMP$ or IC or $TSIZE$ loadings of firms in size decile 5(6), and 5(6) is the second-largest (largest) size decile. $Subsizef$ is obtained by applying equation **??** to the forecasts of $Loading5$ and $Loading6$. The pre-crisis period is from June 2000 to July 2007 for $SRISK$ and 2002 to Q3 2007 for AV. The prediction period is December 2007 to September 2011 for the Fed's liquidity facilities loans $LiqFac$, July 2008 to September 2011 for loans to critical institutions $CritInst$ and November 2008 to December 2009 for Tarp loans $Tarp$. $DumDown$ is a dummy variable equal to 1 from January 2009 to November 2011, when the Fed's liquidity support was decreasing.

	Dep. Var. $\Delta G : \Delta Liqfac$				Dep. Var. $\Delta G : \Delta CritInst$				Dep. Var. $\Delta G : \Delta Tarp$			
	$COMP$		IC		$COMP$		IC		$COMP$		IC	
	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)	Estimate (T-Stat)
Lag G	-0.10**	-0.05	-0.12**	-0.12**	-0.23**	-0.14	-0.33**	-0.30**	-0.60***	-0.47***	-0.63***	-0.46***
	(-2.40)	(-0.88)	(-2.53)	(-2.55)	(-2.07)	(-1.33)	(-2.29)	(-2.35)	(-15.36)	(-10.57)	(-17.47)	(-6.24)
Dumdown	-0.92**	-0.77**	-0.69**	-0.62**	-0.05	-0.04	-0.02	-0.01	—	—	—	—
	(-2.23)	(-2.15)	(-2.20)	(-2.21)	(-1.21)	(-1.19)	(-0.36)	(-0.14)				
Subsizef	0.04	-0.04	0.06***	0.08**	-0.01	-0.03**	0.00	0.01***	0.00	0.00**	0.00	0.00
	(1.05)	(-0.34)	(4.11)	(2.39)	(-1.56)	(-2.61)	(1.47)	(4.14)	(-0.85)	(2.58)	(0.51)	(-1.54)
Dumdown*Subsizef	-0.10	0.06	-0.04**	-0.09**	0.00	0.03**	0.00	-0.01***	—	—	—	
	(-1.64)	(0.56)	(-2.16)	(-2.27)	(-0.01)	(2.27)	(-0.80)	(-4.24)				
Tsizef	—	-0.10	—	0.06	—	-0.03**	—	0.01**	—	0.00***	—	0.00***
		(-0.50)		(1.08)		(-2.20)		(2.40)		(4.82)		(2.99)
Dumdown*Tsizef	—	0.72***	—	0.18***	—	—	—	0.02***	—	—	—	—
		(2.85)		(3.00)				(2.86)				
Adj $R\hat{2}$	0.23	0.33	0.40	0.46	0.19	0.37	0.18	0.24	0.86	0.96	0.85	0.94

Table D.2: Predicting Fed Liquidity Facilities and Tarp Loans in Crisis with Out-of-Sample Forecasts of BVE-Based $TSIZE$ Loadings: Time-Series Evidence

This table shows a regression of changes in crisis-period Tarp loans $Tarp$ and Fed loans via its liquidity facilities $Lfac$ on out-of-sample forecasts of implied subsidies Sub_sizef from the BVE-based $TSIZE^{BVE}$ factor. The forecasts are obtained from estimating a VAR from June 2000 to November 2007. The VAR includes changes in $Loading6$, $Loading5$, $SRISK6$ and $SRISK5$, which are averages of $TSIZE^{BVE}$ factor loadings and $SRISK$ over firms in size deciles $S5$ and $S6$, respectively. The regression with AV forecasts is not shown as there were too few observations for reliable inference. The prediction period is December 2007 to November 2011 for $LiqFac$, and November 2008 to December 2009 for $Tarp$. $DumUp$ is a dummy variable equal to 1 from December 2007 to December 2008. $DumDown$ is a dummy variable equal to 1 from January 2009 to November 2011.

	Dependent variable:	
	$Lfac$	$Tarp$
	Estimate	Estimate
	(T-stat)	(T-stat)
DumUp*(Sub_sizef)	-0.10	—
	(-0.23)	—
DumDown*((Sub_sizef)	-0.07	—
	(-0.26)	—
Sub_sizef	—	-0.15
	—	(-1.11)
Adusted RSquared	0.25	0.09

Table D.3: Predicting Fed Liquidity Facilities and Tarp Loans with Pre-Crisis Loadings of Book-Value $TSIZE$: Cross-Section Evidence

This table shows a censored logistic regression (left-censored at zero) of changes in crisis-period Tarp loans $Tarp$ and Fed loans via its liquidity facilities $Lfac$ on pre-crisis average implied subsidies $Loading5 * M5 - Loading6 * MS6$ from the book value equity (BVE)-based $TSIZE$ loadings. $Loading5$ ($Loading6$) is the average pre-crisis loadings of firms in the second largest (largest) size decile $S5$ ($S6$). $M5$ ($M6$) is the fraction of months that a was in second largest (largest) size decile $S5$ ($S6$) before the crisis. Also included in the regression are the pre-crisis average $SRISK$ loadings. The prediction period is December 2007 to November 2011 for $LiqFac$, and November 2008 to December 2009 for $Tarp$.

	Dependent variable:	
	$Lfac$	$Tarp$
	Estimate (T-stat)	Estimate (T-stat)
Loading5*M5 - Loading6*MS6	-0.43** (-2.16)	-0.03 (-0.01)
Average Log Likelihood	-0.40	-1.56

E. Section 7 of Paper

Table E.1: List of U.S. Globally Systemically Important Banks, as of November 2012

This table shows the banks in our sample that were designated as Globally Systemic Banks (GSIBs), as of November 2012. The data is from http://www.fsb.org/wp-content/uploads/r_121031ac.pdf

Bank of America
Bank of New York Mellon
Citigroup
Goldman Sachs
J.P. Morgan Chase
Morgan Stanley
State Street
Wells Fargo

Table E.2: Loadings on SIFI Factors: Banking Sector

This table shows OLS estimates for loadings on $SIFI$ factors of banking sector portfolios sorted by size and book-to-market (BM). S6 refers to the largest size decile and S5 is the next highest size decile. A separate portfolio of Globally Systemic Banks (GSIBs) is carved out of $S5$ and $S6$. The remaining size groups are not shown. For BM groups, reading left to right, columns correspond from the lowest to highest quintiles of the BM distribution. The loadings are estimated by adding the complexity factor $COMP$ to the SIFI4 model. Standard errors are adjusted for heteroskedasticity and autocorrelation using Newey West (1987) with a maximum of 3 lags. The sample is from July 1986 (when the complex factor data starts) to 2006.

	Low	2	3	4	High
Panel A: Loadings on TSIZE Factor (controlling for COMP, IC, LIQ, LEV, GL)					
S5 Non-GSIB	.24	.40**	.29**	.46**	.52***
S6 Non-GSIB	.09	-.19	.23*	.53***	-.32
GSIB	-.06	.22	.22	.27	.09
Panel B: Loadings on Complexity Factor					
S5 Non-GSIB	.08	.08	-.23	-.44***	-.63***
S6 Non-GSIB	.02	.01	-.04	-.32**	-.35**
GSIB	.02	-.26**	-.31**	-.51***	-.17
Panel C: Loadings on Interconnectedness Factor					
S5 Non-GSIB	.08	-.09	-.08	-.10	-.45***
S6 Non-GSIB	-.09	-.19*	-.34**	-.25**	-.12
GSIB	-.06	.06	-.43***	-.11	-.35**

Table E.3: Time Series Loadings: Fama-French 5-factor Model

This table shows OLS estimates for loadings on the $TSIZE$ factor of portfolios sorted by size (reading top to bottom, rows correspond to the 20th, 40th, 60th, 80th, and 90th percentiles of the size distribution) and book-to-market (reading left to right, columns correspond to the 20th, 40th, 60th, and 80th percentiles of the book-to-market distribution). We regress monthly excess returns of each portfolio on the $TSIZE$ factor and the 5 Fama-French factors: SMB made orthogonal to $TSIZE$, $Mktrf$, HML, investment CMA, and profitability RMW. We also include bond market factors GOV and $CORP$ and the Carhart momentum factor MOM. In Panels B-E we also include the bank size risk factor of Gandhi and Lustig (2014) GL and factors based on interconnectedness IC, leverage LEV, and liquidity LIQ. Standard errors are adjusted for heteroskedasticity and autocorrelation using Newey West (1987) with a maximum of 3 lags. The sample is from 1963m7 to 2006 in Panel A and from 1970 to 2006 in Panels B-E.

	Low	2	3	4	High
Panel A: Loadings on TSIZE Factor					
Smallest	.01	.09***	.08***	.08***	.05*
2	.09**	.12***	.11***	.11***	.09***
3	.07**	.12***	.08***	.14***	.12***
4	.05*	.08***	.11***	.12***	.10***
5	.02	.09***	.10***	.11***	.13***
Largest	-.04**	-.06**	-.10**	.02	-.11*
Panel B: Loadings on TSIZE Factor (controlling for IC, LIQ, LEV, GL)					
Smallest	.00	.11***	.09***	.11***	.07**
2	.09*	.13***	.13***	.12***	.10***
3	.07*	.13***	.09**	.14***	.15***
4	.06**	.10***	.12***	.13***	.11**
5	.02	.12***	.12***	.12***	.16***
Largest	-.05**	-.05	-.13***	.04	-.13*
Panel C: Loadings on Interconnectedness Factor					
Smallest	.00	.00	-.01	-.02	.00
2	.03	.01	.01	.03	.01
3	.03	.02	.01	.02	.02
4	.01	.01	.01	.01	-.01
5	-.01	-.01	.00	.00	-.01
Largest	.01	-.01	.05**	.02	-.09*
Panel D: Loadings on Liquidity Factor					
Smallest	-.01	-.01	.05**	.00	-.01
2	.01	.05	.03	.01	.05**
3	.00	.01	.02	.03	.02
4	.01	.01	.01	.04	.08***
5	-.02	-.02	-.01	.03	.02
Largest	.01	-.06**	-.09**	-.03	.08
Panel E: Loadings on Leverage Factor					
Smallest	.02	.03*	.02	.03*	.05**
2	-.03	-.02	.00	.00	-.02
3	-.04	.00	-.01	.01	.03
4	-.01	.00	.00	.03	.00
5	-.01	.02	.07***	.04*	.04
Largest	.01	.02	.01	.01	-.06

Table E.4: $TSIZE$ Risk in the Cross-Section of Returns: Fama-French 5-factor Model

This table shows estimates of the price of risk for the $TSIZE$ factor, as well as three non-size based SIFI factors based on interconnectedness IC, leverage LEV, and liquidity LIQ, controlling for baseline variables SMB' (the Fama-French factor SMB made orthogonal to $TSIZE$), the Fama-French factors $Mktrf$ and HML as well as CMA and RMW, bond market factors GOV and $CORP$, and the Carhart momentum factor MOM. We first estimate 60 month rolling time series regressions of 30 size and book-to-market sorted portfolio excess returns on these factors in a first stage regression. Then, in each month, we regress the 30 portfolio returns on that month's estimates of factor loadings in a cross sectional regression. The first and second stages are estimated by OLS. We present the time-series averages of these coefficients, along with the standard t-statistic and the Shanken (1992) errors-in-variables corrected t-statistics. The other SIFI factors based on liquidity LIQ, interconnectedness IC, and leverage LEV, are added in rows, along with the bank size risk factor of Gandhi and Lustig (2014) GL. The sample is from 1963m7 to 2006 in the first row and fifth row, where we do not include any SIFI factors. The sample in the second, third, and fourth rows is from 1970 to 2006.

	Cons	TSIZE	Liquidity	Inter	Leverage	TSIZENF
Price of Risk	1.08	0.73				
T-Stat	5.08	2.54				
Shanken T-Stat	4.78	2.15				
Price of Risk	1.19	0.69	-0.01			
T-Stat	4.53	2.26	-0.02			
Shanken T-Stat	4.1	1.86	-0.02			
Price of Risk	1.12	0.5		1.05		
T-Stat	4.46	1.7		2.07		
Shanken T-Stat	4.07	1.4		1.7		
Price of Risk	1.18	0.49			-0.23	
T-Stat	4.71	1.65			-0.5	
Shanken T-Stat	4.36	1.38			-0.39	
Price of Risk	1.1					0.12
T-Stat	5					1.18
Shanken T-Stat	4.66					0.86

Table E.5: Time Series Loadings with Adrian Etula Muir (2014) Leverage Factor

This table shows OLS estimates for loadings on the $TSIZE$ factor of portfolios sorted by size (reading top to bottom, rows correspond to the 20th, 40th, 60th, 80th, and 90th percentiles of the size distribution) and book-to-market (reading left to right, columns correspond to the 20th, 40th, 60th, and 80th percentiles of the book-to-market distribution). As in E.3, we regress monthly excess returns of each portfolio on the $TSIZE$ factor and the 3 Fama-French factors, SMB' (the Fama-French factor SMB made orthogonal to $TSIZE$), $Mktrf$, and HML. We also include the bond market factors GOV and $CORP$, the Carhart momentum factor MOM, and the bank size risk factor of Gandhi and Lustig (2014) GL. Finally, we include the Adrian Etula Muir (2014) leverage factor LEV_{AEM}. Standard errors are adjusted for heteroskedasticity and autocorrelation using Newey West (1987) with a maximum of 3 lags. The sample is from 1968 through 2006 due to the availability of LEV_{AEM}.

	Low	2	3	4	High
Panel A: Loadings on TSIZE Factor					
Smallest	-.02	.09***	.08***	.10***	.06*
2	.08**	.14***	.14***	.13***	.10***
3	.07*	.13***	.09***	.14***	.13***
4	.05	.11***	.12***	.12***	.10**
5	.03	.12***	.11***	.11***	.15***
Largest	-.05*	-.04	-.11**	.03	-.13*
Panel B: Loadings on TSIZE Factor (controlling for IC, LIQ, LEV, GL)					
Smallest	-.02	.08***	.07***	.09***	.06*
2	.07*	.11***	.10***	.11***	.10***
3	.06	.10***	.06**	.12***	.14***
4	.04	.08***	.10***	.11***	.09**
5	.02	.10***	.08***	.11***	.16***
Largest	-.03	-.06	-.14***	.01	-.14*
Panel C: Loadings on Interconnectedness Factor					
Smallest	-.02	-.01	-.01	-.02*	-.01
2	.01	.01	.01	.02*	.01
3	.02	.01	.00	.01	.02
4	-.01	.01	.01	.00	-.01
5	-.02	-.01	-.01	.00	.00
Largest	.03**	-.01	.03	.00	-.09*
Panel D: Loadings on Liquidity Factor					
Smallest	-.01	.00	.06***	.01	.00
2	.02	.07***	.05**	.03	.05**
3	.00	.03	.03	.04*	.03
4	.02	.03	.02	.05*	.08***
5	-.02	.00	.01	.04*	.02
Largest	.00	-.04	-.07**	-.03	.07
Panel E: Loadings on Leverage AEM Factor					
Smallest	-.07	.21***	.39***	.31***	.06
2	.25***	.63***	.68***	.50***	.25***
3	.25***	.72***	.65***	.39***	.12
4	.24***	.65***	.49***	.26***	.14
5	.12**	.45***	.42***	.24***	-.12
Largest	-.33***	.34***	.44***	.29***	-.10

Table E.6: $TSIZE$ Risk in the Cross-Section of Returns, with Adrian Etula Muir (2014) Leverage Factor

This table shows estimates of the price of risk for the $TSIZE$ factor, as well as the Adrian Etula Muir (2014) Leverage factor of AEM, controlling for baseline variables SMB' (the Fama-French factor SMB made orthogonal to $TSIZE$), the Fama-French factors $Mktrf$ and HML, bond market factors GOV and $CORP$, the bank size risk factor of Gandhi and Lustig (2014) GL, and the Carhart momentum factor MOM. We first estimate 60 month rolling time series regressions of 30 size and book-to-market sorted portfolio excess returns on these factors in a first stage regression. Then, in each month, we regress the 30 portfolio returns on that month's estimates of factor loadings in a cross sectional regression. The first and second stages are estimated by OLS. We present the time-series averages of these coefficients, along with the standard t-statistic and the Shanken (1992) errors-in-variables corrected t-statistics. The sample is from 1968 to 2006.

	Cons	TSIZE	LEV_{AEM}
Price of Risk	1.18	0.79	0.08
T-Stat	5.36	2.8	0.37
Shanken T-Stat	5.04	2.34	0.3