

## Understanding the Funding Cost Differences between G-SIBs and non-G-SIBs in the United States

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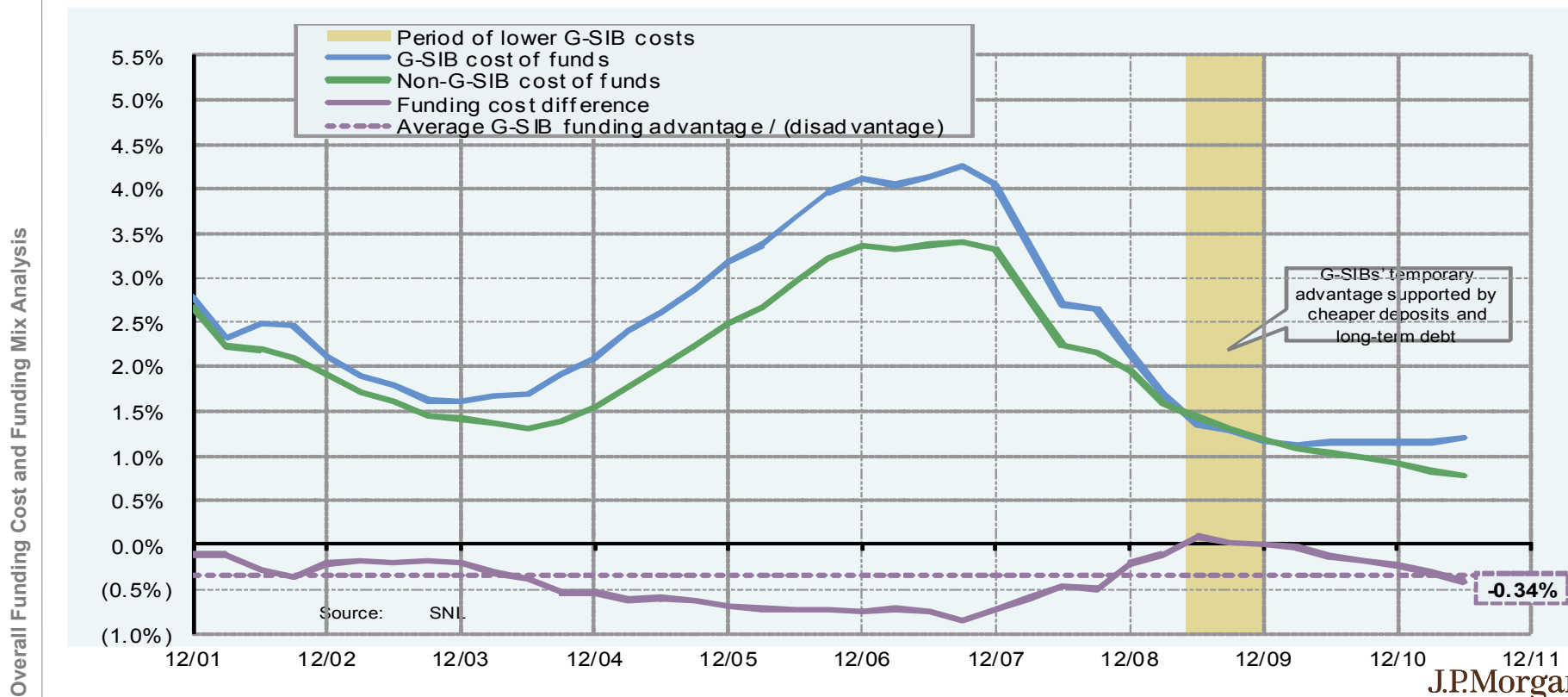
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# Historical Analysis of Cost of Funds

## Historical Analysis over 2002 Q1 – 2011 Q1

- ❑ We define G-SIBs to be the BHCs whose balance sheet assets >\$500B at any time over 2002 Q1 through 2011 Q1.
- ❑ This definition makes G-SIBs account for 60-70% of the industry's assets
- ❑ G-SIBs had an average of about 34 bps higher total disclosed funding costs from 2002-2011.
  - G-SIBs have more expensive funding mix.
  - This disadvantage may also due to Macroeconomic and firm-specific factors.
- ❑ G-SIBs incurred funding cost advantage only during 2009Q2 – 2009Q4 with max 9 bps lower costs.
- ❑ G-SIBs incurred higher costs of 31 bps in 2011Q1, consistent with historical average.

## 2002 – 2011 average cost of funds for U.S. banks: G-SIBs, non-G-SIBs and difference

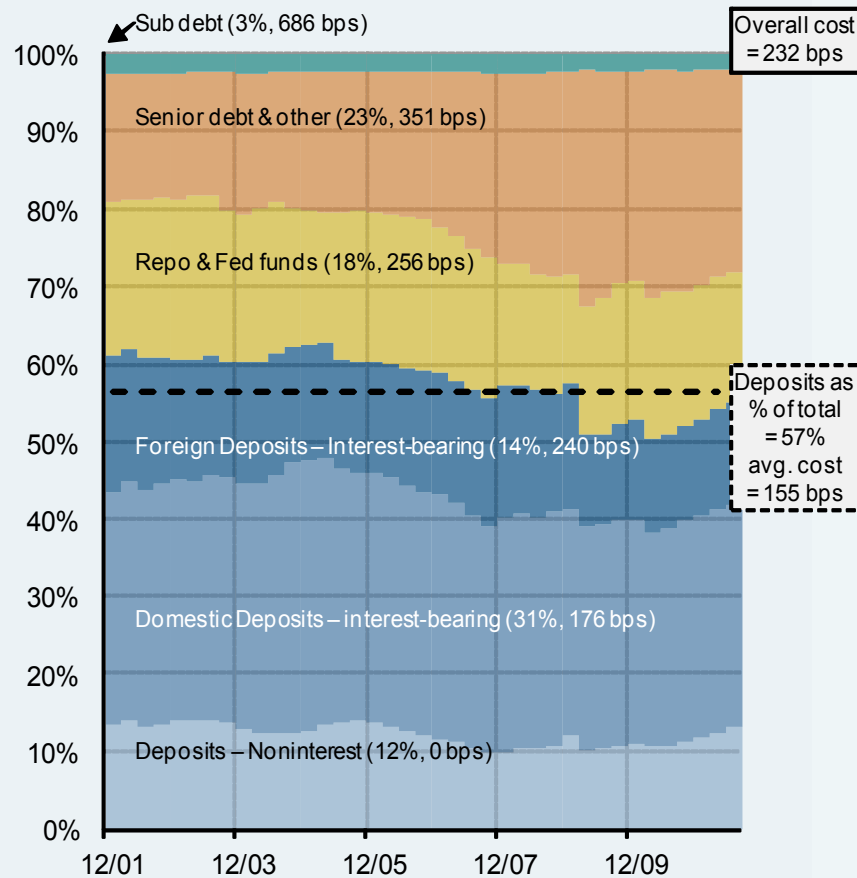


# Funding Mix Analysis

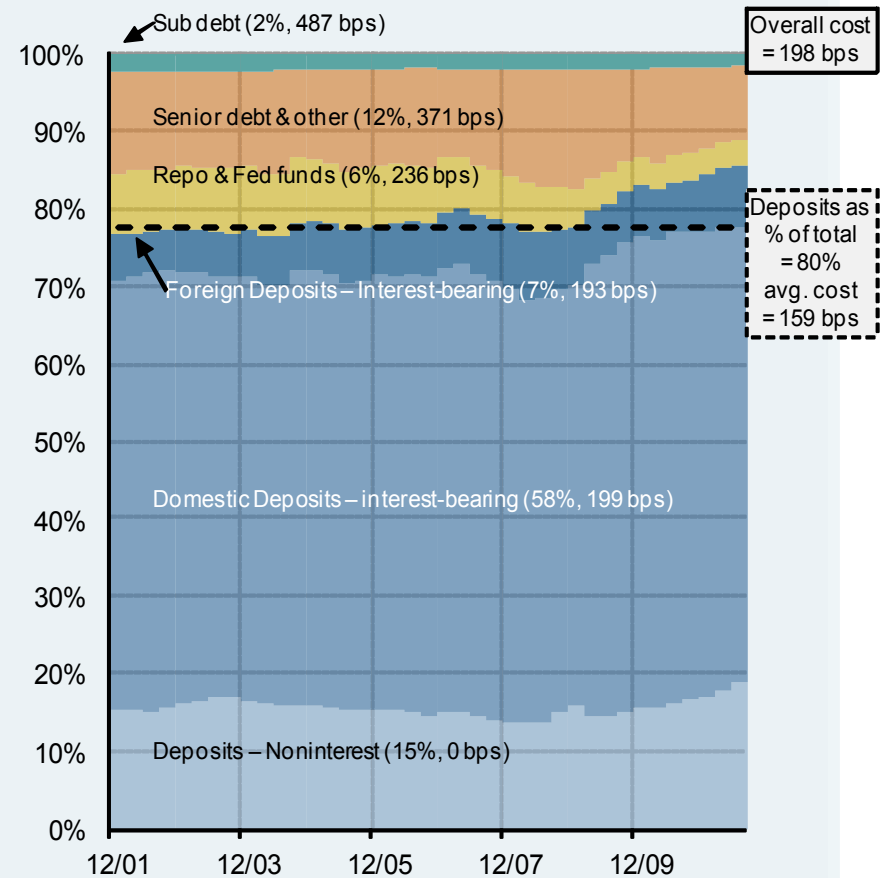
## G-SIBs have more expensive funding mix

Deposits, the cheapest form of funding, account for an average 80% of non-G-SIBs' funding versus 57% of funds for G-SIBs.

### 2002-11 Average Funding Breakdown – G-SIBs (% of funding, with average<sup>1</sup> cost noted)



### 2002-11 Average Funding Breakdown – non-G-SIBs (% of funding, with average<sup>1</sup> cost noted)



Overall Funding Cost and Funding Mix Analysis

1. Average for 1Q02 – 1Q11  
Source: SNL

# Data

## Source of Data (Quarterly)

- ❑ Financial Ratios: compiled by SNL from regulatory filings (FRY-9C)
- ❑ CDS Spreads: Markit Partners
- ❑ Bond Spreads: Reuters' EJV and Barclays
- ❑ Bank Financial Strength Ratings (BFSR): Moody's Investor Services

## Sample and G-SIBs

- ❑ Our sample contains 250 largest U.S. BHCs over period 2002 Q1 – 2011 Q1.
- ❑ G-SIBs are defined as those BHCs whose book assets > \$500B at any point during the sample period.
  - ❑ Alternative definitions, e.g. top 7 banks given a quarter, do not change results materially.
  - ❑ G-SIBs include:
    - J.P. Morgan Chase & Co.
    - Wachovia Corporation
    - Morgan Stanley (only following designation as BHC in 2009)
    - Goldman Sachs Group, Inc. (only following designation as BHC in 2009)
    - Bank of America Corporation
    - Wells Fargo & Company
    - Citigroup, Inc.

## Funding Cost Variables – Dependent Variables

### Cost of Domestic Interest-Bearing Deposits

- ❑ Annualized Interest Expense from Domestic Office Deposits during the Quarter / Average Balance.
- ❑ The ratio is compiled by SNL from regulatory filings (FRY-9C).

### Interest Expense on Fed Funds and Repos

- ❑ Annualized Interest Expense on Fed Funds Purchased and Securities Sold under Agreements to Repurchase during the quarter / Average Balance.
- ❑ The ratio is compiled by SNL from regulatory filings (FRY-9C).

### Option Adjusted Spreads (OAS)

- ❑ OAS spreads of senior unsecured, non-capital eligible securities, measured over Treasuries.
- ❑ We limit sample to one bond per issuer.
- ❑ We select bonds with duration close to 5 years, and bond age close to 2 years.
  - We control bond age to control for the impact of liquidity on spread; newer issues are more liquid.
    - ❖ G-SIBs are more likely to have newer issues
  - We have also examined alternative selection rules, but find no material changes on conclusions
    - ❖ We allow multiple bonds for a BHC, and include an age variable.
    - ❖ We expand the bond sample with all eligible bonds with 4-6 years duration.

### CDS Spreads (CDS)

- ❑ Average 5-year CDS spreads on senior unsecured debt for each BHC.

## Explanatory Variables – Independent Variables

### Fundamental Variables

- Profitability:** Net Income/Total Assets (Profitability) and Net Interest Margin (NIM)
- Earnings Stability (EarningsVol):** Trailing 12 quarter standard deviation of ROA
- Funding Liquidity (Illiquidity):** Net Short-term Liabilities/Total Assets
- Asset Quality (NPL):** (Nonperforming Loans + Real Estate Owned)/(Total Equity + Allowance for Loan and Lease Losses)
- Capital Adequacy:** Tier 1 Common Ratio (Tier 1 Common Capital/Risk Weighted Assets) and Common Equity/Risk Weighted Assets.

### Overall Credit Risk Variables

- Moody's Banks Financial Strength Ratings (BFSR):** an assessment of the stand-alone rating for the lead bank.

### Economic State Variables

- VIX (from CBOE):** a measure of market risk or investor's risk appetite
- Slope:** 5-year Treasury Rate (UST5Y) – 3-month Treasury Rate (UST3M)
- Short Rates:** 3-month Treasury Rate (UST3M)

### Variables Attempting to Proxy Liquidity

- Bond Age**
- Trading Volume**
- Issuance Size**

### SIFI Indicator Variable

- G-SIB Dummy:** those BHCs whose book assets > \$500B at any point during the entire sample period have value 1.

## Cost of Domestic Interest-Bearing Deposits

### G-SIBs Cost Advantage: 23 bps

The SIFI coefficient indicates that there is approximately a 23 bps lower cost of deposits associated with G-SIBs.

### Observed Drivers

- Economic state variables
- Fundamental variables
- Asset quality
- Profitability

### Other Possible Factors

- Large banks have more extensive branch networks, which along with increased ATM availability may provide consumers with greater convenience and thus attract more deposits.
- Large banks who offer mortgages and credit cards are often able to cross-sell deposit accounts and thus attract more deposits.
- Large banks with significant commercial loan accounts may obtain funding through non-interest bearing balances from their commercial clients as compensation for the services they provide. They do not need to fund themselves with expensive consumer deposits.
- Large banks with different asset-liability balance mixes may find greater flexibility in other forms of short-term funding and do not need to pursue interest-bearing consumer deposits.

### Regression

	Coef	t-value
Intercept	0.85	6.61
VIX	0.03	16.63
BFSR	0.00	-0.25
ShortRate	0.52	23.92
Profitability	-0.52	-5.77
Slope	-0.03	-0.93
NPL	0.01	7.20
Illiquidity	0.02	16.72
NIM	-0.17	-9.64
EarningVol	0.00	0.14
SIFIDummy	-0.23	-5.25
<b>SIFI Benefit (bps)</b>	<b>23.1</b>	
Adjusted R2	77%	
DoF	1790	



## Cost of Fed Funds and Repos

### G-SIBs Cost Disadvantage: 19 bps

The SIFI coefficient indicates that G-SIBs bear 19 bps in **higher** costs compared to non-G-SIBs

### Observed Drivers

- Economic state variables – significant
- Fundamental variables – slight
- Asset quality – slight

### Little Importance in Credit Risk and Potential Government Support

- This may largely due to short-term nature of the funding.
- Large banks' repo funding expense may be matched through reverse repos on the other side of their balance sheet, since they have many types of securities (bonds, equities, hybrids, etc..) of varying maturities to satisfy their business needs.
- Repo financing is usually secured.
- Smaller banks may focus on providing repos for more traditional securities, such as treasuries and agencies and also rely relatively more heavily on Fed Funds for less expensive interest costs.

### Regression

	Coef	t-value
Intercept	0.66	3.80
VIX	0.01	5.04
BFSR	-0.02	-2.44
ShortRate	0.73	23.01
Slope	-0.22	-4.09
NPL	0.01	5.63
Illiquidity	0.01	8.45
SIFIDummy	0.19	2.92
<b>SIFI Benefit (bps)</b>	<b>-18.5</b>	
Adjusted R2	81%	
DoF	1775	

## Debt OAS (Over US Treasury)

### G-SIBs Cost Advantage: 3%

Negative SIFI coefficient indicates that G-SIBs have a 3% OAS cost advantage over non-G-SIBs.

### Observed Drivers

- ❑ Economic state variables
- ❑ Fundamental variables (BFSR, profitability, and asset quality)

### Difficulty in Controlling for Liquidity

- ❑ Greater liquidity for debt issued by G-SIBs would be expected, owing to the greater volume outstanding and frequent issuance.
- ❑ We have attempted to control for liquidity by seeking bond ages of all issuers at around two years. Further work is needed.

### Sub-period Analysis – Pre-crisis Cost Disadvantage

Bond OAS	Pre-crisis (02Q1-06Q4)	Crisis (07Q1-09Q1)	Post-crisis (09Q2-11Q1)
SIFI Dummy	0.24	(0.07)	(0.26)
<b>SIFI Benefit</b>	<b>-27%</b>	<b>7%</b>	<b>23%</b>
t-value	4.83	(0.93)	(2.77)
Adjusted R2	68%	86%	67%
DoF	303	150	167

- ❑ Pre-crisis: TBTF did not factor into investor expectations
- ❑ Post-crisis: Investors become more conscious of TBTF and government support

### Regression

	Coef	t-value
Intercept	3.03	16.98
VIX	0.04	12.59
BFSR	0.11	11.60
ShortRate	0.00	-0.01
Profitability	-1.49	-12.31
Slope	0.06	1.57
Duration	0.09	8.06
NPL	0.00	5.91
Bond Age	0.10	9.62
SIFIDummy	-0.03	-0.59
<b>SIFI Benefit (pct)</b>	<b>2.7</b>	
Adjusted R2	74%	
DoF	640	

## CDS Spreads (Over LIBOR)

### G-SIBs Cost Advantage: 12%

Negative SIFI coefficient indicates a G-SIB advantage of 12% for CDS spreads versus non-G-SIB, consistent with that of bonds.

### Observed Drivers

- Economic state variables
- Fundamental variables (BFSR, and profitability)

### Difficulties

- Liquidity may also account for some of the large bank CDS advantage and measures
- Dataset is more limited, as CDS spreads are not as widely available for smaller banks.

### Sub-period Analysis – Pre-crisis Cost Disadvantage

CDS	Pre-crisis (02Q1-06Q4)	Crisis (07Q1-09Q1)	Post-crisis (09Q2-11Q1)
SIFI Dummy	0.04	0.00	-0.12
<b>SIFI Benefit</b>	<b>-5%</b>	<b>0%</b>	<b>11%</b>
t-value	1.03	(0.01)	(1.61)
Adjusted R2	61%	84%	53%
DoF	205	121	95

- Observation is consistent with Debt OAS Sub-period analysis (measured over LIBOR), with observed pre-crisis cost disadvantage.
- All t-statistics are not significant.

### Regression

	Coeff	t-value
Intercept	4.86	21.49
VIX	0.03	8.23
BFSR	0.13	10.83
ShortRate	-0.48	-12.79
Profitability	-1.35	-9.48
Slope	-0.58	-8.74
SIFIDummy	-0.12	-2.59
<b>SIFI Benefit (pct)</b>	<b>11.7</b>	
Adjusted R2	81%	
DoF	435	

## An Estimate of the Overall Funding Cost Benefits over 2002Q1 – 2011Q1

### Aggregating Funding Cost Advantage/Disadvantage

- ❑ We apply the regression results of advantages/disadvantages to the funding mix for G-SIBs and their historical costs.
- ❑ Although these historical costs are, roughly, the average coupons of the debt issued by the G-SIBs weighted by their issuance, we feel over a long horizon, this weighted average will not differ too much from the average predicted by our models.
- ❑ We make a conservative assessment that G-SIB advantage for Sub Debt was the same as for Senior debt, and the G-SIB advantage for Foreign Deposits was the same as for Domestic Deposits.
- ❑ We find G-SIBs enjoyed approximately **9 bps** of lower funding costs.
  - After excluding higher costs for G-SIBs' Fed Funds and Repos, the net benefits increases to **15 bps**.
  - After further excluding non-interest bearing deposits, the net benefits increases to **17.5 bps**.

TREAS - OAS, SIFI DUMMY + BETA (2Y rates used, balance-weighted)

Table – Overall Funding Cost Benefits over G-SIBs' Funding Mix

	Base cost of funds	Average Base Rate	Spread vs. Base Rate	G-SIB benefit	G-SIB benefit in BPS	Spread ex. benefit	Cost of funds ex benefit	Funding mix	Weighted G-SIB benefit in BPS
Non Int Bear	-				-		-	12%	-
Dom Int Bear	176				(23)		199	30%	7.0
For Int Bear	240				(23)		263	14%	3.3
FF & Repo	256				19		238	18%	(3.3)
Senior & other	351	218	132	5%	(6)	139	357	23%	1.4
Sub debt	686	218	468	5%	(22)	490	708	2%	0.5
							Deposits benefit		10.3
							FF & repo disadvantage		(3.3)
<b>Total CoF</b>	<b>232</b>						LT debt benefit		2.0
							Overall benefit		9.0
							Benefit ex. FF & Repo		15.0
							Benefit ex. FF & Rep & Non Int Bear		17.5

Combining G-SIB Differences Across Various Funding Sources

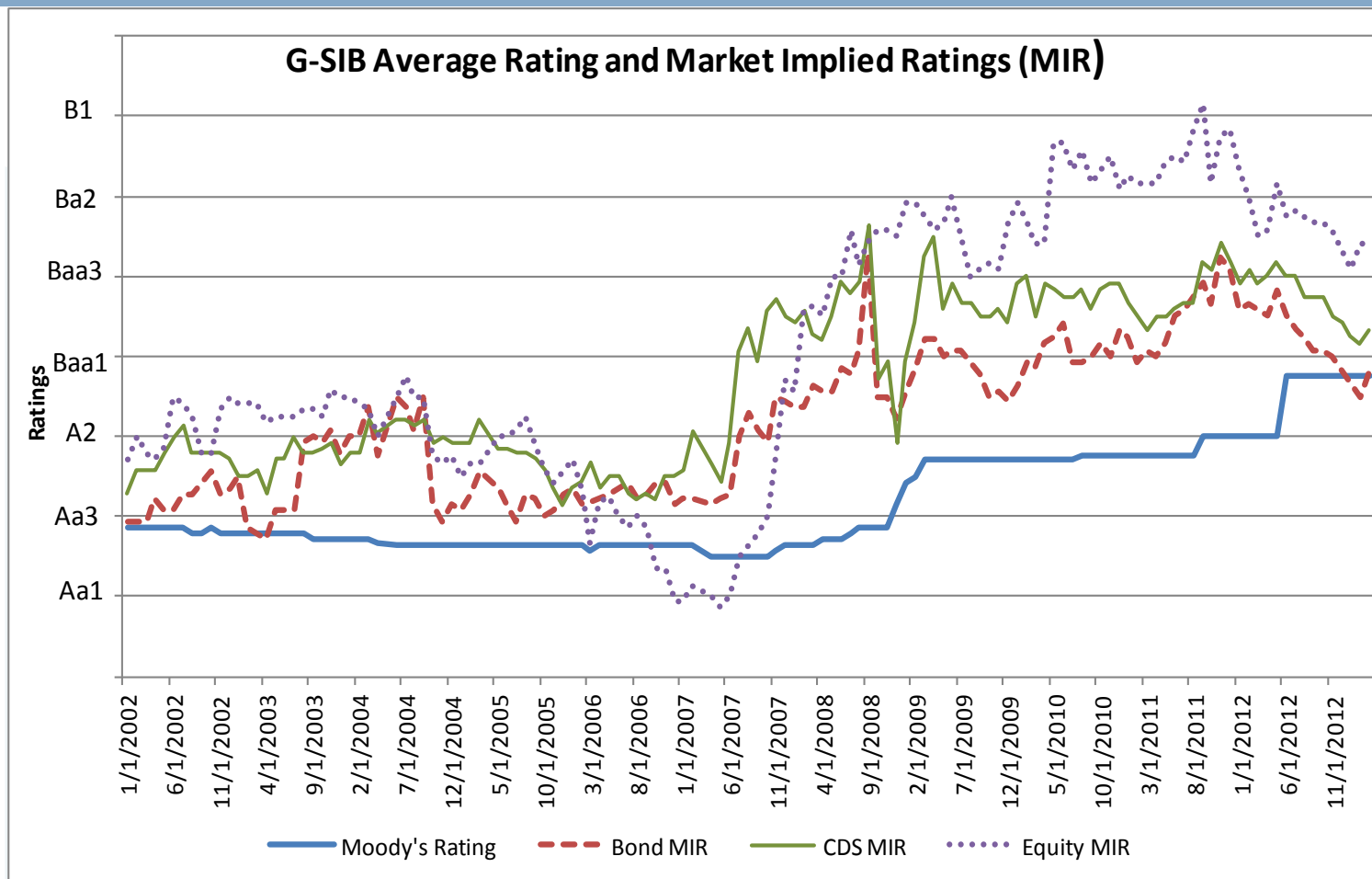
# The uplift argument: rating agencies standalone ratings vs. supported ratings

## NRSROs assign a standalone rating and a rating that assumes government support

- We examine Moody's Market Implied Ratings (MIR) to determine whether the market believes in the supported rating
- We look at G-SIBs vs. non- G-SIBs:
  - Bond MIRs
  - CDS MIRs
  - Equity MIRs

## MIRs significantly worse than the supported rating .

Funding Cost Differences Adjusted for Credit and Macro-economic Factors



# Gap between MIRs and assigned ratings for G-SIBs and non-G-SIBs

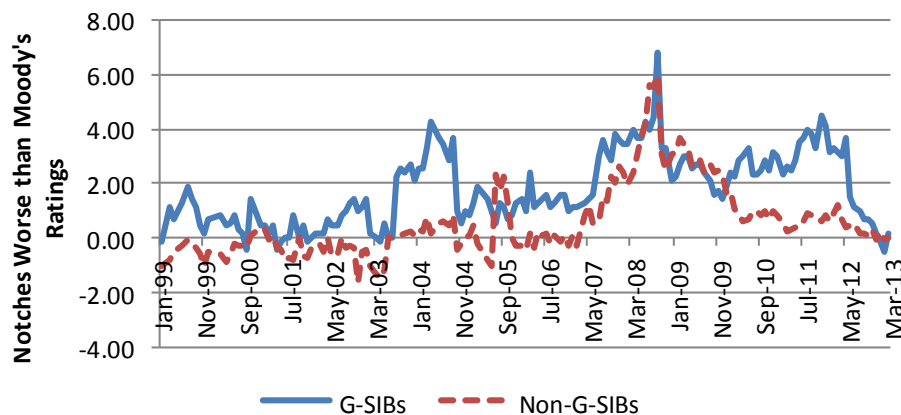
The difference (GAP) in notches between MIRs and ratings is larger for G-SIBs vs. non-G-SIBs

Period Bonds	G-SIB Gap Average (Notches)	Non-G-SIB Gap Average (Notches)
1999-2006	1.11	-0.17
2007-2010	2.83	2.19
2011-2013	2.29	0.49
All years	1.82	0.63

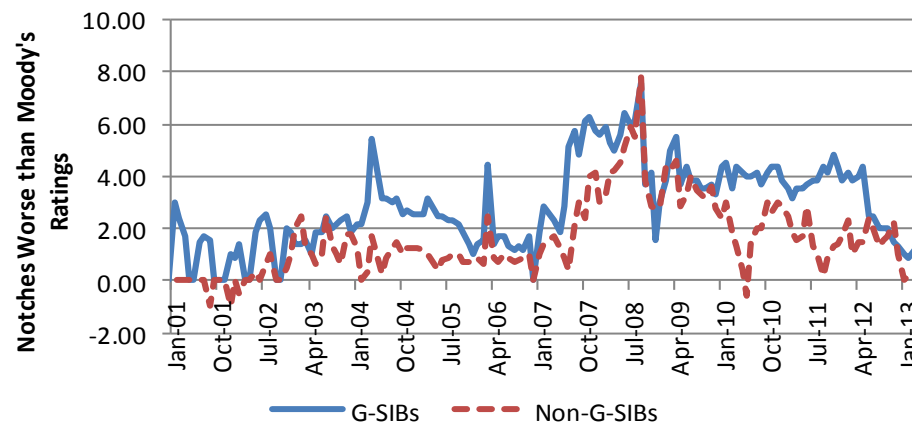
Period CDS	G-SIB Gap Average (Notches)	Non-G-SIB Gap Average (Notches)
1999-2006	2.10	0.91
2007-2010	4.36	2.98
2011-2013	3.09	1.48
All years	3.09	1.78

Funding Cost Differences Adjusted for Credit and Macro-economic Factors

### G-SIBs vs. non-G-SIBs Bond Implied Gap



### G-SIBs vs. non-G-SIBs CDS Implied Gap



## Disentangle Liquidity Effects through Other Industry Analysis

### G-SIB Advantage May Owe to Investor Preference for More Liquid Instruments

- ❑ We seek to disentangle the liquidity effects and G-SIB status by evaluating the impact of size in other industries, where there is less or no expectation of government support.

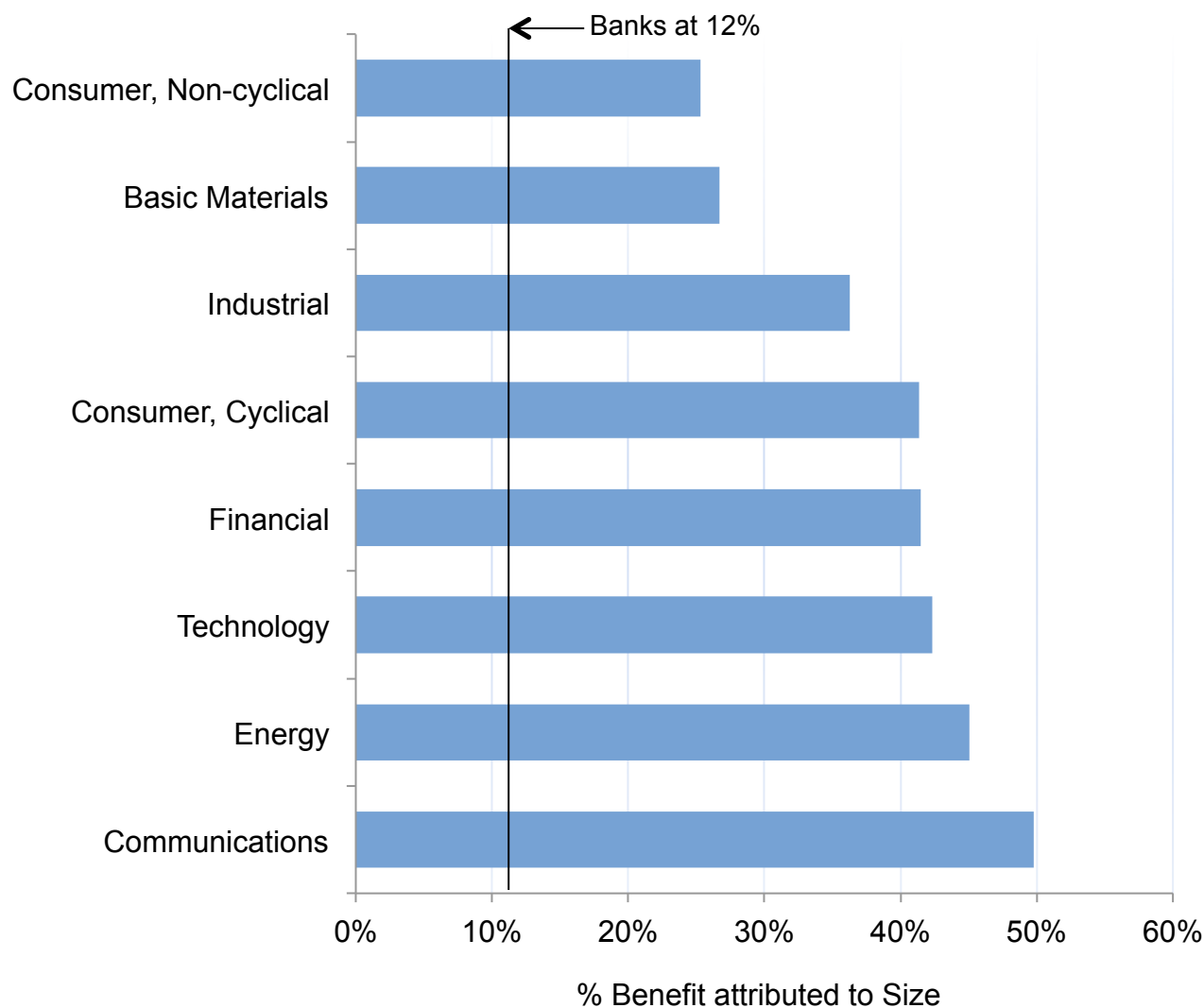
### Variables and Model

- ❑ Dependent Variable: Average 5-year **CDS spreads** for Senior Unsecured Bonds
- ❑ Independent Variables:
  - ❑ **“SIFI/G-SIB” Dummy**: top 60% of the market capitalization of all firms in an industry at each quarter = 1
  - ❑ Economic State Variables
    - **VIX** (from CBOE): market risk/investor’s risk appetite
    - **Slope**: 5-year rate (UST5Y) – 3-month Treasury rate (UST3M)
    - **Short Rates**: (UST3M) the 3-month Treasury rate
  - ❑ Fundamental Variables
    - 5-year **EDF**: from Moody’s Analytics, log transformation.
    - **Profitability**: Return on Assets (ROA)
- ❑ Model:  $Ln(CDS)_t = \beta_0 + \beta_1 \ln(EDF5YR)_{i,t} + \beta_2 VIX_t + \beta_3 ROA_{i,t} + \beta_4 \text{“SIFI” Dummy} + \varepsilon_t$

## Compare Size Effects Across Industries

Table – CDS Spread Regressions for Other Industries 2002 – 2011 Spread Advantages

### Impact of Market Capitalization on CDS Spreads in Other Industries



Impact of Size Effects in Other Industries

- It is not only in the Banking industry that G-SIB status or size is a significant factor in explaining lower CDS Spreads.
- The size advantage among these industries ranges from 25% to 50% compared to G-SIB advantage of 12% in the Banking industry that we found earlier.



## Conclusion

### Our Study

- ❑ We find G-SIBs enjoy 23 bps Cost Advantage in Domestic Interest-bearing Deposits over non-G-SIBs.
  - This may be due to large branch networks, brand recognition and convenience afforded to larger firms.
- ❑ We find G-SIBs enjoy 3% of OAS spread Advantage over non-G-SIBs.
  - We also find substantial differences in sub periods (pre-crisis, crisis, and post-crisis), which is attributable to the perceived strength of banks before crisis (little external support considered).
- ❑ Ratings uplift analysis shows the market ignores the assumed support assigned by NRSROs
- ❑ After combining various sources of funding based on funding mix, we find 9 bps total advantage for G-SIBs.
  - Excluding disadvantage for Fed Funds & Repos, we find 15 bps total advantage for G-SIBs.
  - Excluding both Fed Funds & Repos and non-interest-bearing deposits. We find 18 bps total advantage for G-SIBs.
- ❑ We also find significant size effects in other industries, which appear even greater than what we find for G-SIBs.



## Alternative approaches to evaluating funding benefits from government support

### Objective Value Approach

- ❑ This approach attempts to directly compare funding costs for large versus small banks.
  - Assertion: Differences in these costs are caused by government support for the large TBTF firms.
  - Previous work (*Baker/McArthur, Li et al., Warburton/Anginer, Demirguc-Kunt/Huizinga, Brewer/Jagtiani*) either ignore funding costs at BHC level, apply a perceived subsidy to all funding costs, do not control for credit and other factors, or assume banks TBTF status through mergers.
- ❑ This approach does not acknowledge that differing banks have differing business models. In contrast our approach
  - Examines various funding sources and their respective costs, and the degree to which funding mix impacts overall funding costs.
  - Identifies the contributing factors and estimates their relative contributions.

### Credit Rating Approach

- ❑ The approach considers the differences between “standalone” and issuer rating of large relative to smaller banks
  - Assertion: Credit spreads are aligned with credit ratings; measured differences in spreads are necessarily associated with government support.
  - Previous work (*Haldane, Ueda/di Mauro, Hoenig, Rime, Morgan/Stiroh*) take ratings support uplift at bank level and assume it applies to BHC; also do not control for credit risk and other factors.
- ❑ We relate the amount of “uplift” to the actual spreads and costs of individual firms.
  - “Uplift” – difference between the (non-supported) standalone rating and the rating of the issuer.

## Funding Cost at Bank Holding Company Level

### Study Funding Cost Advantage at Bank Holding Company (BHC) Level

- ❑ Actual government support was applied at BHCs.
- ❑ Higher capital requirements are also applied at BHCs.
- ❑ The BHC holds a large proportion of banks' long-term debt funding, and certain rules constrain the transfer of funding from depository entities to the BHC.

Table: Difference in Funding Costs – Banks vs BHC (bps)

	Large banks > \$100B	Small banks < \$100B	Spread: Large - Small
FDIC: 2001-2007	2.51	2.80	(0.29)
BHC: 2001-2007	3.20	2.67	0.53
FDIC: 2008Q4-2009Q2	1.15	1.93	(0.78)
BHC: 2008Q4-2009Q2	1.69	1.80	(0.11)

## Model Selection

### Selection Process

- Our initial filtration based upon univariate analysis and intuition reduced the list of explanatory variables to 16.
- Secondly we applied stepwise regressions to determine a smaller set of variables.
- The process is conducted for each funding cost variable separately.

### Model Variables Data Distribution

Variable	G-SIB				Non-G-SIB			
	25 <sup>th</sup>	Median	Mean	75 <sup>th</sup>	25 <sup>th</sup>	Median	Mean	75 <sup>th</sup>
CDS5Y (bps)	18.2	31.4	81.6	125.0	20.1	33.7	94.4	105.0
TOAS (bps)	59.22	122.30	166.8	241.30	64.70	100.50	235.10	291.00
Fed Funds & Repos (%)	0.87	1.67	2.31	3.87	0.88	2.02	2.3	3.81
Deposits (%)	0.72	1.41	1.68	2.46	1.14	1.78	1.97	2.74
Asset Quality (NPL) (%)	17.54	34.18	39.05	52.94	14.33	21.41	30.54	38.63
Net Interest Margin	2.25	2.76	2.87	3.93	3.23	3.60	3.61	4.01
Profitability (Net Inc/Assets)	0.13	0.25	0.22	0.36	0.16	0.28	0.18	0.35
BFSR	2.00	3.00	3.74	5.00	5.00	6.00	5.84	7.00
Net ST Liabilities/Assets (%)	-4.64	3.99	2.39	8.58	-4.18	7.00	4.44	13.68
Earnings Stability (STD12TROA)	0.26	0.40	0.46	0.55	0.13	0.29	0.63	0.61
Bond Duration (Year)	4.35	5.38	5.11	5.81	2.51	3.88	3.86	4.62

## Regression Results

### Variable Treatments

- Log transformation is applied for bond OAS and CDS spreads to mitigate the dispersion of spreads.
- “Winsorization” is applied for profitability, asset quality and funding liquidity to reduce impact of outliers.
- GLS is applied for bond OAS regression to account for time dependent heteroscedasticity.

Table – Regression Results

	Cost of Deposits		Cost of Fed Funds		Ln(Treasury OAS)		Ln(CDS)	
	Coeff	t-value	Coeff	t-value	Coeff	t-value	Coeff	t-value
Intercept	0.85	6.61	0.66	3.80	3.03	16.98	4.86	21.49
VIX	0.03	16.63	0.01	5.04	0.04	12.59	0.03	8.23
BFSR	0.00	-0.25	-0.02	-2.44	0.11	11.60	0.13	10.83
ShortRate	0.52	23.92	0.73	23.01	0.00	-0.01	-0.48	-12.79
Profitability	-0.52	-5.77			-1.49	-12.31	-1.35	-9.48
Slope	-0.03	-0.93	-0.22	-4.09	0.06	1.57	-0.58	-8.74
Duration					0.09	8.06		
NPL	0.01	7.20	0.01	5.63	0.00	5.91		
Bond Age					0.10	9.62		
Illiquidity	0.02	16.72	0.01	8.45				
NIM	-0.17	-9.64						
EarningVol	0.00	0.14						
SIFIDummy	-0.23	-5.25	0.19	2.92	-0.03	-0.59	-0.12	-2.59
<b>SIFI Benefit (bps or pct)</b>	<b>23.1</b>		<b>-18.5</b>		<b>2.7%</b>		<b>11.7%</b>	
Adjusted R2	77%		81%		74%		81%	
DoF	1790		1775		640		435	

Funding Cost Differences Adjusted for Credit and Macro-economic Factors

## Sensitivity to Systemic Risk

### Equity Betas

- ❑ Investors are concerned not just with idiosyncratic risk, but also with systemic risk,
  - We incorporate equity betas as an independent variable as a proxy for sensitivity to systematic risk
- ❑ The introduction of equity betas as a measure of sensitivity to systemic risk
  - G-SIBs cost advantage increases from 3% to 5%.
  - Positive beta coefficients confirm our expectation that banks with larger betas shall bear higher funding costs.

Table – Bond OAS and CDS Spreads Regression with Equity Betas

	Ln(TOAS)		Ln(CDS)	
	Coeff	t-value	Coeff	t-value
Intercept	3.12	15.80	4.75	20.66
VIX	0.03	10.93	0.03	7.50
BFSR	0.10	9.77	0.13	10.30
ShortRate	0.00	0.05	-0.46	-12.20
Profitability	-1.38	-11.52	-1.31	-9.18
Slope	0.06	1.24	-0.55	-8.11
Duration	0.08	6.72		
NPL	0.00	5.24		
Bond Age	0.10	9.19		
Beta	0.15	4.16	0.06	2.23
SIFIDummy	-0.05	-1.00	-0.13	-2.76
<b>SIFI Benefit (bps or pct)</b>	<b>4.7%</b>		<b>12.4%</b>	
Adjusted R2	74%		81%	
DoF	587		434	

## Sensitivity to Systemic Risk (Continued)

### Sub-periods Analysis

- Sub-periods analysis also shows the introduction of the equity betas as measures of sensitivity to systemic risk, “unmasked” the impact of the G-SIB cost advantage.

Table – Bond OAS Sub-periods Regression without Equity Betas

Bond OAS	Pre-crisis (02Q1-06Q4)	Crisis (07Q1-09Q1)	Post-crisis (09Q2-11Q1)
SIFI Dummy	0.24	(0.07)	(0.26)
<b>SIFI Benefit</b>	<b>-27%</b>	<b>7%</b>	<b>23%</b>
t-value	4.83	(0.93)	(2.77)
Adjusted R2	68%	86%	67%
DoF	303	150	167

Table – Bond OAS Sub-periods Regression with Equity Betas

Bond OAS with Beta	Pre-crisis (02Q1-06Q4)	Crisis (07Q1-09Q1)	Post-crisis (09Q2-11Q1)
SIFI Dummy	0.13	(0.06)	(0.26)
<b>SIFI Benefit</b>	<b>-14%</b>	<b>6%</b>	<b>23%</b>
t-value	3.00	(0.75)	(2.80)
Adjusted R2	62%	86%	68%
DoF	256	144	165



# Types of Ratings

## Bank Financial Strength Rating (BFSR)

- Reflects Moody's opinion of a bank's intrinsic safety and soundness.
- Excludes certain external credit risks and credit support elements.
- Measures the likelihood that a bank will require assistance from third parties such as its owners, industry group, or official institution, etc.
- Considers factors including bank specific elements, e.g. financial fundamentals, franchise value, and business and asset diversification.

## Bank Deposit Rating

- Reflects Moody's opinion of a bank's ability to repay punctually its foreign and/or domestic currency deposit obligations.
- Considers factors including intrinsic financial strength, sovereign transfer risk, and both implicit and explicit external support elements.
- Does not account for the benefit of deposit insurance schemes that make payments to depositors.
- Recognizes the potential support from schemes that may provide direct assistance to banks.

## Bank Issuer Rating

- If the long-term deposit rating remained Investment Grade, the Issuer Rating uplift from BFSR could be the same as that of the Deposit Rating uplift.
- If the long-term deposit rating was below Investment Grade, then due to depositor preferences, the Issuer Rating uplift would not benefit to the same degree as the Deposit Rating uplift.

## Bank Holding Company (BHC) Issuer Rating

- BHC Issuer Rating is generally 1 notch lower than the Bank Issuer Rating.

# Define Rating Uplift

## Transform Credit Rating to Numeric Measure

- ❑ The BFSR is converted to a Baseline Credit Assessment using the same scale as used by Moody's for other ratings.
- ❑ "Uplift" is calculated as the difference between BFSR and either Deposit, BHC, or Issuer Rating. A positive value indicates an rating uplift.

## Define "Uplift" for Different Funding Costs

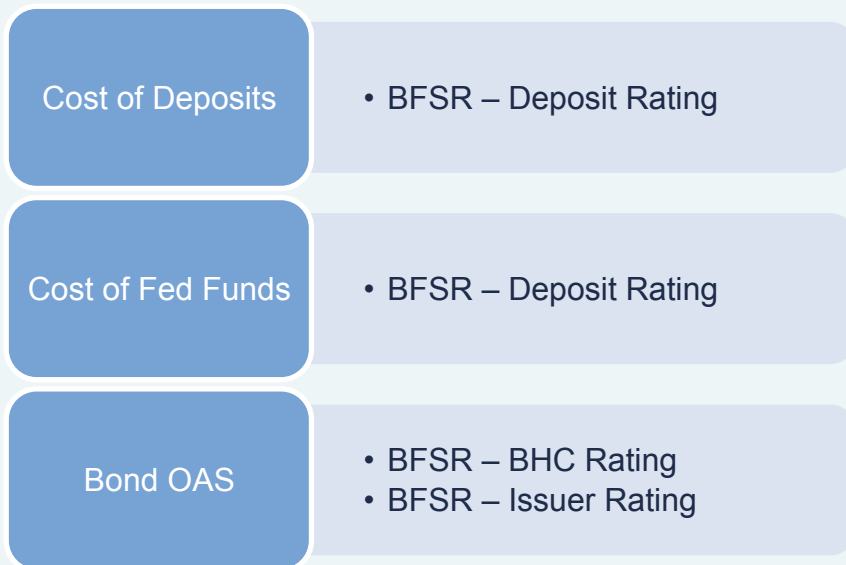


Table – Bank Financial Strength Ratings

BFSR/Baseline Credit Assessment Mapping			
BSFR	Numeric	Baseline	Numeric
A	1	Aaa	1
A-	2	Aa1	2
B+	3	Aa2	3
B	4	Aa3	4
B-	5	A1	5
C+	6	A2	6
C	7	A3	7
C-	8	Baa1	8
C-	9	Baa2	9
D+	10	Baa3	10
D+	11	Ba1	11
D	12	Ba2	12
D-	13	Ba3	13
E+		B1	14
E+		B2	15
E+		B3	16
E		Caa1	17
E		Caa2	18
E		Caa3	19

## Regression with Uplift

### Introducing the Uplift Variable

- ❑ We interact the G-SIB dummy with the amount of “Uplift” associated with G-SIB debt. We also interact the non-G-SIB dummy with the amount of “Uplift” associated non-G-SIB debt.
- ❑ We observe little change in attributed funding cost advantages or disadvantages.
- ❑ Recently Moody’s and other rating agencies have downgraded the degree of uplift provided to BHCs based on Dodd-Frank’s intent to strengthen the ability of regulators to resolve complex financial institutions.

Table – Regression with Uplift Variables

	Cost of Deposits		Cost of Fed Funds		Ln(TOAS)	
	Coeff	t-value	Coeff	t-value	Coeff	t-value
Intercept	0.83	6.58	0.72	4.19	2.90	14.39
VIX	0.03	17.41	0.01	4.86	0.04	12.00
BFSR	0.01	1.81	-0.03	-3.69	0.12	10.21
ShortRate	0.51	23.55	0.73	22.83	-0.01	-0.39
Profitability	-0.46	-5.13			-1.37	-11.17
Slope	-0.05	-1.46	-0.22	-4.08	0.03	0.65
Duration					0.09	7.34
NPL	0.01	7.37	0.01	6.11	0.00	5.73
Bond Age					0.12	10.14
Illiquidity	0.01	15.77	0.01	8.00		
NIM	-0.18	-10.34				
EarningVol	0.00	-0.07				
SIFI&Uplift	-0.13	-6.72	0.03	1.22	-0.12	-3.61
Non-SIFI&Uplift	-0.07	-3.13	-0.03	-0.89	-0.04	-1.28
Average SIFI Uplift	1.24		1.25		-0.06	
Average non-SIFI Uplift	0.04		0.04		-0.97	
<b>SIFI Benefit (bps or pct)</b>	<b>15.8</b>		<b>-4.4</b>		<b>3%</b>	
Adjusted R2	78%		81%		74%	
DoF	1,789		1,774		583	

## Other factors, aside government support, associated with size

### CDS Spreads Widen Unevenly Across Three Major Banks

- We examine the CDS spreads on senior, unsecured debt of three major G-SIBs:
  - JP Morgan
  - Bank of America
  - Citibank
- During the financial crisis, institutions of perceived lower credit quality saw much larger increases in spreads.
- If market participants had uniform expectations of the TBTF across G-SIBs, one might have expected the difference in CDS spreads among these institutions to have been narrower.

Figure – CDS Spreads for Selected G-SIBs 2003Q1 – 2011Q4

Funding Cost Differences Adjusted for Credit and Macro-economic Factors

