

THE VALUE OF BEING A SYSTEMICALLY IMPORTANT FINANCIAL INSTITUTION

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1. INTRODUCTION

The current international financial crisis, which started in 2007 in the USA and soon spread to the rest of the world, has revealed that the failure of an interconnected and complex financial institution, even though not necessarily large in terms of total assets, can threaten the stability of the entire financial system and have serious negative consequences for the real economy. In other words, besides there being institutions that are “too big to fail”, there are also intermediaries that are “too systemic to fail”.

However, the bail-out of a financial institution is very costly; moreover, since the costs of a bailout are borne by taxpayers, bank shareholders may opt to engage in higher risk activities that distort the allocation of capital and make future crises more likely. To reduce moral-hazard problems associated with these “too big or too systemic to fail” institutions, regulators and policymakers have been called upon to define new measures and models for measuring systemic risk and detecting promptly those institutions whose failure could impair the normal functioning of financial markets or lead to the collapse of the entire financial system, i.e. the so-called Global Systemically Important Financial Institutions (SIFIS).

The solution proposed by the Financial Stability Board (FSB) and the Basle Committee on Banking Supervision (BCBS) entails the introduction of additional measures intended to reduce the probability of failure of these intermediaries by increasing their ability to absorb losses. In other words, these banks will be required to raise additional capital to a percentage ranging from 1% to 3.5% of their risk-weighted assets. Using the methodology set out by the BCBS and according to banks' financial data as at the end of 2009, on November 4, 2011 the Financial Stability Board published a list of 29 SIFIS.

This paper investigates the effects of the disclosure of the list published by the FSB/BCBS on SIFIS' market equity value. Using event study methodology applied to a sample of 70 of the world's largest banks, we assess whether following the release of information regarding the methodology used to identify SIFIS and the new capital requirements (July 19, 2011), and the disclosure of the list of 29 SIFIS (November 4, 2011), stock prices of SIFIS reacted significantly and differently from those of other large

banks. Our work contributes to the ongoing debate concerning the regulation of SIFIS.

Since governments in many advanced countries have been forced to use public funds to support distressed financial institutions, thus endangering the stability of sovereign finance, it has become common opinion that regulation should be equipped with tools capable of reducing systemic risk and allocating the cost of resolving financial institutions' difficulties in such a way as to avoid moral hazard incentives. There is general consent that supervisory authorities should implement effective resolution regimes under an international framework, and that financial firms should have a more effective capacity to absorb losses, thus avoiding substantial expenditure for the public sector. Consistently with the above considerations, the new policy framework proposed by the Financial Stability Forum and endorsed by the G-20 is based on a multipronged approach that calls for the use of different policy measures, addressed both to financial supervisory authorities and to financial firms.

However, there are also a few questionable aspects of the SIFI regulatory process, such as the methodology to be adopted for defining systemic risk and identifying SIFIS, the extent to which different measures are effective in reducing banks' risk of failure (especially the additional capital requirements), and the likely macroeconomic impact of requiring additional loss absorbency from SIFIS. These are the main issues addressed by the literature relating SIFIS; indeed, new measures and models for measuring systemic risk and detecting SIFIS promptly has attracted the attention of international institutions (such as the International Monetary Fund and the Bank for International Settlements), academics, supervisory authorities and policy makers (see, among others, IMF, 2009; Adrian and Brunnermeier, 2010; Huang *et al.*, 2009 and 2010; Lo, 2009; Tarashev *et al.*, 2009, 2010; Cornacchia and Di Cesare, 2011). At the same time, the proposal to increase SIFI capital requirements has spurred debate on the possibility that risk-weighted capital standards could reinforce adverse systemic shocks and encourage banks to redirect their activities towards less capital-absorbing business; consequently, additional capital requirements for SIFIS would not necessarily succeed in making financial systems less prone to excessive risk-taking (Admati *et al.* 2011; Elliot and Litan, 2011; Slovic, 2011; Shull, 2012).

Our paper contributes to the existing literature by looking at market reaction to the disclosure of regulatory changes concerning SIFIS. We are aware that the issues tackled by the documents released on the two event dates under investigation might have been discussed extensively beforehand, and markets might have already discounted their outcome. On the other hand, the new regulation issued may have been either weaker or tougher than expected. Therefore, market reaction can be interpreted either as recognition of or refusal of the effectiveness of the regulators' proposals/decisions, as well as an evaluation of the effects of new regulations regarding SIFIS' economic performance.

Our study is organized as follows. The next section reviews the main steps in the regulatory process that has led to the publication of the list of SIFIS and to the introduction of additional capital requirements; Section 3 describes our testable hypotheses; Section 4 defines the methodology and the data-set; Section 5 presents our main results and Section 6 concludes.

2. SIFI REGULATION AND SHAREHOLDER WEALTH EFFECTS

2.1 *Evolution of SIFI Regulation*

The mandate given to the Financial Stability Board on its establishment (April 2009) included “(to) manage contingency planning for cross-border crisis management, particularly with respect to systemically important firms”. However, the importance of the “too big to fail” (TBTf) problems associated with systemically important financial institutions (SIFIs) was clearly stated for the first time at the G20 Pittsburgh Summit of September 25, 2009. G20 leaders called on the Financial Stability Board (FSB) to propose possible measures for addressing this issue by the end of October 2010¹. At that time the FSB also announced that the Basle Committee on Bank Supervision (BCBS) would assess the need for a capital surcharge to mitigate the risk faced by systemic banks.

On October 28, 2009 the FSB published a report² that address two critical issues: first, the definition of systemic risk, defined as “a risk of disruption to financial services that is (i) caused by an impairment of all or parts of the financial system and (ii) has the potential to have serious negative consequences for the real economy”. The second issue concerns the assessment of the systemic importance of a financial institution. Despite the fact that the assessment of systemic importance might vary from time to time and according to the purpose it is used for, the FSB recognizes the importance of features such as “size”, “substitutability” (the extent to which other components of the system can provide the same services in the event of a failure) and “interconnectedness” (links with other components of the system).

On November 7, 2009, the FSB³ announced possible measures to address the “TBTf” problems associated with SIFIs. These measures were aimed at: (i) reducing the probability and the impact of SIFI failure by introducing additional capital requirements for them; (ii) enhancing the recovery and resolution of distressed SIFIs; (iii) reducing contagion risk within financial markets. The importance of these measures was confirmed by the FSB’s report of October 20, 2010⁴, when the detailed policy framework to deal with SIFIs became public. In particular, regarding the reduction of the probability of failure of such institutions, the FSB recommended that SIFIs should have loss

¹ FSB, Overview of Progress in Implementing the London Summit Recommendations for Strengthening Financial Stability, at http://www.financialstabilityboard.org/publications/r_090925a.pdf.

² FSB, Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations, at http://www.financialstabilityboard.org/publications/r_091107d.pdf.

³ FSB, Progress since the Pittsburgh Summit in Implementing the G20 Recommendations for Strengthening Financial Stability, at http://www.financialstabilityboard.org/publications/r_091107d.pdf.

⁴ FSB, Reducing the Moral Hazard Posed by Systemically Important Financial Institutions. Recommendations and Time Lines, at http://www.financialstabilityboard.org/publications/r_101111a.pdf.

absorption capacity beyond the minimum agreed by Basel 3 standards. Together with this framework, on July 19, 2011 the Basle Committee on Bank Supervision (BCBS) published a consultative paper⁵ proposing a detailed methodology for assessing which institutions are systemically important banks (G-SIBs), and new regulatory measures specifically designed for these banks⁶.

The idea behind this decision is that changes to the Basle framework (included in B3) improve risk coverage but they “are not sufficient to address the negative externalities posed by G-SIBs nor are they adequate to protect the system from the wider spillover risks of G-SIBs. The rationale for adopting additional policy measures for G-SIBs is based on the cross-border negative externalities created by systemically important banks which current regulatory policies do not fully address.” Indeed, the failure of a SIFI can have a very big impact on the global financial system and the additional measures suggested by the BCBS are intended, on the one hand, to reduce the probability of the failure of these intermediaries by increasing their ability to absorb losses; on the other hand, they are aimed at reducing the competitive advantages of the “TBTF”s in funding markets, and the moral hazard incentives associated with the expectation of government support in the case of distress. Specifically, the BCBS announced that SIFIS would be grouped into 5 different buckets according to their systemic importance. Each bucket would be required to hold a different level of additional common equity, ranging from 1% to 3.5%⁷ of total risk-weighted assets. In order to identify the SIFIS and to allocate them to their buckets the BCBS proposed an indicator-based measurement approach, considering 5 features of banks:

1. *cross-jurisdictional activity*, measured by the cross-border and cross-currency activity of the bank, i.e. deposits and loans, the holding of securities and participations involving an entity outside its home market, or denominated in a foreign currency;
2. *size*, measured using an accounting measure that includes both on-balance sheet and off-balance sheet items. This feature is considered a key measure of systemic importance;
3. *interconnectedness*, measured as the importance a bank’s intra-financial system activity, i.e. lending and borrowing to other financial institutions, holdings of securities issued by other financial institutions; marking to market of securities, etc;
4. *substitutability*, meaning the lack of readily available substitutes or financial

⁵ BCBS, Global Systemically Important Banks: Assessment Methodology and the Additional Loss Absorbency Requirement. Consultative paper, at <http://www.bis.org/publ/bcbs201.pdf>.

⁶ The term “Global Systemically Important Bank” (G-SIB) is used by the BCBS. So far the methodology for assessing SIFIS and the implementation of additional capital requirements concern banks only, and do not apply to other financial intermediaries. As a consequence, the list of SIFIS is the same as that of G-SIBs, and this is why in the paper we use both “SIFI” and “G-SIB” to mean a systemic bank designated by the FSB and/or BCBS.

⁷ The fifth bucket, associated with a capital requirement of 3.5%, has been left empty. According to the BCBS, banks should meet new capital standards using common equity capital, although the commission will continue to evaluate the possibility of also using other types of instruments, such as “going concern contingent capital”.

institution infrastructure for the services the distressed bank provides. This feature is particularly important for those institutions that provide services such as asset custody, clearing, and settlement of payments;

5. *complexity*, meaning business, structural and operational complexity. The more complex a bank is, the greater are the costs and time needed for the resolution of that bank.

The methodology proposed by the Basle Committee was applied to the as of end-2009 data of a sample of 73 large banks based in 17 countries. According to the indicator scores, the BCBS's report suggested that "the number of G-SIBs will initially be 28, including one bank that has been added based on supervisory judgement applied by the home supervisor". The consultative paper issued on July 19, 2011 also included a detailed timeline for the implementation of the additional capital requirements, as well as for other measures aimed at the orderly resolving of the distress of an SIFI. On the same date the FSB issued a consultative paper⁸ proposing policy measures to increase the capacity of supervisory authorities in the orderly and effective resolving of SIFI distress and in avoiding a burden of resolution costs on the public sector.

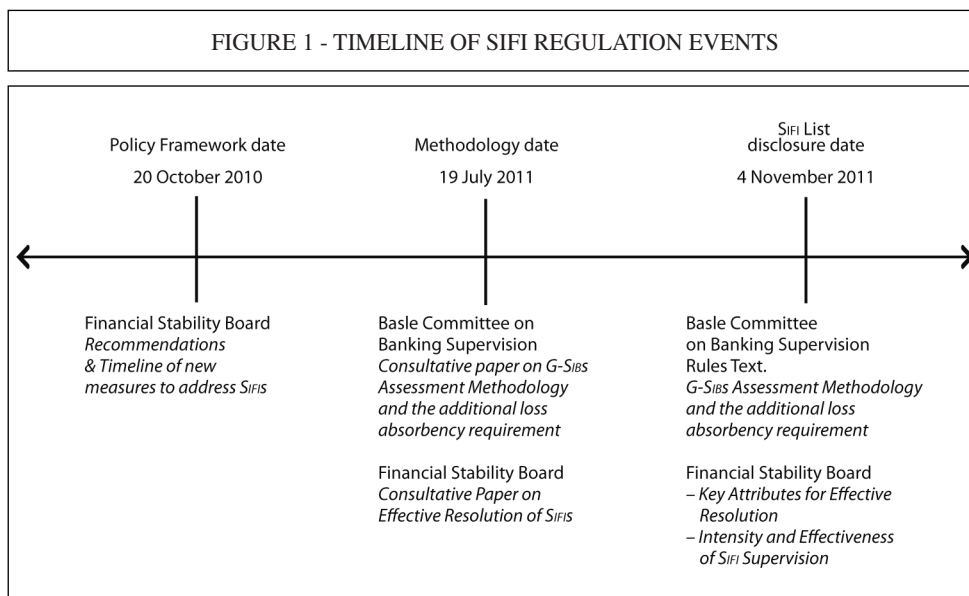
On November 4, 2011⁹ the FSB and BCBS disclosed a list of 29 SIFIs; all of them are banking groups. The allocation of each bank to a bucket, and the corresponding levels of additional loss absorbency, will be disclosed as from November 2012. However, as already stated in the BCBS consultative paper of July 2011, the new capital standards will be phased in only from 2016 and will apply to those banks identified in November 2014 as SIFIs. The allocation of those banks to buckets at November 2014 will also determine the amount of capital they should have in order to satisfy the new regulations. By 2019 the new capital standards will be fully applied, but the list of SIFIs may change, since it will be updated annually, and methodology and indicators will be reviewed every 3-5 years.

In addition to supplementary capital requirements, by the end of 2012 the 29 SIFIs will have to meet the requirements related to the Recovery and Resolution Planning (RRP), introduced by the FSB¹⁰. Recommendations concerning RRP are addressed mainly to national supervisory authorities, which should make all efforts to implement a regime resolving systemic banks. However, SIFIs are responsible for providing a recovery plan and for producing and channelling to the relevant authorities information that could be useful for assessing on a timely and continuous basis the real viability of the RRP. Finally, SIFIs will be subject to more intense, more effective and more reliable supervision (Figure 1).

⁸ FSB, Effective Resolution of Systemically Important Financial Institutions, at http://www.financialstabilityboard.org/publications/r_110719.pdf. The FSB Paper can be traced, in part, to a March 2010 BCBS Paper, "Report and Recommendations of the Cross-border Bank Resolution Group," <http://www.bis.org/publ/bcbs169.pdf>.

⁹ BCBS, Global Systemically Important Banks: Assessment Methodology and the Additional Loss Absorbency Requirement Rules Text, at <http://www.bis.org/publ/bcbs207.pdf>.

¹⁰ FSB, Key Attributes of Effective Resolution Regimes, at http://www.financialstabilityboard.org/publications/r_111104cc.pdf.



3. THE IMPACT OF A REGULATORY CHANGE ON BANK PRICES: OUR TESTABLE HYPOTHESES

Our paper investigates how the market has interpreted the regulatory change implied by the publication of the SIFIS list: as good news, bad news or no news at all. Why, in the first place, should the market react to specific “SIFI” regulation? Almost all the banks included in the list of SIFIS are indeed “too big to fail” (TBTF), being the largest financial institutions in the world: the market could already expect that these banks would receive full financial support (a form of complete deposit insurance) in a situation of distress. Consequently, we should expect no market reaction to the decision to include these banks in a specific list of systemically important banks (the irrelevance explanation).

However, a “TBTF” policy has only been explicitly formalized in the US, where in 1984, in the wake of the Continental Illinois liquidity crisis, the Comptroller of the Currency decided to provide total deposit insurance to eleven banks deemed to be simply “too big to fail” (O’Hara and Shaw, 1990). No such explicit regulatory policy has been declared in Europe or in other countries. Furthermore, such policy has so far been relevant only for deposit-taking financial institutions, while it has excluded investment banks, as the Lehman Bros. failure demonstrates. On the contrary, the new regulatory proposal concerning SIFIS is not confined to large deposit-taking institutions, but includes all those banks (even specialized ones or “small” ones in terms of total assets) that are deemed to be highly interconnected and difficult to substitute, whose failure could threaten the stability of the global financial system, impair public confidence in the broader financial system or

determine serious disruptions in international payment and settlement systems. Therefore, the market could view the SIFI regulation as an extended version of the US TBTF policy, given that SIFIS will be declared to be too relevant for the global economy to be allowed to fail, irrespective of their size, specialization, or business model. Such a policy would affect these banks' fund costs. More specifically, the interest rate a bank pays for its deposits, CDs, and other non-deposit borrowings should reflect the possibility of its bankruptcy; if we remove such a possibility, the bank's fund costs are no longer tied to its riskiness: it will pay no risk premium (leading to a reduction in funding costs) and will be exposed to perverse incentives to increase the riskiness of its operations. In both cases, the bank will attain a higher expected return. The value of this increased (future) profitability would lead to a positive market reaction, i.e. positive wealth effects accruing to SIFIS (the "*profit-based reaction*" explanation). The definition of a list of SIFIS could also be beneficial to non-included (yet large) banks, as the potential for contagion is very much reduced in the expectation of an orderly and effective resolution of distress related to the designated SIFIS.

Alternatively, the market could view the regulatory default prevention action, specifically the increase in capital requirements beyond Basle 3, robust national resolution and recovery regimes and cross-border harmonization and coordination, attached to the SIFI regulation as being such heavy covenants that all the wealth effects noted above would melt like snow in the sun. In other words, the "safety net" guaranteed to SIFIS is not a free meal and SIFIS are asked to "participate" (with a stronger capital base) in the goal of reducing their "loss given default". Besides, SIFIS will be submitted to more intense supervision and will have to set up or improve their production information systems. Consequently, regulation imposes a heavier burden on SIFIS with respect to their competitors (mainly national), and their equity values would be expected to react negatively (the *regulatory burden explanation*).

To summarise, we test the hypothesis that banks' equity values could react to a regulatory change (new set of regulations for SIFIS); three possible explanations of such a change are at work:

1. *irrelevance explanation*: the SIFI regulation is not considered a dramatic regulatory change; markets already believe that the largest banks will obtain specific financial support in the case of insolvency, and no wealth effect can be tied to the new regulation.
If, on the contrary, the regulatory change did trigger a market reaction, was this reaction positive or negative?
2. The *profit-based reaction explanation* stresses the importance for bank returns of the potential reduction in funding costs and so predicts a positive market reaction.
3. On the contrary, the *regulatory burden explanation* emphasizes the negative impact of an increase in capital regulation and in the supervisory burden, and so predicts a negative market reaction.

4. SAMPLE AND METHODOLOGY

4.1 *Sample*

In its document released on November 4, 2011¹¹, the BCBS states that, applying the BCBS methodology, the 29 SIFIS were identified among a sample of 73 banks from Australia, Belgium, Brazil, Canada, China, France, Germany, India, Italy, Japan, Korea, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The sample was not disclosed, nor was the methodology used to include a bank or a country. We know only that “these 73 banks account for broadly 65% of global banks’ assets” (p. 10; footnote 16). In the future, the Basel Committee will develop a methodology to produce the sample of banks and will disclose it.

Therefore, in order to find a sample of banks similar to that of the 73 banks, we run the following search on the Bankscope database: “include all those banks”:

1. whose headquarters are in the following world region/country: North America, Western Europe, Scandinavia, Far East and Central Asia, South and Central America;
2. are among the Top250 banks with respect to their loan portfolio;
3. whose total assets in 2010 exceeded \$ 200 million;
4. whose stocks are listed.

Our sample excludes those institutions whose daily stock price data were not publicly available nor were actively traded during the estimation period. This resulted in a sample of 70 banks, which includes all the 29 SIFIS in the list published on November 4, 2011, and a sizeable number of excluded potential TBTF banks (Table 1).

4.2 *Methodology*

The case for using event studies to evaluate the impact of a regulatory change was made by Schwert in 1981, and since then numerous studies have been published, not only in the domain of banking regulation (see MacKinlay, 1997; Lamdin, 2001). We assess the market reaction to the proposal and subsequent enactment of the SIFIS regulation.

An event study examines returns during an “event window” to determine whether these returns were abnormally positive or negative. The event window represents the entire length of time over which the analyst may look for a price reaction to what investors may consider as “new information” (news). In the case of a regulatory change, the event window could be a less concise time and concept. A regulatory change was at some time first substantively broached, then debated and ultimately determined when the change was enacted. The event window would encompass this entire time frame (Lamdin, 2001). As shown in the previous paragraph, the SIFI

¹¹ BCBS, Global Systemically Important Banks: Assessment Methodology and the Additional Loss Absorbency Requirement Rules Text, November 2011.

TABLE 1 - SAMPLE OF BANKS⁽¹⁾

Bank Name	Country code	Total Assets mil Usd 2010
Erste Group Bank AG	AT	271,712
Dexia	BE	534,039
KBC Groep NV/ KBC Groupe SA-KBC Group	BE	369,235
Banco do Brasil SA	BR	523,295
Banco Bradesco SA	BR	406,129
Itau Unibanco Holdings	BR	454,019
Royal Bank of Canada RBC	CA	797,261
Toronto Dominion Bank	CA	735,947
Bank of Nova Scotia (The) - Scotiabank	CA	596,990
Bank of Montreal-Banque de Montreal	CA	502,737
Canadian Imperial Bank of Commerce CIBC	CA	385,415
UBS AG	CH	1,508,303
Credit Suisse Group AG	CH	1,115,065
Industrial & Commercial Bank of China (The) - ICBC	CN	2,456,295
China Minsheng Banking Corporation	CN	353,769
China Everbright Bank Co. Ltd	CN	223,457
China Construction Bank Corporation	CN	1,949,219
Bank of China Limited	CN	1,877,520
Agricultural Bank of China Limited	CN	1,853,319
Bank of Communications Co. Ltd	CN	731,828
China Merchants Bank Co. Ltd	CN	443,583
China CITIC Bank Corporation Limited	CN	438,966
Deutsche Bank AG	DE	2,799,978
Commerzbank AG	DE	856,208
Danske Bank A/S	DK	596,004
Banco Santander SA	ES	1,619,260
Banco Bilbao Vizcaya Argentaria SA	ES	773,306
BNP Paribas	FR	2,542,739
Crédit Industriel et Commercial - CIC	FR	323,405
Crédit Agricole SA	FR	2,230,053
Société Générale	FR	1,528,493
Natixis⁽²⁾	FR	656,892
Barclays Plc	GB	2,417,327
Hsbc Holdings Plc	GB	2,555,579
Lloyds Banking Group Plc	GB	1,500,535
Royal Bank of Scotland Group Plc (The)	GB	2,329,726
Standard Chartered Plc	GB	599,070
Bank of Ireland	IE	200,388
State Bank of India	IN	369,070
UniCredit Spa	IT	1,199,080
Intesa Sanpaolo	IT	827,042
Gruppo Monte dei Paschi di Siena	IT	311,427
Mitsubishi UFJ Financial Group Inc.	JP	2,384,446

(continued)

Bank Name	Country code	Total Assets mil USD 2010
Mizuho Financial Group	JP	1,890,274
Nomura Holdings Inc.	JP	441,393
Resona Holdings Inc.	JP	505,574
Sumitomo Mitsui Financial Group Inc.	JP	1,598,471
Woori Finance Holdings Co. Ltd	KR	271,214
Shinhan Financial Group	KR	249,820
KB Financial Group Inc.	KR	240,701
ING Groep NV	NL	1,655,102
DnB ASA	NO	354,781
Svenska Handelsbanken	SE	356,340
Skandinaviska Enskilda Banken AB	SE	343,025
Swedbank AB	SE	269,620
Nordea Bank AB	SE	926,645
Oversea-Chinese Banking Corporation Limited OcBC	SG	213,545
DBS Group Holdings Ltd	SG	262,049
Bank of America Corporation	US	2,129,046
Bank of New York Mellon Corporation	US	325,266
Citigroup Inc.	US	1,873,878
JP Morgan Chase & Co.	US	2,265,792
Morgan Stanley	US	749,898
Prudential Financial Inc.	US	624,521
US Bancorp	US	340,122
Wells Fargo & Company	US	1,313,867
Pnc Financial Services Group Inc.	US	271,205
State Street	US	216,827
Goldman Sachs	US	923,225
Capital One Financial Corporation	US	206,019

⁽¹⁾ The list includes financial institutions from North America, Western Europe, Scandinavia, Far Eastern and Central Asia, South and Central America, with total assets exceeding \$ 200 million, for which daily stock price data were publicly available and which actively traded during our estimation period. SIFIS in bold.

⁽²⁾ Natixis is the only listed subsidiary of the non-listed BNC, Banque Populaire Casse d'Epargne, included in the SIFI list.

Source: Bankscope database.

regulation comprises a long time span, starting in 2009 and ending in 2011. Along this timeline, two dates in our opinion are of particular interest for assessing the market reaction to the SIFI regulation (Figure 1).

- a. July 19, 2011, when the BCBS published the methodology defining the characteristics of an SIFI for the first time;
- b. November 4, 2011, when the final list was published.

The first chosen event date (19th July) would seem to be more informative for market participants, since not only did the BCBS broach the methodology but it also declared that the first list of SIFIS would be likely to consist of 28 of the world's largest institutions. The BCBS also made it clear how to determine the amount of additional capital required by SIFIS and the timeline for the phasing in of the new rules.

In our event study we follow the standard approach (see Campbell, Lo and McKinlay, 1997) and calculate abnormal returns for each of the 70 sample banks for a five-day window centred on each event date (T^*). The abnormal return AR_{it} for bank i at time t is defined as the difference between actual stock returns and a measure of “normal” returns R_{it} estimated using the standard market model (Fama, 1985):

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where R_{it} and R_{mt} are the period- t return on security i and the market portfolio, respectively, and ε_{it} is the zero mean disturbance term; α_i and β_i are a bank-specific intercept and the covariance with the market, respectively.

We regress daily stock returns for bank i on the daily stock returns of a national market index over the estimation window. This is common practice in multi-country event studies, where the use of a national market index and local currency returns are seen as the most appropriate choices (Campbell *et al.*, 2010). Data on national stock market indices and individual stock prices are from Datastream. The parameters α_i and β_i are estimated separately for each institution via ordinary least squares using daily data for days -241 to -41 relative to each event date T^* (19/7/2011 or 4/11/2011), forming a 200-day estimation window, consistent with previous research¹². The estimation window is far enough ahead of the event not to be contaminated by this event, but still representative of the changing correlations in extremely volatile markets since the onset of the financial crisis in 2007. For European banks, this period includes the peaks of the sovereign crisis that exacerbated their funding problems. Our event window comprises 5 trading days: from T^*-2 to T^*+2 where T^* is the event date. This is a generally-used window that helps consider both the risk of a news leak before the event date and the possibility that investors will react slowly to the implications of the news.

In order to test the persistence of the effects of the regulatory change during the event window, abnormal returns are aggregated through time, i.e. the relevant “window” around the event date (T^*), to compute the cumulative abnormal return, CAR_{t_1, t_2} :

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

We start with an aggregate analysis, in which we compare abnormal stock returns for different (average) “portfolios” of our sample banks. The first comparison is between the twenty-nine banks that were ultimately designated as systemically important – the SIFIS – and the forty-one large banks that were ultimately deemed not to be systemically important – non-SIFIS. We distinguish between these two sets across both events, even though the list of SIFIS was not actually revealed until November 4, 2011, i.e. the second event date. Thus, when looking at the first event

¹² Petrella and Resti (2012).

(July 19, 2011), we would expect differences between SIFIS and non-SIFIS only to the extent that the market has deciphered beforehand which banks would be included in the final list. The second comparison considers the geographical distribution of SIFIS; more specifically, SIFIS are divided into three sub-samples (Europe, USA or Asia) according to where their headquarters are located, as at the time of investigation the stock markets of these areas were showing different patterns and were facing quite dissimilar cycle phases.

5. REACTION TO ANNOUNCEMENT OF A NEW REGULATORY REGIME

5.1 *Residual results*

The estimated abnormal returns, associated with the full sample and with each set of banks, are reported in Table 2. The pre-release event, when the methodology was presented, led to a common positive reaction to the future regulatory change by the market: both the full sample and our partitions of banks enjoyed positive, large and significant abnormal returns; therefore the irrelevance hypothesis can be discarded in favour of the profit-based reaction explanation. In particular, the greater positive reaction to the methodology event shown by the stock prices of possible future SIFIS suggests that the event was something more than good news for those banks the market at that time considered likely to be included in the list of SIFIS.

The relative better performance of EU SIFI stocks compared to their US peers supports the rejection of the irrelevance hypothesis: until the methodology date, no very large, complex or interconnected EU bank was totally confident that it would certainly be rescued by its national Supervisor and Government, as no explicit TBTF policy had been declared in Europe. It could also be the case that this higher positive rebound represents the market answer to two successive pieces of good news, i.e. the results of the EBA stress test, released on July 15, 2011¹³, which few EU large banks failed to pass, and the subsequent release of the SIFI regulation on July 19.

An additional explanation for these larger and significant abnormal returns enjoyed by EU banks could rest on the potential for supranational support in the case of insolvency of an SIFI. Indeed, SIFIS pose a threat to the stability of the global economy, and their insolvency would not be simply a national problem; consequently the change in regulation could also be read as the willingness not to treat SIFI insolvency at national level in the future. This is particularly good news for larger EU banks for two reasons: firstly, they could be “too big to be saved” by their national government alone, without leading the latter towards bankruptcy; secondly, the recent sovereign debt crisis has dramatically reduced the potential for intervention in favour of its banking system by almost all EU governments, apart from Germany and a few others.

¹³ See Petrella and Resti (2012) for an evaluation of the ability of EU-wide stress tests to provide valuable information to the market.

TABLE 2 - MARKET REACTION AROUND THE TWO EVENTS⁽¹⁾

Methodology date (19/7/2011)	CAR (-2; +2)			CAR (0;+2)		
	n. obs	Avg	p-val	n.obs	Avg	p-val
Full sample	70	2.20%	0.03	70	3.26%	0.02
SIFIS	29	2.93%	0.05	29	5.06%	0.02
Non-SIFIS	41	1.69%	0.07	41	1.99%	0.07
<i>Differences in means</i>		<i>1.24%</i>	<i>0.13</i>		<i>3.07%</i>	<i>0.00</i>
EU SIFIS	17	4.19%	0.03	17	7.26%	0.01
Us SIFIS	8	1.93%	0.15	8	3.06%	0.07
Asian SIFIS	4	-0.45%	0.40	4	-0.28%	0.42
List release date (4/11/2011)	CAR (-2; +2)			CAR (0;+2)		
	n. obs	Avg	p-val	n.obs	Avg	p-val
Full sample	70	-0.411%	0.43	70	-0.477%	0.40
SIFIS	29	-0.553%	0.39	29	-0.626%	0.35
Non-SIFIS	41	-0.310%	0.46	41	-0.371%	0.45
<i>Differences in means</i>		<i>-0.243%</i>	<i>0.83</i>		<i>-0.25%</i>	<i>0.73</i>
EU SIFIS	17	-1.11%	0.34	17	-1.02%	0.35
Us SIFIS	8	0.93%	0.35	8	0.51%	0.42
Asian SIFIS	4	-1.16%	0.29	4	-1.22%	0.28
negative CAR banks	36	-3.61%	0.02	38	-2.30%	0.24
positive CAR banks	34	2.98%	0.24	32	1.68%	0.10
<i>Differences in means</i>		<i>-6.59%</i>	<i>0.00</i>		<i>-3.98%</i>	<i>0.00</i>
negative CAR SIFIS	16	-3.23%	0.07	15	-2.51%	0.12
positive CAR SIFIS	13	2.74%	0.12	14	1.40%	0.26
<i>Differences in means</i>		<i>-5.96%</i>	<i>0.00</i>		<i>-3.91%</i>	<i>0.00</i>

⁽¹⁾ This table reports the average CAR for the different sets of banks for each of the two events. The SIFIS are the twenty-nine banks that were ultimately designated as systemically important; Non SIFIS are the forty-one large banks that were ultimately deemed not to be systemically important. EU, Us and Asian banks are SIFIS with headquarters in Europe, Us and Asia, respectively. For all events, the CARs are calculated around a five-day window (-2, 0, +2) or a three-day window (0, +2), where 0 is the event day.

The two events are described in detail in Figure 1.

The release of the SIFI list (second event), in contrast generated no obvious, robust pattern of response. No significant response can be found at full sample level or with respect to the disaggregation between SIFIS and non-SIFIS, or with respect to our sample's geographical distribution. This non-reaction makes sense, as the release of the list did not supply much new information. As for stock market response, the announcement of the names of the twenty-nine SIFIS was a non-event. Indeed, after the disclosure by the BCBS on July 19 of the methodology for assessing SIFIS, market participants had enough time to identify potential SIFIS. Given that the criteria proposed in July were fully confirmed, the only news brought by the documents jointly issued by the FBS and the BCBS on November 4 with respect to the event of July 19, was the names of the SIFIS and their number, which increased from 28 to 29. All the other

information was already present in previous documents and the market had probably already discounted it.

In addition, the negative sign of market response should be noted: abnormal returns were negative around the event. This change in perception regarding the impact of the new regulation (in favour of “the regulatory burden” explanation) could be the result of the fact that market participants were now totally aware that these banks would be asked to comply with “more intense, more effective and more reliable regulation” within a short space of time while the potential for a reduction in funding costs has, for the most part, been stripped away by the EU sovereign debt crisis¹⁴.

Interestingly, a non-significant reaction of this kind is the mathematical combination of diverse market responses, which no longer encompass our two pre-defined partitions of the sample. Indeed, some banks in our sample enjoy positive, quite large market responses, while others are faced with the exact opposite: this happens amongst both SIFIS and non-SIFIS, and among banks of the same nationality. We therefore decided to differentiate between “negative CAR banks” and “positive CAR banks”, these being, respectively, those banks receiving a negative or a positive response from the market around the time of the announcement of the SIFIS list. This partition was applied only to the SIFIS. In both cases, we observe large and statistically significant differences in abnormal returns. The implications are quite interesting. As of the methodology date, it seems that the market had enough time to predict the exact identity of SIFIS, on the one hand, and on the other circumscribe the final effect of the regulatory change, this being positive or negative according to the specific characteristics of each bank. In fact, whether a bank should increase its capital base according to the SIFI regulation will depend on the level of its Common Equity Tier 1 ratio with respect to the standards set out by Basle 3 plus the minimum additional loss absorbency required by the FBS and BCBS. The additional loss absorbency requirement will be conducive to a capital increase to the extent that an SIFI is not already compliant with the requirement. We expect that having a larger capital base and/or lower leverage could be helpful in reducing the negative effects attached to the SIFI regulation. The next section analyses the correlation between CARs and bank-specific characteristics in terms of capital adequacy.

5.2 Residual returns and bank characteristics

One question raised by the results of the previous section concerns which specific SIFIS benefited (or lost) the most from being designated as a systemically important financial institution. From our earlier discussion of the profit effect of a classical

¹⁴ “During 2010 and 2011 the range of spreads at which euro area banks issued long-term bonds was actually almost as high as during 2009. However, the large discrimination between different issuers in the latest episode of the crisis has mainly been driven by the issuer’s nationality rather than by the instrument’s credit quality, as measured by ratings” (ECB, *Monthly Bulletin*, November 2011, p. 77).

“too big to fail” policy, in which very large banks are granted full deposit insurance coverage with no specific covenant (e.g. additional capital requirements and/or a more intense supervision) attached to it, it is likely that the riskiest banks have the most to gain from the implicit subsidy ensured by the SIFI regulation.

However, the regulatory policy proposed by the FSB and the BCBS is specifically intended to curb, as far as possible, this kind of (unwanted) moral hazard byproduct, through specific additional supervisory measures, ranging from new capital standards beyond the minimum agreed by Basle 3 standards, to the banks’ obligation to provide recovery plans and transmit additional information on their health status to supervisory authorities. Consequently it is likely that the banks with the lowest capital holdings – which are deemed to be the riskiest – will have the most to lose from the introduction of the SIFI regulation.

Table 3 presents the abnormal returns for the final sample of SIFIS segmented by their capital adequacy, measured by the TIER 1 solvency ratio and leverage (equity/

CAR (0, +2)	Mean	Median
Total SIFIS	-0.63%	-0.10%
SIFIS with positive CARS	1.40%	1.11%
SIFIS with negative CARS	-2.51%	-1.44%
Bottom 25% solvency ratio 2010	-1.15%	-1.00%
Top 25% solvency ratio 2010	0.88%	1.04%
difference (p-value in parenthesis)	-2.03%	(0.1462)
Bottom 25% solvency ratio 2011	-3.11%	-1.04%
Top 20% solvency ratio 2011	0.95%	1.26%
difference (p-value in parenthesis)	-4.06%	(0.1671)
Bottom 25% solvency ratio 2010_2011	-0.877%	-0.64%
Top 25% solvency ratio 2010_2011	0.879%	1.04%
difference (p-value in parenthesis)	0.000%	(0.1686)
Bottom 25% leverage 2010	-1.07%	-0.40%
Top 25% leverage 2010	2.15%	2.15%
Bottom 25% leverage 2011	-1.43%	-0.91%
Top 25% leverage 2011	-6.57%	-6.57%
Bottom 25% leverage 2010_2011	-1.29%	-0.55%
Top 25% leverage 2010_2011	2.15%	2.15%

This table reports the CARS calculated around a three-day window (0, +2), where 0 is the event day, for our sample of SIFIS, and for the samples separated by our two measures of capital adequacy, solvency ratio and leverage. Solvency ratio is the TIER 1 ratio while leverage is the ratio of equity over total assets.

total assets) at year-end 2010, year-end 2011 and an average of 2010 and 2011¹⁵. The CARS reported refer to the bottom 25% and top 25% banks of the distribution of our two measures of capital adequacy. We then test whether the difference between the two subgroups is statistically different from zero. While the more capitalized and less leveraged SIFIS have positive CARS, average abnormal returns for riskier banks are negative.

In Table 4 we present the Pearson correlation coefficients for the CARS for the overall sample and for SIFIS, separated by capital adequacy. The correlation coefficients confirm the dichotomy among our sample of SIFIS. Both measures of capital adequacy indicate that the greater the solvency (a higher TIER 1 ratio or a higher Equity/Total assets ratio), the higher the abnormal returns. These results are consistent with the hypothesis that the new measures for addressing the problems of systemic risk in

TABLE 4 - BANK SOLVENCY RATIO, LEVERAGE AND CARS⁽¹⁾

	Pearson correlation coefficient	
	CAR (0, +2)	p-value
<i>SIFIS (29 banks)</i>		
Solvency ratio 2010	25.18%	0.20
Solvency ratio 2011	47.72%	0.01
Solvency ratio 2010_2011	38.09%	0.05
Leverage 2010	33.04%	0.08
Leverage 2011	35.58%	0.06
Leverage 2010_2011	34.74%	0.06
<i>Full sample (70 banks)</i>		
Solvency ratio 2010	3.65%	0.78
Solvency ratio 2011	15.36%	0.22
Solvency ratio 2010_2011	9.22%	0.46
Leverage 2010	9.34%	0.44
Leverage 2011	16.41%	0.17
Leverage 2010_2011	13.05%	0.28

This table reports correlations of bank solvency ratios and leverage with the CARS calculated around a three-day window (0, +2), where 0 is the event day. Solvency ratio is the TIER 1 ratio, while leverage is the ratio of equity over total assets.

¹⁵ On November 4, analysts would have had access to the following financial reports: Reports and Accounts as at December 31, 2010 (March 31 2011 for those banks whose financial year closes in March, such as Japanese banks); consolidated first half financial report as at June 30, 2011 (September 30, 2011), consolidated Interim reports at September 30 2011. The Bankscope database does not provide such detailed information for the full sample of banks under investigation; indeed, we only have access to year-end information. In order to obtain the best proxy for the type of accounting information available to the market when the SIFI list was released, we computed average accounting data as of year-end 2010 and 2011.

banking will be more binding for those banks that are less capitalized and far more leveraged than their peers, i.e. those banks for which the requirement to meet capital standards above Basle3 standards could indeed lead to the need for them to increase their capital base. This result is significant only for those banks that will have to comply with the new set of regulations, i.e. for SIFIS.

6. CONCLUDING REMARKS

In this paper we investigate the wealth effects of the new SIFI regulation announced in July 2011 and finalized on November 4, 2011. We measure the market reaction to this set of regulations using an event study of bank stock prices for the largest 70 banks in the world. Our study reveals a number of intriguing effects resulting from the introduction of SIFI regulation.

Of the two events we studied, the one with biggest and most significant impact on stock returns was that of July 19, 2011, when details of the criteria for determining systemic banks were released by the BCBS, and details of the policy measures to increase the capacity of authorities to resolve SIFI distress in an orderly and effective manner were released by the FSB.

Our findings demonstrate that wealth effects may arise because regulatory policies affect the profitability of both included and non-included banks in the SIFI list. In particular, all large banks are positively affected by the introduction of a regulation meant to tackle systemic risk for two different reasons: on the one hand, SIFIS are assured support in the case of insolvency with no regulatory ambiguity; on the other hand, non-SIFIS benefit from the reduction in potential for contagion risk implied by a policy intended to resolve systemically important banks' distress in an orderly and effective way.

However, once the market has fully comprehended the supervisory implications of the SIFI regulation, our "regulatory burden" explanation comes into play: on the disclosure date, the effect of regulation switches and becomes negative, in particular if the need to raise new capital is deemed to be likely. Indeed, those SIFIS with lower capital adequacy (lower TIER 1 ratios and/or higher leverage) face negative abnormal returns while their more capitalized and less leveraged peers take advantage of positive cumulative abnormal returns. Overall, the disclosure of the identity of global systemic banks did not result in a generalized positive response from the market, which appeared to discriminate between riskier and less risky banks and the probable effects of the loss absorbency requirements set out by the FSB and BCBS. As a result, our findings support the view that SIFI regulation is a move in the right direction towards addressing and reducing the negative externalities associated with those institutions that are perceived as not allowed to fail due to their size, interconnectedness, complexity, lack of substitutability or global scope. The market seems to believe that the measures set out could indeed reduce the moral hazard costs associated with any explicit/implicit guarantee of government support for SIFIS.

Future work will entail an in-depth analysis of other bank characteristics (apart

from capital adequacy) that might lead the market to differentiate between SIFIS. Indeed, the 29 banks are quite diverse financial institutions in terms of business model, governance and ownership structure. A closer look at these aspects and their links with capital adequacy could benefit the ongoing debate over SIFI regulation.

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