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**Article**

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Volker Brühl\*

# How to Define a Systemically Important Financial Institution – A New Perspective

The recent financial crisis has demonstrated that a failure of systemically important financial institutions (SIFIs) could seriously damage the stability of the financial system. A precise and consistent definition of a SIFI is pivotal to ensure efficient and effective regulation of the global financial sector. This paper proposes a threefold test that indicates which financial institutions are systemically important across the various industry segments.

The recent financial crisis has revealed substantial deficiencies in the regulation and supervision of the international banking sector. Comprehensive reform packages like Basel III or the Dodd-Frank Act in the United States have been established to improve the resilience of the banking sector in general, and particularly in times of financial or economic distress. Key measures of these reforms include a substantial increase of capital requirements, both in quantitative and qualitative terms, and the introduction of internationally harmonised liquidity standards. Furthermore, improvements were made in risk management and governance processes, and the transparency measures and disclosure procedures of the institutions were strengthened.<sup>1</sup>

The problem that financial institutions could either be “too big to fail” or “too interconnected to fail” has been addressed by the G20 and various international organisations, such as the Financial Stability Board (FSB), the Basel Committee on Banking Supervision (BCBS), the International Association of Insurance Supervisors or the International Organization of Securities Commissions. Financial institutions have been characterised as systemically important if their distress or disorderly failure would cause significant disruption to the financial system and economic

activity due to their size, complexity and systemic interconnectedness.<sup>2</sup> A failure of such systemically important financial institutions (SIFIs) could seriously damage the stability of the financial system due to spillover effects to other financial institutions and to private and institutional investors. The negative externalities of a SIFI failure would also inflict damage on the real economy through multiple channels. SIFIs are expected to have higher loss-absorbency capacities and are subject to more intensive supervision and resolution planning in order to reduce moral hazard and to take into account the specific relevance of SIFIs for the stability of the global financial system.

Regulatory practice currently follows indicator-based approaches that are applied to the banking and insurance sectors to identify global systemically important banks (G-SIBs) and global systemically important insurers (G-SIIs). These indicators include, for example, the size of banks, their interconnectedness, the lack of readily available substitutes for services or infrastructures they provide, their global activity and their complexity. All are deemed important indicators to measure the global systemic importance of banks.<sup>3</sup> The FSB and the BCBS published the most recent list of G-SIBs in November 2015, which contains 30 institutions allocated into five “buckets”. Each bucket represents the level of systemic importance in descending order and determines the required level of additional common equity loss absorbency as a percentage of risk-weighted assets that applies to each G-SIB. The additional capital requirements range from 3.5% (Bucket 5) to 1.0% (Bucket 1).<sup>4</sup>

\* This paper is based on the award-winning contribution to the crowd-sourced innovation contest organised by the Center for Finance and Policy at the Massachusetts Institute of Technology and the Harvard Crowd Innovation Lab. The contest was launched at the end of 2015 to generate new proposals to specify sets of criteria that regulators should apply to designate a financial institution as systemically important.

1 See Basel Committee on Banking Supervision: Basel III: A global regulatory framework for more resilient banks and banking systems, Basel 2011, Bank for International Settlements; 111th Congress of the United States: Dodd-Frank Wall Street Reform and Consumer Protection Act, Public Law 111-203, July 2010.

2 See Financial Stability Board: Reducing the moral hazard posed by systemically important financial institutions, FSB Recommendations and Time Lines, Basel, October 2010.

3 See Basel Committee on Banking Supervision: Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement, Basel, July 2013; and Basel Committee on Banking Supervision: The G-SIB assessment methodology – score calculation, Basel, November 2014.

4 See Financial Stability Board: 2015 Update of list of global systemically important banks (G-SIBs), Basel, November 2015.

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Furthermore, as of November 2015, nine insurance groups have qualified as G-SIIs that are subject to higher loss absorbency requirements and further policy measures.<sup>5</sup> The identification of G-SII also rests on a similar indicator-based approach, with the key parameters of size, interconnectedness, global activity, asset liquidation and substitutability being measured via additional insurance-specific indicators.<sup>6</sup> Additionally, there are a wide range of financial institutions outside the banking and insurance sectors, including finance companies, asset management firms (e.g. hedge funds) and market intermediaries. A failure in any of these institutions could equally trigger instability in the financial system. It is particularly challenging to find a common methodology for identifying such non-bank non-insurer (NBNI) financial institutions as globally systemically important, due to the fact that their underlying business models, risk profiles and transmission channels are very heterogeneous.<sup>7</sup>

A growing number of research publications have emerged that deal with financial networks as a means to better understand the interconnections among financial institutions and their relevance for systemic risk. However, there are still several issues to be resolved, such as data requirements and empirical testing of underlying model assumptions before they might be used in practice by regulatory authorities.<sup>8</sup> A precise and consistent definition of a SIFI is pivotal to ensure efficient and effective regulation, for example, by quantifying capital surcharges and avoiding regulatory arbitrage between different segments of the financial services industry.<sup>9</sup> This paper proposes a threefold test logic that enables us to classify financial institutions as systemically important – independent of the specific industry segment.

5 See Financial Stability Board: 2015 Update of list of global systemically important insurers (G-SIIs), Basel, November 2015.

6 See International Association of Insurance Supervisors: Global Systemically Important Insurers: Initial Assessment Methodology, Basel, July 2013; and International Association of Insurance Supervisors: Global Systemically Important Insurers: Updated Assessment Methodology, Basel, June 2016.

7 A preliminary assessment methodology has been presented by the FSB and the International Organization of Securities Commissions. See FSB/IOSCO: Assessment Methodologies for Identifying Non-Bank Non-Insurer Global Systemically Important Financial Institutions – Proposed High-Level Framework and Specific Methodologies, Madrid/Basel, March 2015; or Financial Stability Board: Progress and Next Steps Towards Ending “Too-Big-To-Fail” (TBTF), Report of the Financial Stability Board to the G-20, Basel, September 2013.

8 For a literature survey, see e.g. A.-C. Hüser: Too Interconnected to Fail: A Survey of the Interbank Networks Literature, SAFE Working Paper Series No. 91, Frankfurt 2015.

9 See e.g. Board of Governors of the Federal Reserve System: Calibrating the GSIB Surcharge, Washington, July 2015. Regarding the forthcoming total loss-absorbing capacity (TLAC), see Basel Committee on Banking Supervision: TLAC Quantitative Impact Study (QUIS) Report, November 2015; Financial Stability Board: Principles of loss-absorbing and recapitalisation capacity of G-SIBs in resolution, Basel 2015.

## The proposal

The methodology to identify SIFIs outlined in this proposal is based on the assumption that a SIFI is systemically important if it has: i) *global market relevance*, ii) *a high level of risk potential*, and iii) *a high level of interconnectedness* with other financial institutions. As an initial filter for selecting financial institutions to be tested, a minimum threshold for total assets could be applied. This implies that financial institutions with total assets below this limit would be considered too small to have a systemic impact if they were to fail. From a global perspective, a limit of US\$200 billion appears reasonable, as even mid-sized financial institutions would then be included in the sample. Alternatively, one could consider an even lower threshold; for example, the ECB categorises banks with more than €30 billion in total assets as significant. If we assume that a financial institution has to own or manage total assets with a value of at least US\$200 billion, one could select approximately the top 100 banks, the top 50 insurance firms and the top 100 investment firms (together the “Top 250”), whereby some of the largest financial conglomerates would fall into all three buckets.<sup>10</sup>

## A threefold SIFI test

Accordingly, this paper proposes a threefold indicator-based SIFI test along the three dimensions outlined above: a *market relevance test*, a *risk potential test* and an *interconnectedness test*. Based on this logic, a financial institution is categorised as a SIFI, if and when it passes the SIFI test in all three dimensions (see Figure 1). The test should be repeated on a regular basis.

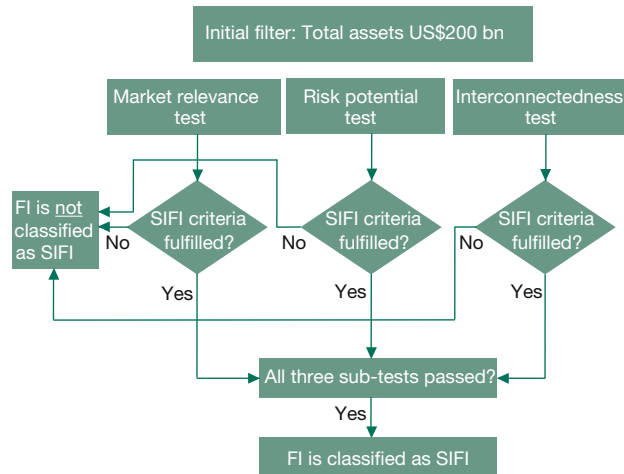
## Market relevance test

The rationale behind the first test is that a SIFI is assumed to have global market relevance and therefore a leading position in most of its core markets. Depending on the business model and product offering, global market relevance could either be reflected by leading positions in global markets (e.g. investment banking) or in multiple local markets, provided that the geographic footprint covers all major economic regions (Americas, EMEA, APAC). If this is the case, the conclusion that a failure would significantly affect a large customer base appears to be reasonable.

To conduct the market relevance test, market shares in each core market of the respective financial institution

10 This rough estimate refers to the global ranking of financial institutions in each segment; see for example the SNL Financial Database, available at <http://www.snl.com>.

Figure 1  
SIFI test overview



Source: Author's illustration.

must be measured. Table 1 illustrates a possible segmentation for banking, insurance and NBNI (here represented by asset management<sup>11</sup>). Note that the respective market shares should be calculated for different regional markets where appropriate, e.g. in retail banking, or on a global basis, e.g. for capital markets businesses such as equities; rates; and fixed income, currencies, and commodities.

The test examines whether a potential SIFI has a market share above a certain *critical market share* in its defined market segments. The calibration of the respective critical market share should be subject to a detailed market concentration analysis per product line and region, possibly using a Lorenz curve. Moreover, a cut-off point for the cumulative share of the largest financial institutions must be defined, depending on the respective market structure, to calculate the critical market shares. As an example, we assume a threshold of 25%, i.e. for each market segment the cumulative market share of the largest 25% of financial institutions by market share is calculated.<sup>12</sup> The critical market share would be the marginal market share attributable to the smallest financial institution within the top 25%. The respective financial institution would be classified as a SIFI (subject to the outcome of the other two tests) if the test reveals that the market shares are equal to or greater than the respective

11 A further segmentation of NBNI (e.g. including finance companies) appears reasonable.

12 The 25% threshold is offered as an example and should be calibrated depending on market concentration. Furthermore, it could make sense to set a minimum figure of e.g. five per cent for the calculated critical market share to take into account highly fragmented markets.

Table 1  
Example for segmentation of the market relevance test

Industry segment	Market segment	Product line	Market share
Banking	Retail	Loans, deposits	Regional
Banking	Corporates	Loans, deposits, derivatives	Regional
Banking	Investment banking	Rates, fixed income, currencies, commodities, equities	Global
Insurance	Life insurance		Regional
Insurance	Non-life insurance		Regional
Insurance	Reinsurance		Global
NBNI	Investments	Asset management	Global

Source: Author's depiction.

critical market share for either at least one product line in all major economic regions (for regional markets) or at least one global market. For instance, a market-leading retail bank that conducts business only in one core economic region, e.g. the Americas, would not qualify as a SIFI due to a lack of global market relevance. Conversely, an investment bank with a market-leading position in at least one global product line (e.g. equities or fixed income sales and trading) would pass the market relevance test.

### Risk potential test

The rationale behind the second test is that the level of risk of the entire business activities of a SIFI must be high enough to constitute a substantial part of the overall risk potential associated with the largest worldwide financial institutions (e.g. the Top 250). The risk categories that are considered are market risk, credit risk, operational risk, liquidity risk and insurance risk. A reasonable estimate for an aggregate risk figure could be derived from an economic capital (EC) model that banks have to implement according to the Basel III regulatory framework. In the United States, large banks also deploy EC models, although the results are not published in detail. Usually EC models are based on Monte Carlo simulations with a Value at Risk (VaR) methodology that aggregates the individual risk categories and takes into account diversification effects. EC models estimate economic loss, defined as the unexpected loss for a 12 month period that is not exceeded with a confidence level of at least 99%. Due to the shortcomings of the VaR approach to covering tail risks, it might be reasonable to consider an expected

shortfall approach to calculate the EC.<sup>13</sup> Insurance groups also use the EC approach widely as a key tool for managing capital adequacy according to the “Own Risk and Solvency Assessment (ORSA)” as part of the Solvency II Directive (Directive 2009/138/EC) in the EU or the “Risk Management and Own Risk and Solvency Assessment Model Act (#505)” in the United States.

However, NBNI financial institutions like asset management firms are not yet obliged to implement EC models. Similar to the market assessment test, global risk concentration is analysed by applying the EC concept to the Top 250 financial institutions and calculating the cumulative risk share of the top 25% with the largest risk potential, as indicated by the EC. The *critical risk share* would be the marginal risk share attributable to the smallest financial institution within the top 25%. As with the critical market share described above, the threshold of 25% is only used as an example and needs to be set in line with the distribution and concentration of the overall risk potential in the industry. If the test reveals that the risk share is equal to or greater than the critical risk share, the respective financial institution would be classified as a SIFI, subject to the outcome of the two other tests.

#### Interconnectedness test

The rationale behind the third test is that the failure of a SIFI could, due to its size and interconnectedness, trigger defaults of other financial institutions and/or substantial losses for its shareholders or institutional and private debt holders to an extent that trust in the stability of the global financial system would be endangered, potentially leading to disruptions in global financial markets. A simplified approach to measure the level of interconnectedness is based on a matrix that quantifies the bilateral financial relationships among the Top 250 financial institutions.

In Table 2 each element in the matrix  $Exp_{ij}$  represents the financial exposure of financial institution  $i$  ( $FI_i$ ) versus financial institution  $j$  ( $FI_j$ ) in per cent of the total financial exposure, where financial exposure is defined as the sum of loans, equity positions and the market value of derivative contracts between the respective institutions. The sum of each column shows the net liability position ( $NLP_j$ ) of  $FI_j$  (in per cent) versus all other financial institutions in the Top 250, while the sum of each row reflects the net receivable position ( $NRP_i$ ) of  $FI_i$  (in per cent) versus all other financial institutions. The sum of all columns and rows is

<sup>13</sup> See Basel Committee on Banking Supervision: Fundamental review of the trading book: A revised market risk framework, Basel, October 2013; or Basel Committee on Banking Supervision: Fundamental review of the trading book: outstanding issues, Basel, February 2015.

**Table 2**  
**Financial interconnectedness matrix**

Interconnectedness test					
	$FI_1$	$FI_2$	$FI_3$	$FI_n$	$\Sigma$
$FI_1$	$Exp_{11}=0$	$Exp_{12}$	$Exp_{13}$	$Exp_{1n}$	$NRP_1$
$FI_2$	$Exp_{21}$	$Exp_{22}=0$	$Exp_{23}$	$Exp_{2n}$	$NRP_2$
$FI_3$	$Exp_{31}$	$Exp_{32}$	$Exp_{33}=0$	$Exp_{3n}$	$NRP_3$
$FI_n$	$Exp_{n1}$	$Exp_{n2}$	$Exp_{n3}$	$Exp_{nn}=0$	$NRP_n$
$\Sigma$	$NLP_1$	$NLP_2$	$NLP_3$	$NLP_n$	100%

$FI_i$  = Financial institution  $i$ .  $Exp_{ij}$  = Risk position of  $FI_i$  to  $FI_j$  (loans, equity positions and derivative contracts).  $NRP_i$  = Net receivables position of  $FI_i$  (cumulative receivables position to other  $FIs$ ).  $NLP_j$  = Net liability position of  $FI_j$  (cumulative liabilities position to other  $FIs$ ).

Source: Author's elaboration.

100%. A financial institution is considered a SIFI if the net receivables and/or net liabilities positions exceed a critical threshold, which could again be calibrated for the top 25% of financial institutions with the strongest financial interconnections.

#### Conclusion

The proposal developed here has certain similarities with the indicator-based approach developed by the Basel Committee on Banking Supervision. However, a three-fold test avoids any weighting or aggregation of factors to generate an overall score. Moreover, this proposal uses a common set of criteria applicable to all types of financial institutions, although these criteria still need to be adapted to the specific industry segment. On the other hand, regulatory authorities would have to ensure that not only banks and insurance companies but also NBNI financial institutions are obliged to establish economic capital models that are consistent in terms of methodology and data requirements. Furthermore, each financial institution within the Top 250 would have to register and report all financial interconnections with any other member of the Top 250 to ensure full transparency, and a complete “250 x 250 financial interconnection matrix” would need to be constructed. Such a financial-interconnectedness matrix would help to significantly increase transparency about mutual dependencies and financial relations among the largest financial institutions across the various industry segments and could also be a helpful element within an early warning system to detect systemic risk. Subject to thorough data analysis, it appears likely that a number of financial institutions currently in Bucket 1 of the G-SIB list would not be SIFIs according to this proposal. On the other hand, some NBNI, such as Blackrock or the Vanguard Group, would most likely be classified as SIFIs.