

Systemically Important Insurers and Banks

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- 1. Introduction**
- 2. SIFIs and G-SIFIs**
- 3. Choosing G-SIFIs using risk analysis**
- 4. Conclusions**

1. New regulatory frameworks distinguish between systemically important institutions and the rest

SI's attract tighter regulation because of

- a) Too Big to Fail
- b) Externalities

2. How to identify SIFIs?

Regulators face practical issue of how to choose SIs

- a) The score card approach
- b) The apples and pears problem
- c) A risk model based approach

3. Should insurers be regarded as SI's?

Controversial...

- a) IAIS argues that SI status for insurers due to non-traditional activities, i.e., the "AIG effect"

1. **Financial institutions interact and affect the real economy in ways that are not reflected in market prices leading to externalities**
 - Distressed asset sales by one firm may push down collateral values leading to increased debt overhang for other borrowers
 - Levered firms may be subject to multiple equilibria in which creditors (i) withdraw or (ii) maintain funding. The collapse of one firm may induce others to flip to a bad “bank run” equilibrium
 - Agents’ withdrawal from traded asset markets cuts values for others as illiquidity premiums increase.
2. **Some firms are so large that the fiscal and political fall out of letting them fail is unacceptable – they are Too Big to Fail**
3. **Some institutions play a key infrastructure role in markets so their failure disrupts activity until alternatives are established**
 - Custodian banks
 - CCPs
 - Johnson Matthey
 - Australian bank key to their construction industry

- Since the crisis, regulators have sought to identify **Systemically Important Financial Institutions** with a view to treating them differently in financial regulation
- Some national regulators pushed ahead in early identification and regulatory treatment of SIFIs
- For example **Switzerland**, determined in 2008 that UBS and Credit Suisse should meet tighter capital and liquidity rules than other banks
- Internationally, the **Financial Stability Board** has pushed for conservative regulatory treatment of Global SIFIs
- The Basel Committee (**BCBS**) and the International Association of Insurance Supervisors (**IAIS**) have developed criteria for identifying G-SIFIs, respectively **G-SIBs** and **G-SIIs**

G-SIFI criteria for insurers

Category (and weighting)	Individual Indicator	Indicator Weighting (2011 data)
Size (5%)	Total assets	2.5%
	Total revenue	2.5%
Global activity (5%)	Revenues derived outside of home country	2.5%
	Number of countries	2.5%
Interconnectedness (40%)	Intra-financial assets	5.7%
	Intra-financial liabilities	5.7%
	Reinsurance	5.7%
	Derivatives	5.7%
	Large exposures	5.7%
	Turnover	5.7%
Non-traditional insurance and non-insurance activities (45%)	Level 3 assets	5.7%
	Non-policy holder liabilities and non-insurance revenues	6.4%
	Derivatives trading	6.4%
	Short term funding	6.4%
	Financial guarantees	6.4%
	Minimum guarantee on variable insurance products	6.4%
	Intra-group commitments	6.4%
Liability liquidity	6.4%	
Substitutability (5%)	Premiums for specific business lines	5%

- Indicators “**Size**” and “**Global activity**” have small weights (5% each)
- Primary considerations are “**Interconnectedness**” (40%) and engaging in “**Non-traditional insurance**” and “**Non-insurance**” activities (45%)
- Indicator for “**Substitutability**” (i.e., special specialisation) gets small weight (5%)

G-SIFI criteria for banks

Indicator-based measurement approach		
Category (and weighting)	Individual Indicator	Indicator Weighting (2011 data)
Cross-jurisdictional activity (20%)	Cross-jurisdictional claims	10%
	Cross-jurisdictional liabilities	10%
Size (20%)	Total exposures as defined for use in the Basel III leverage ratio	20%
Interconnectedness	Intra-financial system assets	6.67%
	Intra-financial system liabilities	6.67%
	Wholesale funding ratio	6.67%
Substitutability/ financial institution infrastructure (20%)	Assets under custody	6.67%
	Payments cleared and settled through payment systems	6.67%
	Values of underwritten transactions in debt and equity markets	6.67%
Complexity (20%)	OTC derivatives notional value	6.67%
	Level 3 assets	6.67%
	Held for trading and available for sale value	6.67%

- All five categories get 20% weights each
- Indicators “Size” and “Cross-jurisdictional” important unlike for insurers
- Indicator “Interconnectedness” less important than insurers
- Indicator “Complexity” not included for insurers
- High (20%) weight given for “Substitutability”, i.e., providing important infra-structure or market role

Regulators' Chosen G-SIFI Firms

- Which firms were designated by regulators as **G-SIFIs**?
- **9 insurers** (most European) and **30 banks** (again most European)

G-SIFIs identified in 2014	
US Insurers	American International Group MetLife, Inc. Prudential Financial, Inc.
European Insurers	Allianz SE Assicurazioni Generali S.p.A. Aviva plc AXA S.A. Prudential plc
Asian Insurers	Ping An Insurance (Group) Company of China, Ltd.

Questions:

- Should insurers be designated as G-SIFIs at all?
- Would the failure of a domestic bank like Lloyds or Banque Populaire really have a global impact

G-SIBS identified in 2011	
US Banks	Bank of America Bank of New York Mellon Citigroup Goldman Sachs JP Morgan Chase Morgan Stanley State Street Wells Fargo
European Banks	Banque Populaire CdE Barclays BNP Paribas Commerzbank Credit Suisse Deutsche Bank Dexia Group Crédit Agricole HSBC ING Bank Lloyds Banking Group Nordea Royal Bank of Scotland Santander Société Générale UBS Unicredit Group
Asian Banks	Bank of China Mitsubishi UFJ FG Mizuho FG Mitsui FG Sumitomo

- Note that **scoring financial institutions based on indicators** and then according them different regulatory/supervisory treatment **has a long history**
- **US OCC** developed **CAMELS** approach in 1970s
- Bank of England developed RATE which evolved into **ARROW** approach of the **UK's FSA** which was applied to insurers and asset managers as well as to banks
- The idea was to **focus supervisory efforts** on institutions that score high for risk based on multiple quantitative and qualitative indicators
- This approach has been **down-played since the crisis**
- The UK's PRA and FCA now recognise supervisory objective of reducing insolvency likelihood for all regulated firms
- But inevitably there has to be focus on a few firms because of **resource constraints**

A Quantitative Risk Approach

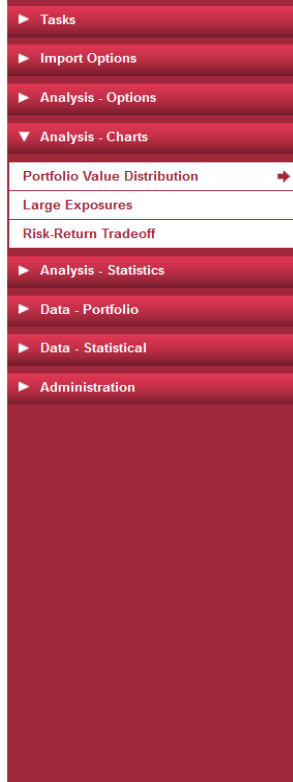
- The **FSA's ARROW** approach and the **current G-SIFIs criteria** face problem of trying to **score totally different institutions**
- ARROW led the FSA to **switch** significant regulatory resources away **from banks and towards insurers** - which looks like a big **mistake** following the crisis
- Also, the riskiness of a firm's activities should affect the level of regulatory attention. Relying on the rules for calculating capital alone is not enough
- Here I look at what one learns from a more direct, quantitative approach to assessing high risk regulatory status
- **The idea is:**
 1. **Make a judgment about the externalities that arise if a regulated firm defaults**
 2. **Model the regulator's "liability" as a portfolio of exposures to these liabilities**
 3. **Rank institutions by their regulatory marginal VaRs**

Firms for evaluation

- I collected the total asset and liability data for 175 U.S. companies in which there are 43 insurance companies and 48 banks.
- The firms include 9 out of the 20 biggest insurance companies and 21 out of the 50 biggest (based on year-end 2013 assets).
- There are 16 out of the 20 biggest banks and 30 out of the 50 biggest (again based on 2013 year-end assets).

	Count	Total asset	Total liability
Banks	48	13,736,079	12,306,495
Life Insurance	14	1,667,601	1,533,947
General Insurance	29	3,134,365	2,580,760
Manufacturing	19	114,129	62,443
Utilities	65	911,733	652,449
Total	175	19,563,908	17,136,094

- The total asset of all U.S. banks is 15 trillion as of year-end 2014.
- The total asset of insurance industry is 5.5 trillion as of year-end 2013.



Portfolio Value Distribution

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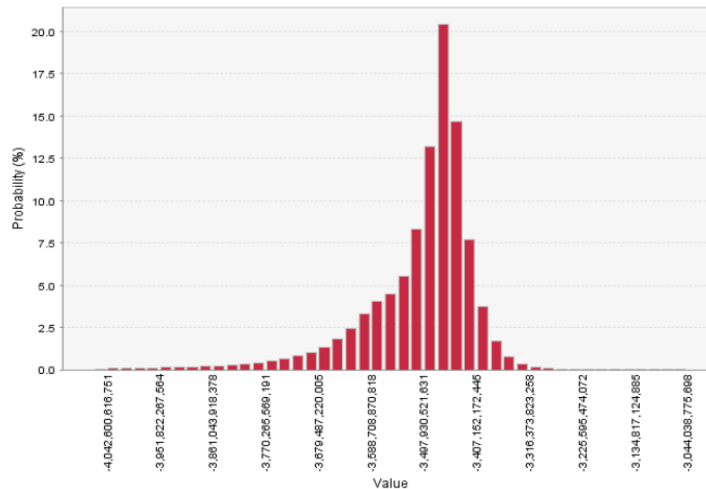
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- I model externalities as profile exposures like the **default leg of a guarantee**
- Exposure “**par**” equal to **fraction of current total assets** and assumed to have 5 year horizon
- Firms’ **ratings** evolve as in a standard ratings-based credit portfolio model
- Calibrated **correlations** based on historical ratings transitions and on spread indices

Transition matrix

	AAA	AA	A	BBB	BB	B	CCC	D
AAA	0.93	0.06	0.01	0.00	0.00	0.00	0.00	0.00
AA	0.01	0.92	0.07	0.00	0.00	0.00	0.00	0.00
A	0.00	0.04	0.90	0.05	0.00	0.00	0.00	0.00
BBB	0.00	0.00	0.04	0.92	0.04	0.00	0.00	0.00
BB	0.00	0.00	0.00	0.07	0.84	0.07	0.01	0.01
B	0.00	0.00	0.00	0.00	0.07	0.83	0.05	0.05
CCC	0.00	0.00	0.00	0.00	0.01	0.17	0.56	0.26
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00

For simplicity used the TM for all sectors

Ratings based factor correlations

	Banks	Life Insurance	General Insurance	Manufacturing	Utilities
Banks	1.00	0.82	0.84	0.49	0.39
Life Insurance	0.82	1.00	0.96	0.86	0.76
General Insurance	0.84	0.96	1.00	0.80	0.67
Manufacturing	0.49	0.86	0.80	1.00	0.75
Utilities	0.39	0.76	0.67	0.75	1.00

The correlations between sector factors not so dissimilar in magnitude but ratings based more plausible

Intra-sector correlations

	ρ (rating-based)	ρ (spread-based)
Banks	0.19	0.52
Life Insurance	0.15	0.69
General Insurance	0.12	0.57
Manufacturing	0.21	0.54
Utilities	0.10	0.58

Spread based correlations

	Banks	Life Insurance	General Insurance	Manufacturing	Utilities
Banks	1.00	0.80	0.71	0.80	0.67
Life Insurance	0.80	1.00	0.73	0.77	0.74
General Insurance	0.71	0.73	1.00	0.73	0.64
Manufacturing	0.80	0.77	0.73	1.00	0.85
Utilities	0.67	0.74	0.64	0.85	1.00

- Each of five sectors has a **single factor**
- I **estimated** intra-sector correlations using individual firm-level data on **spreads and ratings**
- **Spread based** estimates yield **much higher factor weights**
- Compare to the **Basel 12-24%** factor weights

Assumed severity fractions

	Severity
Banks	0.5
Life Insurance	0.4
General Insurance	0.4
Manufacturing	0.3
Utilities	0.3

- **Academic studies of direct costs of formal bankruptcies surveyed by Altman and Hotchkiss (2006) in the US range from 1% to 9%**
- Davydenko, Strebulaev and Zhao (2012) estimate total bankruptcy cost equal to 20% of asset value – 13% for bond renegotiations and 29% for bankruptcies
- Crucial issue is **what is the magnitude of the externality (i.e. the efficiency cost) if a firm defaults?**
- I assume it is a **fraction of total assets** and let this “severity fraction” depend on the sector
- Social cost of bankruptcy may be much higher
- IMF Financial Stability Report estimates GDP peak to trough drop due to crisis to be 2.6%, 4.9%, and 4.1%. How much is permanent?
- Other authors have higher estimates and assume some fraction permanent

	Rating-based correlation		Spread-based correlation	
	Marginal VaR 50.0bp	Marginal VaR 10.0bp	Marginal VaR 50.0bp	Marginal VaR 10.0bp
	MVaR			
Banks	526,327	765,220	790,583	1,323,533
General Insurance	27,668	52,037	126,897	203,034
Life Insurance	11,898	22,454	54,793	108,174
Manufacturing	-37	2,760	2,508	3,377
Utilities	1,638	8,383	14,752	32,093
Total	567,494	850,854	989,533	1,670,211
	MVaR/Total asset			
Banks	3.83%	5.57%	5.76%	10.75%
General Insurance	1.66%	3.12%	7.61%	13.24%
Life Insurance	0.38%	0.72%	1.75%	4.19%
Manufacturing	-0.03%	2.42%	2.20%	5.41%
Utilities	0.18%	0.92%	1.62%	4.92%
Total	2.90%	4.35%	5.06%	9.75%

Key points:

- **Total 99.9% VaR is USD 1.6 trillion** (\approx 9% of US GDP) with spread-based calibration
- **Insurers** (especially life) **contribute relatively little** to the total externality-based VaR measure
- **Manufacturing and utility firms make negligible contributions**

- MVaRs measured here as impact on total VaR of dropping each exposure.
- MVaR for a category calculated by adding up MVaRs for firms in the category.

	Total asset	Rating	Rating-based correlation		Spread-based correlation	
			Marginal VaR 50.0bp	Marginal VaR 10.0bp	Marginal VaR 50.0bp	Marginal VaR 10.0bp
Metlife Inc	885,000	A-	8,965	12,316	31,795	45,633
Prudential Insurance Company Of America	732,000	AA-	3,972	5,329	14,914	28,502
American International Group Inc	541,000	A-	4,681	7,410	18,902	32,504
Berkshire Hathaway Inc	485,000	AA	1,468	3,511	9,828	18,793
Hartford Financial Services Group Inc	278,000	BBB	3,882	5,233	16,276	24,646
New York Life Insurance Co.	260,000	AA+	1,154	1,854	4,581	11,904
Lincoln National Corp	237,000	A-	1,512	5,122	10,417	23,865
Voya Financial Inc	221,000	BBB-	2,224	4,847	13,141	21,946
Principal Financial Group Inc	208,000	BBB+	2,943	4,935	14,731	22,068
Aflac Inc	121,000	A-	1,240	990	4,388	12,502
Genworth Financial Inc	108,000	BBB-	1,187	1,821	6,179	6,704
Travelers Co Inc	104,000	A	744	1,970	3,385	9,045
Protective Life Corp	68,784	A-	703	1,838	2,443	6,037
Unum Group	59,404	BBB	664	1,314	4,006	5,504
Aetna Inc	49,765	A-	421	-211	1,237	5,491
American Financial Group Inc	42,087	BBB+	365	514	2,908	3,396
Cno Financial Group Inc	34,781	BB	494	757	2,132	2,575
Aon Corp	30,251	A-	129	624	965	1,323
Assurant Inc	29,715	BBB+	273	1,363	2,355	2,959
Progressive Corp	24,408	A+	238	647	823	1,080
Total	4,519,194		37,258	62,185	165,404	286,477

Insurer findings

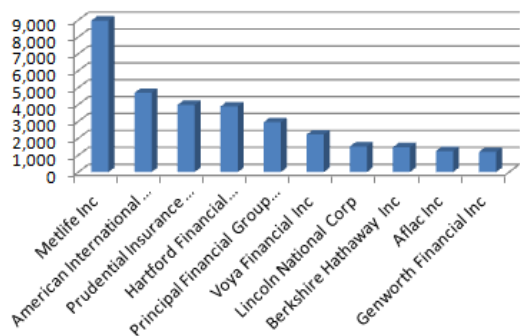
- It is **striking** that my approach yields exactly same G-SII candidates as the BCB choice
- Major **step down in MVaR from the three actual G-SIFIs to Berkshire Hathaway**

	Total asset	Rating	Rating-based correlation		Spread-based correlation	
			Marginal VaR 50.0bp	Marginal VaR 10.0bp	Marginal VaR 50.0bp	Marginal VaR 10.0bp
J.P.Morgan Chase & Co	2,415,689	A	141,457	234,750	141,259	246,831
Bank Of America Corp	2,102,273	A-	105,398	136,292	115,775	202,689
Citigroup Inc	1,880,382	A-	96,949	104,087	106,942	176,972
Wells Fargo & Co	1,523,502	A+	61,106	65,228	79,515	128,681
Goldman Sachs Group Inc	911,507	A-	21,287	31,026	47,380	78,816
Morgan Stanley	832,702	A-	19,698	35,578	40,255	64,218
Bank Of New York Mellon Corp	374,516	A+	6,203	10,610	20,131	31,818
U.S. Bancorp	364,021	A+	6,890	10,681	18,265	25,692
Pnc Financial Services Group Inc	320,192	A-	5,411	10,855	15,250	30,803
Capital One Financial Corp	296,933	BBB	9,940	10,988	23,486	34,192
State Street Corp	243,291	A+	3,102	9,265	12,049	20,508
Hsbc Usa Inc	185,487	A+	3,413	6,816	9,299	18,440
Bb&T Corp	183,010	A-	2,828	6,993	9,036	14,303
Suntrust Banks Inc	175,335	BBB	4,836	5,858	15,112	25,958
American Express Co	153,375	BBB+	4,275	6,478	11,701	17,097
Ally Financial Inc	151,167	BB	4,909	9,039	11,445	15,221
Ameriprise Financial Inc	144,576	A	1,544	3,977	8,229	16,370
Fifth Third Bancorp	130,443	BBB+	1,921	8,600	10,871	19,126
Citizens Financial Group Inc	122,154	BBB+	2,870	6,657	9,003	15,445
Regions Financial Corp	117,396	BBB-	3,211	5,860	10,647	13,007
Total	12,627,951		507,249	719,637	715,650	1,196,185

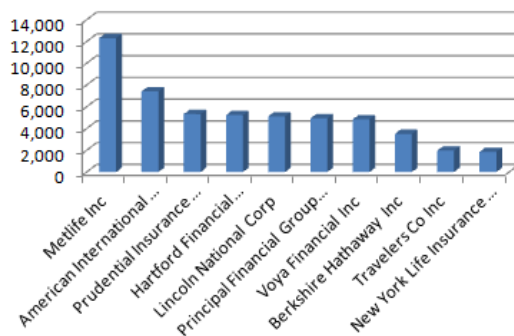
Bank findings

- For banks my approach yields **almost** exactly same G-SIB candidates as the BCBS choice
- **State Street** (justified by their custodian activity) is the only exception

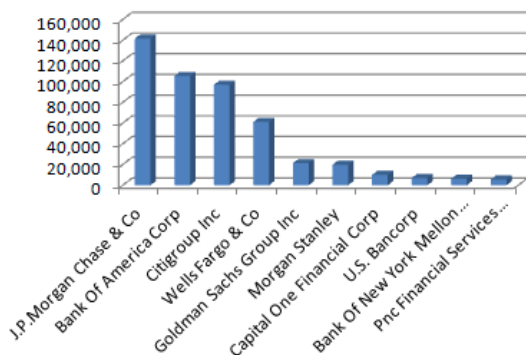
Marginal VaR 50.0bp (rating-based correlation)



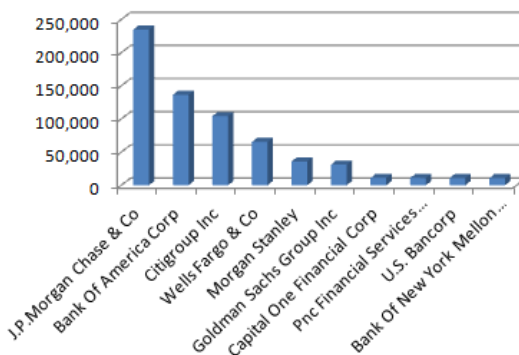
Marginal VaR 50.0bp (spread-based correlation)



Marginal VaR 50.0bp (rating-based correlation)



Marginal VaR 50.0bp (spread-based correlation)



- Comparing banks and insurers, they are definitely apples and pears by this measure
- **MVaRs of insurers contributing most risk are radically smaller than those of riskiest banks**

1. It is perhaps a matter of **taste** whether one finds a simple **quantitative analysis** as a more transparent basis for judging G-SIFI status than a **subjectively weighted average** of **different indicators**
2. But a **quantitative approach** has the **advantage** that it is less subject to the **apples and pears** problem of comparing insurers and banks
3. (An **arbitrariness** in my approach. and hence a weakness, comes from severity assumptions but it at least **forces consideration of losses**)
4. **Strikingly**, my analysis yields almost exactly the same G-SIFI candidates as the BCBS-IAIS approaches (the only exceptions being key custodian “infrastructure providers”)
5. The analysis suggests that **insurers** as a group are **less** of a source of risk than **banks**
6. It is true that **the riskiest G-SII** is a bigger source of risk than **the two least risky G-SIBs** but these are included as **custodian banks**
7. So one could argue that the **effective MVaR cut-off** for **G-SIBs** is **above that of the riskiest G-SII**

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