Sebastian Schich, Oana Toader

To Be or Not to Be a G-SIB: Does It Matter?

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To Be or Not to Be a G-SIB:
Does it Matter?

Sebastian Schich
Organisation for Economic Cooperation and Development (OECD)

Oana Toader
Autorité de contrôle prudentiel et de résolution (Banque de France - ACPR)

Abstract

Elements of recent bank regulatory reform directly focus on ending the «too-big-to-fail» phenomenon. As part of these efforts, a number of banks have been designated as «globally systemically important banks» (henceforth G-SIBs) and a tighter regulatory, supervisory and resolution failure regime has been imposed on them. The present article asks what has been the effect of this special treatment on the value of implicit bank debt guarantees of these banks, as measured by credit rating uplifts. Based on a sample of 27 G-SIBs and a control group of 177 other large banks from 23 countries for the 2007 to 2015 period, the article finds that this treatment has not yet significantly altered the value of implicit bank debt guarantees for G-SIBs. They continue to benefit from a significantly higher value of implicit guarantee than other banks. The article also finds that tightened resolution practices, at the national level, have significantly reduced the value of implicit guarantees for other banks, but not for G-SIB banks.

Keywords: Bank Failure Resolution; G-SIB; Too-big-to-fail; Implicit Guarantees.
JEL Codes: G01; G21; G24; G28.

1 Introduction

This article analyses the «special treatment» being administered as part of recent bank regulatory reforms to the group of so-called «globally systemically important» banks, and its effects on the perception that these banks are «too-big-to-fail». It is well-known that the perception that a bank is too big or important to be allowed to fail on its debt («too-big-to-fail») is reflected in the value of implicit bank debt guarantees. Thus, even though bank regulatory, supervisory and failure resolution regime reforms do not directly target the values of implicit bank debt guarantees, such reforms are expected to lower these values, not least because banks should become stronger and more resilient. Also, parts of the reforms are attempts to make the resolution of bank failures more effective and smooth. In this context, a «special» regulatory treatment is being admin-

istered to a group of selected banks, consisting of two elements. First, based on a specific methodology, some banks are designated as so-called «globally systemically important banks» (henceforth G-SIBs)[1]. Second, these banks are subjected to a more demanding and intrusive regulatory, supervisory, and failure resolution regime. Our analysis seeks to investigate whether and to what extent this «special» treatment has mattered in the sense that it has significantly altered the value of implicit bank debt guarantees for G-SIBs as compared to other banks.

Our article is related to a growing literature that is developing around the themes of «too-big-to-fail», implicit bank debt guarantees, and the effects of regulatory reforms. Two strands of that literature are particularly relevant. One strand consists of studies that attempt to identify whether, to what extent, and which banks benefit from funding costs advantages due to perceived implicit guarantees. In their analysis, these studies consider either information available in credit ratings or the prices of debt, equity or related derivative instruments to assess the value of such guarantees (e.g. Anginer and Warburton, 2010; Haldane, 2010; Ueda and Weder di Mauro, 2013). Another strand of the literature analyses the effects of regulatory and resolution reforms, and related announcements or practices, on financial market prices or credit ratings to see to what extent the notion of «too-big-to-fail» has been reduced (*e.g.* Schich and Kim, 2012; Santos, 2014; Kleinow *et al.*, 2014; Moenninghoff *et al.*, 2015; Schäfer *et al.*, 2016).

The present article exploits the information available in bank credit ratings to infer the values of implicit bank debt guarantees and asks what the effect on such values of the «special treatment» administered to G-SIBs has been. Section 2 provides a short review of selected policy responses to the global financial crisis. Section 3 presents the data considered in the empirical analysis, and Section 4 explains the empirical methodology and results. Section 5 concludes the paper.

2 Background: Policy Response to the Global Financial Crisis

The immediate policy response to a financial crisis consists of making the provisions of a financial safety net available, and in the process, this safety net is typically extended. The global financial crisis that started in 2007 was no exception to this rule. Arguably, a qualitative shift also took place this time. In particular, a distinguishing feature of the immediate policy response to this most recent global financial crisis was that, effectively, the guarantor-of-last-resort function was added to the traditional safety net functions (Schich, 2013). This response consisted of the lender of last resort, deposit insurance including failure resolution, and a regulatory and supervisory framework. The guarantor-of-last resort function might have already been part of the financial safety net even before the recent global financial crisis, but its existence was confirmed in a more explicit form; for example, it was reflected in public statements suggesting officially backed blanket

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[1] The term *designation* is used here to refer to the official recognition of banks' level of systemicity by the Financial Stability Board (FSB), according to Basel Committee methodology. The FSB, in consultation with the Basel Committee on Banking Supervision (BCBS) and national authorities, publishes an annual list of global systemically important banks (G-SIBs).

guarantees for bank deposits and the provision on a temporary basis of explicit government guarantees for newly issued unsecured bank bonds.

While perhaps necessary under the circumstances, this policy response is not costless. Among the various costs, it has possibly further enshrined the notion that the debt of some banks is «special» in the sense that public authorities would not allow the bank to fail on servicing it. As a result of this situation, bank counterparties assume that bank debt benefits from an implicit guarantee provided to them by public authorities. Such perceptions lower the funding costs of the beneficiary banks, create competitive distortions in relation to firms not benefitting from similar perceptions, increase moral hazard and generate incentives for additional risk-taking on the part of bank managers. Ultimately, the stability of the entire financial system is threatened.

Recent regulatory, supervisory and failure resolution framework reforms have aimed to limit such undesirable effects, with the main elements of the reforms being already agreed on. They intend to make both individual institutions and the overall system more resilient, by augmenting the liquidity and loss-absorbing capacity of banks, and making them more easily resolvable in times of financial distress. Among the various initiatives, a number of specific reforms coordinated at an international level by the Basel Committee for Banking Supervision (BCBS) and the Financial Stability Board (FSB) explicitly aim to limit the notion of «too-big-to-fail».

One key element of these reforms is the identification of a list of banks considered to be systemically important at the global level. In November 2011, the BCBS (2011) published a methodology for identifying such G-SIBs, consisting of five criteria characterising a bank such as its size, interconnectedness, substitutability, complexity and the cross-jurisdictional nature of activities. Based on this methodology, the FSB published an initial official list of G-SIBs in November 2011 (FSB, 2011), although, reportedly, leaked unofficial lists were published already in November 2009 and 2010 by the *Financial Times* (Moenninghoff *et al.*, 2015). Subsequent to the first official publication in 2011, in November 2012 (FSB, 2012), the methodology was considerably changed and the composition of the newly published list was revised. Starting with November 2012, banks have been allocated to different buckets corresponding to their «systemicity» score, with implications for the required level of additional loss absorbency capacity and capital[2].

G-SIBs[3] are required to meet different and more demanding standards than other banks. In particular, they are required to meet higher loss absorbency requirements that are being phased in from 1 January 2016 and that are to be fully implemented by 1 January 2019. They are also required to meet a new standard on Total Loss Absorbing Capacity (TLAC), published in November 2015 and to be phased in from January 2019 (FSB, 2015a). Additionally, the scope of supervision of G-SIBs is expanded to include higher standards for risk management functions, risk data aggregation capabilities, risk governance and internal controls. More effective resolution regimes are also being developed

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[2] Compared with the list of G-SIBs published in 2011, two banks were added to the list published in 2012 (BBVA and Standard Chartered) and three banks removed (Dexia, undergoing an orderly resolution process; Commerzbank and Lloyds, both as result of a decline in their estimated global systemic importance). For details on the allocation to and role of different buckets see BCBS (2011).

[3] Please see Table A.1 in Appendix A for the list of sample banks including G-SIBs.

and cross-border supervisory colleges are put in place for almost all of them. G-SIBs are subject to requirements for group-wide resolution planning and regular resolvability assessments. The resolvability of each G-SIB is reviewed in a high-level FSB Resolvability Assessment Process by senior policy-makers within Crisis Management Groups established for each firm. A recent FSB (2017) report on the *Implementation and Effects of the G20 Financial Regulatory Reforms* of 2017 notes that progress regarding resolvability has been made, but also that there are areas where further progress is still required.

3 Data and Descriptive Statistics

The analysis is based on panel data consisting of annual data for 204 large banks from 23 OECD countries from 2007 to 2015, including 27 G-SIBs (Appendix Table A.1)[4]. The measure of the value of implicit guarantee is the credit rating uplift for unsecured senior debt[5], which is obtained by subtracting (the numerical equivalent of) the stand-alone credit rating (SACR)[6] from (the numerical equivalent of) the all-in credit rating (AICR)[7] as reported by Moody's.

Figure 1 shows the evolution over time of the simple average of the stand-alone credit rating (SACR) and the credit rating uplift for all sample banks (AICR minus SACR). The value of the uplift peaked in 2010, then declined, but increased again in 2015. At that date, it stood at levels above those observed during the first two years of the current sample. The figure also shows that the intrinsic financial strength of sample banks has continuously declined until recently, when it again increased slightly from 2014 to 2015.

Figure 2 distinguishes between G-SIBs and other banks, and shows that the mean and interquartile range of the credit rating uplifts differ considerably between the two groups. The range of values is tighter overall for the sub-group of G-SIBs than for the other banks. The variation over time regarding these statistical moments is also less pronounced in the case of the group of G-SIBs than in the case of the group of other banks. The mean is fairly similar across groups, while the difference in the median is more pronounced, and amounts to about one credit rating notch during the period after 2011.

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[4] The sample is obtained from Blix-Grimaldi *et al.* (2016) and subsequently updated, although data for two countries (Turkey and Mexico) is excluded as some information on credit rating uplifts is difficult to interpret.

[5] It should be noted that measuring the value of implicit guarantees is not straightforward and a single best measure does not exist. The present analysis follows Ueda and Weder di Mauro (2013) and relies on credit rating agency data, which has the advantage that the data is easily comparable across borders.

[6] As in previous studies using credit rating data from Moody's, the rating categories starting from AAA are linearly transformed into numerical equivalents starting from 20 and then declining by one for each rating «notch». The stand-alone credit rating (SACR) is proxied by the bank credit assessment, which in principle is spread over the same rating categories as the AICR. In practice, it tends however to be lower on average than the latter, reflecting that there is a positive credit rating uplift due to the assumed external support.

[7] The AICR is proxied by the long-term issuer rating and, where unavailable, by the senior-unsecured rating or the long-term foreign bank deposit rating. The numerical equivalents of these three ratings are not always the same for each bank at one point in time. In fact, especially the senior unsecured foreign currency credit rating tends to differ from the other types of ratings on a few occasions, although mostly, the differences reflect differences in the timing of rating changes (e.g. one rating is adjusted up or downwards only with some delay). The maximum difference observed in the sample is two notches. There is no systematic pattern in the sense that one type of rating is always higher than the other two ratings.
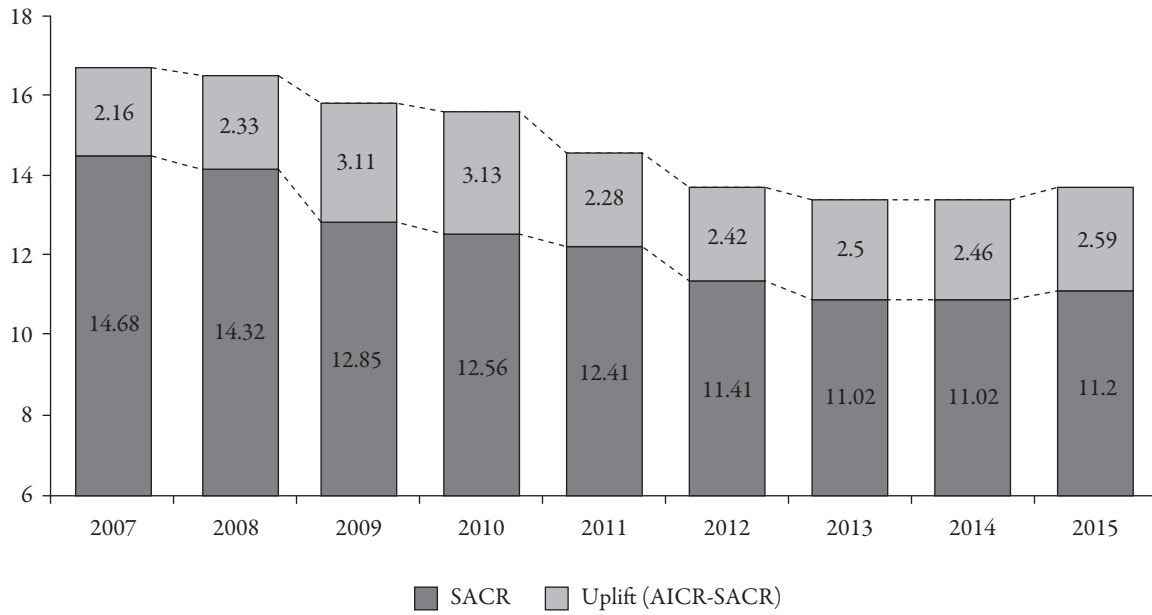
Figure 1: Changes in stand-alone and all-in credit ratings.

Notes: Annual averages of credit ratings and rating uplifts for a sample of 204 banks from 23 countries. The size of bars shows the value of the all-in credit rating (AICR). Shown in the chart is *i*) the intrinsic strength rating (SACR, the dark-shaded part of the bars), and *ii*) the credit rating uplift due to assumed external support, the difference between the AICR and the SACR (the light-grey-shaded part of the bars).
Source: Author's calculation based on Moody's ratings.
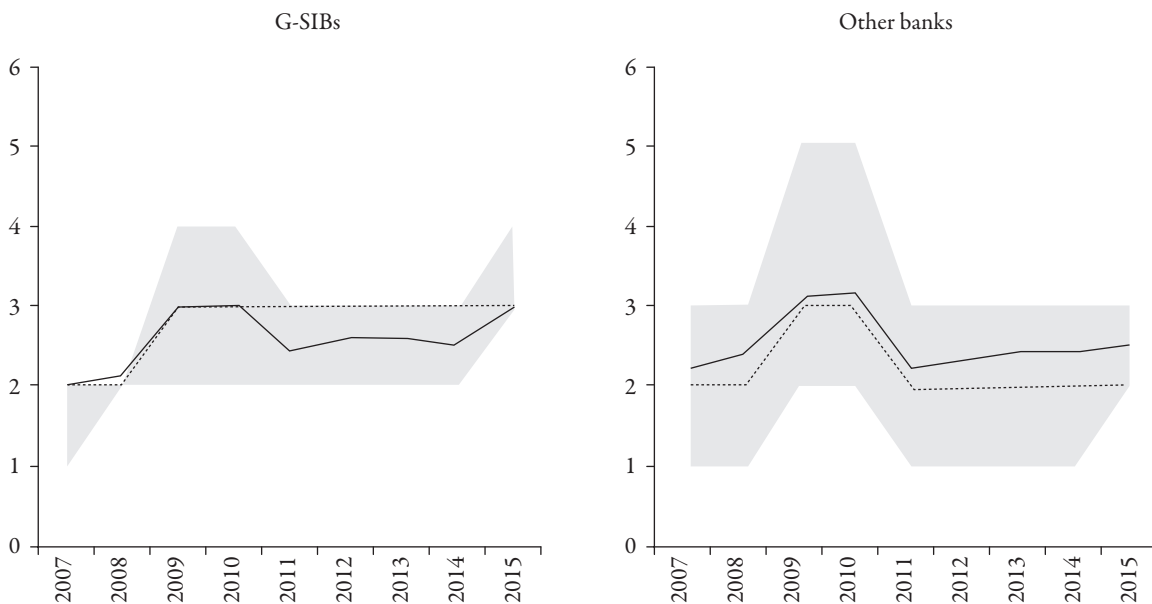
Figure 2: Distribution of estimates of the value of implicit guarantees.

Notes: The left-hand chart shows the values of the mean (straight line), median (dotted line) and 25% and 75% percentile (upper and lower ends of the grey-shaded area) for the group of 27 G-SIB banks and the right-hand chart for 177 other banks. Total sample includes 204 banks from 23 countries.
Source: Author's calculation based on Moody's ratings.

4 Estimation Approach and Results

4. 1 Estimation method

A difference-in-difference (DID) estimator is applied, considering G-SIB designation in November 2011 as the beginning of the special «treatment» applied to a group of selected banks i.e. the G-SIBs[8]. The dependent variable is the estimated value of implicit debt guarantee given by the credit rating uplift. Explanatory variables include *Treatment_group$_i$*, *Treatment$_t$* and *Treatment_group$_i$ x Treatment$_t$*, which are defined as follows:

– *Treatment_group$_i$* is equal to one for the group of treated banks, i.e. banks that have been included in the list of G-SIBs, and it is equal to zero for banks never included in that list (henceforth referred to as other banks)[9].

– *Treatment$_t$* describes the timing of the treatment; it is equal to zero for the period until the designation of G-SIBs, i.e. until the first publication of that list (or, alternatively, the publication of the revised list one year later) and equal to one afterwards.

– The binary variable *Treatment_group$_i$* x *Treatment$_t$* takes the value of one for the treatment group only in the post-treatment period.

The direction of the effect of the treatment on the value of implicit bank debt guarantees of the «treated» banks is not clear *a priori*. The designation as a G-SIB is intended to limit the value of implicit guarantees. However it might in principle also further entrench the perception that the designated banks are too important to be allowed to fail, which would support or even increase the value of implicit bank debt guarantees of treated banks compared to non-treated banks. The basic specification explaining the value of credit uplift for bank i in year t, referred to as $UPLIFT_{it}$, is as follows:

$$(1) \qquad UPLIFT_{it} = \alpha_1 + \beta Treatment\_group_i + \delta Treatment_t + \\ + \gamma(Treatment\_group_i \ x \ Treatment_t) + \alpha_2 X_{it} + \varepsilon_{it},$$

which includes, in addition to the main explanatory variables described above, the vector X_{it} consisting of control variables, to be described in Section 4.2. As regards the interpretation of estimation results, the coefficient β captures the differences across groups that are constant over time. The coefficient δ captures differences across time that are common to both groups. The coefficient γ measures the effect of the treatment on the treated group. Figure 3 provides a graphical representation of the interpretation of the various parameter estimates from the model (1).

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[8] We also consider November 2012 as an alternative treatment date, which implies both a different treatment date as well as a different composition of the list of «treated». i.e G-SIB banks (see Table 1). In addition, as a robustness check, we consider the publication of the unofficial leaked G-SIB lists by the *Financial Times* in 2010 and 2009. The results are very similar and available upon request. As an additional robustness test, we consider OLS estimates both in levels and in differences. This approach was used in several previous empirical studies of the determinants of the value of implicit bank debt guarantees. We obtain similar results as earlier studies; they are available on request.

[9] Note that this approach does not allow one to exploit separately the information available for banks that were initially included but subsequently excluded from the list, as was the case for BBVA in 2015. We ran alternative regressions including and excluding that bank, with broadly unchanged results. They are available on request.
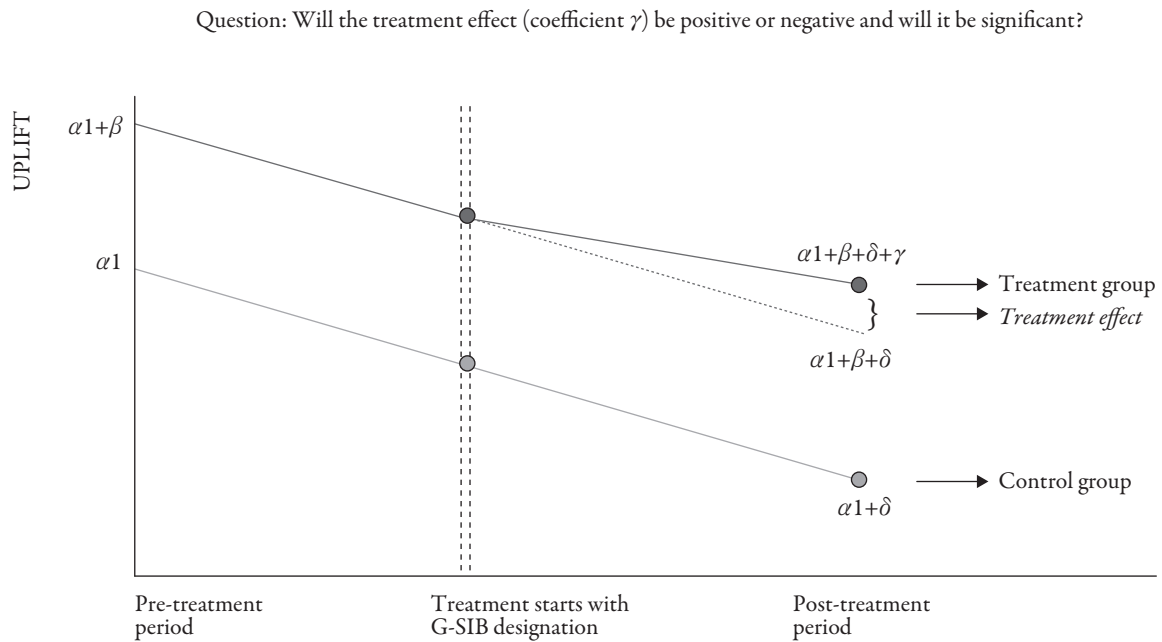
Question: Will the treatment effect (coefficient γ) be positive or negative and will it be significant?

Figure 3: Interpretation of difference-in-difference parameter estimates.

4.2 Control variables

In attempting to address the question regarding the effect of G-SIB designation, a key challenge of the empirical analysis consists of choosing appropriate control variables capturing observable differences between «treated» and «non-treated» banks that might have an effect on the value of implicit bank debt guarantees. Some related work is fortunately available on this topic. Estrella and Schich (2015) provide a conceptual framework for valuing guarantees in the presence of risky debtors and guarantors, and they show that the value of a (risky) debt guarantee is higher, the lower the debtors' own credit strength and the higher that of the guarantor. Ueda and Weder di Mauro (2013) and Li, Qu and Zhang (2011) confirm the role of fiscal strength of the sovereign as an empirical determinant of credit rating uplifts for banks, and Schäfer *et al.* (2016) show that the effect on the value of implicit guarantees of creditor bail-in cases depends on the strength of the domestic sovereign. We proxy the strength of a bank by its intrinsic financial strength credit rating (*SACR*) and the strength of the sovereign where it is headquartered by the respective sovereign credit strength (*SCR*).

In addition, the effects of developments in domestic failure resolution regimes need to be taken into account. Thus, we include control variables describing the introduction of specific national resolution frameworks. In addition, resolution practices might also matter. For example, Schich and Kim (2012) suggest that changes in perceptions are more likely to occur where holders of unsecured bank debt have actually incurred losses. In fact, in countries where legal changes were made to establish more effective resolution regimes, and where subsequently actual failure resolutions involved losses of the part of at least some holders of unsecured bank debt, noticeable declines in the value of implicit

guarantees were observed. Similarly, Schäfer *et al.* (2016) observe that bail-in «actions speak louder than words».

Against the background of these considerations, the subsequent empirical analysis considers changes in bank failure resolution frameworks as additional control variables (introduction of new or refined legal regimes; see Appendix Table A.2) as well as practices (involving unsecured bank bond holders in the burden sharing; see Appendix Table A.3)[10]:

– *NRF* (new resolution framework) is a dummy variable that takes on the value of one if a new bank failure resolution regime has been adopted in the home country of a bank.

– *DL* (debtholders losses) is a dummy that takes on the value of one for a bank whenever the bank failure resolution practices in the home country changed to the effect that failure resolution included situations where holders of either subordinated or senior unsecured debt instruments incurred losses.

– *NRF x DL* is an interaction dummy variable that takes on the value of one for a bank whenever both bank failure resolution regimes and practices changed in the home country.

Table 1 presents the values of the dummy variables related to resolution (*NRF*, *DL*, *NRF x DL*) in graphical form; the numbers of banks concerned including G-SIBs are shown in the second column.

4.3 Empirical results

The results are reported in Table 2 and three observations are singled out for special attention.

First, the signs of the key control variables are all significant in the expected direction. In particular, the coefficient of the banks' own strength, *SACR*, is found to be negative and highly significant i.e. weaker banks benefit from greater values of implicit guarantees. The coefficient of the strength of the domestic sovereign, *SCR*, is significantly positive banks headquartered in countries with a stronger sovereign (in terms of credit rating assessment) benefit from higher values of implicit guarantees. Both observations are consistent with empirical findings in several previous empirical studies (*e.g.* Schäfer *et al.*, 2016) and recent conceptual work (*e.g.* Estrella and Schich, 2015) on the role of the strengths of the debtor and the guarantor in the valuation of risky guarantees.

Second, the coefficients of the other control variables that capture changes in either resolution regimes or practices (or both) are almost always significant in the expected direction. The coefficient for the variable capturing the introduction of a new resolution framework, *NRF*, is negative as expected and it is significant in one other specification (in the other, it is not significant however). The results regarding changes in resolution practices are stronger. The coefficient of *DL* is highly significant in both specifications i.e. once debt holders are involved in the burden-sharing associated with a bank failure resolution in a specific country (with losses being effectively imposed on them), the value

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[10] Sovereign strength as well as resolution frameworks and practices (dummy variables) are country-specific variables, i.e. these variables take on the same value for all banks in the same country.

Table 1: Sample banks and changes in resolution regimes and practices by country

Country	Number of banks	2007	2008	2009	2010	2011	2012	2013	2014	2015
Australia	7								▩	▩
Austria	7			░	░	░	▩	▩	▩	▩
Belgium	4				░	░	▒	▩	▩	▩
Canada	6						░	░	░	░
Denmark	6		▩	▩	▩	▩	▩	▩	▩	▩
Finland	3									
France	9 (4 GSIBs)							░	░	░
Germany	19 (1 GSIB)					▒	▒	▒	▒	▒
Greece	4					▩	▩	▩	▩	▩
Ireland	5			░	▩	▩	▩	▩	▩	▩
Italy	13 (1 GSIB)									
Japan	18 (3 GSIBs)									
Luxembourg	2									
Korea	9									
Netherlands	9 (1 GSIB)			▒	▒	▒	▩	▩	▩	▩
New Zealand	4									
Norway	9									
Portugal	6				░	░	▩	▩	▩	▩
Spain	10 (1 GSIB)			░	░	░	░	▩	▩	▩
Sweden	6 (1 GSIB)						░	░	░	░
Switzerland	8 (2 GSIBs)									
United Kingdom	15 (4 GSIBs)		▒	▩	▩	▩	▩	▩	▩	▩
United States	25 (8 GSIBs)		▒	▒	▩	▩	▩	▩	▩	▩

Legend:
- ░ New resolution framework introduced (NRF)
- ▒ Losses imposed on unsecured debtholders (DL)
- ▩ Both, new resolution framework introduced and debtholder losses imposed

Notes: Number of banks denotes the total number of banks from each country in our sample, with the number of G-SIBs in parentheses. Cells with vertical stripes indicate that a change in the bank failure resolution framework has occurred in the respective country at the beginning of the indicated period, cells with dots indicate that unsecured bank debtholders have been exposed to losses as part of changes in actual bank failure resolution practices, and dark-grey shaded cells indicate that both these types of events have occurred in the respective country at the beginning of the marked period. More details are in Appendix Tables A.2 and A.3.

of implicit bank debt guarantees for banks in that country subsequently declines. The variable *NRF × DL* captures situations where both a new resolution framework was introduced and debt holders were included in the burden-sharing in the process experiencing losses. The coefficient of this variable is also highly significantly and negative, as expected.

Third, the results regarding the effects of G-SIB status are mixed. Banks designated as G-SIBs benefit from higher values of implicit guarantees than other banks, on average over the sample. In fact, the coefficient of the variable *Treatment_group* is positive and statistically significant. Also, the coefficient δ of the variable *Treatment* is negative, implying that the value of implicit guarantees declined during the treatment period for all banks.

Table 2: DID estimates considering G-SIB designation in November 2011

Variables	(1) UPLIFT	(2) UPLIFT	(3) UPLIFT	(4) UPLIFT	(5) UPLIFT
Treatment_group	0.606***	0.693***	0.820***	0.821***	0.739***
	(5.372)	(6.140)	(7.100)	(7.115)	(6.275)
Treatment	−0.664***	−0.303***	−0.477***	-0.464***	−0.337***
	(−6.963)	(−3.138)	(−5.332)	(-4.766)	(−3.715)
Treatment_group x Treatment	0.135	0.184	0.104	0.106	0.222
	(0.900)	(1.254)	(0.700)	(0.717)	(1.463)
Strength of bank (*SACR*)	−0.384***	−0.407***	−0.403***	-0.404***	−0.404***
	(−21.30)	(−22.37)	(−23.89)	(-23.30)	(−24.08)
Sovereign credit strength (*SCR*)	0.267***	0.285***	0.262***	0.263***	0.260***
	(17.77)	(19.41)	(18.96)	(18.48)	(18.58)
New resolution framework (*NRF* = 1)		−0.762***		−0.0324	
		(−8.453)		(−0.312)	
Debtholders losses (*DL* = 1)			−1.290***	−1.275***	
			(−15.59)	(−13.16)	
NRF × DL					−1.364***
					(−14.69)
Constant	2.663***	2.703***	3.273***	3.268***	3.190***
	(12.40)	(12.49)	(14.73)	(14.73)	(14.20)
Observations	1,836	1,836	1,836	1,836	1,836
R²	0.301	0.325	0.388	0.388	0.378
R² adj	0.299	0.323	0.386	0.385	0.376
F	108.1	105.7	158.3	135.9	149.2

Notes: Dependent variable is UPLIFT. The treatment considered is the adoption of G-SIB status in November 2011. Data for 204 banks, although not fully available for 3 G-SIBs, resulted in five missing observations. Robust t-statistics in parentheses. R-squared adjusted for the number of predictors in the model. Significance at 1%, 5%, 10% identified by ***, **, and *, respectively.

Table 3: Average values of uplift, SACR, and SCR for G-SIB and other banks

	GSIBs		Other banks		All sample	
	2007-11	2012-15	2007-11	2012-15	2007-11	2012-15
UPLIFT	2.53	2.69	2.61	2.46	2.60	2.49
SACR	15.34	12.71	13.06	10.94	13.36	11.18
SCR	19.67	18.39	18.93	17.47	19.03	17.59

The average reduction in the estimated value of implicit subsidies in the period 2012 to 2015 compared to the period 2007 to 2011 for the whole sample amounts to 0.2 notches. This average hides differences from one bank to another. In fact, while the value of implicit guarantees declined for non-G-SIBs from 2.61 and 2.46 notches, it increased for G-SIB banks from 2.53 to 2.69 notches (Table 3). This difference is not significant, however. In fact, it turns out that the effect of the treatment on the treated banks (coefficient γ) is not significantly different from the effect of the treatment on control group banks. Thus, the «treatment» was not successful in limiting the value of implicit debt guarantees for G-SIB banks than for non-G-SIB banks. While the overall regulatory

Table 4: Difference-in-differences specifications considering changes in national resolution frameworks

Variables	(1) UPLIFT	(2) UPLIFT	(3) UPLIFT	(4) UPLIFT
	G-SIBs		Other banks	
Treatment_group	−0.774*	−0.798*	−0.216**	0.0675
	(−1.916)	(−1.932)	(−2.111)	(0.653)
Treatment	−0.553***	−0.320*	−0.0165	0.984***
	(−3.011)	(−1.659)	(−0.0920)	(4.612)
Treatment_group x Treatment	0.207	0.204	−0.814***	−1.360***
	(0.479)	(0.463)	(−3.735)	(−5.800)
Strength of bank (SACR)	−0.543***	−0.530***	−0.395***	-0.391***
	(−18.80)	(−18.37)	(−20.85)	(−21.65)
Sovereign crdit strength (SCR)	0.359***	0.368***	0.296***	0.271***
	(13.64)	(14.20)	(19.00)	(17.89)
Debtholders losses ($DL = 1$)		−0.384***		−1.268***
		(−3.008)		(−11.98)
Constant	3.914***	3.643***	2.419***	2.855***
	(6.895)	(6.508)	(11.50)	(13.06)
Observations	234	234	1,602	1,602
R^2	0.654	0.667	0.306	0.363
R^2 adj	0.647	0.659	0.304	0.361
F	89.37	78.21	101.2	125.5

Notes: Dependent variable is UPLIFT. Change in national resolution frameworks considered as «treatment» (the date of which might differ from country to country) and «treatment group» are banks in countries where change occurred. Data as before. Robust t-statistics in parentheses. Significance at 1%, 5%, 10% identified by ***, **, and *, respectively.

reform package has implied a decline in the value of implicit bank debt guarantees for our sample banks, designating some banks as G-SIBs and subjecting them to more onerous regulatory and supervisory treatment did not have a significant additional effect.

4.4 Considering alternative specifications

To shed further light on the difference between G-SIBs and other banks, changes in resolution frameworks or practices (or both) are modelled here as «alternative treatments» and separate regressions are run for the sub-samples of G-SIB and non-G-SIB banks[11]. First, we consider changes in resolution frameworks as «treatment». Thus, «treated» banks are the banks in countries with changes in resolution frameworks and the treatment beginning is the introduction of a new resolution framework, which differs from country to country but is the same for all banks in the same country. Table 4 shows that banks in the *Treatment_group* tend to have lower values of implicit guarantees; the coefficient of *Treatment_group* is negative and significant in three out of four specifications, although only at the 10% level of significance in the case of the G-SIB sample regressions. The results for the variable *Treatment* are difficult to interpret, however. They are negative

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[11] An alternative would have been to consider a dummy variable to distinguish between G-SIB and non-G-SIB banks, although such an approach is not feasible for reasons of collinearity. Separate regressions for G-SIBs and non-G-SIBs are considered when investigating the effect of country-specific changes in practices or regimes on the value of implicit bank debt guarantees. When including both G-SIBs and non G-SIBs in one single regression, the consideration of country-specific changes in resolution regimes and practices implies that the values for the *Treatment* and the cross-variable *Treatment_group x Treatment* are identical.

Table 5: Difference-in-differences specifications considering changes in resolution practices

Variables	(1) UPLIFT	(2) UPLIFT	(3) UPLIFT	(4) UPLIFT
	G-SIBs		Other banks	
Treatment_group	−1.571***	−1.123***	−0.721***	−0.717***
	(−5.459)	(−3.630)	(−5.376)	(−5.352)
Treatment	−0.403**	−0.220	−0.0959	0.00114
	(−2.423)	(−1.279)	(−0.600)	(0.00695)
Treatment_group × Treatment	0.991***	0.733**	−0.804***	−0.779***
	(3.001)	(2.135)	(−3.620)	(−3.512)
Strength of bank (SACR)	−0.466***	−0.500***	−0.380***	−0.388***
	(−18.06)	(−18.40)	(−22.73)	(−21.93)
Strength of sovereign (SCR)	0.321***	0.338***	0.261***	0.265***
	(11.09)	(11.82)	(17.56)	(17.49)
New resolution framework (NRF = 1)		−0.555***		−0.235**
		(−3.682)		(−2.423)
Constant	3.397***	3.717***	2.969***	3.044***
	(5.839)	(6.191)	(13.63)	(13.55)
Observations	107	107	1,729	1,729
R^2	0.637	0.658	0.377	0.379
R^2 adj	0.629	0.650	0.375	0.377
F	114.0	101.4	173.9	145.2

Notes: Dependent variable is UPLIFT. Change in national resolution practices considered as «treatment» (the date of which might differ from country to country) and «treatment group» are banks in countries where change occurred. Robust t-statistics in parentheses. Significance at 1%, 5%, 10% identified by ***, **, and *, respectively.

and significant for G-SIB banks, but estimated signs change in the case of other banks, and the coefficient is positive and highly significant in the fourth specification (which includes a dummy variable controlling for resolution practices). The interaction variable *Treatment_group × Treatment* is not significant for the sample of G-SIB banks, but is highly significant and negative for non-G-SIB banks. The interpretation is that changes in resolution frameworks affect the value of implicit guarantees for non-G-SIB banks (limiting their value) but not for G-SIB banks. All other control variables have the expected signs, including the dummy variable controlling for changes in resolution regimes.

Considering a change in resolution practices as the «alternative treatment», the results in Table 5 highlight that banks in countries that have involved debt-holders in the burden-sharing associated with bank failure resolution tend to have significantly lower credit rating uplifts than banks in countries where bank debt-holders have not incurred any losses. The estimated coefficient for the variable *Treatment_group* is significant and negative in all four specifications. The coefficient of the variable *Treatment* is significant and negative in only one of the four specifications. The variable *Treatment-group × Treatment* is always significant. Remarkably, the sign changes from the G-SIB to the non-G-SIB sample. As regards the latter, the treatment implies that the value of the implicit guarantees for banks in countries in which bank debt-holders have been involved in the burden-sharing becomes significantly lower than for banks in countries where no such treatment was given. By contrast, the treatment effect was significantly positive in the case of G-SIB banks. Therefore, it would appear that the treatment effect acted to reinforce the perception that G-SIB bank debt is «special». In fact, the bank failure resolution cases that involved losses on the part of creditors only included non-G-SIB banks, and that observation might have been interpreted as evidence that G-SIB bank creditors tend

Table 6: Difference-in-differences specifications considering changes in resolution regimes and practices

Variables	(1) UPLIFT G-SIBs	(2) UPLIFT Other banks
Treatment_group	−1.594***	−0.835***
	(−5.429)	(−7.308)
Treatment	−0.417*	−0.101
	(−1.920)	(−0.465)
Treatment_group x Treatment	1.063***	−0.873***
	(2.911)	(−3.346)
Strength of bank (*SACR*)	−0.475***	−0.385***
	(−18.83)	(−23.37)
Strength of sovereign (*SCR*)	0.316***	0.255***
	(10.71)	(17.31)
Constant	3.585***	3.136***
	(6.103)	(13.96)
Observations	107	1,729
R^2	0.633	0.384
R^2 adj	0.626	0.382
F	112.9	176.6

Notes: Dependent variable is UPLIFT. Change in both national resolution frameworks and resolution practices considered as «treatment» (the date of which might differ from country to country) and «treatment» group are banks in countries where both changes occurred. Robust t-statistics in parentheses. Significance at 1%, 5%, 10% identified by ***, **, and *, respectively.

to be exempted from any burden-sharing associated with failure resolution. Again, all coefficients of the control variables in Table 5 are significant in the expected direction.

Table 6 shows the results for estimates in which the «alternative treatment» consists of *both* a new resolution regime being introduced *and* bank debt-holders being involved in the burden-sharing of actual bank failure resolution cases, incurring some losses in the process. The coefficient of *Treatment_group* is significantly negative: banks located in countries where both these changes took place benefit from a significantly lower credit uplift than banks in countries where only either one of the two or no change at all occurred. That being said, the coefficient of the variable *Treatment* is not always highly significant or significant at all. Again, the coefficients of the variable *Treatment_group* × *Treatment* is always significant, with signs changing for the two groups. Similar to the results shown in Table 5, G-SIB banks seem to have benefited from higher credit rating uplifts as a result, while non-G-SIBs saw their credit rating uplifts significantly decline. As before, the coefficients of the control variables are significant and have the expected signs.

Our results complement those of event studies that assess the short-term effects on financial market prices of regulatory announcements, such as Moenninghoff *et al.* (2015). The authors in this study assess the effect on post-event abnormal stock returns following 12 policy or regulatory announcements between November 2008 and November 2011. Many of those regulatory announcements are associated with negative abnormal returns for G-SIBs (two of which are significant), consistent with a view that the market value declines for banks that are exposed to more costly and intrusive regulation arising from G-SIB status. By contrast, the designation of banks as G-SIBs in November 2011 has an offsetting positive effect as compared to these other events. The authors conclude that designating G-SIBs eliminated ambiguity about the presence of government guarantees,

and thereby may have run counter to the regulators' intent to contain the effects of the «too-big-to-fail» phenomenon at that point in time. Our results are not inconsistent with that interpretation; they suggest that the value of implicit guarantees did not decline by significantly more for G-SIBs than it did for other banks since the former were officially designated as G-SIBs in November 2011.

5 Concluding Remarks

The results confirm the findings of earlier empirical studies that weaker banks benefit from higher values of implicit debt guarantees, as do banks headquartered in countries with stronger sovereigns (e.g. Ueda and Weder di Mauro, 2013; Estrella and Schich, 2015; Toader, 2015). The study also finds evidence that the value of implicit bank debt guarantees is higher for banks that have been officially designated as «G-SIBs» than for other banks. By contrast, there is no firm evidence that the designation of G-SIBs and subjecting these designated banks to tighter, more intrusive and wide-ranging regulatory, supervisory and resolution reform frameworks, has reduced the value of the implicit subsidies of these banks. If anything, in countries where tightened national resolution practices have implied a compression of the value of implicit guarantees for other banks, G-SIBs tend to have been impacted by an opposite effect.

The results in the present paper are nonetheless consistent with the view that the broader package of regulatory reform, and in particular changes to resolution regimes, have had the desired effects, which is to limit the notion that the debt of banks benefits from implicit publicly provided guarantees. In this regard, actions seem to speak louder than words: imposing losses on debtholders as part of changed resolution practices matters more than changing resolution frameworks but without applying the newly available instruments and implicating debtholders in the loss-sharing. That said, G-SIBs' debt valuations have escaped the effect of changed resolution practices so far; in that sense, being a G-SIB does matter.

On a conceptual issue, the use of the difference-in difference approach for the empirical analysis does not require the «special treatment» being administered to G-SIBs to be already completed. Rather, the approach is helpful even if the special treatment is ongoing – which is the case here – and it is helpful to identify whether, and to what extent, a significant effect can be identified as of yet. So far, the answer is no. It remains to be seen whether another application of the present approach, once the various aspects of reforms, especially those pertaining to G-SIBs are more fully implemented, will generate different results.

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APPENDIX A: Details Regarding Sample Data

Table A1: List of sample banks

Country	Banks
Australia	ANZ Banking Group Ltd
	Bank of Queensland Ltd
	Commonwealth Bank of Australia
	Macquarie Bank Ltd
	National Australia Bank Ltd
	Suncorp-Metway Ltd
	Westpac Banking Corporation
Austria	BAWAG P.S.K. AG
	Erste Group Bank AG
	Hypo Tirol Bank
	Oesterreichische Volksbanken AG
	Raiffeisen Bank International AG
	UniCredit Bank Austria AG-Bank Austria
	Vorarlberger Landes-und Hypothekenbank AG
Belgium	Belfius Banque SA
	BNP Paribas Fortis SA/ NV*
	ING Belgium SA/NV-ING*
	KBC Bank NV
Canada	Bank of Montreal
	Bank of Nova Scotia (The)
	Canadian Imperial Bank of Commerce
	National Bank of Canada
	Royal Bank of Canada
	Toronto Dominion Bank
Denmark	Danske Bank A/S
	Jyske Bank A/S
	Nordea Bank Danmark A/S
	Nykredit Bank A/S
	Spar Nord Bank
	Sydbank A/S
Finland	Aktia Bank Plc
	Nordea Bank Finland Plc*
	Pohjola Bank plc
France	Crédit Agricole CIB SA
	Banque Fédérative du Crédit Mutuel
	Banque PSA Finance SA
	BNP Paribas SA
	BPCE SA
	Crédit Agricole S.A.
	Dexia Crédit Local SA
	RCI Banque SA
	Société Générale SA
Germany	Bayerische Landesbank
	Commerzbank AG
	DekaBank Deutsche Girozentrale AG
	Deutsche Apotheker- und Aerztebank eG
	Deutsche Bank AG
	Deutsche Pfandbriefbank AG
	Deutsche Postbank AG
	DZ Bank AG-Deutsche Zentral-Genossenschaftsbank
	HSH Nordbank AG
	Hypothekenbank Frankfurt AG
	Landesbank Baden-Wuerttemberg
	Landesbank Berlin AG
	Landesbank Hessen-Thueringen Girozentrale
	Münchener Hypothekenbank eG
	Norddeutsche Landesbank Girozentrale
	Sparkasse KölnBonn
	Volkswagen Bank GmbH
	Portigon AG
	WGZ-Bank AG
Greece	Alpha Bank AE
	Eurobank Ergasias SA
	National Bank of Greece SA
	Piraeus Bank SA
Ireland	Allied Irish Banks plc
	Bank of Ireland
	Depfa Bank Plc
	Permanent TSB Plc
	Ulster Bank Ireland Limited*
Italy	Banca Carige SpA
	Banca delle Marche SpA
	Banca Monte dei Paschi di Siena SpA
	Banca Popolare di Milano SCaRL
	Banca Sella Holding SpA
	Banco Popolare - Società Cooperativa
	Cassa di Risparmio di Bolzano SpA
	Cassa di risparmio di Ferrara SpA
	Credito Valtellinese Soc Coop
	Intesa Sanpaolo

Table A1: *continued*

Japan
UniCredit SpA
Unione di Banche Italiane Scpa-UBI Banca
Aozora Bank Ltd
Mitsubishi UFJ Financial Group
Chiba Bank Ltd.
The Chugoku Bank, Ltd
The Gunma Bank Ltd
The Higo Bank
Hiroshima Bank Ltd
Joyo Bank Ltd.
Mizuho Bank Ltd
The Norinchukin Bank
Ogaki Kyoritsu Bank
Resona Bank Ltd
San-In Godo Bank, Ltd
Shinkin Central Bank
Shoko Chukin Bank Ltd
Sumitomo Mitsui Banking Corporation
The Suruga Bank, Ltd
Bank of Yokohama, Ltd

Luxembourg
Banque et Caisse d'Epargne de l'Etat Luxembourg
Banque Internationale à Luxembourg SA

Netherlands
ABN AMRO Bank NV
Credit Europe Bank N.V.
ING Bank NV
Nederlandse Waterschapsbank
NIBC Bank N.V.
Bank Nederlandse Gemeenten NV, BNG
Rabobank Nederland
Royal Bank of Scotland NV (The)-RBS NV
SNS Bank N.V.

New Zealand
ANZ Bank New Zealand Limited*
ASB Bank*
Bank of New Zealand*
Westpac New Zealand Limited*

Norway
DNB Bank ASA
Nordea Bank Norge ASA*
Sparebank 1 Nord-Norge
SpareBank 1 SMN
SpareBank 1 SR-Bank ASA
Sparebanken More
Sparebanken Sor
Sparebanken Vest
Storebrand Bank ASA

Portugal
Banco BPI SA
Banco Comercial Português, SA
Banco Espirito Santo SA
BANIF - Banco Internacional do Funchal, SA
Caixa Economica Montepio Geral
Caixa Geral de Depositos

South Korea
Busan Bank
Daegu Bank Ltd.
Hana Bank
Industrial Bank of Korea
KB Kookmin Bank
Korea Development Bank
Korea Exchange Bank
Shinhan Bank
Woori Bank

Spain
Banca March SA
Banco Bilbao Vizcaya Argentaria SA
Banco de Sabadell SA
Banco de Valencia SA
Banco Popular Espanol SA
Banco Santander SA
Bankia, SA
Bankinter SA
Caixabank. S.A.

Sweden
Caja Laboral Popular Coop de credito
Ibercaja Banco SAU
Landshypotek Bank AB
Länsförsäkringar Bank AB (Publ)
Nordea Bank AB (publ)
Skandinaviska Enskilda Banken AB

Table A1: *continued*

Country	Bank
	Svenska Handelsbanken
	Swedbank AB
Switzerland	Banque Cantonale Vaudoise
	Clientis AG
	Credit Suisse AG
	EFG Bank AG
	Raiffeisen Schweiz Genossenschaft
	St. Galler Kantonalbank AG
	UBS AG
	Zuger Kantonalbank
United Kingdom	Bank of Scotland Plc
	Barclays Bank Plc
	Co-operative Bank Plc (The)
	Coventry Building Society
	HSBC Bank plc
	Leeds Building Society
	Lloyds Bank Plc
	National Westminster Bank Plc
	Nationwide Building Society
	Principality Building Society
	Royal Bank of Scotland Plc (The)
	Skipton Building Society
	Standard Chartered Bank
	West Bromwich Building Society
	Yorkshire Building Society
United States	BancorpSouth Bank
	Bank of America, NA
	Bank of Hawaii
	Bank of New York Mellon (The)
	Branch Banking and Trust Company
	Citibank NA
	Comerica Bank
	Discover Bank
	First National Bank of Omaha
	FirstMerit Bank NA
	Frost Bank
	Goldman Sachs Bank USA
	JP Morgan Chase Bank, NA
	Morgan Stanley Bank, NA
	New York Community Bank
	Old National Bank
	People's United Financial, Inc
	Regions Bank
	Silicon Valley Bank
	State Street Bank and Trust Company
	Synovus Bank
	TCF National Bank
	Trustmark National Bank
	Webster Bank NA
	Wells Fargo Bank, NA

Notes: Bank name in bold and italics for banks designated as G-SIB as part of the lists published by the FSB (2011, 2012, 2013, 2014, 2015b)

Table A2: Introduction of new resolution Frameworks BY COUNTRY

Country	Year	Legislation
Australia		
Austria	2012	Supervisory Guidelines
	2014	Austrian Bank intervention and Restructuring Act
Belgium	2010	Financial Crisis Law
Canada	2012	Canada Deposit Insurance Corporation (CDIC) Act
	2012	Winding-up and Restructuring Act (Amendment)
Denmark	2008	Danish Financial Stability Act
	2011	Amendment
	2010	Bank Package III
Finland		
France	2013	Financial and Monetary Code
	2013	Ring-fencing and Resolution Law
Germany	2010	Bank Restructuring Act decided in 2010
	2013	German Bank Separation Act
Greece	2011	Amendment of the Banking Act
Ireland	2010	Credit Institutions (Stabilisation) Act
	2011	Central Bank and Credit Institutions (Resolution) Act
Italy		Consolidated Banking Law
Japan		
Korea		
Luxembourg		
Netherlands	2012	Act on Special Measures for Financial Institutions
New Zealand	2013	Open Bank Resolution
Norway		
Portugal	2012	Amendments to the resolution regime for credit and financial institutions
Spain	2009	Law on Bank Restructuring and Credit Institution Equity Reinforcement
	2012	Law 9/2012
Sweden	2012	Royal Decree-law
Switzerland	2012	FINMA Banking Insolvency Ordinance
United Kingdom	2009	Banking Act
United States	2010	Dodd-Frank Act

Notes: Dates are included only for new resolution framework introduced during our sample period.
Sources: Schich and Kim (2012) and authors' updates based on own judgement.

Table A3: Changes in resolution practices by country

Country	Banks	Date of failure (or recapitalisation)	Stakeholders' loss-bearing			Depositors	
			Shareholders	Subordinated bondholders	Senior unsecured bondholders	In excess of ceiling	Below maximum coverage ceiling
Austria	KommunalKredit	11/2008	•	○	○	○	○
	Hypo Alpe Adria	03/2015	⊙	•	(·)	○	○
	Oesterreichische Volksbanken	02/2012	⊙	○	○	○	○
Belgium	Fortis Bank	09/2008	⊙	○	○	○	○
	KBC Bank	10/2008	⊙	○	○	○	○
	Dexia Belgium	09/2008-11/2011	⊙	○	○	○	○
Denmark	Roskilde Bank	08/2008	•	•	○	○	○
	EBH Bank	11/2008	•	•	○	○	○
	Løkken Sparebank	03/2009	•	•	○	○	○
	Gudme Raaschou Bank	04/2009	•	•	○	○	○
	Fionia Bank	05/2009	•	•	○	○	○
	Capinordic Bank	02/2010	•	•	○	○	○
	Eik Banki P/F and Eik Bank Denmark	09/2010	•	•	○	○	○
	Amagerbanken	02/2011	•	•	(·)	(·)	○
	Fjordbank Mors	06/2011	•	•	(·)	(·)	○
	Max Bank	10/2011	•	•	○	○	○
	Sparekassen østjylland	04/2012	•	•	○	○	○
	Spar Salling Sparekasse	04/2012	•	•	○	○	○
France	Dexia Crédit Local	09/2008-11/2011	⊙	○	○	○	○
Germany	Weser Bank	04/2008	•	n.a	n.a	○	○
	Hypo Real Estate	05/2009	•	○	○	○	○
	IKB	07/2009	⊙	○	○	○	○
	Commerzbank	11/2008	⊙	○	○	○	○
	BayernLB	05/2009	⊙	○	○	○	○
	WestLB	11/2009-06/2012	⊙	○	○	○	○
	HSH Nordbank	03/2009	⊙	○	○	○	○
Greece	Proton Bank	10/2011	•	•	n.a	○	○
	T Bank	12/2011	•	⊙	n.a	○	○
	Cooperative Bank of Lesvou-Limnou	03/2012	•	n.a	n.a	○	○
	Cooperative Bank of Lamia	03/2012	•	n.a	n.a	○	○
	Achaiki Cooperative Bank	03/2012	•	n.a	n.a	○	○
	Agricultural Bank of Greece	07/2012	•	•	n.a	○	○

Table A3: *continued*

Country	Banks	Date of failure (or recapitalisation)	Shareholders	Subordinated bondholders	Senior unsecured bondholders	Depositors In excess of ceiling	Depositors Below maximum coverage ceiling
Iceland	Landsbanki	10/2008	·	·	·	○	○
	Glitnir	10/2008	·	·	(·)	○	○
	Kaupthing	10/2008	·	·	(·)	○	○
Ireland	AIB	12/2010	⊙	(·)	○	○	○
	Anglo Irish Bank	01/2009	·	(·)	○	○	○
	Anglo Irish Bank	11/2010	·	·	(·)	○	○
	Bank of Ireland	07/2011	·	·	(·)	○	○
	EBS Building Society	12/2009	n.a	(·)	○	○	○
	IL&P	07/2011	⊙	(·)	○	○	○
	Allied Irish Banks PLC	06/2011	·	·	(·)	○	○
	Irish Life (future Permanent tsb)	07/2011	·	·	(·)	○	○
	INBS	12/2009	n.a	(·)	○	○	○
Luxembourg	Fortis Banque Luxembourg	12/2008	⊙	○	○	○	○
Netherlands	ABN AMRO	12/2008	⊙	○	○	○	○
	DSB Bank	10/2009	·	·	(·)	(·)	○
	SNS Bank N.V.	02/2013	·	○	○	○	○
Portugal	Banco Portugues de Negocios	11/2008	·	·	·	○	○
	Banco Privado Portugues	04/2010	·	○	(·)	(·)	○
	Banco Espírito Santo	06/2013	·	○	(·)	○	○
Spain	Cajasur	05/2010	·	·	○	○	○
	Banco CAM	06/2011	⊙	○	○	○	○
	Nova Caixa Galicia	09/2011	⊙	○	○	○	○
	Catalunya Caixa	09/2011	·	○	○	○	○
	Unnim	09/2011	·	○	○	○	○
	Banco de Valencia	11/2011	⊙	○	○	○	○
	BFA-Bankia	05/2012	⊙	○	○	○	○
	BFA-Bankia	04/2013	·	·	(·)	○	○
Sweden	Carnegie Investment Bank	11/2008	⊙	○	○	○	○
Switzerland	HQ Bank	08/2010	⊙	·	○	○	○
	UBS	10/2008	·	·	○	○	○
United Kingdom	Northern Rock	02/2008	·	(·)	○	○	○
	Northern Rock	12/2011	·	·	(·)	○	○

Country	Banks	Date of failure (or recapitalisation)	Stakeholders' loss-bearing			Depositors	
			Shareholders	Subordinated bondholders	Senior unsecured bondholders	In excess of ceiling	Below maximum coverage ceiling
	Bradford& Bingley	09/2009	•	(•)	(•)	○	○
	Heritable Bank	10/2008	•	•	(•)	○	○
	Kaupthing Singer & Friedlander	10/2008	•	•	(•)	○	○
	London Scottish Bank	11/2008	•	n.a	(•)	○	○
	Dunfermline Building Society	03/2009	•	(•)	○	○	○
	Southsea Mortgage Investment	06/2011	•	n.a	(•)	(•)	○
	RBS	10/2008	•	○	○	○	○
	Lloyd	10/2008	•	○	○	○	○
United States	Washington Mutual Bank	09/2008	•	•	(•)	○	○
	IndyMac Bank	07/2008	•	•	•	(•)	○
	Colonial Bank	08/2009	•	•	•	○	○
	Lehman	09/2008	•	•	•	(•)	(•)
	CIT Group Inc.	11/2009	•	•	(•)	n.a	n.a
	Financl Guaranty Ins Co(FGIC)	12/2009	•	•	(•)	n.a	n.a
	AMBAC Assurance Corp	03/2010	•	•	(•)	○	○

Notes:
•: full loss (either 100% haircut for bondholders or wiping-out of common shareholders).
(•): partial loss.
⊙: dilution or share price depreciation as a result of recapitalisation by the government.
O: no loss.
n.a: not applicable.

Sources: Schich and Kim (2012) and authors' updates based on own judgement.