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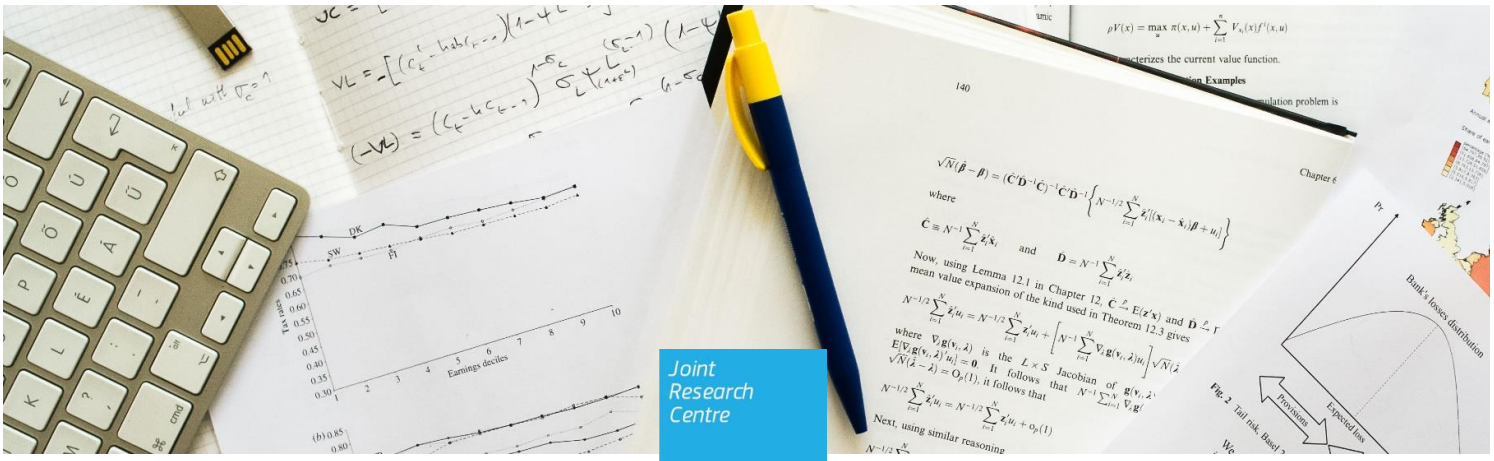

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Do CDS markets care about the G-SIB status?

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ABSTRACT

"Ending too big to fail" is a declared policy aim and a key element of the globally coordinated financial regulatory reform. An official list of banks considered to be global systemically important (G-SIBs) is published on an annual basis since 2011. The goal of the present paper is to assess to what extent equity and CDS markets care about the official releases of the G-SIB lists and, in particular, whether the inclusion of a bank in the G-SIB list is good or bad news for bank debt and equity holders. The analysis applies both event-studies and panel regressions and relies upon European banks' CDS senior and subordinated quotes and equity prices to evaluate their reactions to the publications of the G-SIB lists. The analysis spans from the first leaked G-SIB list by the Financial Times as of 2009 to the 2017 official publication of the list.

Results show that equity and senior/subordinated CDS spreads react differently to the events considered and that reactions evolve over time. During the first events considered in the analysis, CDS of banks classified as G-SIBs react less than those of other banks. Results for more recent events are more mixed, potentially reflecting that recent releases of G-SIBs lists entail less information. The analysis also devotes special attention to a subset of "intermediate" banks that in principle are eligible to enter in the G-SIBs list, as compared to other banks that will obviously be included/excluded in the list given their size and footprint. This narrowed focus allows us to obtain more efficient results.

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1 Introduction

During the recent global financial crisis, many large banking groups received liquidity support or were bailed out by central banks or national governments based on the view that they were too big or too complex to fail. This choice was mainly driven by the fact that restoring the confidence of the financial system and protecting depositors and households was of utmost importance for the stability of the whole economy. Subsequently, more attention was paid to the adverse effects of choices to use taxpayers' money in this way, not least as it tended to increase moral hazard. Regulators therefore implemented a number of policies, also with the goal of reducing or eliminating this "too big to fail" (TBTF) expectation. Among other measures, regulators increased the capital requirements and introduced stricter supervision and resolution planning (see e.g. Heynderickx et al. (2016), Benczur et al. (2017) and appendix A of Schich (2018) for overviews of policy initiatives).

In this context, in 2011 the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB) developed a methodology to identify Global Systemically Important Banks (G-SIBs). According to the definition adopted[1], G-SIBs are "financial institutions whose distress or disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity". The FSB publishes the list of G-SIBs on a yearly basis. Higher capital charges are now imposed on these banks, and they are subjected to more intrusive regulatory, supervisory and failure resolution regimes than their peers. These measures are meant to incentivise G-SIBs to reduce their systemic importance so as not to be TBTF. At the same time, there is a risk that this approach further entrenches the view that the thus identified banks are TBTF and that their debt benefits from implicit government guarantees.

The present paper assesses to what extent the inclusion of banks in the list of G-SIBs can be regarded as good or bad news for equity and debt holders. It analyses the reactions of prices of credit default swaps (CDS) for subordinated and senior bank debt and those of bank stocks to announcements regarding "G-SIB status" (as defined by inclusion of a bank in the list). CDS prices are particularly relevant, since they capture credit risk

[1] See https://www.fsb.org/work-of-the-fsb/policy-development/addressing-sifis/

information that is specific and cannot be inferred from the prices of other financial instruments such as equity or bonds (see e.g. Lee et al. (2018)). The methods used are event-studies and panel regressions and they consider the reactions of banks' CDS senior and subordinated quotes and equity prices to the (annual) publication of the FSB G-SIBs list from 2011 to 2017, the publication of the draft methodology in 2011 and the publication of supposedly leaked unofficial lists in 2009 and 2010 by the Financial Times.

Some related studies exist. For example, Afonso et al. (2014) and Kroszner (2016) provide overviews of studies investigating funding cost differences between large and small banks, suggesting that the former benefit from implicit guarantees. In doing so, they consider various instruments, including CDS spreads, stock returns, deposit costs, ratings, balance sheet data and premiums on M&As. King (2009) studies the reactions of equity prices and senior debt CDS spreads to the announcements of banks' rescue packages in the EU and in the US between October 2008 and January 2009. Following Ait-Sahalia et al. (2012), Fiordelisi et al. (2014) compile a detailed list of monetary policy interventions' announcements in the Euro area, the US, Japan, the UK and Switzerland to evaluate the effects of these interventions on conditions in the interbank market, stock market, and banking sector. Horvath and Huizinga (2015) focus on a single event, the creation of the European Financial Stability Facility (EFSF) in 2010 and its enlargement in 2011, and investigate its impact on banks' shares, banks and sovereign CDS. Mink and De Haan (2013) focus on the news on the 2010 Greek sovereign debt crisis and its potential bailout and assess the effects on bank stock prices for 48 European banks. Zhao (2018) explicitly considers different CDS contracts written on senior and unsecured bank debt and evaluates their reactions before and after the Basel III announcements.

Focusing on G-SIBs versus other banks, Bongini et al. (2015) use an event study method and identify differences in the stock market reactions of G-SIBs versus other banks following announcements related to the list of banks identified as G-SIBs. Their analyses are based on a sample of the 70 world's largest banks. The authors conclude that, in reaction to the July 2011 identification methodology release, European banks experienced abnormal positive returns, suggesting that it confirmed expectations that European authorities might be more willing to support banks if needed. Both G-SIBs and other sample banks benefitted. Moenninghoff et al. (2015) estimate the stock prices reactions for a sample of 300 large international banks and consider a larger set of events, covering both regulatory announcements and

those related to G-SIBs designations (most of the events were G20 summits). The authors identify negative bank stock price reactions subsequent to many of the events, while the announcement of the official list of G-SIBs had an offsetting positive effect. Thus, the authors conclusion is consistent with a strengthened perception of the existence of implicit bank debt guarantees.

Schäfer et al. (2016b) analyse the effects of four major country-level regulatory events in Europe and in the US on the stock returns and the CDS spreads of European and US banks. Results demonstrate that all the reforms seemed to have lowered bailout expectations. The effects were particularly distinct for the US banks, as a response to the Dodd-Frank Act and the Volker rule. The regulatory announcements also show some spillover effects across countries. A similar paper by the same authors, Schäfer et al. (2016a), analyses the reactions of CDS spreads and stock returns in response to five bail-in cases that occurred between 2011 and 2014 as well as to the implementation of the European Single Resolution Mechanism. The authors conclude that the occurrence of bail-in, especially after the Cyprian case, is reflected in a subsequent increase in CDS spreads, signalling a reduction in bailout expectations. These various studies are related to the present analysis; a more structured review of the literature on implicit bank debt guarantees is available in Schich (2018).

A different perspective is adopted in the paper by Violon et al. (2017): they assess if and how G-SIBs designations have an impact on banks' business models and overall activities. To achieve this objective, they apply a difference-in-difference approach. In another application of such an approach, Schich and Toader (2017) find that there is no evidence that banks considered G-SIBs, as compared to other banks, have experienced a larger decline in credit rating uplifts due to assumed government support.

We contribute to this stream of literature by focusing specifically on isolating the effect of the G-SIB designation announcements in an extended set of relevant events compared to the previous works, accounting also for G-SIBs announcements from 2012 to 2017. Moreover, we develop an *ad-hoc* analysis focused on a subset of "intermediate" banks that in principle are eligible to enter in the G-SIBs list. We focus on this subsample since we believe that there is more information on banks that are close to the eligibility of being G-SIB, rather than study banks that will obviously be included in the list given their size and footprint. Results demonstrate that, during the first events, CDS of banks classified as G-SIB react less than the other banks, thus pointing to a potential different treatment from the markets. Reactions

to more recent events did not signal any clear cut trend.

The paper proceeds as follows. Section 2 provides an overview of the G-SIB designation and describes the relevant events in our analysis. Section 3 describes the methodology and the dataset used in the subsequent analysis. The empirical evidence is presented in Section 4, and Section 5 concludes.

2 The G-SIB list

The focus of this study is the reaction of credit derivatives and equity markets to specific events, namely announcements of information regarding the constituents of the list of banks considered to be G-SIBs. The FSB defines these entities as "financial institutions whose distress or disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity". In 2011 the BCBS agreed on specific measures targeting the G-SIBs. These measures were meant to strengthen the resilience of the financial system and to create incentives to reduce their systemic importance. They also set the methodology to assess their systemic importance and the corresponding additional capital requirements. Starting from November 2011, the FSB applies this methodology to identify the banks classified, on a yearly basis, as G-SIBs. The methodology mainly consists of a quantitative analysis complemented by a supervisory judgement backed by additional indicators and qualitative information. The quantitative analysis computes a relative score to assess the riskiness of each institution and the measure is a weighted average of 12 balance sheet indicators covering different risk categories. Banks with a final score higher than 130 are designated as G-SIBs, subject to the supervisory judgement. The complete description of the methodology can be found in BCBS (2013). Starting from 2012, the final score is also used to allocate the G-SIBs to different buckets corresponding to different additional capital requirements.

Following Moenninghoff et al. (2015), we analyse two events prior to the publication of the official list of G-SIBs by the FSB in November 2011, which are the publication of unofficial (supposedly leaked) lists of banks that might be classified as G-SIB by the Financial Times in November 2009 and 2010. Our paper also extends the analysis to include the publications of the yearly updates of the G-SIB list during the years from 2012 to 2017, implying six additional events. These updates also include the allocation of G-SIB to different buckets, associated with different capital surcharges, which took place for the first time in November 2012. In addition to these events, following Bongini et al. (2015), we also consider the publication by the BCBS on 19 July 2011 of the detailed methodology to identify G-SIB banks. Table 1 summarizes the events considered in this analysis, following an approach already applied in Moenninghoff et al. (2015). For all G-SIBs designation event, the table highlights which banks are classified as G-SIBs

and, starting from 2012, it also indicates to which bucket each G-SIBs is assigned.

The yearly list of banks classified as G-SIBs is fairly stable over time. That said, some banks change their status, that is they drop out or (re)enter an updated list. Such changes occur on four occasions (note that the leaked list is considered as reference for the first official list). Table 2 shows the banks that either (i) entered the list, as compared to the previous one, or (ii) that were dropped from the list.

Table 1: Overview of inclusion of selected sample banks in the list of G-SIBs

Notes: Dark circles indicate G-SIB status (that is whether a bank is included or not in the list of G-SIBs) to the left of the double vertical line. To the right of this line, the number of empty circles indicates the bucket to which the G-SIB bank is allocated, which range from one to four (the fifth bucket that is associated with the highest additional capital requirements has remained empty so far). The publication of the official methodology does not imply any official release of the G-SIBs list and for the purpose of the present analysis, we consider G-SIBs for this specific event those banks classified a G-SIBs in the second leaked list. The total number of banks in our sample is 46.

		Pre-designation: leaked list			Post-designation: official list						
Bank name	Home country	Publication of leaked FSB list of 24 G-SIBs by Financial Times 30 Nov. 2009	Re-publication of leaked FSB list of 24 G-SIBs by Financial Times 10 Nov. 2010	Publication of the G-SIBs methodology 19 July 2011	Official publication of initial list of G-SIBs by FSB 4 Nov. 2011	Update of G-SIBs list by FSB 1 Nov. 2012	Update of G-SIBs list by FSB 11 Nov. 2013	Update of G-SIBs list by FSB 6 Nov. 2014	Update of G-SIBs list by FSB 3 Nov. 2015	Update of G-SIBs list by FSB 21 Nov. 2016	Update of G-SIBs list by FSB 21 Nov. 2016
BNP Paribas	France	•	•	•	•	○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○	○ ○
Royal Bank of Scotland	UK	•	•	•	•	○ ○	○ ○	○ ○	○	○	○
HSBC	UK	•	•	•	•	○ ○ ○ ○	○ ○ ○ ○	○ ○ ○ ○	○ ○ ○ ○	○ ○ ○	○ ○ ○
Crédit Agricole	France	–	–	–	•	○	○ ○	○	○	○	○
Barclays	UK	•	•	•	•	○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○	○ ○	○ ○
Deutsche Bank	Germany	•	•	•	•	○ ○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○
ING Group	Netherlands	•	•	•	•	○	○	○	○	○	○
Lloyds Banking Group	UK	–	–	–	•	–	–	–	–	–	–
Banco Santander	Spain	•	•	•	•	○	○	○	○	○	○
Société Générale	France	•	•	•	•	○	○	○	○	○	○
UniCredit	Italy	•	•	•	•	○	○	○	○	○	○
UBS	Switzerland	•	•	•	•	○ ○	○ ○	○	○	○	○
Commerzbank	Germany	–	–	–	•	–	–	–	–	–	–
Credit Suisse	Switzerland	•	•	•	•	○ ○	○ ○	○ ○	○ ○	○ ○	○
Intesa Sanpaolo	Italy	•	•	•	–	–	–	–	–	–	–
Dexia	Belgium	–	–	–	•	–	–	–	–	–	–
BBVA	Spain	•	•	•	–	○	○	○	–	–	–
Nordea	Sweden	–	–	–	•	○	○	○	○	○	○
Standard Chartered	UK	–	–	–	–	○	○	○	○	○	○
BPCE	France	–	–	–	•	○	○	○	○	○	–
Number of G-SIBs		13	13	13	17	16	16	16	15	15	14

Table 2: Overview of inclusion of selected sample banks in the list of G-SIBs

Note: as detailed in Section 3.3, Dexia is not included in the present analysis. Natixis and BPCE are treated as a single bank.

Date	Event	Banks newly included in the list	Banks excluded from the list
4 Nov. 2011	Official publication of initial list of G-SIBs by FSB	Credit Agricole Natixis (BPCE group) Commerzbank Dexia Lloyds Banking Group	Banco Bilbao Viz.Arg. Intesa San Paolo
1 Nov. 2012	Update of G-SIBs list by FSB	Banco Bilbao Viz.Arg. Standard Chartered Bank	Commerzbank Dexia Lloyds Banking Group
3 Nov. 2015	Update of G-SIBs list by FSB		Banco Bilbao Viz.Arg.
21 Nov. 2017	Update of G-SIBs list by FSB		Natixis (BPCE group)

3 Methodology and datasets description

Our primary research question is whether inclusion of a bank in the G-SIB list is "news" for bank debt and equity holders and whether inclusion in the list is "good news" or "bad news". For this analysis, we analyse the reaction of the market in an event study setting, applying two different methodologies. The first methodology is the standard Event Study approach (see MacKinlay (1997)) aimed to verify the magnitude of the market reaction compared to the "normal" behaviour assessed trough the market model. The second methodology applies a panel regression with event dummies, including also covariates that control for bank characteristics and general market conditions. In both approaches, we estimate the returns of the instrument (equity and CDS) differently, given the different characteristics of the two instruments. For the equity, the returns are calculated as the percentage difference of the stock price as follows:

$$R\_EQ_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \times 100 \tag{1}$$

where $R\_EQ_{i,t}$ is the return at time t for bank i, and $P_{i,t}$ is the stock price at the day t (closing price) for bank i. We multiply the return by 100 to have percentages return. For the CDS, we define the return as minus the first difference in CDS spread as to make the results for CDS spread more easily comparable with equity returns. Thus, a positive return change is "good news" for the CDS, since if the quoted spread reduces, the riskiness of the reference entity reduces. The formal calculation is the following:

$$R\_CDS_{i,t} = -(CDS_{i,t} - CDS_{i,t-1}) \tag{2}$$

where $R\_CDS_{i,t}$ is the (minus) first difference at time t for bank i, and $CDS_{i,t}$ is the CDS price at the day t (closing price) for bank i. CDS prices are expressed conventionally in basis points.

3.1 Event study methodology

We define two relevant time intervals, or windows, to estimate the normal returns and the abnormal returns: the estimation window and the event window. The estimation window includes a period that is before the event and has two characteristics, namely it is not contaminated by events of the same

type and is reasonably long to obtain efficient estimations of the regressions' coefficients. The event window includes the event date and a number of days before and after, in order to estimate not only the effect of the announcement at the day of event, but also anticipated or delayed reactions. On the one hand, it can be that the market fully anticipates the event, thus at the day of the event, no reaction is captured by the model. On the other hand, the market does not anticipate the event but slowly incorporates the information into the prices. In practice, the reaction at bank level depends from many factors, including also the liquidity of the stock (or CDS) in the market, or the goodness of the fit of the market model. We include different specifications of the event window, which varies from five days before the event to five days after the event. The estimation window is fixed at 150 trading days, and ends six days before or two days before the event, depending on the model estimated. The timing of the announcements related to the designation of G-SIBs allows us to have non-overlapping estimation windows, which thus ensures that the estimated beta coefficients are not contaminated by events of the same type. The estimation of the abnormal return, or the actual return of the bank in the event window minus the normal return over the event window, represents the expected return regardless the event. For each bank i and event j at time τ_j the abnormal return (AR_{i,τ_j}) is defined as:

$$AR_{i,\tau_j} = R_{i,\tau_j} - \mathbb{E}[R_{i,\tau_j}|X_{\tau_j}] \tag{3}$$

where R_{i,τ_j} represents the actual return (equity or CDS returns) and $\mathbb{E}[R_{i,\tau_j}|X_{\tau_j}]$ represents the normal return conditioned to the information X_{τ_j} included in the estimation window. To calculate the expectation in the formula above, we regress the return of the relevant market to obtain an estimation of the sensitivity of the bank price to the market. The model reads as follow:

$$R_{i,\tau_j} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t} \text{ with } \mathbb{E}[\epsilon_{i,t}] = 0 \text{ and } var(\epsilon_{i,t}) = \sigma^2_{\epsilon_{i,t}} \tag{4}$$

where $R_{m,t}$ represents the return of the market, $\epsilon_{i,t}$ the error term with zero mean and variance equal to $\sigma^2_{\epsilon_{i,t}}$. Hence, the abnormal returns are calculated as:

$$AR_{i,\tau_j} = R_{i,\tau_j} - (\alpha_i + \beta_i R_{m,t}) \tag{5}$$

The choice of the most suitable market index is crucial to obtain reliable estimations of the normal and then abnormal return. The market indices used for the present analysis will be discussed in Section 3.4. To draw conclusions

at the event level, we compute the following aggregated statistics. First, for a given bank i we define the Cumulative Abnormal Return $CAR_i(\tau_{1_j}, \tau_{2_j})$ for the event τ_j as the abnormal returns cumulated from τ_{1_j} to τ_{2_j}, that represents the beginning and the end of the event window.

$$CAR_i(\tau_{1_j}, \tau_{2_j}) = \sum_{\tau=\tau_{1_j}}^{\tau_{2_j}} AR_{i,\tau} \tag{6}$$

We also define the Average Abnormal Return (AAR) and the Cumulated Average Abnormal Return ($CAAR$) as the arithmetic average of the abnormal returns and cumulated abnormal returns, respectively, for each event j that occurs at time τ_j across banks i:

$$AAR_{\tau_j} = \frac{1}{N} \sum_{i=1}^{N} AR_{i,\tau} \tag{7}$$

$$CAAR(\tau_{1_j}, \tau_{2_j}) = \frac{1}{N} \sum_{i=1}^{N} CAR_i(\tau_{1_j}, \tau_{2_j}) \tag{8}$$

In our empirical applications we test the following four hypotheses, focused on $CAAR$.

$$\begin{array}{ll} H_0{:}CAAR(\tau_{1_j},\tau_{2_j})=0 & H_1{:}CAAR(\tau_{1_j},\tau_{2_j})\neq 0 \\ H_0{:}CAAR^{\text{G-SIB}}(\tau_{1_j},\tau_{2_j})=CAAR^{\text{noG-SIB}}(\tau_{1_j},\tau_{2_j}) & H_1{:}CAAR^{\text{G-SIB}}(\tau_{1_j},\tau_{2_j})\neq CAAR^{\text{noG-SIB}}(\tau_{1_j},\tau_{2_j}) \end{array} \tag{9}$$

The first test verifies whether the event has an impact on the cumulated return of the sample banks, i.e. whether the CAAR are different from zero. The second hypothesis test whether the group of G-SIBs banks react differently compared to the group of non-G-SIBs. For the first test we carried out a number of parametric and non-parametric tests to verify whether the cumulative average abnormal returns are statistically different from zero. We apply seven tests: the standard T-test, the adjusted Patell test (Kolari and Pynnönen (2010); Patell (1976)), the adjusted BMP test (Kolari and Pynnönen (2010); Boehmer et al. (1991)), the Wilcoxon rank test (Wilcoxon (1945)) and the general sign test (Cowan (1992)), the Generalized Rank T-test and the Generalized Rank Z-test (Kolari and Pynnonen (2011)). The second test compares the CAAR for the G-SIB and non-G-SIB groups and

we employ the independent 2-groups t-test, the Mann-Whitney-Wilcoxon test and the Kruskal-Wallis test (Hollander et al. (2013)). These tests are aimed to provide a statistical assessment of the different behavior of the two groups. In other words, if the market reaction with respect to the banks included in the list of G-SIBs is different compared to the banks excluded, hence signaling that the status of being a G-SIB has an impact compared to the non-G-SIB, especially for the debt holders.

3.2 Panel regression

The second methodology developed in this analysis relies on a panel regression, where we also include controls for different characteristics of the bank itself and the general market conditions. The advantage of this methodology is that it allows estimating the effect of the events in a single model and, in addition, comparing the effect of the events among different groups of banks. To assess the effect of the events, we introduce a set of dummy variables, one for each event, that takes the value of one around the event dates and zero otherwise. To take into account the different impact across groups of banks, we introduce a set of interaction terms. More formally, we estimate the following model:

$$\begin{aligned} R_{i,t} =& \alpha_i + \beta_1 R_{m,t} + \beta_2 GSIB_{i,t} + \beta_{3,n} D_{t,n} + \beta_{4,n}(D_{t,n} \cdot GSIB_{i,t}) \\ &+ \beta_5 TA_{i,t} + \beta_6 SOV_{i,t} + \epsilon_{i,t} \\ & \text{where } \mathbb{E}[\epsilon_{i,t}] = 0 \text{ and } var(\epsilon_{i,t}) = \sigma^2_{\epsilon_{i,t}} \end{aligned} \tag{10}$$

where $R_{i,t}$ represents the return (CDS first difference, or log return for equity) for the bank i at time t, α_i the specific intercept term, one of each bank, $R_{m,t}$ represents the return of the market, $GSIB_{i,t}$ a dummy that takes the value of 1 when bank i at time t is designated as a G-SIB. The latter variable maintains the value of 1 as long as the bank is included in the list, and zero if it is excluded. The variables $D_{t,n}$ represents a set of n dummy variables, one for each relevant event. The n interaction terms $D_{t,n} \cdot GSIB_{i,t}$ allow to test the null hypothesis that the average return of the non-G-SIBs differs from the one of the G-SIBs. In case it is statistically significant, is also yields the size and the direction of the reaction of G-SIB compared to the others. As pointed out by Allison (1977), Shaver (2019), and Giesselmann and Schmidt-Catran

(2018), the interpretation of the main effect in the fixed-effect regression with interaction terms might be bias, but the interaction term itself is not. For that reason, we mainly discuss our results considering only the interaction terms in the panel regressions.

As control variables, we include $TA_{i,t}$ that corresponds to the (yearly) log of total asset of each bank to control for the size, and $SOV_{i,t}$ is the returns of the correspondent sovereign CDS, which is country-specific. Finally, $\epsilon_{i,t}$ is the error term with zero mean and variance equal to $\sigma^2_{\epsilon_{i,t}}$. In our specification, the market index is the same for all banks, thus the model can be estimated using Ordinary Least Square (OLS). We pool all events and banks in a panel dataset, and we restrict our analysis on a 160 window before the event, adding at the end of the window three days, one before the event, one at the day of the event, and one after the event. With this framework, we can capture the average abnormal returns in the surrounding of the events, also controlling for the country riskiness related to each bank. In each specification, we use fixed effects by bank, and robust standard errors clustered at bank level.

The baseline estimation includes all the banks in our sample; however, we run the same analysis also in a subset of banks, based on the value of the GSIBs score estimated using BCBS data and the inclusion/exclusion of the banks in the final list (see Appendix C for a description of the subset). The regression model is:

$$\begin{aligned} R_{i,t} =& \alpha_i + \beta_1 R_{m,t} + \beta_2 IE_{i,t} + \beta_{3,n} D_{t,n} + \beta_{4,n}(D_{t,n} \cdot GSIB_{i,t}) \\ &+ \beta_5 TA_{i,t} + \beta_6 SOV_{i,t} + \epsilon_{i,t} \end{aligned} \tag{11}$$

$$\text{where } \mathbb{E}[\epsilon_{i,t}] = 0 \text{ and } var(\epsilon_{i,t}) = \sigma^2_{\epsilon_{i,t}}$$

where the additional dummies $IE_{i,t}$ indicates whether a bank is included or excluded from the FSB list. The choice of the subsample and the related analysis will be presented in Section 4.3.

3.3 Data

Data on CDS spreads[2] come from the Intercontinental Exchange (ICE) of CMA Datavision, which provides quotes for 650 distinct reference entities,

[2]In this paper we use interchangeably the terms "CDS quotes", "CDS prices" and "CDS spreads", albeit we only observe bid and ask quotes of CDS. For our analysis, we used the mid quotes.

including financial and non-financial companies. Such database includes information on restructuring clauses (XR = No Restructuring CR = Old /Full Restructuring MR = Modified Restructuring MM = Modified Modified Restructuring, both for the 2003 and 2014 definitions), seniority (senior or subordinated debt), with and without upfront, and with different levels of coupon, usually related to the riskiness of the reference entity and the actual level of CDS spread.[3] The present analysis focuses on single-name CDS on senior and subordinated debt of 131 European banks. All contracts considered are in EUR, for five-years maturity and contain the MM restructuring clause, (the contents of which changed with ISDA standards in September 2014). We apply several data quality checks and cleaning procedures to the initial raw dataset, given that during our sample period, banks changed their names, merged or were acquired by other entities. Moreover, data were not available for all banks for each date, with subordinated debt being available for fewer banks than senior debt CDS quotes. The dataset on CDS quotes consists of daily data from 1 January 2007 to end-January 2018 for senior debt for 89 banks and for subordinated debt for 65 banks.

Equity prices are closing prices obtained from Bloomberg. Data are available only for listed banks and our sample includes 55 banks, 16 of which are G-SIBs.

It is worth highlighting that three banks needed a tailor-made analysis. During the sample period, Dexia CDS quoted spread over-react in the sample period due to the sale of Dexia Bank Belgium to the Belgian State, and the subsequent orderly resolution plan by the European Commission of end 2012.[4] For this reason, Dexia is not included in our final dataset. Regarding the CDS quotes of Natixis[5] and BPCE, Banque Populaire and Caisse d'Epargne merged on 2012 and, given that the spread is populated for BPCE only after 2015, we merged the time series of BPCE and of Natixis and used a unique series for both banks, renamed as Natixis (BPCE Group).

After merging the CDS and equity prices datasets, we end up with a final

[3]For details about the 2014 Credit Derivatives Definitions, see "ISDA Frequently Asked Questions 2014 Credit Derivatives Definitions & Standard Reference Obligations" available at `https://www.isda.org/a/ydiDE/isda-2014-credit-definitions-faq-v12-clean.pdf`.

[4]See the press release of Dexia available at `http://www.dexia.com/EN/journalist/press_releases/Pages/Ongoing_restructuring_of_the_Dexia_Group.aspx` and the European Commission Press Release IP/12/1447 of 28 December 2012.

[5]Natixis was the investment bank of both Banque Populaire and Caisse d'Epargne.

dataset that includes 46 banks with observations for all three variables (senior and subordinated CDS spreads and equity prices) spanning from January 2007 to January 2018. Table 3 shows selected summary statistics of the data: average values, corresponding standard deviations in brackets and the range of the 5th – 95th percentiles. The first column refers to the entire sample of banks and the second one to those banks that are always included on the list of G-SIBs (that is both on all official as well as the leaked unofficial lists). Holders of equity and debt of G-SIBs have fared slightly better than holders of equity and debt of other banks, on average.

Table 3: Summary statistics

Note: StDev stands for standard deviation and $p_{0.05}$ and $p_{0.95}$, respectively, for the 5^{th} and 95^{th} percentile. Statistics for CDS are expressed in percentage points.

	All sample banks	Banks always considered G-SIBs
Number of banks	46	13
Average equity return (StDev)	0.01% (3.59%)	0.032% (3.204%)
($p_{0.05}$, $p_{0.95}$) equity return	(-4.62%, 4.636%)	(-3.91%, 3.981%)
Average subordinated CDS change (StDev)	-0.035 (104.32)	0.045 (12.5)
($p_{0.05}$, $p_{0.95}$) Subordinated CDS change	(-17.36, 16.920)	(-15.17, 14.90)
Average senior CDS change (StDev)	0.03 (28.59)	0.038 (6.47)
($p_{0.05}$, $p_{0.95}$) Senior CDS change	(-11.615, 11.385)	(-9.10, 9.11)
MSCI index return (StDev)	0.031% (1.083%)	
Itraxx index return (StDev)	0.04 (3.48)	

It is worth highlighting that the criteria adopted to construct the sample makes it biased towards the largest banks (it is in fact more likely that large banks are the reference entity of CDS contracts or have their equity quoted). This is confirmedby observing that, out of the 33 banks not always G-SIBs, 24 have been classified by EBA[6] as Other Systemically Important Institutions

[6]see https://eba.europa.eu/risk-analysis-and-data/other-systemically-important-institutions-o-siis-

(O-SII) in the years 2015-2018.

3.4 Construction of market reference indices

The methodology discussed in Section 3.1 relied upon a market index to estimate abnormal returns. This section discusses the indices used as market references for CDS and equity.

The reference index for the equity market is the MSCI Europe, which includes large and mid-cap companies across 15 countries in Europe.[7] The ideal market index for CDS would be the ITRAXX Europe Index, compiled by IHS-Markit, which includes the 125 most liquid European CDS.[8] This index changes composition each six months and thus we develop a methodology to reconstruct a stable pseudo-ITRAXX indices for the senior and subordinated CDS. To build these indices, we select all entities (financial and non-financial) such that (i) their CDS quotes are available in our dataset, and (ii) they belong to the ITRAXX components for at least five 6-months rolling windows from 2009 to 2018[9]. We subsequently aggregate the CDS quotes by means of an arithmetic average. These indices comprise all entities included in the ITRAXX for which we have available CDS quotes, both financial and non-financial. Following the criteria used to construct the ITRAXX, we require a firm to be present in the list of components for at least five 6-months rolling windows from 2009 to 2018.

Figure 1 shows the sector composition of our indices.[10] This approach allows us constructing two indices, one based on the senior CDS (referred to in the following as "pseudo-ITRAXX senior") and another one based on subordinated CDS ("pseudo-ITRAXX subordinated").

Ideally, the pseudo-ITRAXX senior index might be a proper market index for the senior CDS returns and the pseudo-ITRAXX subordinated for the subordinated CDS returns. However, subordinated CDS are available mainly for large banks and are very scarce for non-financial corporates, thus we do

[7]The index covers about 85% or the market capitalization of each country. See for details `https://www.msci.com/europe`.

[8]See `https://ihsmarkit.com/products/markit-itraxx.html` for details on the Index characteristics.

[9]ITRAXX components are renewed every 6 months, based on the liquidity of the underlying reference entities.

[10]All quotes considered are in EUR, five-year maturity and with MM restructuring clause. The coupon and the upfront are selected according to data availability.

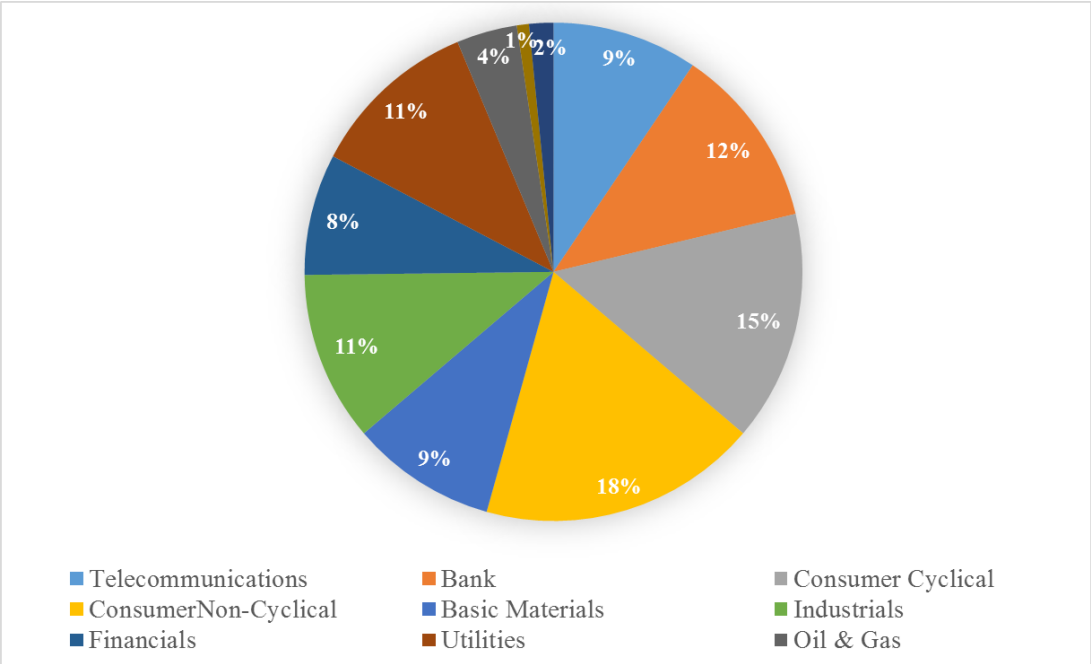

Figure 1: Sector composition of pseudo-ITRAXX indices

not deem to use the subordinated index as an appropriate market index, since using it could bias the estimation of the abnormal returns. Therefore, we use the pseudo-ITRAXX senior index as a market index also for the subordinated CDS abnormal returns.

Figure 2 shows the evolution of the two pseudo-ITRAXX indices and the MSCI Europe. To facilitate the comparison of results for the equity market with those for the debt markets, we multiply the CDS indices by -1. It implies that an increase in the (multiplied by minus one) CDS indices and the equity index can be both interpreted as "good news" for debt and equity holders, respectively. The figure shows that the historical development of the pseudo-ITRAXX senior (multiplied by minus one) and the MSCI Europe are broadly similar, while the pseudo-ITRAXX subordinated debt index exhibits more volatility. The pseudo-ITRAXX subordinated index is mainly composed by G-SIB banks, which reflects the observation that most subordinated CDS contracts in our sample are written on financial institutions and in particular banks. For that reason, we will consider the pseudo-ITRAXX

senior index as market reference in the subsequent empirical analysis for both senior and subordinated individual CDS spreads.

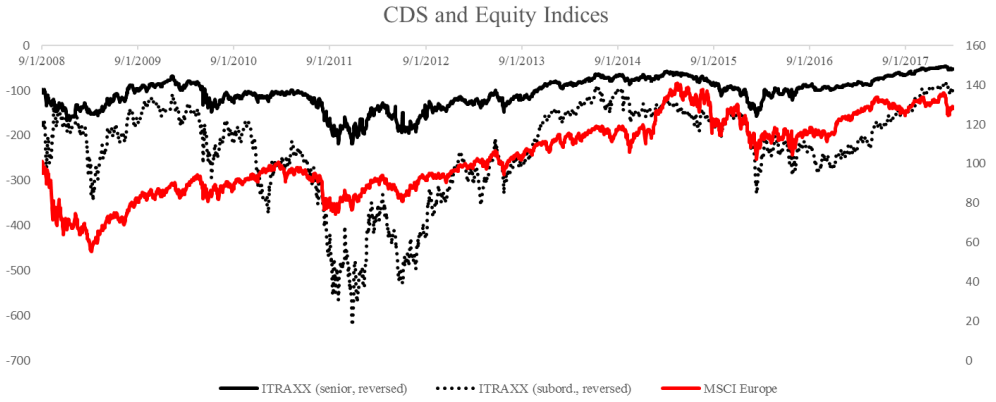

Figure 2: CDS and Equity Indices

4 Results

4.1 Event-study analysis

We begin to discuss our results starting from the standard Event Study methodology, where for each bank and each event, we compute the abnormal return (AR) and we aggregate them across events and groups of banks. More specifically, we selected as a baseline the event window size equal to $(-1; +1)$, which includes three days and centred on the event day. We compute the cumulated impact of each event (CAAR) independently and we distinguish between banks classified as G-SIBs in that given event and the "other" banks. Table 4 presents results on the CAAR.[11] We provide an overall statistical assessment for the goodness of fit for the market model in Appendix A. Using the cumulated return (CAR) rather than the average across the window size, we take into account that the market reaction to the publication of the list can be anticipated or delayed.

Each column presents results for a single event and separate results are reported for the three types of bank samples considered in the exercise (equity, subordinated and senior debt). In the discussion of the results, we focus on the difference in terms of market reaction between the banks that have G-SIB status at a specific point in time, and "Other" banks (grey rows in the tables and tests below). Rows labelled "Difference G-SIBs - other" report the difference of the CAAR computed for all G-SIBs and the CAAR of the "other" banks. If being a G-SIBs is beneficial, we expect that the market reaction of the G-SIB banks is more positive or less negative than for non-G-SIBs. To distinguish between these two cases, we include in the tables the CAAR for both G-SIBs and non-G-SIBs.

[11] Results and statistics for the AAR are provided in Table 10 of Appendix B.

Table 4: Market reaction around ten designation-related events (CAAR, -1 +1 window)

Notes: Absolute returns over the event window and their statistical significance. CAAR reported is for three-days (-1:+1) cumulative abnormal return. We report also a set of tests for the average difference between G-SIBs and other banks. The value of the difference, together with the t-test significance, is reported under "Difference". For the t-test, Mann-Whitney and Kruskal-Wallis comparison test, the value represents the test statistic with significance. Equity return are expressed in percentages, while CDS returns are expressed as a first difference in basis point.

		Pre-designation: leaked list			Post-designation: official list						
Bank sample	Bank	Publication of leaked FSB list of 24 G-SIBs by Financial Times 30 Nov. 2009	Re-publication of leaked FSB list of 24 G-SIBs by Financial Times 10 Nov. 2010	Publication of the G-SIBs methodology 19 July 2011	Official publication of initial list of G-SIBs by FSB 4 Nov. 2011	Update of G-SIBs list by FSB 1 Nov. 2012	Update of G-SIBs list by FSB 11 Nov. 2013	Update of G-SIBs list by FSB 6 Nov. 2014	Update of G-SIBs list by FSB 3 Nov. 2015	Update of G-SIBs list by FSB 21 Nov. 2016	Update of G-SIBs list by FSB 21 Nov. 2016
G-SIB	Equity	-0.763	-2.438 ***	2.043 **	-1.495 *	-1.129 **	0.611	-2.806 ***	-1.114	-0.135	-0.706
Other	Equity	-1.233	-1.815 ***	3.094 ***	0.551	-1.752 **	0.668	-3.623 ***	0.351	-0.637	-1.169 ***
Difference G-SIB-Other	Equity	0.469	-0.623	-1.051	-2.047	0.624	-0.057	0.817	-1.465	0.501	0.463
T-test	Equity	36.252	44.419	41.715	45.306	42.879	44.982	32.388	43.744	37.702	32.99
Mann-Whitney	Equity	173	237	234	310	198	269	196	248	197	168
Kruskal-Wallis	Equity	1.599	0.049	0.023	1.005	0.65	0.222	1.03	0.132	1.262	1.12
G-SIB	Subord	1.826	-13.342 ***	1.052	-1.082	5.837 ***	2.327 *	-0.336	-4.715 ***	3.247 **	2.633 ***
Other	Subord	-5.569 **	-60.233 ***	-13.913 **	5.215	14.613	3.931 *	-0.214	-1.671	-7.907	2.787 ***
Difference G-SIB-Other	Subord	7.395	46.891	14.965	-6.296	-8.776	-1.604	-0.122	-3.044	11.153	-0.154
T-test	Subord	31.972 **	22.42 *	28.689 **	12.297	21.933	33.33	30.188	40.04	27.96	37.631
Mann-Whitney	Subord	54 ***	114	85	84	174	183	175	298 *	131 **	160
Kruskal-Wallis	Subord	8.548 ***	1.367	2.182	0.006	0.28	0.001	0.521	3.089 *	4.053 **	0.389
G-SIB	Senior	1.134	-3.711 ***	3.014	0.088	-0.796	-0.005	-2.186 ***	-2.775 ***	0.528	1.514 ***
Other	Senior	-3.733 **	-18.754 ***	-0.961	-13.157	11.853	1.95	1.144	-7.154	0.358	1.878 ***
Difference G-SIB-Other	Senior	4.867	15.043	3.975	13.244	-12.65	-1.955	-3.33	4.379	0.17	-0.363
T-test	Senior	41.532 ***	31.93 **	29.584	27.403	29.998	34.708	34.142 *	32.387	37.074	34.63
Mann-Whitney	Senior	104 **	126 **	144	240	329 **	248	352 **	297	237	186
Kruskal-Wallis	Senior	6.29 **	4.217 **	1.133	0.223	4.213 **	0	4.408 **	1.212	0.055	0.194

The differences in CAAR (Table 4) diverge substantially across bank samples. For equity we do not find significant differences, while for subordinated and senior CDS spreads, we observe significant differences for some events. This could indicate that CDS markets entail more information compared to equity markets, or that the credit default swap market is more sensitive to such events compared to the equity. This observation does not confirm the findings of Moenninghoff et al. (2015) as they found that equity reacted significantly different for the G-SIB and non-G-SIB banks in the first three events. It should however be stressed that our sample only comprises European G-SIBs, while their results are mainly driven by non-European G-SIBs.

Looking at the CDS, we find a significant positive difference for senior and subordinated debt for the two leaked lists. It should be, however, noticed that for the second leaked list, we only find that one difference test is significant for subordinated debt. It is also interesting to see that for the first event the CAAR of G-SIBs is positive, while for "Other" banks it is negative. For the second leaked list this is not the case. Both the CAAR are negative, but the CAAR of "Other" banks are much more negative. It seems thus that CDS markets incorporated the information of the leaked lists and believed that being a G-SIB is beneficial at the time of the publication by the Financial Times.

The publication of the G-SIB methodology does not seem to have a different impact on G-SIBs or non-G-SIBs. Only the t-test on the difference for subordinated debt is significant. For the other events we do not find that they are consistently (same sign) significantly different for senior and subordinated debt. This supports the argument of Moenninghoff et al. (2015) that the publication of the G-SIB list becomes less and less informative over time. It is clear that certain big banks like HSBC or Deutsche Bank will be in the G-SIB list and thus the information content is limited for these banks. For banks that could drop out or enter in the list there should be more information content (see Section 4.3).

For robustness purposes, Table 11 show the same results for a different window size, namely $(-5; +5$ window). Figures let us conclude that our main findings are robust with respect to the size of the windows.

The above discussion of results mainly focused on the different reactions between the G-SIB and other banks. To complete the analysis, we also tested whether the selected events have a significant impact, i.e. CAAR are different from zero. In Table 4, we included the values of CAAR and the significance of the standard t-test, but we also implemented the parametric

and non-parametric tests discussed in Section 3.1. The results of these tests are presented in Table 12 and Table 13 of Appendix B. We find that in most cases the T-test is consistent with the two non-parametric tests (Gsign and Wilcoxon), while in other cases the Patell and BMP test cannot reject the null hypothesis of an CAAR equal to zero. In general, the reaction of G-SIB banks displays stronger significance for the subordinated CDS market, where all but one event (the publication of the methodology) have at least one test significant. The strongest events in terms of significance across bank samples are the re-publication of the leaked list by the Financial Times, and the 2017 list. The same conclusions apply to the non G-SIBs. As pointed out before, the results are not always consistent between the equity and the CDS. For the latter, the most common reaction is a negative coefficient, meaning that during the time of the event, the spread increase significantly, implying an increase of the riskiness of the bank (insure against the default of the bank become more expensive). Besides the value perceived by the shareholders and reflected in the equity price, debt holders appear to be more sensitive to the designation events.

4.2 Panel regression analysis

The present section aims to provide additional empirical evidence of the market reactions to the events related to the designation of a bank as a G-SIB. Following the model discussed in Section 3.2, we run a set of different panel regressions, introducing the interaction terms between the G-SIB status and the dummy that identifies the single events, including one day before and one day after the release (three days in total). The results are presented in Table 5 and are divided into three blocks. Each column refers to a different market (equity, senior and subordinated CDS). The first block displays the main effects of the events on the non-GSIB banks. The second block includes the dummy variable that identifies the G-SIB status and the interaction terms for each event. The third block contains the coefficients of the control variables, namely the market return (MSCI for the Equity, ITRAXX for the CDS) to control for the market conditions; the log of total asset for each bank (end of the year) to control for the bank size; and finally, the country-specific sovereign CDS for each bank, that allows to control for the additional riskiness of the bank that comes from the home countries.

Considering the three markets, the reaction of the sample of banks is in general negative. In addition, most of the cases do not have a statistically

different reaction between the two groups of banks, with some notable exceptions. The first exception regards the publication of the methodology in 2011, where the equity market of non-G-SIB banks do not statistically react (the overall reaction coefficient is the sum of the main effect reported in the first block and the constant reported in the third block). Compared to the other group, G-SIB banks react in a negative way (the overall reaction coefficient is given by the sum of the main effect shown in the first block, the interaction term reported in the second block and the constant reported in the third block): in fact, the coefficient for the interaction term is negative and significant. A similar result is also confirmed by the senior CDS. G-SIBs and non-G-SIBs show a negative reaction, but with a lower magnitude for the G-SIB, as the coefficient of the interaction term is positive, but smaller compared to the dummy for the event. The same situation, but with opposite signs, occurs for the publication of the list in 2013, where the reaction of the equity market is positive, though less pronounced, for the G-SIB banks. A similar positive reaction occurs in the list of 2014 for the senior and subordinated CDS of non G-SIBs, as opposed to the Equity, which is reacting with opposite sign. The negative reaction is however consistent with the coefficient for the G-SIB (negative and significant), and it can be explained with regard to the weight that the banking system is having on the Equity index, which is higher compared to the CDS index. To complete the description of results, Table 6 summarizes, for all events considered in the analysis, the predictive margin estimated for G-SIBs and other banks (non G-SIBs).

Given the different methodology and the additional control variables that we add for the regression, a direct comparison with the Event Study methodology is not possible. Nevertheless, most of the results from the previous analysis have the same sign and a similar magnitude. The three control variables are all significant and with the expected sign: the market index and the sovereign CDS return have a positive coefficient. The total asset, which controls for bank size, have a negative coefficient, indicating that bigger banks react less than smaller banks. In addition, we use also the fixed effect estimation to control for banks heterogeneity. More generally, for the first three events and for the CDS market, G-SIB appears to have a different reaction: their quoted CDS react less than the other banks, signalling a potential different treatment from the market participants. A bank that is included in the list has to meet stricter requirements in terms of capital and regulatory scrutiny. The CDS market might recognize the status of G-SIB as an additional insurance, and charging a risk premium on banks that do

not have the status. In this view, the new regulation has positive externalities for the debt market, enhancing the resilience of the systemic banks and reducing the potential pitfalls in case of a severe crisis. The last event in our sample (the publication of the 2017 list) appears to have a positive effect for all banks, in the aftermath of a revised framework to calculate the G-SIB score from the BIS.[12]

One potential explanation relies on the fact that there has been an improvement for some banks, that moves to a lower bucket (thus implying a reduction of additional capital buffers). In addition, according to the Basel III Monitoring Report of September 2017, "all banks in the sample meet both the Basel III risk-based capital minimum Common Equity Tier 1 (CET1) requirement of 4.5% and the target level CET1 requirement of 7.0% (plus any surcharges for G-SIBs, as applicable)"[13], testifying that systemic banks are reducing their systemic footprint and reduce their default risk. On the other side, this additional capital effort might be viewed by the equity market as a potential weakness for the overall profitability. This might explain why the equity market overall reacts negatively to the event.

4.3 Abstracting from "the obvious" to obtain more precise estimates

Table 2 presented in Section 2 suggests that the list does not vary a lot in terms of constituents from one year to another. In fact, in the case of many banks in the sample, it appears obvious that they are either part of that list or not. In those "obvious" cases, updates of the list contain limited "news". Examples are banks that are so large that they would be expected to always figure on the list (e.g. HSBC, Deutsche Bank, BNP Paribas) and banks that have such a limited global systemic footprint that they would never be considered G-SIBs. More interesting are the cases between these two groups, that is banks that might or might not be considered G-SIBs. To focus on these cases, we use the scores on bank systemic importance estimated using data published by the BCBS and select a sub-sample of altogether eleven

[12]See the BIS proposal on the "Consultative document Global systemically important banks - revised assessment framework" of March 2017 and the subsequent new methodology.

[13]See the "Basel III Monitoring Report September 2017" Basel Committee on Banking Supervision available at `https://www.bis.org/bcbs/publ/d416.pdf`

banks with scores around the cut-off threshold of 130.[14]

Table 7 provides estimates of panel regression models for this sub-sample, identifying when banks have changed status compared to the previous date. We estimate the difference in results for banks that are "switching in" and "switching out" of the list, with the baseline being banks that remain unchanged. The complete list of banks included and excluded has been presented in Section 2. We focus in particular on the results related to the interaction terms, which allow us to assess whether there are differences between the switching banks and the other banks.

We first focus on cases where banks have been newly included in the list. We do find that only for the first event ("Switch IN # Initial list of G-SIBs by FSB (Nov 2011)" in Table 7) there is a significant reaction for the senior CDS. Compared to the banks that do not change status, the sign of the coefficient for senior CDS is the opposite but with comparable order of magnitude. Thus, in this case, the estimation suggests that there is value for the banks newly included in the G-SIB, and the (senior) credit market recognizes a positive premium (reduction in the spread) for those banks. The equity market and the subordinated CDS market do not react to this event in our framework. For the second event ("Switch IN # Update of G-SIBs list (2012)" in Table 7), that is the publication of the 2012 list, there are no significant different reactions for the banks that have been included and the other banks. However, the coefficients of the event dummies are significant and positive for both senior and subordinated CDS ("Update of G-SIBs list (2012)" in Table 7). The order of magnitude of the reaction is slightly higher for the non-switching banks.

Next, we discuss the results in instances where banks have been excluded from the list, which occurred altogether four times (considering that the composition of the leaked list is the reference for the first official list). In the case of the publication of the first official list, results for equity and credit markets differ. Exclusion is bad news for equity holders but not for creditors, as the interaction term for equity is negative and significant for dropped banks only. There is no difference between the two groups for senior debt; subordinated debt of dropped banks reacts positively, while that of the remaining banks react negatively. On the occasion of the 2012 update of the list, the equity market does not react to exclusions; by contrast, subordinated debt market reacts very positively. One potential explanation of the reaction

[14]The construction of the sub-sample is explained in more details in Appendix C.

in subordinated debt markets is that the commitment of the no-longer G-SIB banks to change their business models and reduce the riskiness of the activity was credible. For instance, just a week after the publication of the 2012 G-SIBs list, Commerzbank issued a press release stressing a change in their business model, reducing costs and emphasizing that the core capital will exceed regulatory thresholds.[15]

That being said, the interpretation of the results for excluded banks on the occasion of the 2015 and 2017 updates is different. In both these cases, exclusion of banks meets with negative reactions in both markets for senior and subordinated debt ("Switch OUT # Update of G-SIBs list (2015)" and "Switch OUT # Update of G-SIBs list (2017)" in Table 7). Looking at the predictive marginal effects, Table 8 shows that for the 2017 event the overall effect is negative for the banks that switch out, and positive for the others. This observation is consistent with the interpretation that there is a value for bank creditors in seeing "their" bank as part of the G-SIB list, while exclusion from the list might increase the perceived riskiness of the debt of banks.

Comparing our results with the existing literature, we do not arrive at the conclusion of Bongini et al. (2015) and Moenninghoff et al. (2015), i.e. there was little additional information in the updates of the G-SIBs list. If we limit our sample to the banks that might or might not be designated as a G-SIBs, we find significant market reactions for banks that are included and excluded from the list. Especially exclusion from the G-SIBs list seems to have a negative impact on both the CDS and equity prices of the impacted banks. Hence, we need to conclude that there is still some information content in the yearly publication of the G-SIBs list.

[15] See `https://www.commerzbank.com/en/hauptnavigation/aktionaere/service/archive/ir-nachrichten_1/2012_7/ir_nachrichten_detail_12_29837.html`. While the press release was only published following the period under investigation, it might be reflective of an ongoing effort of Commerzbank to stress its efforts to change towards a less risky business model. The exclusion of the bank from the G-SIB list might perhaps be seen as a form of official endorsement of the credibility of the announced trend change in bank business model towards one with enhanced credit strength and more limited risk.

Table 5: Panel regression with the full sample of banks

VARIABLES	(1) Equity	(2) Senior CDS	(3) Subordinated CDS
Events			
First Leaked List (2009)	-0.625***	-1.192***	-1.964***
	-0.215	-0.393	-0.658
Second Leaked List (2010)	-0.542*	-6.772**	-18.854**
	-0.272	-2.672	-7.788
Publication of the G-SIB methodology (Jul 2011)	0.549	-11.035***	-9.492
	-0.353	-3.497	-5.661
Publication of initial list of G-SIBs by FSB (Nov 2011)	-0.854**	-1.683	-3.757
	-0.366	-1.592	-2.867
Update of G-SIBs list (2012)	-0.055	3.090***	7.073**
	-0.217	-1.044	-2.66
Update of G-SIBs list (2013)	0.597***	0.071	0.751
	-0.151	-0.287	-0.649
Update of G-SIBs list (2014)	-0.888***	1.669*	2.730*
	-0.2	-0.858	-1.606
Update of G-SIBs list (2015)	0.006	-0.652	-1.027
	-0.148	-0.443	-1.185
Update of G-SIBs list (2016)	-0.447**	-0.17	-1.856
	-0.198	-0.451	-3.066
Update of G-SIBs list (2017)	-0.434**	0.305*	0.849**
	-0.18	-0.174	-0.382
Interaction Terms			
GSIBS	-0.089	-0.193**	-0.251
	-0.054	-0.081	-0.304
GSIBS # First Leaked List (2009)	0.538	1.121**	1.663**
	-0.327	-0.467	-0.702
GSIBS # Second Leaked List (2010)	-0.23	5.494**	14.913*
	-0.333	-2.696	-7.981
GSIBS # G-SIB methodology (Jul 2011)	-1.194***	8.361**	6.286
	-0.42	-3.458	-5.219
GSIBS # Initial list of G-SIBs by FSB (Nov 2011)	0.637	1.529	4.919
	-0.532	-1.793	-3.083
GSIBS # Update of G-SIBs list (2012)	0.095	-1.968*	-2.799
	-0.247	-1.037	-2.568
GSIBS # Update of G-SIBs list (2013)	-0.431**	-0.419	-0.761
	-0.198	-0.385	-0.845
GSIBS # Update of G-SIBs list (2014)	0.312	-1.618*	-1.916
	-0.262	-0.889	-1.669
GSIBS # Update of G-SIBs list (2015)	-0.44	-0.16	0.428
	-0.274	-0.438	-1.155
GSIBS # Update of G-SIBs list (2016)	0.561**	0.427	2.998
	-0.226	-0.48	-3.06
GSIBS # Update of G-SIBs list (2017)	0.087	-0.058	-0.466
	-0.222	-0.201	-0.607
Control Variables			
Market Return	1.285***	0.689***	0.864***
	-0.045	-0.054	-0.164
Log Bank Total Asset	-0.205**	-0.478*	-3.681*
	-0.094	-0.266	-2.188
Sovereign CDS Return (Country-Specific)	0.047***	0.433***	0.851***
	-0.007	-0.056	-0.295
Constant	2.602**	6.198*	46.966*
	-1.2	-3.379	-27.873
Observations	63,594	62,229	60,987
Adjusted R2	0.24	0.123	0.00335
Bank Fixed Effect	Y	Y	Y
N. Banks	47	47	47

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Predictive margins of the panel regression with the full set of banks

Events	**Equity**		**Senior CDS**		**Subordinated CDS**	
	GSIBS	**OTH**	**GSIBS**	**OTH**	**GSIBS**	**OTH**
First Leaked List (2009)	-0.158	-0.605	-0.170	-1.121	-0.593	-2.052
Second Leaked List (2010)	-0.842	-0.523	-1.375	-6.690	-4.226	-18.908
Publication of the G-SIB methodology (Jul 2011)	-0.715	0.566	-2.767	-10.944	-3.492	-9.565
Official publication of initial list of G-SIBs by FSB (Nov 2011)	-0.287	-0.833	-0.252	-1.610	0.867	-3.841
Update of G-SIBs list (2012)	-0.031	-0.036	1.021	3.153	3.972	6.966
Update of G-SIBs list (2013)	0.095	0.614	-0.447	0.140	-0.303	0.657
Update of G-SIBs list (2014)	-0.646	-0.868	-0.049	1.734	0.520	2.632
Update of G-SIBs list (2015)	-0.504	0.025	-0.909	-0.582	-0.891	-1.117
Update of G-SIBs list (2016)	0.042	-0.428	0.158	-0.100	0.847	-1.944
Update of G-SIBs list (2017)	-0.417	-0.414	0.148	0.373	0.089	0.756

Table 7: Panel regression with subsample of banks based on FSB score: inclusions and exclusions

VARIABLES	(1) Equity	(2) Senior CDS	(3) Subordinated CDS
Events			
Publication of initial list of G-SIBs by FSB (Nov 2011)	0.368	-2.875***	-1.542
	-0.528	-0.709	-1.831
Update of G-SIBs list (2012)	-0.057	1.777*	3.954**
	-0.198	-0.811	-1.635
Update of G-SIBs list (2015)	0.368	-2.875***	-1.542
	-0.528	-0.709	-1.831
Update of G-SIBs list (2017)	-0.32	-0.812***	-0.744***
	-0.403	-0.08	-0.22
Interaction Terms			
Banks Switching IN	-0.064***	-0.109	-0.575*
	-0.019	-0.091	-0.317
Switch IN # Initial list of G-SIBs by FSB (Nov 2011)	-1.479	5.630*	2.855
	-1.043	-2.816	-4.415
Switch IN # Update of G-SIBs list (2012)	0.421	-0.72	-0.758
	-0.414	-0.899	-1.967
Banks Switching OUT	0.042	0.223	-0.085
	-0.044	-0.161	-0.206
Switch OUT # First List (2011)	-1.597*	0.31	3.783
	-0.757	-1.032	-2.39
Switch OUT # Update of G-SIBs list (2012)	0.652	0.684	6.373**
	-0.603	-2.097	-2.134
Switch OUT # Update of G-SIBs list (2015)	-0.890**	-1.429***	-2.341***
	-0.393	-0.245	-0.288
Switch OUT # Update of G-SIBs list (2017)	-0.095	-1.171***	-3.042***
	-0.168	-0.18	-0.429
Control Variables			
Market Return	1.393***	0.758***	1.157***
	-0.061	-0.11	-0.182
Log Bank Total Asset	-0.217***	-0.295	-0.558**
	-0.036	-0.166	-0.232
Sovereign CDS Return (Country-Specific)	0.106***	0.577***	0.812***
	-0.013	-0.035	-0.058
Constant	2.942***	4.072	7.673**
	-0.492	-2.26	-3.149
Observations	15,493	15,720	15,733
Adjusted R2	0.484	0.551	0.415
Bank Fixed Effect	Y	Y	Y
N. Banks	11	11	11

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Predictive margins of the panel regressions with subsample of banks

Events	**Equity**		**Senior CDS**		**Subordinated CDS**	
	IN	**Not Sw.**	**IN**	**Not Sw.**	**IN**	**Not Sw.**
Official publication of initial list of G-SIBs by FSB (Nov 2011)	-1.232	0.31	2.724	-2.796	1.015	-1.263
Update of G-SIBs list (2012)	0.347	-0.006	1.047	1.864	3.018	4.346
	OUT	**Not Sw.**	**OUT**	**Not Sw.**	**OUT**	**Not Sw.**
Official publication of initial list of G-SIBs by FSB (Nov 2011)	-1.223	0.332	-2.107	-2.637	2.337	-1.364
Update of G-SIBs list (2012)	0.661	-0.027	2.698	1.796	10.285	4.000
Update of G-SIBs list (2015)	-1.154	-0.304	-1.97	-0.764	-3.073	-0.663
Update of G-SIBs list (2017)	-0.57	-0.512	-0.708	0.24	-1.872	1.238

5 Conclusions

As part of the response to the recent financial crisis, ending "too big to fail" became a declared policy goal. In this context, the BCBS and the FSB developed a methodology to identify global systemically important banks (G-SIBs). Subsequently, the FSB has started publishing, on a yearly basis, an (updated) list of banks classified as G-SIBs. Banks included in these lists are subject to higher capital charges and to more intrusive regulatory, supervisory and failure resolution regimes than their peers. However, from the previous research in this area, it is not clear whether the effect for a banks' creditors of being part of the list is positive or negative. Some argue[16] that the initial inclusion in the G-SIB list of a bank was positive news for its equity holders, which has been interpreted as a perception of an implicit guarantee for the banks.

The goal of the present paper is to determine if the markets consider the announcement of being classified as G-SIB as a good or bad news. To achieve this goal, we assess the reaction of banks' CDS quotes and of equity prices to the annual publication of G-SIB lists from 2011 to 2017, the publication of the draft methodology in 2011 and the unofficial lists published by the Financial Times in 2009 and 2010. Analysis relies on data for a sample of 47 European banks and markets' reactions are estimated via both an event study and a panel regression approach.

Unlike some of the previous literature, our results do not suggest that inclusion of a bank in the list of G-SIBs is *unequivocally* positive for its debtholders. In fact, inclusion in that list is not always positive, nor its exclusion from it. Our results suggest that the case of a strong cross-institutional effect either way, that is always good or always bad, has weakened over time. The effects of tighter regulatory and supervisory approaches to the G-SIB banks have become more evident, perhaps partly offsetting the effects of the perception of implicit guarantees that might accompany the G-SIB label. Our analysis, focusing on a subset of banks that are close to the cut-off threshold defined by the BCBS/ FSB methodology to identify G-SIBs banks, suggests that the credit market attributes a positive premium to banks included in the G-SIB list, while exclusion of a bank from the list seem to be perceived as an indication of increased riskiness.

For some events, our analysis suggests that results for different types of

[16] See for instance Moenninghoff et al. (2015) or Bongini et al. (2015).

bank samples might point in opposite directions, that is appearing to be good news for equity holders and band news for debt holders and vice versa. We interpret these results in view of the different interest that equity and CDS holder have, that can lead to different reaction in the market. The G-SIB status has a significantly higher regulatory burden, that include additional capital, higher disclosure standards, and a more intrusive scrutiny by the regulators. On the one hand, these additional requirements are strengthening the banks' balance sheets, making them safer and more resilient. On the other hand, the additional regulatory capital and the other measures related to the enhanced regulation might harm the profitability of the bank. We attempt to measure this trade-off, that appears to be crucial in our banking sample. Overall, our results suggest that markets care about the classification of a bank as a G-SIB and it generally recognized a positive premium to them. The aforementioned trade-off is also a regulatory dilemma. In fact, if the financial markets are recognizing that the G-SIBs regulation is effective and reduce the riskiness of the banks, then it might be extended to all the other banks, regardless their systemic importance. This may justify an increase in the supervision. However, the recent development of the banking business, including new technologies and new competitors (i.e. Fintech companies) are harming the banking profitability, that can be further reduced if the regulation is too costly in terms of capital.

That said, the results of the present analysis do not allow us to determine to what extent results are driven by changes in the perception of implicit guarantees as a result of TBTF status or by changes in perceived riskiness as a result of changed capital requirements and actual ratios as well as more intrusive supervisory frameworks. Further research would be necessary to shed light on this issue.

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Appendix A

We analyse a set of statistics to assess the goodness of fit of the market models applied to estimate the abnormal returns (Equations 4 and 5 of Section 3.1). We run a separate regression for each bank i in the dataset and, for each regression, we focus our analysis on the significance of the beta coefficient and the R-squared. In fact, a poor performance of the market model might challenge the results of the event study. Table 9 provides an overview for each bank about the statistical properties of the regressions. The number, reported for each bank and for each source, refers to the average R-Squared value across the ten estimation events. The number in parentheses refers to the proportion of times where the beta coefficient is statistically different from zero at the 5% level (100% means that all the coefficients are statistically significant, thus different from zero). Banks are sorted in alphabetical order, G-SIBs on the top, then banks that do not always belong to the G-SIBs group (status switching banks) and finally those that have never been classified as G-SIBs.

All estimates for G-SIBs banks have strongly significant beta coefficients, and reasonably high average R-squared, with the exception of Nordea Bank for the CDS, where the average R-Squared is lower. As regards other banks, the beta coefficients display a reasonable level of significance for the senior and subordinated CDS in most of the cases: this indicates that the CDS spreads are closely correlated to the pseudo-ITRAXX senior index. For the equity, the choice of MSCI Europe as "market reference" also seems to be appropriate, since the explanatory powers and significance levels are mostly above the usual levels.

Table 9: Overview of inclusion of selected sample banks in the list of G-SIBs

Notes: The number indicated, for each bank and for each source, refers to the average R-Squared value across the ten estimation events. The number in parentheses refers to the proportion of times where the beta coefficient is statistically different from zero at the 5% level (for example, 70% means that beta coefficients are statistically significant thus different from zero, in 7 out of 10 events). For the G-SIBs column, Y indicates that the banks have always been in the G-SIBs list, S stands for switch (the bank enter or exit from the group), N indicates that the bank never appeared in the list.

Bank Name	**G-SIBs**	**Senior**	**Subord.**	**Equity**
Banco Santander S.A.	Y	0.61 (100%)	0.51 (100%)	0.55 (100%)
Barclays Bank Plc	Y	0.54 (100%)	0.49 (100%)	0.46 (100%)
BNP Paribas	Y	0.56 (100%)	0.51 (100%)	0.59 (100%)
Credit Agricole SA	Y	0.59 (100%)	0.51 (100%)	0.48 (100%)
Credit Suisse Group	Y	0.59 (100%)	0.51 (100%)	0.46 (100%)
Deutsche Bank AG	Y	0.56 (100%)	0.45 (100%)	0.51 (100%)
HSBC Bank PLC	Y	0.45 (100%)	0.46 (100%)	0.46 (100%)
ING Bank NV	Y	0.49 (100%)	0.44 (100%)	0.59 (100%)
Nordea Bank AB	Y	0.1 (100%)	0.06 (100%)	0.5 (100%)
Royal Bank of Scotland PLC	Y	0.52 (100%)	0.44 (100%)	0.37 (100%)
Societe Generale SA	Y	0.58 (100%)	0.52 (100%)	0.54 (100%)
UBS AG	Y	0.54 (100%)	0.49 (100%)	0.49 (100%)
UniCredit SpA	Y	0.58 (100%)	0.45 (100%)	0.41 (100%)
Banco Bilbao Vizcaya Argentaria SA	S	0.58 (100%)	0.52 (100%)	0.53 (100%)
Commerzbank AG	S	0.56 (100%)	0.49 (100%)	0.33 (100%)
Lloyds Bank Plc	S	0.53 (100%)	0.49 (100%)	0.38 (100%)
Natixis (BPCE group)	S	0.17 (100%)	0.17 (100%)	0.42 (100%)
Standard Chartered Bank	S	0.47 (100%)	0.44 (100%)	0.37 (100%)
ABN AMRO Bank N.V.	N	0.43 (20%)	0.35 (20%)	0.31 (20%)
Allied Irish Banks Plc	N	0.08 (70%)	0.03 (70%)	0.07 (70%)
Banca Monte dei Paschi di Siena SpA	N	0.45 (90%)	0.41 (90%)	0.26 (90%)
Banca Popolare di Milano SCRL	N	0.24 (90%)	0.22 (90%)	0.3 (90%)
Banco BPI S.A.	N	0.11 (90%)	0.07 (90%)	0.22 (90%)
Banco Comercial Portugues SA	N	0.32 (90%)	0.39 (90%)	0.2 (90%)
Banco de Sabadell SA	N	0.26 (100%)	0.13 (100%)	0.31 (100%)
Banco Popolare SC	N	0.5 (90%)	0.4 (90%)	0.37 (90%)
Banco Popular Espanol SA	N	0.29 (90%)	0.21 (90%)	0.34 (90%)
Bankia SA	N	0.19 (60%)	0.14 (60%)	0.22 (60%)
Bankinter SA	N	0.25 (100%)	0.14 (100%)	0.34 (100%)
BES (2014 Novo Banco)	N	0.32 (60%)	0.31 (60%)	0.23 (60%)
Caja de Ahorros del Mediterraneo	N	0.14 (10%)	0.34 (10%)	0.02 (10%)
Danske Bank A/S	N	0.17 (100%)	0.16 (100%)	0.4 (100%)
DnB NOR ASA	N	0.14 (100%)	0.07 (100%)	0.37 (100%)
Erste Group Bank AG	N	0.21 (90%)	0.1 (90%)	0.37 (90%)
Governor and Company of the Bank of Ireland	N	0.1 (100%)	0.09 (100%)	0.27 (100%)
Intesa Sanpaolo S.p.A.	N	0.59 (100%)	0.52 (100%)	0.48 (100%)
KBC Groep NV	N	0.15 (100%)	0.09 (100%)	0.45 (100%)
La Caixa (Caja Ahorros Barcelona Fundacion Caixa)	N	0.22 (100%)	0.21 (100%)	0.37 (100%)
Mediobanca SpA	N	0.4 (100%)	0.19 (100%)	0.39 (100%)
Old Mutual Plc	N	0.17 (100%)	0.08 (100%)	0.52 (100%)
Permanent TSB Public limited Company	N	0.08 (50%)	0.09 (50%)	0.09 (50%)
Raiffeisen Bank International AG	N	0.14 (90%)	0.04 (90%)	0.37 (90%)
Skandinaviska Enskilda Banken (SEB)	N	0.15 (100%)	0.06 (100%)	0.53 (100%)
Svenska Handelsbanken	N	0.15 (100%)	0.08 (100%)	0.47 (100%)
Swedbank AB	N	0.12 (100%)	0.08 (100%)	0.49 (100%)
Unione di Banche Italiane ScpA	N	0.2 (100%)	0.16 (100%)	0.36 (100%)

Appendix B

Table 10: Market reaction around ten designation-related events (AAR, -1 +1 window)

Notes: Absolute returns over the event window and their statistical significance. AAR stands for 1-day abnormal return and CAAR for three-days (-1:+1) cumulative abnormal return. We report also a set of tests for the average difference between G-SIBs and Other banks. The value of the difference, together with the t-test significance, is reported under "Difference". For the t-test, Mann-Whitney and Kruskal-Wallis comparison test, the value represents the test statistic with significance. Equity return are expressed in percentages, while CDS returns are expressed as a first difference in basis point.

		Pre-designation: leaked list			Post-designation: official list						
Bank sample	Bank	Publication of leaked FSB list of 24 G-SIBs by Financial Times 30 Nov. 2009	Re-publication of leaked FSB list of 24 G-SIBs by Financial Times 10 Nov. 2010	Publication of the G-SIBs methodology 19 July 2011	Official publication of initial list of G-SIBs by FSB 4 Nov. 2011	Update of G-SIBs list by FSB 1 Nov. 2012	Update of G-SIBs list by FSB 11 Nov. 2013	Update of G-SIBs list by FSB 6 Nov. 2014	Update of G-SIBs list by FSB 3 Nov. 2015	Update of G-SIBs list by FSB 21 Nov. 2016	Update of G-SIBs list by FSB 21 Nov. 2016
G-SIB	Equity	-0.763	-2.438 ***	2.043 **	-1.495 *	-1.129 **	0.611	-2.806 ***	-1.114	-0.135	-0.706
Other	Equity	-1.233	-1.815 ***	3.094 ***	0.551	-1.752 **	0.668	-3.623 ***	0.351	-0.637	-1.169 ***
Difference G-SIB-Other	Equity	0.469	-0.623	-1.051	-2.047	0.624	-0.057	0.817	-1.465	0.501	0.463
T-test	Equity	36.252	44.419	41.715	45.306	42.879	44.982	32.388	43.744	37.702	32.99
Mann-Whitney	Equity	173	237	234	310	198	269	196	248	197	168
Kruskal-Wallis	Equity	1.599	0.049	0.023	1.005	0.65	0.222	1.03	0.132	1.262	1.12
G-SIB	Subord	1.826	-13.342 ***	1.052	-1.082	5.837 ***	2.327 *	-0.336	-4.715 ***	3.247 **	2.633 ***
Other	Subord	-5.569 **	-60.233 ***	-13.913 **	5.215	14.613	3.931 *	-0.214	-1.671	-7.907	2.787 ***
Difference G-SIB-Other	Subord	7.395	46.891	14.965	-6.296	-8.776	-1.604	-0.122	-3.044	11.153	-0.154
T-test	Subord	31.972 **	22.42 *	28.689 **	12.297	21.933	33.33	30.188	40.04	27.96	37.631
Mann-Whitney	Subord	54 ***	114	85	84	174	183	175	298 *	131 **	160
Kruskal-Wallis	Subord	8.548 ***	1.367	2.182	0.006	0.28	0.001	0.521	3.089 *	4.053 **	0.389
G-SIB	Senior	1.134	-3.711 ***	3.014	0.088	-0.796	-0.005	-2.186 ***	-2.775 ***	0.528	1.514 ***
Other	Senior	-3.733 **	-18.754 ***	-0.961	-13.157	11.853	1.95	1.144	-7.154	0.358	1.878 ***
Difference G-SIB-Other	Senior	4.867	15.043	3.975	13.244	-12.65	-1.955	-3.33	4.379	0.17	-0.363
T-test	Senior	41.532 ***	31.93 **	29.584	27.403	29.998	34.708	34.142 *	32.387	37.074	34.63
Mann-Whitney	Senior	104 **	126 **	144	240	329 **	248	352 **	297	237	186
Kruskal-Wallis	Senior	6.29 **	4.217 **	1.133	0.223	4.213 **	0	4.408 **	1.212	0.055	0.194

Table 11: Market reaction around ten designation-related events (CAAR, -5 +5 window)

Notes: Absolute returns over the event window and their statistical significance. AR stands for 1-day abnormal return and CAR for ten-days (-1:+5) cumulative abnormal return. We report also a set of tests for the average difference between G-SIBs and Other banks. The value of the difference, together with the t-test significance, is reported under "Difference". For the t-test, Mann-Whitney and Kruskal-Wallis comparison test, the value represents the test statistic with significance.

		Pre-designation: leaked list			Post-designation: official list						
Bank sample	Bank	Publication of leaked FSB list of 24 G-SIBs by Financial Times 30 Nov. 2009	Re-publication of leaked FSB list of 24 G-SIBs by Financial Times 10 Nov. 2010	Publication of the G-SIBs methodology 19 July 2011	Official publication of initial list of G-SIBs by FSB 4 Nov. 2011	Update of G-SIBs list by FSB 1 Nov. 2012	Update of G-SIBs list by FSB 11 Nov. 2013	Update of G-SIBs list by FSB 6 Nov. 2014	Update of G-SIBs list by FSB 3 Nov. 2015	Update of G-SIBs list by FSB 21 Nov. 2016	Update of G-SIBs list by FSB 21 Nov. 2016
G-SIB	Equity	-3.425 **	-2.923 **	2.881 *	-8.205 ***	-2.198	-2.637 ***	-4.565 ***	-2.743 *	-3.997 ***	0.004
Other	Equity	-4.252 ***	-4.802 ***	6.482 ***	-6.098 ***	-8.175 ***	-3.044 ***	-9.296 ***	-2.796 ***	-7.297 ***	-0.511
Difference G-SIB-Other	Equity	0.827	1.88	-3.6	-2.107	5.977	0.407	4.73	0.053	3.3	0.515
T-test	Equity	29.627	45.927	34.697 *	41.801	42.915 **	42.853	41.238 **	21.583	45.826	41.392
Mann-Whitney	Equity	197	167	301 *	285	145 **	239	144 **	195	187	168
Kruskal-Wallis	Equity	0.501	1.97	2.908 *	1.79	4.256 **	0.041	4.902 **	0.31	1.811	1.12
G-SIB	Subord	-1.21	-21.539 ***	-25.862 ***	8.039	-18.668 **	9.762 **	2.197	-6.886 ***	0.172	3.998 **
Other	Subord	-21.299 ***	-123.726 **	-27.798 **	11.737	-5.331	13.59 **	3.297	-7.499 *	30.605	2.191
Difference G-SIB-Other	Subord	20.089	102.187	1.936	-3.698	-13.337	-3.829	-1.1	0.613	-30.433	1.807
T-test	Subord	29.407 ***	22.601 **	21.287	14.563	30.208	36.153	31.843	41.626	27.371	37.109
Mann-Whitney	Subord	49 ***	92 *	133	82	174	177	215	228	233	127
Kruskal-Wallis	Subord	8.906 ***	3.586 *	0.133	0.001	0.28	0.04	0.001	0.005	0.344	2.432
G-SIB	Senior	0.3	-3.197	-16.485 ***	-9.799 *	-15.022 ***	0.921	-0.953	-5.317 ***	-3.161	3.279 ***
Other	Senior	-9.988 ***	-39.586 ***	-57.121 **	24.148	-18.785	6.361	1.909	60.926	-2.797	-3.657
Difference G-SIB-Other	Senior	10.288	36.389	40.636	-33.947	3.764	-5.44	-2.863	-66.243	-0.364	6.935
T-test	Senior	41.962 ***	33.868 ***	27.576 *	30.384 *	35.934	42.195	40.01	32.041	45.362	36.361 ***
Mann-Whitney	Senior	91 ***	99 ***	170	293 *	241	257	311	284	301	88 ***
Kruskal-Wallis	Senior	8.08 ***	7.45 ***	0.113	3.199 *	0.001	0.041	1.447	0.659	1.416	8.884 ***

Table 12: G-SIB significance tests: CAAR (-1,+1)

		Pre-designation: leaked list			Post-designation: official list						
Bank	Test	Publication of leaked FSB list of 24 G-SIBs by Financial Times 30 Nov. 2009	Re-publication of leaked FSB list of 24 G-SIBs by Financial Times 10 Nov. 2010	Publication of the G-SIBs methodology 19 July 2011	Official publication of initial list of G-SIBs by FSB 4 Nov. 2011	Update of G-SIBs list by FSB 1 Nov. 2012	Update of G-SIBs list by FSB 11 Nov. 2013	Update of G-SIBs list by FSB 6 Nov. 2014	Update of G-SIBs list by FSB 3 Nov. 2015	Update of G-SIBs list by FSB 21 Nov. 2016	Update of G-SIBs list by FSB 21 Nov. 2016
Equity	*Ttest*	-0.883	-4.053 ***	2.969 **	-2.012 *	-2.565 **	1.398	-4.585 ***	-1.543	-0.431	-1.728
Equity	*Patell*	-0.29	-1.065	0.911	-0.394	-0.43	0.318	-1.923 *	-0.531	-0.032	-0.578
Equity	*BMP*	-0.228	-0.802	0.51	-0.349	-0.366	0.297	-0.933	-0.21	-0.045	-0.523
Equity	*TRank*	-0.349	-1.151	0.954	-0.368	-0.628	0.225	-1.048	-0.218	-0.232	-0.713
Equity	*ZGRank*	-1.031	-3.404 ***	2.851 ***	-1.342	-2.086 **	0.69	-3.378 ***	-0.727	-0.744	-2.003 **
Equity	*Wilcoxon*	51	86 ***	12 **	114 *	110 **	49	134 ***	83	65	77
Equity	*Gsign*	6 ***	2 ***	11 ***	4 **	5 ***	8 **	1	5	7	4 ***
Subord.	*Ttest*	0.941	-5.025 ***	0.334	-0.328	3.028 ***	2.129 *	-0.388	-5.213 ***	2.755 **	4.063 ***
Subord.	*Patell*	0.727	-2.107 **	-0.191	0.047	0.389	0.333	-0.311	-0.726	0.307	1.064
Subord.	*BMP*	0.312	-0.957	-0.064	0.041	0.429	0.345	-0.445	-1.037	0.507	1.796 *
Subord.	*TRank*	0.362	-1.398	-0.003	0.129	0.735	0.491	-0.307	-1.273	0.719	1.676 *
Subord.	*ZGRank*	1.171	-4.654 ***	-0.009	0.445	2.521 **	1.65 *	-0.97	-4.132 ***	2.053 **	4.303 ***
Subord.	*Wilcoxon*	91 ***	48	62	16 **	29 **	65	116 ***	18 **	3 ***	91 ***
Subord.	*Gsign*	10	0 ***	5	7 ***	12 *	13	6	2	11 **	13 ***
Senior	*Ttest*	1.164	-4.455 ***	1.301	0.029	-0.709	-0.008	-5.614 ***	-7.59 ***	1.035	6.941 ***
Senior	*Patell*	0.637	-0.929	0.344	-0.047	-0.009	0.014	-0.942	-0.691	0.083	1.01
Senior	*BMP*	0.268	-0.572	0.139	-0.028	-0.016	0.014	-1.267	-1.182	0.075	1.959 *
Senior	*TRank*	0.388	-0.981	0.362	-0.016	-0.08	-0.18	-1.198	-1.509	-0.049	1.929 *
Senior	*ZGRank*	1.244	-3.277 ***	1.135	-0.055	-0.272	-0.61	-3.942 ***	-5.018 ***	-0.153	5.167 ***
Senior	*Wilcoxon*	21 *	88 ***	32	87	77	56	135 ***	120 ***	50	1 ***
Senior	*Gsign*	11	2 ***	8	7 ***	8 ***	10	1	0 ***	8	13 ***

Table 13: G-SIB significance tests: CAAR (-5,+5)

		Pre-designation: leaked list			Post-designation: official list						
Bank	Test	Publication of leaked FSB list of 24 G-SIBs by Financial Times 30 Nov. 2009	Re-publication of leaked FSB list of 24 G-SIBs by Financial Times 10 Nov. 2010	Publication of the G-SIBs methodology 19 July 2011	Official publication of initial list of G-SIBs by FSB 4 Nov. 2011	Update of G-SIBs list by FSB 1 Nov. 2012	Update of G-SIBs list by FSB 11 Nov. 2013	Update of G-SIBs list by FSB 6 Nov. 2014	Update of G-SIBs list by FSB 3 Nov. 2015	Update of G-SIBs list by FSB 21 Nov. 2016	Update of G-SIBs list by FSB 21 Nov. 2016
Equity	*Ttest*	-1.109	-5.55 ***	3.616 ***	0.785	-2.543 **	0.762	-7.579 ***	0.229	-0.631	-2.996 ***
Equity	*Patell*	-0.436	-1.192	1.264	0	-0.482	0.308	-1.715 *	-0.452	-0.179	-1.06
Equity	*BMP*	-0.341	-0.872	1.021	0	-0.626	0.434	-2.168 **	-0.25	-0.116	-1.032
Equity	*TRank*	-0.628	-1.063	1.468	0.138	-0.975	0.268	-1.999 **	0.055	-0.422	-1.148
Equity	*ZGRank*	-2.401 **	-4.433 ***	5.657 ***	0.573	-3.342 ***	0.908	-7.406 ***	0.23	-1.568	-3.498 ***
Equity	*Wilcoxon*	427 *	555 ***	40 ***	231	312 **	132	431 ***	281	358	363 **
Equity	*Gsign*	13 ***	6 ***	30 ***	15 ***	6 ***	18	1 **	11	12 *	7 ***
Subord.	*Ttest*	-2.262 **	-3.272 ***	-2.856 **	0.94	1.507	1.791 *	-0.071	-0.904	-0.853	3.48 ***
Subord.	*Patell*	-0.205	-3.294 ***	-1.177	0.41	0.575	0.358	0.029	-0.202	0.034	1.169
Subord.	*BMP*	-0.247	-1.712 *	-0.924	0.351	0.859	0.433	0.049	-0.357	0.037	1.908 *
Subord.	*TRank*	-1.126	-1.928 *	-0.77	0.539	1.037	0.453	-0.376	-0.336	-0.603	1.494
Subord.	*ZGRank*	-3.025 ***	-5.801 ***	-2.059 **	1.323	2.536 **	1.35	-1.014	-1.103	-1.505	2.758 ***
Subord.	*Wilcoxon*	253 ***	146 **	22	57	74	201	261	202	52 *	253 ***
Subord.	*Gsign*	5 ***	0 ***	7 **	4 ***	15	15 *	10 *	12	10 *	18
Senior	*Ttest*	-2.545 **	-3.643 ***	-0.092	-0.85	1.189	0.837	0.673	-1.521	0.219	3.082 ***
Senior	*Patell*	-0.324	-1.749 *	-0.787	0.233	0.759	0.079	0.01	-0.341	0.081	0.98
Senior	*BMP*	-0.259	-1.503	-0.387	0.245	0.836	0.126	0.012	-0.628	0.103	1.854 *
Senior	*TRank*	-0.771	-1.539	-0.344	0.529	0.726	-0.038	-0.176	-0.817	-0.185	1.664 *
Senior	*ZGRank*	-2.759 ***	-5.737 ***	-1.141	1.873 *	2.457 **	-0.133	-0.552	-2.98 ***	-0.49	3.542 ***
Senior	*Wilcoxon*	349 *	465 ***	231	143	134	203	251	388 *	246	64 **
Senior	*Gsign*	9 ***	2 ***	11 *	13 ***	20	19	13 **	9	17	21

Appendix C

As discussed in Section 2, the identification of G-SIBs by the FSB relies on a methodology, published since 2014, with a fixed cut-off of 130 on the score. A bank above this cut-off is usually designated as a G-SIBs, but in some cases the supervisors might include additional banks in the list or change the reference bucket exercising the "supervisory judgment". The BCBS publishes the vintages of the balance sheet data necessary to compute the scores foreseen by the above-mentioned methodology (the so-called high level indicators).[17] They are available from 2013 and they are reported for around 80 worldwide banks. Using these data and applying the methodology published by the BCBS, we estimated the banks' scores for the years 2013-2017. They are reported in Table 14.

To better understand the dynamics of the implicit guarantee, and the subsequent market reaction to the designation, we decided to analyse separately a subsample of banks that are around the cut-off threshold. The underlying idea is that the market price differently the effect of implicit guarantee versus additional capital requirement for banks close to the cut-off. Banks on the top of the list have a different treatment from the market since they will be almost surely included in the list. In fact, according to Table 1, the banks in the top positions are quite stable across time, and the market already recognises that they will be included in the G-SIBs list. We expect a different reaction for banks that are switching or that are close to the cut-off, given that they can be included or not in the list. To construct our subsample of banks, we average out the score in the five available years, and we consider only those banks whose average score is between $\pm 40\%$ of the threshold, namely between 78 and 182. Banks in bold in Table 14 are the final components of our sub-sample.

[17] See `https://www.bis.org/bcbs/gsib/`

Table 14: G-SIBs estimated scores and rankings (in parentheses)

Bank Name	**2013**	**2014**	**2015**	**2016**	**2017**
HSBC Bank PLC	476.9 (1)	439.3 (1)	416.3 (1)	410 (1)	410.5 (1)
Deutsche Bank AG	417 (2)	360 (3)	357.1 (2)	333.8 (2)	363.3 (2)
BNP Paribas	407.2 (3)	404.7 (2)	329.1 (3)	311.3 (3)	314.6 (3)
Barclays Bank Plc	384.4 (4)	349.4 (4)	308 (4)	291.3 (4)	284 (4)
Credit Suisse Group	263.8 (5)	269.5 (5)	273.8 (5)	228.3 (5)	211 (5)
Royal Bank of Scotland PLC	**238.5 (6)**	**212.5 (6)**	**154.4 (10)**	**127.8 (13)**	**117.7 (15)**
Societe Generale SA	225.4 (7)	210.3 (7)	209 (6)	200 (6)	203.9 (7)
Credit Agricole SA	**218 (8)**	**186.3 (10)**	**167.4 (9)**	**160.9 (9)**	**179.6 (9)**
UBS AG	200.9 (9)	189.2 (9)	190.2 (8)	184 (8)	189 (8)
Banco Santander, S.A.	196 (10)	208.4 (8)	201.9 (7)	192.5 (7)	208.6 (6)
UniCredit SpA	**147.6 (11)**	**165.4 (11)**	**148.2 (11)**	**134.4 (11)**	**142 (11)**
ING Bank NV	**144.1 (12)**	**132.4 (14)**	**140.1 (12)**	**159.1 (10)**	**161.2 (10)**
Natixis (BPCE group)	**140.9 (13)**	**151.3 (12)**	**125.7 (14)**	**125.5 (14)**	**129.7 (13)**
Standard Chartered Bank	**133 (14)**	**141.5 (13)**	**133.4 (13)**	**132.5 (12)**	**131.5 (12)**
Commerzbank AG	**121.3 (15)**	**107.1 (16)**	**90.8 (18)**	**78.2 (18)**	**80 (18)**
Nordea Bank AB	**120.5 (16)**	**129.2 (15)**	**122.9 (15)**	**115 (15)**	**117.8 (14)**
Lloyds Bank Plc	**98.2 (17)**	**97.2 (17)**	**94.9 (17)**	**80 (17)**	**74.4 (19)**
Banco Bilbao Vizcaya Argentaria SA	**92.1 (18)**	**89.6 (18)**	**102.5 (16)**	**99.4 (16)**	**92.5 (16)**
Danske Bank A/S	88 (19)	72 (21)	66.2 (22)	58.7 (23)	64.3 (22)
Intesa Sanpaolo S.p.A.	**80.1 (20)**	**79.9 (20)**	**75 (19)**	**75.1 (19)**	**85.5 (17)**
Cooperatieve Rabobank U.A.	77.3 (21)	80.4 (19)	69.5 (21)	67.2 (21)	60 (23)
DZ Bank AG	61 (22)	60.4 (23)	54.5 (23)	68.7 (20)	72.3 (20)
DnB NOR ASA	60.4 (23)				
Banque Federative du Credit Mutuel	58.4 (24)	63.4 (22)	70.5 (20)	65.7 (22)	68.7 (21)
Skandinaviska Enskilda Banken (SEB)	58.4 (25)	49.9 (25)	48.1 (25)		
Landesbank Baden-Wuerttemberg	57.7 (26)				
ABN AMRO Bank N.V.	44.9 (27)	47.9 (26)	49.7 (24)	49.1 (24)	53.6 (24)
Bayerische Landesbank	44.8 (28)				
Svenska Handelsbanken	44.5 (29)	42.8 (27)			34.7 (25)
CaixaBank SA	25.8 (30)	22.9 (28)	22 (26)	18.9 (25)	22.5 (26)
Nationwide Building Society	13.2 (31)				
DNB Bank ASA		51.9 (24)			

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