



UW Faculty of Management  
Working Paper Series  
No 4 / September 2014

# **THE ANALYTICAL FRAMEWORK FOR IDENTIFYING AND BENCHMARKING SYSTEMICALLY IMPORTANT FINANCIAL INSTITUTIONS IN EUROPE**

**Renata Karkowska**

*University of Warsaw, Faculty of Management*

*Poland*

*rkarkowska@wz.uw.edu.pl*

*JEL classification:* C1, F36, F65, G21, G32, G33

*Keywords:* banking, Systematically Important Financial Institutions, SIFI,  
systemic risk, liquidity, leverage, profitability

UW FM Working Paper Series are written by researchers employed at the Faculty of Management of UW and by other economists, and are published by the Faculty.

DISCLAIMER: An objective of the series is to get the research results out quickly, even if their presentations are not fully polished. The findings, interpretations, and conclusions expressed in this Working Paper are those of their author(s) and do not necessarily the views of the Faculty of Management of UW.

© **By the Author(s)**. The papers are written by the authors and should be cited accordingly.

**Publisher:** University of Warsaw, Faculty of Management Press

Address:

Str.: Szturmowa 1/3; 02-678 Warsaw, Poland

Telephone: +48 22 55 34 164

Fax: +48 22 55 34 001

*This paper can be downloaded without charge from:*

<http://www.wz.uw.edu.pl/serwisy,witryna,1,dzial,326.html>

*Information on all of the papers published in the UW Faculty of Management Working Paper Series can be found on Faculty of Management Website at:*

<http://www.wz.uw.edu.pl/serwisy,witryna,1,dzial,326.html>

**ISSN 2300-4371 (ONLINE)**

# **The Analytical Framework For Identifying And Benchmarking Systemically Important Financial Institutions In Europe**

**Renata Karkowska<sup>1</sup>**

*University of Warsaw, Faculty of Management*

*Poland*

*rkarkowska@wz.uw.edu.pl*

## **ABSTRACT**

The aim of this article is to identify systemically important banks on a European scale, in accordance with the criteria proposed by the supervisory authorities. In this study we discuss the analytical framework for identifying and benchmarking systemically important financial institutions. An attempt to define systemically important institutions is specified their characteristics under the existing and proposed regulations. In a selected group of the largest banks in Europe the following indicators i.e.: leverage, liquidity, capital ratio, asset quality and profitability are analyzed as a source of systemic risk. These figures will be confronted with the average value obtained in the whole group of commercial banks in Europe. It should help finding the answer to the question, whether the size of the institution generates higher systemic risk? The survey will be conducted on the basis of the financial statements of commercial banks in 2007 and 2010 with the available statistical tools, which should reveal the variability of risk indicators over time. We find that the largest European banks were characterized by relative safety and without excessive risk in their activities. Therefore, a fundamental feature of increased regulatory limiting systemic risk should understand the nature and sources of instability, and mobilizing financial institutions (large and small) to change their risk profile and business models in a way that reduces the instability of the financial system globally.

*JEL classification: C1, F36, F65, G21, G32, G33*

*Keywords: banking, Systematically Important Financial Institutions, SIFI, systemic risk, liquidity, leverage, profitability*

---

<sup>1</sup> Corresponding author : PhD Renata Karkowska, University of Warsaw, Faculty of Management, Institute of Financial Systems of Economy, Str. Szturmowa 1/3, post code 02-678 Warsaw, fax number +48 22 5534001, telephone +48 22 5534150

## **Contents**

<b>1. INTRODUCTION.....</b>	<b>5</b>
<b>2. CONCEPT AND THE ROLE OF SYSTEMATICALLY IMPORTANT INSTITUTIONS.....</b>	<b>5</b>
<b>2.1 Criteria for the classification and categories of systematically important institutions.....</b>	<b>7</b>
<b>3. RESEARCH METHODOLOGY.....</b>	<b>12</b>
<b>4. RESULTS.....</b>	<b>13</b>
<b>5. CONCLUSIONS.....</b>	<b>17</b>
<b>6. REFERENCES.....</b>	<b>17</b>

## **1 INTRODUCTION**

Crisis of 2007-2008 revealed a serious lack of information on the size and condition of the financial markets and institutions at the sector level. It turned out that the supervisory authorities do not have sufficient sources to identify global markets and mega financial institutions of systemic importance - Systematically Important Financial Institutions (SIFI's). Determination of systemically important institutions has become a priority of regulatory authorities, but the problem turned out to be more difficult than previously thought. Statements of practitioners and academics present position, that the amount of the assets is not the only prerequisite for systemically important institutions category. Cooperation between the Financial Stability Board, Committee on the Global Financial System, Basel Committee on Banking Supervision, the Committee of Payment and Settlement Systems aimed to identify global systemically important institutions, and thereby reduce systemic risk.

Given the above, the study is to compare the risks taken in the largest banks (in terms of total assets) out of the other banks in Europe. The study was put hypothesis that the risk taken by the largest banks in Europe is not higher than in other banks. Therefore, we should pay special attention to look at smaller banks, which dealing as the group may contribute much more to the instability of banking sector. More important will be the risk of SIFI's substitutability of their services and international relations, in the light of the potential danger of bankruptcy of one of the largest banks.

The rest of the paper is organized as follows. In section 2 we present SIFI definition and terminology. In section 3 we show research methodology. In section 4 we calculate risk ratio for the largest banks in Europe. In section 5, we discuss results. Finally, section 5 concludes.

## **2 CONCEPT AND ROLE OF SYSTEMICALLY IMPORTANT INSTITUTIONS**

From the point of view of present analysis it seems important issue of the definition of systemically important banks. In recent years the doctrine of the bank "too big to fail" is based on the belief that some banks because of their size and importance of the financial sector should be funded in the event of risk of bankruptcy. This is due to the belief that the collapse of one bank could cause serious disturbances in the functioning of the financial system. The existence of an institution whose activities have a significant share in the domestic or international market, means that any disruption of the functioning of the entity prevents proper functioning of other entities. What in the further consequently cause accumulation of systemic risks and problems with public finances of countries.

The reason for the introduction of the above-mentioned categories of mega-institutions are:

- ✓ phenomenon of financialisation of the economy, ie separation of rotation of cash transactions from material goods and services markets within the meaning of real economic transactions,
- ✓ risks generated by Too Big to Fail (TBTF) institutions.

Until September 2008, the general principle of Too Big To Fail was valid in relation to global capital groups - too big to fail, or to be able to finance its liquidation. The costs of bankruptcy systemically important institutions are so heavy that they can not be covered by public finance of home, or host country.

The concept of systemically important institutions established in the course of deliberations on identifying the situation when and what kind of financial institution may lead to the materialisation of systemic risk. Mega-institutions have such a large network of connections that bankruptcy would cause significant disturbance of the whole financial system.

A proposal for the concept of systemically important institutions is presented in Table 1 Weistroffer (2011).

***Table 1 The size of the concept of systemically important financial institutions***

<b>Size</b>	<b>Contributing to systemic risk</b>	<b>Participation in the transmission disturbances</b>
The systemic significance	Marginal part in the disturbances, controlled bankruptcy.	Expected participation of institutions in the realization of systemic risk; losses for the bank's customers.
Risk measures	- the share of interbank liabilities, - liquidity and maturity of assets, - the effect of transmission of contagion risk volatility of asset prices in different markets.	- correlation in assets value, - leverage, - risk absorption capacity.
Macroprudential Policy	- taking into account the costs of bankruptcy, - avoiding moral hazard behavior.	The ability to survive of system events.

**Source: own study based on Weistroffer (2011).**

Systemically important institutions are those whose effects can have negative effects on the functioning of the financial system on an international scale.

## **2.1 Criteria for the classification and categories of systemically important institutions**

Given the lack of clear definition of systemically important institutions is considered the market benchmark, as a quantification of the size might indicate the existence of systemic risk. It seems that these indicators should be fairly stable in the face of daily market volatility, and be an utilization to the long term strategy. At the same time encourage the boards to the use of prudential norms and do not take steps manipulation.

According to the literature and guidelines Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS) basic indicators, indicating danger to systemic risk, can be identified based on the following criteria:

- ✓ size (the total value of the position calculated for the purposes of the leverage ratio under Basel III in relation to the total of the items),
- ✓ international links (the sum of receivables/liabilities from financial institutions relative to total receivables from financial institutions of all banks),
- ✓ degree of substitutability of services and infrastructure (the value of assets that the bank holds in custody as depositary with respect to their values for all banks included in the study),
- ✓ complexity (nominal value of derivative transactions with OTC, the value of assets in the trading book),
- ✓ transjurisdictional activity – foreign receivables/liabilities to the claims of all banks included in the survey (BIS, 2011, s. 4-10).

The methodology involves the use of 20% by weight for each of the indicators.

### ***The size of Systematically Important Financial Institutions***

Frequently as a measure of determining the meaning of the mega-institution adopts the size of assets, equity, and market turnover. However, in the course of research on systemic risk criterion of the institution gives way to the interrelation of entities, the liquidity gap, or the size of the leverage against the entity (Karkowska, 2012). According to the typology adopted by the ECB as large banks are referred to those which are asset size greater than 0.5% of the consolidated total assets of the banks of the European Union. Table 2 provides a summary of the banks in Europe (from the group of the 100 largest banks in the world according to BIS), in which the share of assets in relation to gross domestic product is the greatest. This means that in other countries there is no banking institution in such

serious dimensions. It should be noted that in all these countries the share of large banks is more than half the assets of the banking system, which in the context of systemic risk can be an important source of risk. This statement also reflects the strong processes of consolidation of the banking system in developed countries of Europe and the dominance of large institutions. Nearly 30% of the total number of banks in each of the analyzed developed countries are capital banking groups (see Table 2). Descriptive statistics for a selected group of the largest banks in Europe are presented in Appendix 1.

**Table 2 Statement of the largest banks in Europe (from the group of the 100 largest banks in the world): the value of assets in the domestic banking system and GDP. Geographical breakdown, as of the second quarter of 2012.**

Lp	Bank	Kraj	Aktywa (bln USD)	Aktywa (% krajowych aktywów bank.)	Aktywa (% udział PKB kraju)
1	Deutsche Bank	Germany	2822	76.9	81.1
2	HSBC	UK	2652	27.8	108.1
3	Barclays	UK	2545	26.7	103.8
4	BNP Paribas	France	248	39.3	91.5
5	Crédit Agricole S.A.	France	2269	35.9	83.7
6	Royal Bank of Scotland Group	UK	2208	23.2	90.0
7	Banco Santander S.A.	Spain	1627	50.7	116.4
8	Société Générale	France	157	24.8	57.9
9	ING	Netherlands	1558	90.2	194.2
10	Lloyds Banking Group	UK	15	15.7	61.2
11	UBS	Switzerland	1478	57.5	238.0
12	UniCredit	Italy	1202	45.0	58.2
13	Credit Suisse Group	Switzerland	1092	42.5	175.9
14	Nordea Bank	Sweden	892	47.9	162.4
15	Commerzbank	Germany	847	23.1	24.3
16	Intesa Sanpaolo	Italy	839	31.4	40.6
17	Banco Bilbao Vizcaya Argentaria S.A.	Spain	784	24.4	56.1
18	Standard Chartered	UK	624	6.6	25.5
19	Danske Bank	Denmark	590	100.0	183.6
20	Dexia	Belgium	518	59.0	104.2
21	DnB ASA	Norway	397	100.0	79.1
22	Bankia S.A.	Spain	392	12.2	28.0
23	Svenska Handelsbanken	Sweden	365	19.6	66.5
24	KBC	Belgium	360	41.0	72.4
25	Skandinaviska Enskilda Banken	Sweden	341	18.3	62.0
26	Banca Monte dei Paschi di Siena	Italy	292	10.9	14.1
27	Erste Group Bank	Austria	271	58.5	66.1
28	Swedbank	Sweden	263	14.1	47.9
29	Banco de Sabadell S.A.	Spain	210	6.5	15.0
30	Banco Popular Espanol S.A.	Spain	199	6.2	14.3
31	Bank of Ireland	Ireland	199	54.9	94.8
32	Raiffeisen Bank International	Austria	192	41.5	46.9
33	SNS Reaal	Netherlands	169	9.8	21.1
34	Banco Popolare	Italy	168	6.3	8.1
35	UBI Banca	Italy	168	6.3	8.1
36	Allied Irish Banks Plc	Ireland	163	45.1	78.0

**Source: own study based on BIS database**

This is the approach of Financial Stability Board and the Bank for International Settlements, annually updating statistics 100 largest banks in the world. For comparative scale of the phenomenon, these values are presented in the form of the indicator, relative to GDP, or market capitalization. Undoubtedly, the size of the institution is an important factor generated systemic risk, but not the most



important. Bankruptcy larger institutions causes higher losses in scale economies than less. In other words, the larger the institution in terms of assets, capitalization, etc., ceteris paribus, the stronger the impact of systemic risk. On the other hand, it should be considered whether limiting the size of financial entities, will serve the security of the financial system. Empirical research on whether the costs of maintaining a large financial institution outweigh the benefits of economies of scale, are varied. And the impact of the size of the entity on its share of systemic risk in the world seems to be still unresolved and require further research.

### **International links**

Interconnectedness of financial institutions is generally measured by share of assets and liabilities in the system of intra-system, for example. Value of the credit exposure of the institution to the rest of the system and its contribution to systemic risk. What is the contribution of credit risk to the rest of the system, and thus the potential involvement of the institution in the systemic event. The Basel Committee also proposes to use the interbank funding rate, ie. share of the funding coming from sources other than retail deposits in total liabilities. They also reflect claims and liabilities in the interbank financial markets and the allocation of credit risk between financial institutions. Due to the allocation / risk diversification and liquidity interconnectedness can bring benefits to the diverse structure of the financial system.

### **The substitutability of services and infrastructure**

Substitutability of the financial institution is particularly difficult to measure. It should not be wrongly identified with market dominance. Although the Basel Committee proposes the use of the indicator complex assets under custody, whether the payments settled through payment systems, but it would be more appropriate analysis of scenarios and the likelihood that an institution may exit the of the market and no longer offer their services. Measurement of substitutability of services in this way requires (a) a consistent definition of what constitutes a market system, and (b) of the definition of the market share of systemic importance.

In the assessment of substitutability should not be limited to financial intermediaries, but also to markets, or payment systems, which can play an important systemic role at the national level or international level, in the financial system and the whole economy (FSB et al, 2009, p. 2). The author's research suggests that the cause of systemic disorders may be, for example, repo market, intensively developing since the security deposits requirement in derivative transactions. Supervisors have a strong basis in supporting the smooth functioning and flexibility of the market. During the crisis, it turned out that the infrastructure transaction settlement had basic flaws that could lead to serious instability in times of market stress (Karkowska, 2013). An example the above is the bankruptcy of Bear Stearns, which is the main subject of clearing the repo market. The bankruptcy of the entity

meant that money market funds instead of money would receive a collateral Bear Stearns, which in the absence of the possibility of liquidation would lead to a run on the financial market (Acharya, Richardson, 2009, p. 297).

### **The complexity of the components of the financial system**

Complexity relates generally to the organizational structure of the institution, but its sources also refer to the complex structure of assets. The Basel Committee shall adopt the latter view and measure the complexity of the notional value of OTC derivatives, especially those whose valuation is not directly observable in the market. Such an approach to measures of complexity based on the assumption that the more complicated harder to sell assets and more complex corporate structures are more difficult to solve. In both cases, finding appropriate indicators it is rather difficult to determine.

### **Transjurisdictional activity (the activity of company on a global scale)**

The activity of a global financial institution is generally measured by the level of cross-border claims and liabilities. The Basel Committee also proposes as an auxiliary measurement of non-domestic revenues. Generally it is assumed that banks conducting its activities globally are a particular threat to the stability of the global financial system, in relation to those that are active only in the domestic market. Globally active banks are often higher than domestic and through foreign financing exposure may result in wider transnational contagion channel systemic risk.

On the other hand, the measurement of the global activity of banks is a typical example of how to determine the relevance of systemic institutions should not be used for comparative purposes for the regulatory authorities. For the assignment of regulatory burdens for cross-border claims and liabilities implies the risk of causing unintended side effects. If, through the regulation of SIFI's banks globally operating will generate higher marginal costs in their cross-border activities, than their local competitors, it will be less competitive, automatically. Čihák (2011) and Mayer (2011) argue that systemic immunity increases with increasing cross-border linkages, at least to a point. After crossing the optimum point, the resistance decreases again until your financial institution does not restore the kind of "elasticity". In connection with the sovereign debt crisis in some EU Member States, large cross-border institutions could help create a more flexible banking system in the euro area and to provide a stable basis for financing. Opinions on the risks arising from the activities of the global banks are divided.

These criteria can not be considered as the only determinants of SIFIs. It should also be considered, including gross or net income, market capitalization criteria in the case of size, volatility contagion effect (contagion) or correlation valuation of assets.

As a systemically important intermediaries can be distinguished also offering payment services, risk management, and investment programs. Frequently as single entities may mean little, but their lack of substitutability nature may introduce a system in crisis. Brunnermeier (2009) introduces the categories of financial institutions in the context of the spread of channels disorders:

- ✓ systemically important financial institutions, which because of its size and concentration of activity is considered to be dominant in the relevant market according the classical doctrine of "too big to fail".
- ✓ large and complex financial institutions, ie. insurance companies or pension funds, usually regarded as irrelevant systemic internationally. However, that may have a significant economic impact on the economy within national legislation, in the event of disruption of business.
- ✓ small size in terms of assets and irrelevant for a single entity, and analyzed in terms of groups which may have significant systemic importance, due to the high level of correlation of assets and risk taking. An example of this type of category SIFI's are investment funds, ie., cash and hedge funds.
- ✓ small entities, but significant activity conducted financial transactions. An example of what can be brokers nationwide.

On the one hand, the new prudential standards support the safety of banks and the entire financial system stability. On the other hand, the new regulations by the fact that impose stricter prudential standards for banks hinder their functioning and inhibit the growth of banking. They should therefore be made reasonably.

### **3 RESEARCH METHODOLOGY**

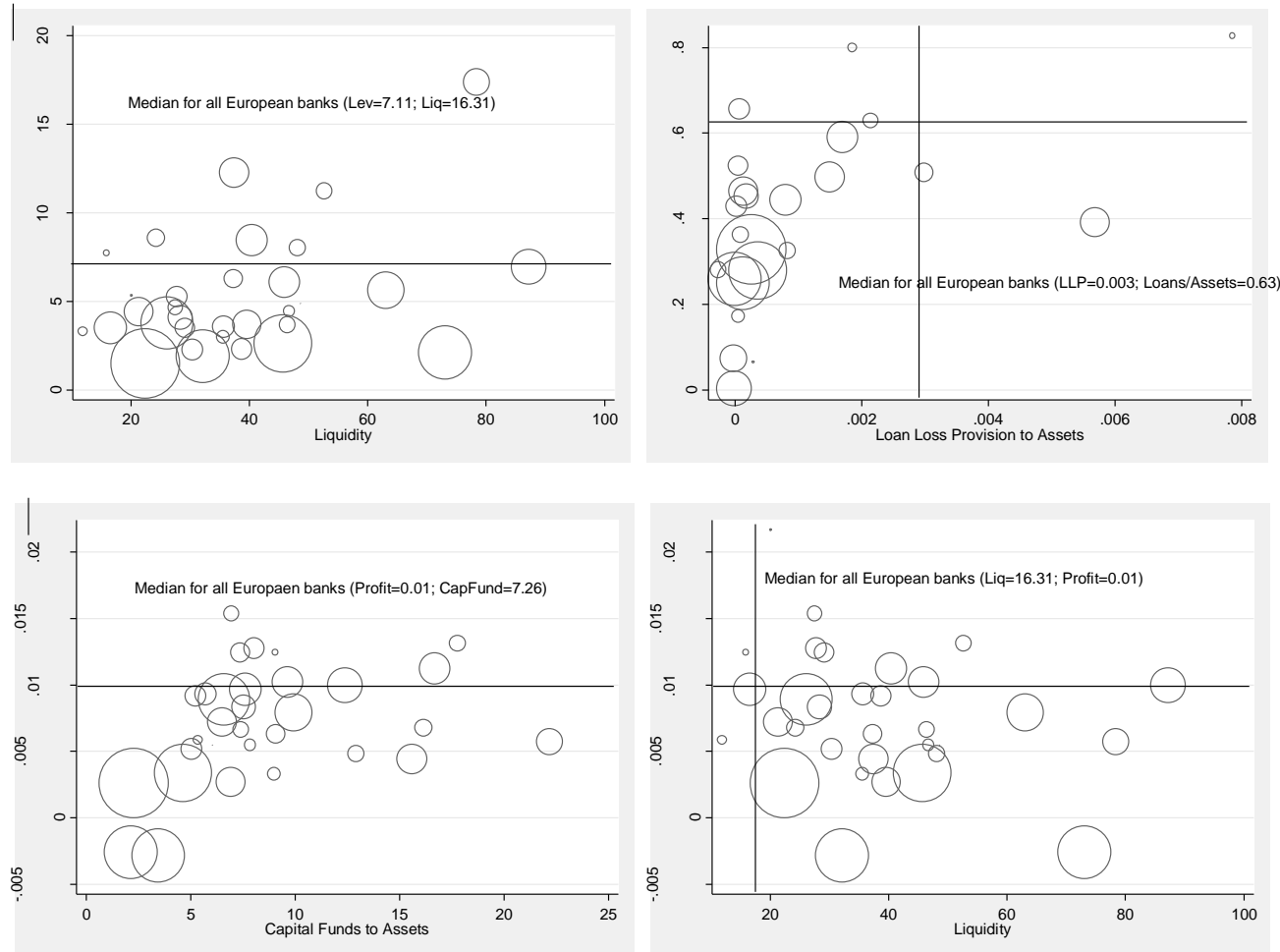
With a view to the selection criteria, specified banks to the rank of systemically important institutions, the study was based on the analysis of risk and efficiency indicators in the activities of the largest (in terms of total assets to GDP) commercial banks in Europe. For this purpose, the research group was selected - 36 commercial banks of the 100 largest banks in the world, according to the classification made by the Bank for International Settlements. In

turn, in newly appointed group of European banks there was estimated the following indicators, ie.: Leverage ratio=Equity/Total Assets, Profitability=Profit before tax/Total Assets, Liquidity=Liquid Assets/Deposits, Capital Ratio, Credit Asset Quality=Loan Loss Provisions/Total Assets, Loans/Total Assets of bank, as a source of potential systemic risk signals. The results for the 36 largest banks in Europe were compared with the results averaged (median indicator) for 3963 banks in Europe, which should help in finding the answer to the question, whether in fact the entity size generates a higher risk? The research will be conducted on the basis of the financial statements of commercial banks available in the Bankscope database, for the period of 2007 and 2010. It should reveal the variability of risk indicators over time. The time analysis was chosen because of the comparative activities of the largest banks in the time before the crisis (2007) and after the financial crisis (2010). To better understand the study, and the effective analysis, the results of the study are presented in graphical form.

### **3 RESULTS**

Graphical presentation of the analysis of indicators in the activity of the largest banks in Europe was done in Figure 1 for 2007 and Figure 2 for 2010. The results for the largest banks in Europe have been compiled with averaged results for banks across Europe. Calculations for all European banks gave the following results: Leverage Ratio=7.11%, Liquid Assets/Total Deposits=16.31%, Capital Funds/Total Assets=7.26%, Loan Loss Provision/Total Assets=0.003%, Loans/Total Assets=0.63%, Profit before Tax/Total Assets=0.01%. Detailed analysis of risk indicators of excessive debt, liquidity, capital adequacy and effectiveness of the largest commercial banks in Europe showed that they take the risk does not differ from the average across Europe.

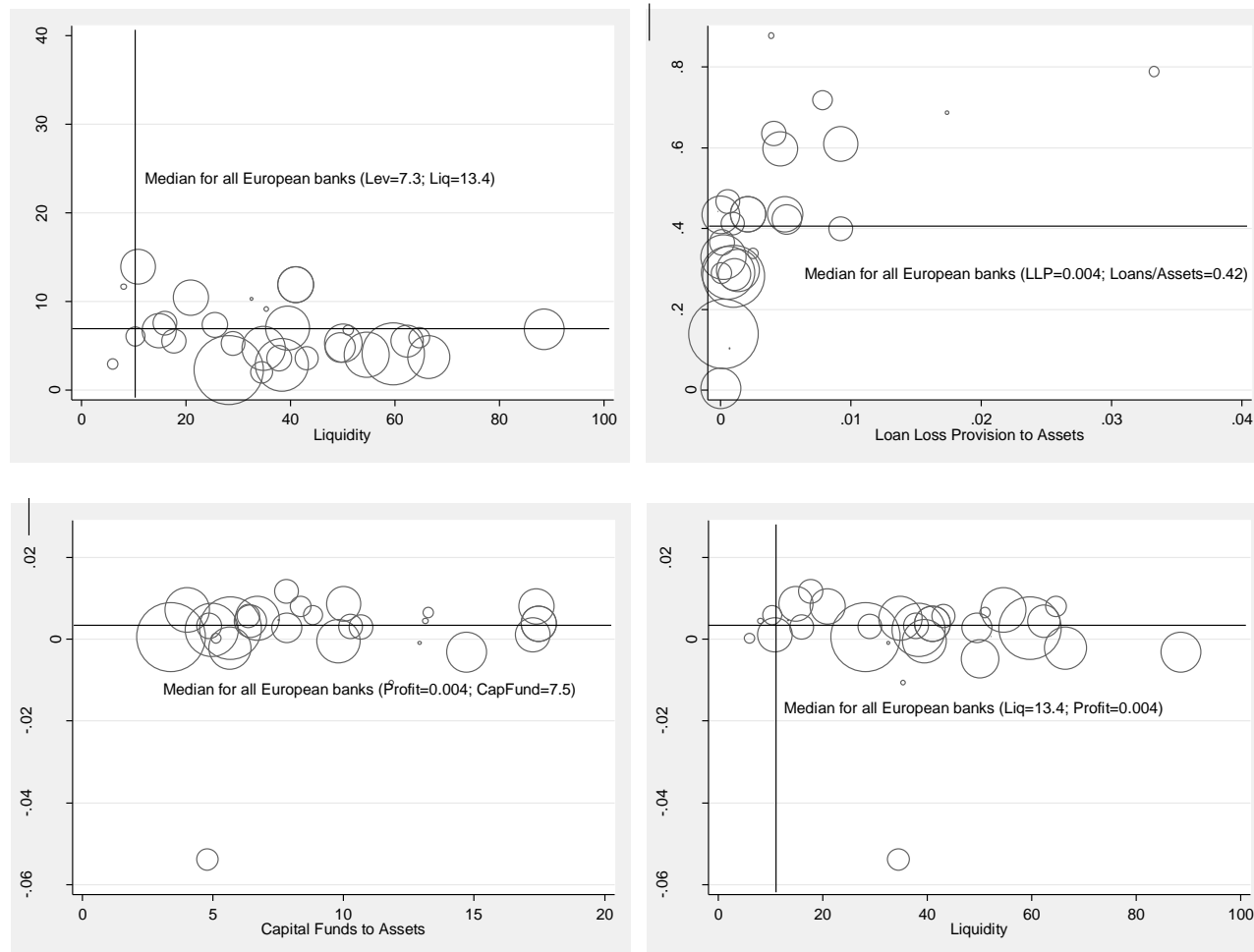
**Figure 1 Indicator analysis of the activities of the largest banks in Europe in 2007.**



**Notes:** The 36 largest banks in Europe. Area of symbol proportional to bank's average assets. Leverage ratio=Equity/Total Assets, Profitability=Profit before tax/Total Assets, Liquidity=Liquid Assets/Deposits. The horizontal and vertical line presents median value of particular ratio for all European banks in 2007. Source: own calculations based on Bankscope data (2012).

On the basis of Bankscope database, in most cases the Leverage Ratio for large banks in Europe proved to be lower than the average for all European banks. Decreasing trend remained despite the crisis from 2008 to 2009. This phenomenon shows that the largest banks in Europe do not take excessive risks leverage before the crisis. Similar results were obtained for the indicator is Liquid Assets Deposits - the biggest banks have greater resources of liquid assets in relation to the accepted deposits than the average bank in Europe. It is difficult to indicate excessive exposure to liquidity risk by the largest banks. After a period of crisis, the liquidity of the banks also increased, which suggests that banks could have problems with liquidity during the crisis. Liquidity transformation and the allocation of credit create system-wide risk that would also be present in a system without SIFIs. Confronting the liquidity ratio of banks to their performance, proved to be the classic principle the lower liquidity, the higher the profitability of the bank. The value of the indicator of profitability in 2007 showed significant variation to the whole of Europe (see Figure 1), which has been vast change in 2010 (see Figure 2). The bank's profitability decreased from 0.01 to 0.004. It is also clearly visible that the crisis affected the alignment of the profitability ratio and approached the profits of the largest banks to the average for the whole of Europe. It is difficult to agree with the statement that the largest banks in Europe achieve superior returns by taking excessive risk of insolvency or liquidity. It seems that the scale effect does not significantly affect the efficiency of the largest banks. Taking into account the profitability of the largest banks in the light of their risk of default (expressed in Capital Funds/Total Assets Ratio) can be noted that in 2007, the phenomenon is characterized by a great diversity (see Figure 1 left-down Chart). The largest banks of the study group had a Capital Ratio below the average in Europe. This situation can turn to anxiety due to the risk of insolvency of major financial institutions and the security of the entire financial system. It is important that the sample not included banks with above-average profitability and low ratio of equity to total assets. It should be noted that the threat of insolvency caused by the financial crisis brought no improvement - 2010 little changed in scale security banks. An analysis concerning the lending activities of banks showed that the largest banks lending to decline in the period 2007-2010 from 63% to 42%. Loans Total Assets Ratio is received for the largest banks below the average for the whole of Europe. Also noteworthy is the increase in the allowance for risk LLP in both the major banks as well as across Europe (see Figure 2, right-upper Chart).

**Figure 2 Indicator analysis of the activities of the largest banks in Europe in 2010.**



**Notes:** The 36 largest banks in Europe. Area of symbol proportional to bank's average assets. Leverage ratio=Equity/Total Assets, Profitability=Profit before tax/Total Assets, Liquidity=Liquid Assets/Deposits. The horizontal and vertical line presents median value of particular ratio for all European banks in 2010. Source: own calculations based on Bankscope data (2012).

In conclusion, the study showed that the risk taken by the largest banks in Europe is not higher than in other banks. Therefore, we should pay special attention to look at smaller banks, which in the group may contribute to the instability of the sector. By confronting the results with the averages for the whole of Europe in terms of liquidity risk, leverage, and profitability, these banks were characterized by relative safety. Thus, the more important may be the risk of substitutability their services and international relations in the light of the potential danger of bankruptcy of one of the largest banks.

## **5 CONCLUSIONS**

Given the methodology of the activities undertaken by the Financial Stability Board would doubt the legitimacy of providing only the largest banks on SIFI's lists. It seems economic repercussions of system scenarios should also include insurance company, investment and pension funds, or other entities, which according to the above categories may be source of systemic risk? Should be consider whether the publication of systemically important entities not turn attention of investors and supervisors of smaller entities, being able to disrupt the financial system. In the light of this study, the risk taken by the largest banks in Europe are not essential as the banking instability indicators.

The basis of the regulations limiting systemic risk is to understand the nature and sources of SIFI instability. The advantage of the methodology developed by the Basel Committee should be to mobilize financial institutions to change their risk profile and business models in a way that reduces the instability of the financial system globally. A financial institution's contribution to systemic risk is generally reflected in its liabilities to the rest of the system, i.e. to other financial institutions, and in its possible impact on asset and credit markets. It thus captures how important an institution is for the deposit system and how vulnerable it is to a systemic shock.

## **REFERENCES**

1. Acharya V.V., M. Richardson (2009), *Restoring Financial Stability. How to Repair a Failed System*, Wiley Finance, New Jersey
2. BIS (2011), *Global systemically important banks: assessment methodology and the additional loss absorbency requirement*. Rules text, Basel Committee on Banking Supervision, Basel, November 2011
3. Brunnermeier M., et. al. (2009), *The Fundamental Principles of Financial Regulation*. Geneva Reports on the World Economy 11, International Center for Monetary and Banking Studies, Geneva.
4. Cihák, Martin; Sònia Muñoz and Ryan Scuzzarella (2011). *The Bright and the Dark Side of Cross-Border Banking Linkages*. IMF Working Paper No. 11/186.



5. FSB, IMF, BIS (2009), Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations. Report to G20 Finance Ministers and Governors, Financial Stability Board, International Monetary Fund, Bank for International Settlements, October.
6. Karkowska R. (2013), Czy rynek repo może stać się przyczyną kolejnego kryzysu?, Prace i Materiały Wydziału Zarządzania Uniwersytetu Gdańskiego.
7. Karkowska R., Olszak M. (2012), Leverage and funding gap of EU banks and the business cycle, w: Perspektywy integracji ekonomicznej i walutowej w gospodarce światowej. Dokąd zmierza strefa euro?, Wydawnictwo NBP i WNE, Warszawa.
8. Mayer, Thomas, Jochen Möbert and Christian Weistroffer (2010). Macroeconomic imbalances and the Eurosystem. Global Economic Perspectives. Deutsche Bank. June 2011.
9. Weistroffer Ch., (2011), Identifying systemically important financial institutions (SIFIs), Deutsche Bank Research.

*Faculty of Management Working Paper Series No 4/ 2014*

**Appendix 1 Indicator analysis of for the activities of the largest banks in Europe in 2007, based on the database Bankscope**

Bank name	Country name	Average Assets	Capital Funds/ Total Assets	Leverage	Liquid Assets/Deposits	Loans/Total Assets	LLP/Total Assets	Profit before Tax/Total Assets
Deutsche Bank AG	GERMANY	2 380 301 056	2,27	1,5	22,45	0,33	0	0
BNP Paribas	FRANCE	1 679 249 920	4,65	2,63	45,65	0,28	0	0
UBS AG	SWITZERLAND	1 414 399 360	2,13	2,13	73,01	0,26	0	0
Société Générale	FRANCE	1 394 032 768	3,45	1,9	32,1	0,25	0	0
Royal Bank of Scotland	UNITED KINGDOM	1 376 651 008	6,59	3,81	26,11	0,4		0,01
HSBC Bank plc	UNITED KINGDOM	849 587 264	6,02	4,9	48,56	0,36		0,01
Raiffeisen Centrobank AG	AUSTRIA	849 587 264	6,51	5,33	20,11	0,06	0	0,02
ING Bank	NETHERLANDS	669 304 384	9,93	5,64	63,08	0,27		0,01
Crédit Agricole S.A.	FRANCE	590 790 528	12,38	6,97	87,15	0	0	0,01
Lloyds TSB Bank Plc	UNITED KINGDOM	527 250 080	7,63	3,51	16,49	0,74		0,01
Banco Bilbao Vizcaya Argentaria SA	SPAIN	482 156 192	9,64	6,09	45,98	0,59	0	0,01
Banco Santander SA	SPAIN	477 009 120	16,69	8,48	40,39	0,44	0	0,01
Intesa Sanpaolo	ITALY	449 784 192	15,59	12,27	37,46	0,5	0	0
Danske Bank A/S	DENMARK	421 235 200	6,51	4,41	21,3	0,46	0	0,01
Commerzbank AG	GERMANY	418 591 200	6,92	3,68	39,57	0,39	0,01	0
UniCredit	ITALY	341 399 968	22,18	17,39	78,44	0,08	0	0,01
KBC Bank	BELGIUM	296 706 752	7,54	4,1	28,28	0,45	0	0,01
Allied Irish Banks	IRELAND	232 846 304	5,72	3,55	35,6	0,51		0,01
Skandinaviska Enskilda Banken AB	SWEDEN	212 935 632	5,04	2,3	30,31	0,43	0	0,01
Bank of Ireland	IRELAND	209 866 688	5,22	2,33	38,77	0,42		0,01
DNB Bank ASA	NORWAY	208 674 624	8,05	5,25	27,72	0,66	0	0,01
Svenska Handelsbanken	SWEDEN	204 869 488	7,39	3,5	29,05	0,52	0	0,01
Banca Monte dei Paschi di Siena	ITALY	167 369 648	9,07	6,27	37,32	0,51	0	0,01
Standard Chartered Bank	UNITED KINGDOM	157 282 496	16,15	8,59	24,22	0,3		0,01
Swedbank AB	SWEDEN	138 467 840	7,41	3,7	46,44	0,36	0	0,01
Nordea Bank AB	SWEDEN	135 370 960	17,77	11,26	52,72	0,28	0	0,01
Erste Group Bank AG	AUSTRIA	128 891 944	12,9	8,04	48,12	0,33	0	0
Banco Popular Espanol SA	SPAIN	108 494 768	6,93	4,69	27,56	0,63	0	0,02
Dexia Banque Internationale	LUXEMBOURG	86 529 216	8,99	3,02	35,48	0,17	0	0
SNS Bank	NETHERLANDS	71 263 064	7,84	4,46	46,73	0,48		0,01
Barclays Bank S.A.	SPAIN	40 551 892	5,34	3,3	11,82	0,8	0	0,01
Banca Popolare Commercio e Industria	ITALY	16 326 954	9,05	7,75	15,88	0,83	0,01	0,01

**Source: own study based on Bankscope**