



BANCA D'ITALIA
EUROSISTEMA

Identifying and Tracking Global, EU and Eurozone Systemically Important Banks with Public Data

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“How to regulate and resolve systemically important banks”

Overview

- This paper develops a methodology to identify systemically important banks, based on that developed by the BCBS (2011);
- This methodology is based on publicly available data, providing transparent results and a ranking of the banks according to their systemic importance (SI) scores;
- First attempt to identify SIBs at the European level;
- The methodology is applied to three different samples (global, EU, Eurozone) for 2010 and 2011;

Motivation/1

Our primary objective is to identify the set of European SIBs, relying on the methodology developed by the BCBS(2011). Their identification is of paramount importance for financial stability and supervisory purposes.

The global financial crisis highlighted the threats and the distortions to the financial system posed by systemically important banks.

An institution, market or instrument is systemic if its failure or malfunction causes widespread distress, either as a direct impact or as a trigger for broader contagion.

“While size can be important in itself, it is much more significant when there are connections to other institutions. The relevance of size will also depend on the particular business model and group structure, and size may be of greater systemic concern when institutions are complex” (FSB/IMF/BIS, 2009)

Motivation/2

Why European banks?

As the BCBS(2012) states about D-SIFIs : there might be several financial institutions that are not significant at the global level, but could have an important impact on their domestic financial system.

The Sovereign Debt Crisis highlighted the fragility of several national banking systems and the difficulties of the current EU financial architecture in dealing with them. Thus, the EU is moving towards a new framework that will increasingly acquire the features of a single jurisdiction.

It is then more and more important to identify EU/EZ-SIBs, from both a micro- and a macro-prudential perspective.

Motivation/3

Moreover, the cross-sectional and dynamic analysis of the results could shed further light on the systemic importance issue, on its developments and on potential remedies to existing shortcomings.

Finally, relying on publicly available data, the paper could help to cover the gap between market agents' information and regulatory information.

Relevant Literature

We lie in the stream of the 'systemic risk' literature.

However, while the systemic importance (SI) of a bank can be interpreted as an LGD concept, the contribution to systemic risk (SRC) of the same bank should be regarded as the interaction between LGD and PD.

SI and SRC are usually investigated in different branches of the literature. The measurement of SRC is deeply intertwined with risk-dependent variables and mainly relies on market-based data - Acharya et al. (2010), Adrian and Brunnermeier (2011), Drehmann and Tarashev (2011), etc.

The measurement of SI favours indicator-based approaches that rest on firm characteristics, business models, etc. rather than on risk-sensitive variables - BCBS (2011, 2013), ECB (2006), FSOC(2011), IAIS (2013), etc.

The BCBS approach/1

The BCBS methodology encompasses many dimensions of systemic importance, is relatively simple, and is more robust than currently available model-based measurement approaches and methodologies that only rely on a small set of indicators or market variables.

The approach is based on five main categories of systemic importance (size, interconnectedness, substitutability, complexity, and cross-jurisdictional activity), providing the backbone to build the indicators.

The BCBS approach/2

1.Size (20%);

2.Interconnectedness (20%):

- a. Intra-financial system assets (6.67%);
- b. Intra-financial system liabilities (6.67%);
- c. Total marketable securities (6.67%);

3.Substitutability (20%):

- a. Assets under custody (6.67%);
- b. Payments cleared and settled through payments systems (6.67%);
- c. Values of underwritten transactions in debt and equity markets (6.67%);

4.Complexity (20%):

- a. OTC derivatives notional value (6.67%);
- b. Level 3 assets (6.67%);
- c. Held for trading and available for sale value (6.67%);

5.Cross-jurisdictional activity (20%):

- a. Cross-jurisdictional claims (10%);
- b. Cross-jurisdictional liabilities (10%).

The BCBS approach/3

In the BCBS-FSB exercise, a sample of 73 banks was agreed, based on size and supervisory judgement by supervisors.

For each bank, the score for a particular indicator is calculated by dividing the individual bank amount by the aggregate amount summed across all banks in the sample. The score is then weighted by the indicator weighting within each category. Each of the five categories is normalized to 1. The five categories are then summed together.

A tentative cut-off point between G-SIBs and the rest of the sample is set, based on the clustering of the scores produced by the methodology.

A bucketing phase follows, serving the scope of endogenously establishing the additional capital surcharges of the G-SIBs.

[The List](#)

Data & methodology/1

The dataset is built entirely relying on publicly available data, collecting data for the largest 100 banks for each sample (global, EU, Eurozone).

In the EU/EZ samples foreign subsidiaries are included in the 100-bank samples (according to the BCBS D-SIBs consultative document).

Main data sources: Bankscope, Dealogic, BIS international banking statistics, SNL Financial, etc.

Some minor assumptions are necessary to adapt the available data to each category descriptions of the BCBS methodology:

1. Size
2. Interconnectedness
3. Substitutability
4. Complexity
5. Cross-Jurisdictional Activity

Data & methodology/2

Once data are completed it is possible to calculate the overall scores and rank all the banks according to their Systemic Importance.

The subsample of SIBs is identified through an agglomerative hierarchical clustering method (the average linkage method), as in ECB(2006).

Results

Once the G-SIBs, EU-SIBs and EZ-SIBs are completed, the following evidence emerges:

1. The results are fairly stable, since banks' characteristics change only slowly from year to year;
2. The list of G-SIBs is very close to the official one, showing only minor differences and a high degree of overall reliability of the methodology;
3. 9 out of 35 EU-SIBs are subsidiaries of foreign banks (mostly based in the UK, which account for 12 of 35 EU-SIBs); the SI weight of foreign subsidiaries rose between 2010 and 2011 → increased scope for supervisors to carefully oversee them;
4. In the EZ-SIBs sample we see a more limited role played by foreign subsidiaries; EZ and EU banking sectors are closely intertwined as most of the foreign subsidiaries EU-SIBs based in the UK have a broad EU projection → the SI of these banks is a matter of interest not only for UK regulators but also for EU regulators;
5. the SI of EZ banks is shrinking (at the advantage of non-EZ EU banks).

Selected Empirical Evidence/1

While linear correlation of every category with SI is quite high...

Spearman Correlation	G-SIBs		EU-SIBs		EZ-SIBs	
	2010	2011	2010	2011	2010	2011
year						
Size	0.885	0.882	0.865	0.880	0.883	0.901
Interconnect.	0.902	0.903	0.883	0.896	0.842	0.853
Substitutability	0.847	0.856	0.825	0.849	0.768	0.829
Complexity	0.906	0.905	0.876	0.880	0.842	0.878
C-J Activity	0.888	0.880	0.861	0.876	0.835	0.837

Kendall tau-b	G-SIBs		EU-SIBs		EZ-SIBs	
	2010	2011	2010	2011	2010	2011
year						
Size	0.733	0.716	0.734	0.747	0.749	0.777
Interconnect.	0.769	0.767	0.743	0.752	0.694	0.711
Substitutability	0.660	0.676	0.648	0.679	0.602	0.663
Complexity	0.750	0.745	0.732	0.728	0.672	0.722
C-J Activity	0.721	0.713	0.705	0.721	0.686	0.683

The Spearman and Kendall tau-b correlation coefficients are lower than the linear correlation and decrease for smaller samples → increased scope for ranking EU and Eurozone banks according to SI.

Selected Empirical Evidence/2

HHI*	G-SIBs		EU-SIBs		EZ-SIBs	
	2010	2011	2010	2011	2010	2011
year						
Size	0.0085	0.0084	0.0187	0.0196	0.0260	0.0274
Interconnect.	0.0111	0.0105	0.0217	0.0208	0.0292	0.0297
Substitutability	0.0153	0.0151	0.0134	0.0138	0.0258	0.0277
Complexity	0.0222	0.0225	0.0243	0.0294	0.0383	0.0371
C-J Activity	0.0186	0.0182	0.0263	0.0295	0.0389	0.0386
<i>SI</i>	<i>0.0143</i>	<i>0.0140</i>	<i>0.0213</i>	<i>0.0221</i>	<i>0.0334</i>	<i>0.0337</i>

The normalized Herfindhal Index shows that the market concentration of SI is not very high, but is higher for smaller samples: the larger the reference market the more evenly distributed is SI.

Question for regulators: Is it better to allow SI concentration to rise or not?

Decrease in global HHI* and increase in EU/EZ HHI* → SI more evenly distributed across different regions of the world (decreasing in the EU and in the US, increasing in Asia), and more concentrated within regions.

Recent Developments

1. The lengthening of the sample (2007-2012) allows significant advances in the analysis of the topic. First evidence:
 - a. surge in the SI scores for Asian (mainly Chinese) banks, and increased concentration in the EU sample;
 - b. in the first crisis years (2007-2009) several G-SIBs in financial distress;
 - c. Considering the whole time-span, EU/EZ-SIBs samples are quite stable, with only minor changes from 2009 onwards;
 - d. Within the EU, while the UK banking system maintain its lead through the years, Germany's total SI score decreases, while Spain's increases.
2. This ampler dataset will also allow to analyse more thoroughly the role played by each category; moreover SI could be analysed in relation to other economic and financial variables to ascertain its role in several issues (implicit guarantees, profitability, long-term funding, etc.);

Further Steps

1. New Rules Text (BCBS, 2013). A refinement of the methodology has been released: this framework allows to easily include and analyse the amendments and their impact on the SIBs identification issue.
2. This framework is also well-suited to include, among the EU/EZ-SIBs identification criteria, many European specificities, such as: sovereign-bond holdings, market-making activities in sovereign-bond markets, share of a country's banking sector, etc.

THANK YOU



2012 FSB G-SIBs list

Bucket (Capital surcharges)	Banks	Bucket (Capital surcharges)	Banks
4 (2.5%)	Citigroup Deutsche Bank HSBC JP Morgan Chase	1 (1.0%)	Bank of China Banque Populaire CdE BBVA Group Crédit Agricole ING Bank Mizuho FG Nordea Santander Société Générale Standard Chartered State Street Sumitomo Mitsui FG Unicredit Group Wells Fargo
3 (2.0%)	Barclays BNP Paribas		
2 (1.5%)	Bank of America Bank of New York Mellon Credit Suisse Goldman Sachs Mitsubishi UFJ FG Morgan Stanley Royal Bank of Scotland UBS		

Data Assumptions: substitutability

No reliable data – or assumptions – for the payment systems subcategory.

Then, this is the only subcategory that has been discarded. Anyway its impact on the overall score is limited (7%).

AUC and values of underwritten transactions are restricted to a European horizon for the EU and Eurozone samples.

Data Assumptions: complexity

The OTC Derivatives subcategory is filled with data of overall derivatives, since banks provide the breakdown of this variable only very seldom.

Since banks follow different accounting standards (e.g. IFRS vs US GAAP) a derivatives of banks following the US GAAP are scaled up by a correction factor δ :

$$\delta = \frac{K_{eu} (1 - K_{us})}{K_{us} (1 - K_{eu})}$$

Where K_i is the average share of derivatives to total assets for accounting principle "i"

Data Assumptions: c-j activity

Data on cross-jurisdictional activity is only available at the country level (BIS International Banking Statistics).

Data for individual banks are allocated through this function:

$$CJclaims_{ij} = \alpha \left(TA_{ij} \frac{X_j}{TA_j} \right) + (1 - \alpha) \left(\beta_{ij} TA_{ij} \frac{X_j}{\beta_j TA_j} \right)$$

where α is the weighting factor, TA_{ij} are the total assets of bank i , while TA_j are the total banking assets of country j , X_j are the cross-jurisdictional claims for country j and β is the share of cross-border gross income. In the baseline, the two assumptions are equally weighted, so $\alpha = 0.5$.

G-SIBs

Rank	2010				2011			
	Bank	Bucket	FSB G-SIFIs		Bank	Bucket	FSB G-SIFIs	FSB Bucket
1	JP Morgan	2.5%	√		JP Morgan	2.5%	√	2.5%
2	Deutsche Bank	2.5%	√		Deutsche Bank	2.5%	√	2.5%
3	BNP Paribas	2.5%	√		Citigroup	2.0%	√	2.5%
4	Barclays	2.5%	√		HSBC	2.0%	√	2.5%
5	Citigroup	2.0%	√		Barclays	2.0%	√	2.0%
6	HSBC	2.0%	√		BNP Paribas	2.0%	√	2.0%
7	Bank of America	2.0%	√		Bank of America	1.5%	√	1.5%
8	Royal Bank of Scotland	1.5%	√		Royal Bank of Scotland	1.5%	√	1.5%
9	UBS	1.5%	√		UBS	1.5%	√	1.5%
10	Crédit Agricole	1.5%	√		Crédit Agricole	1.5%	√	1.0%
11	Société Générale	1.5%	√		Mitsubishi UFJ	1.5%	√	1.5%
12	Goldman Sachs	1.5%	√		Goldman Sachs	1.5%	√	1.5%
13	Credit Suisse	1.5%	√		Société Générale	1.5%	√	1.0%
14	Mitsubishi UFJ	1.5%	√		Credit Suisse	1.0%	√	1.5%
15	Morgan Stanley	1.0%	√		Bank of New York Mellon	1.0%	√	1.5%
16	Bank of New York Mellon	1.0%	√		Morgan Stanley	1.0%	√	1.5%
17	Banco Santander	1.0%	√		Banco Santander	1.0%	√	1.0%
18	Mizuho FG	1.0%	√		Wells Fargo	1.0%	√	1.0%
19	ING Bank	1.0%	√		Mizuho FG	1.0%	√	1.0%
20	Unicredit	1.0%	√		BPCE Group	1.0%	√	1.0%
21	BPCE Group	1.0%	√		ING Bank	1.0%	√	1.0%
22	Wells Fargo	1.0%	√		Unicredit	1.0%	√	1.0%
23	Dexia	1.0%	√		State Street Corporation	1.0%	√	1.0%
24	Lloyds Banking Group	1.0%	√		Sumitomo Mitsui	1.0%	√	1.0%
25	State Street Corporation	1.0%	√		Lloyds Banking Group	1.0%		
26	Sumitomo Mitsui FG	1.0%	√		ICBC	1.0%		
27	Commerzbank	1.0%	√		Nordea Bank	1.0%	√	1.0%



EU-SIBs

Rank	2010				2011			
	Bank	Country	Bucket	Subsidiary	Bank	Country	Bucket	Subsidiary
1	BNP Paribas	France	1		Deutsche Bank	Germany	1	
2	Deutsche Bank	Germany	1		HSBC	UK	1	
3	HSBC	UK	1		Barclays	UK	1	
4	Barclays	UK	1		BNP Paribas	France	1	
5	Crédit Agricole	France	2		Royal Bank of Scotland	UK	2	
6	Royal Bank of Scotland	UK	2		Crédit Agricole	France	2	
7	Société Générale	France	2		Société Générale	France	2	
8	JP Morgan Securities	UK	3	√	Goldman Sachs International	UK	3	√
9	Banco Santander	Spain	3		Banco Santander	Spain	3	
10	UniCredit	Italy	3		JP Morgan Securities	UK	3	√
11	BPCE Group	France	3		BPCE Group	France	3	
12	ING Bank	Netherlands	4		Credit Suisse International	UK	3	√
13	Goldman Sachs International	UK	4	√	Merrill Lynch International	Ireland(*)	4	√
14	Lloyds Banking Group	UK	4		Lloyds Banking Group	UK	4	
15	Commerzbank	Germany	4		Nordea Bank	Sweden	4	
16	Dexia	Belgium	4		ING Bank	Netherlands	4	
17	Credit Suisse International	UK	4	√	Unicredit	Italy	4	
18	Merrill Lynch International	Ireland(*)	4	√	Citigroup Global Markets	UK	4	√
19	UBS	UK	4	√	UBS	UK	4	√
20	Nordea Bank	Sweden	4		Commerzbank	Germany	4	
21	Morgan Stanley International	UK	4	√	Morgan Stanley International	UK	4	√
22	Bank of New York Mellon	Belgium(*)	4	√	Danske Bank	Denmark	4	
23	Rabobank	Netherlands	4		Rabobank	Netherlands	4	
24	Intesa Sanpaolo	Italy	4		Bank of New York Mellon	Belgium(*)	4	√
25	Citigroup Global Markets	UK	4	√	Dexia	Belgium	4	
26	BBVA	Spain	4		BBVA	Spain	4	
27	Danske Bank	Denmark	4		Nomura International	UK	4	√
28	Credit Mutuel	France	4		Standard Chartered	UK	4	
29	Nomura International	UK	4	√	Landesbank BW	Germany	4	
30	Landesbank BW	Germany	4		Intesa Sanpaolo	Italy	4	
31	DZ Bank	Germany	4		DZ Bank	Germany	4	
32	Standard Chartered	UK	4		Bayerische Landesbank	Germany	4	
33	Bayerische Landesbank	Germany	4		Credit Mutuel	France	4	
34	Hypo Real Estate	Germany	4		Svenska Handelsbanken	Sweden	4	
35	KBC Bank	Belgium	4		Banca Civica	Spain	4	

EZ-SIBs

Rank	2010				2011			
	Bank	Country	Bucket	Subsidiary	Bank	Country	Bucket	Subsidiary
1	BNP Paribas	France	1		Deutsche Bank	Germany	1	
2	Deutsche Bank	Germany	1		BNP Paribas	France	1	
3	Crédit Agricole	France	2		Crédit Agricole	France	2	
4	Société Générale	France	2		Société Générale	France	2	
5	Banco Santander	Spain	3		Banco Santander	Spain	3	
6	BPCE Group	France	3		BPCE Group	France	3	
7	UniCredit	Italy	3		Unicredit	Italy	3	
8	ING Bank	Netherlands	4		ING Bank	Netherlands	4	
9	Commerzbank	Germany	4		Merrill Lynch International	Ireland (*)	4	√
10	Dexia	Belgium	4		Commerzbank	Germany	4	
11	Merrill Lynch International	Ireland (*)	4	√	Rabobank	Netherlands	4	
12	Rabobank	Netherlands	4		Dexia	Belgium	4	
13	Intesa Sanpaolo	Italy	4		BBVA	Spain	4	
14	Bank of New York Mellon	Belgium (*)	4	√	Intesa SanPaolo	Italy	4	
15	BBVA	Spain	4		Bank of New York Mellon	Belgium (*)	4	√
16	Credit Mutuel	France	4		Landesbank BW	Germany	4	
17	Landesbank BW	Germany	4		Credit Mutuel	France	4	
18	DZ Bank	Germany	4		ABN AMRO Bank NV	Netherlands	4	
19	HSBC France	France	4	√	DZ Bank	Germany	4	
20	Hypo Real Estate	Germany	4		Nordea Bank Finalnd Plc	Finland	4	√
21	Bayerische Landesbank	Germany	4		HSBC France	France	4	√
22	Nordea Bank Finland	Finland	4	√	Bayerische Landesbank	Germany	4	
23	KBC Bank	Belgium	4		KBC Bank	Belgium		
24	ABN AMRO Bank NV	Netherlands	4		Banca Civica	Spain		
25	Bankia	Spain	4		Bankia	Spain		
26	Norddeutsche Landesbank	Germany	4		Norddeutsche Landesbank	Germany		
27	Portigon AG	Germany	4		Hypo Real Estate	Germany		
28	HELABA	Germany	4		HELABA	Germany		
29	Banca Monte dei Paschi di Siena	Italy	4		La Caixa	Spain		
30	La Caixa	Spain	4		Portigon AG	Germany		
31					HSH Nordbank	Germany		
32					Banca Monte dei Paschi	Italy		
33					Erste Group Bank	Austria		
34					Kutxabank	Spain		
35					DekaBank	Germany		
36					Raiffeisen Group	Austria		
37					Bank of Ireland	Ireland		
38					Banco de Sabadell	Spain		
39					Banco BPI	Portugal		
40					Ibercaja Banco SAU	Spain		