

# DISCUSSION PAPER SERIES

DP15564

## **GSIB STATUS AND CORPORATE LENDING: AN INTERNATIONAL ANALYSIS**

Hans Degryse, Mike Mariathasan and Thi Hien Tang

**FINANCIAL ECONOMICS**



# GSIB STATUS AND CORPORATE LENDING: AN INTERNATIONAL ANALYSIS

*Hans Degryse, Mike Mariathan and Thi Hien Tang*

Discussion Paper DP15564  
Published 16 December 2020  
Submitted 15 December 2020

Centre for Economic Policy Research  
33 Great Sutton Street, London EC1V 0DX, UK  
Tel: +44 (0)20 7183 8801  
[www.cepr.org](http://www.cepr.org)

This Discussion Paper is issued under the auspices of the Centre's research programmes:

- Financial Economics

Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as an educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Hans Degryse, Mike Mariathan and Thi Hien Tang

# GSIB STATUS AND CORPORATE LENDING: AN INTERNATIONAL ANALYSIS

## Abstract

Global Systemically Important Banks (GSIBs) benefit from implicit government guarantees but face additional capital requirements and oversight. This paper examines the effectiveness of the Financial Stability Board's recently introduced GSIB-framework and its short-run implications for the real economy, by exploiting the leak of a partially accurate GSIB list by the Financial Times. We find that GSIB-designation reduces the supply of syndicated loans to risky corporate borrowers by 8%, and that these borrowers experience lower asset-, investment- and sales growth than similar firms borrowing from non-GSIB banks. The results appear to be driven by stricter supervision, not by higher capital surcharges.

JEL Classification: N/A

Keywords: N/A

Hans Degryse - [hans.degryse@kuleuven.be](mailto:hans.degryse@kuleuven.be)  
*KU Leuven and CEPR*

Mike Mariathasan - [mike.mariathasan@kuleuven.be](mailto:mike.mariathasan@kuleuven.be)  
*KU Leuven*

Thi Hien Tang - [thihien.tang@kuleuven.be](mailto:thihien.tang@kuleuven.be)  
*KU Leuven*

# GSIB status and corporate lending: An international analysis<sup>1</sup>

**Hans Degryse**

KU Leuven and CEPR, hans.degryse@kuleuven.be

**Mike Mariathasan**

KU Leuven, mike.mariathasan@kuleuven.be

**Hien T. Tang**

KU Leuven, thihien.tang@kuleuven.be

## Abstract

Global Systemically Important Banks (GSIBs) benefit from implicit government guarantees but face additional capital requirements and oversight. This paper examines the effectiveness of the Financial Stability Board's recently introduced GSIB-framework and its short-run implications for the real economy, by exploiting the leak of a partially accurate GSIB list by the *Financial Times*. We find that GSIB-designation reduces the supply of syndicated loans to risky corporate borrowers by 8%, and that these borrowers experience lower asset-, investment- and sales growth than similar firms borrowing from non-GSIB banks. The results appear to be driven by stricter supervision, not by higher capital surcharges.

---

<sup>1</sup> We would like to thank Andreas Barth, Thorsten Beck, Eddy Cardinaels, Rainer Haselmann, Ragnar Juelsrud, Jan-Pieter Krahen, Camelia Minoiu, Thomas Mosk, Carola Mueller, Steven Ongena, Oliver Rehbein, Kasper Roszbach, Consuelo Silva, and seminar participants at Goethe University Frankfurt, KU Leuven, Norges bank, PUC Chile, and the University of Bonn for their helpful suggestions. Financial support from FWO Flanders and KU Leuven (C1 grant) is gratefully acknowledged.

## 1. Introduction

The risk of national and global contagion during the 2008 crisis forced governments to bail out financial institutions with the potential to severely disrupt the global financial system. To the extent that such interventions can be anticipated, they reveal implicit guarantees of government support that may induce moral hazard ex-ante. Implicit guarantees have been shown to amplify risk-taking, undermine market discipline, create competitive distortions, and generally increase the likelihood of future distress (Dam and Koetter, 2012; Balasubramnian and Cyree, 2011; Ueda and Weder di Mauro, 2013; Mariathasan, Merrouche, and Wergler, 2014; Moenninghoff, Ongena, and Wieandt, 2015).

That governments cannot credibly commit not to bail out large financial institutions in the future lead to the emergence of the regulatory concept of “Global Systemically Important Banks” (GSIBs), with the Financial Stability Board (FSB) establishing its GSIB framework in 2011. This framework is designed to reduce moral hazard through a combination of stricter regulation and oversight. Apart from imposing higher capital requirements on GSIBs, the new framework also promotes closer supervision, more effective resolution mechanisms, and stronger financial market infrastructure.<sup>2</sup> In this paper, we examine the effectiveness of the FSB’s GSIB-framework and its short-run implications for the real economy. Using an international sample, we investigate, in particular, how GSIB-designated banks adjust their lending behavior towards corporates, how this adjustment affects firm performance, and whether the effect is driven primarily by higher capital requirements or the complementary supervisory scrutiny.

While the existing literature already provides good guidance on the expected effects of capital requirements on bank lending<sup>3</sup>, examining the specific effect of GSIB-designation is interesting for a number of reasons: First, because GSIB-designation also certifies banks as being systemically important; this might increase moral hazard and regulators need to know whether the

---

<sup>2</sup> See FSB (October 2010), *Reducing the moral hazard posed by systemically important financial institutions* at [https://www.fsb.org/wp-content/uploads/r\\_101111a.pdf](https://www.fsb.org/wp-content/uploads/r_101111a.pdf)

<sup>3</sup> Examples include Behn, Haselmann, and Wachter (2015), Juelsrud and Wold (2020), Gropp, Mosk, Ongena, and Wix (2019), or Degryse, Karapetyan, and Karmakar (2020).

certification effect is dominated by the effect of stricter regulatory requirements and supervisory scrutiny. Second, because the known effects of higher capital requirements, even for large banks, may not necessarily extrapolate to GSIBs. On the one hand, because GSIBs tend to have more market power, political influence, and more opportunities for cross-jurisdictional arbitrage, and on the other hand, because GSIB-designation implies a competitive disadvantage vis-à-vis non-GSIB competitors that do not face the additional requirements. Third, because additional capital requirements under the GSIB-framework are complemented explicitly by more supervisory scrutiny and it remains an open question how these two components of the framework interact. The closest papers to ours are Favara, Ivanov, and Rezende (2019) and Behn and Schramm (2020) who do not consider announcement or leakage effects (see below) and who focus either on the impact of de facto capital surcharges on lending by GSIBs or on longer term effects.

With this in mind, we investigate three research questions by means of a difference-in-differences approach: How do GSIB-designated banks adjust their loan terms around their GSIB designation? Do GSIB-designated banks change the composition of their corporate lending? And, do the adjustments of GSIBs' lending behavior affect firm outcomes?

We use data on syndicated loans for 81 international bank holding companies that were all at some point considered for GSIB designation by the Bank for International Settlements.<sup>4</sup> We study bank lending at the bank-, bank-country-industry-, and bank-firm-level. At the bank level, we find that GSIB designated banks (our treatment group) cut their lending in the syndicated loan market by 9.1% compared to non-GSIBs (the control group) in the year following their GSIB designation. This result, however, should be treated cautiously since there might still be demand factors that drive responses by GSIBs versus non-GSIBs differentially, but are not controlled for when using loan data at the bank level. To improve identification and control for firm demand, we saturate our model with country-industry, firm, or firm-time fixed effects. We find that GSIBs

---

<sup>4</sup> In robustness checks, we also study a larger list of banks with assets exceeding USD 100 billion. Results are qualitatively similar.

reduce their credit supply primarily at the intensive margin; e.g., by 6% to the same firm compared to non-GSIBs. Interestingly, our evidence also shows that this lending cut does not seem to be driven by the expectation of capital surcharges. GSIBs that can expect more moderate surcharges cut lending to a specific firm by 6.5% compared to non-GSIBs while we find no significant effect for GSIBs that can expect higher surcharges.

Although the FSB list in November 2011 was the first official GSIB designation, a potential concern could be that the *Financial Times (FT)* leaked an early GSIB list in November 2009. We therefore examine whether the official GSIB designation uniformly affects lending of all GSIB-designated banks. We find that GSIB banks that were not on the leaked list reduce lending at the intensive margin to a specific country-industry or firm by 10% to 11% whereas banks that were correctly predicted by the FT reduce lending by about 3% to 5%. To the best of our knowledge, we are the first to exploit the FT's leak for identification and -in fact- to account for it in the analysis of banks credit supply. Our findings suggest that controlling for the leak is indeed important.

In response to more intense supervision which strongly focuses on reducing banks' risk-taking behavior, GSIB-designated banks might further adjust the composition of their corporate lending in order to lower their risk profile. This also helps to reduce risk-weighted assets and thus lowers the required regulatory capital. We therefore examine how banks reallocate their lending across industries and firms after being identified as a GSIB. We find that GSIBs reduce their lending to high-risk borrowers but not for low-risk ones. Specifically, GSIBs that were not on the FT list cut their credit supply at the intensive margin to all borrowers and are more likely to stop and less likely to start lending to risky borrowers. In contrast, GSIBs that were correctly predicted by the FT list reduce their lending to high-risk borrowers at the intensive margin (by 5.7%) but not to less risky firms; at the extensive margin, they do not appear to adjust their lending. When splitting GSIBs into banks that can expect low vs. high capital surcharges, we document that only GSIBs with low predicted surcharges reduce their credit supply to risky firms. This is not driven by higher expected surcharges as out of the "correctly predicted" ones on the FT list only around

30% can expect higher surcharges. This again suggests that GSIBs lower credit supply to borrowers in response to stricter supervisory scrutiny and not primarily in response to higher capital requirements.

In a final step, we link the lending adjustment of GSIBs to outcomes at the firm level to investigate whether the introduction of the new GSIB framework has any effect on the real economy. Using firm-level data and comparing firms that are dependent on GSIBs' credit supply (the treatment group) with firms that are not dependent on GSIBs' credit supply (the control group), we show that GSIB-dependent risky borrowers experience lower asset growth (by 2.2%) and lower investment growth (by 5.4%) compared to similarly risky firms that are not GSIB-dependent.

The existing literature on the impact of GSIB designation is scarce, and rarely uses granular loan-level data. Violon, Duranty, and Toaderz (2017), Behn, Mangiante, Parisi, and Wedow (2019), and Goel, Lewrick, and Mathur (2019) focus on the adjustment of banks' balance sheet after being identified as GSIBs. In particular, Violon et al. (2017) use a sample of 97 largest international banks over the period 2005-2016 and find that the GSIB designation does not have any aggregate effect on bank lending. Behn et al. (2019) examine a sample of 97 European banks between Q3/2014 and Q4/2017 and document that both GSIBs and banks with reporting obligations reduce their risk score in the last quarter of the year, suggesting window-dressing behavior to lower the possibility of being a GSIB or facing higher capital surcharges. In line with Violon et al. (2017), Goel et al. (2019) use a sample of all banks with reporting obligations over the period 2012-2017 and show that GSIBs' experience no reduction in their lending compared to non-GSIBs. They do find, however, that GSIBs reduce their risk scores by reducing the share of uncollateralized borrowing.

Another strand of the literature focuses on the stock market reaction to the designation of GSIBs (Abreu and Gulamhussen, 2013; Moenninghoff et al., 2015). Abreu and Gulamhussen (2013), for instance, do not find any abnormal returns around the official announcement of the



GSIBs list on November 4, 2011, implying that the GSIB designation does not help to reduce the moral hazard problem. In line with this finding, Moenninghoff et al. (2015) document a positive market reaction to the official GSIB designation on November 4, 2011 which can be attributed to a too-big-to-fail perception by investors and thus suggests an increase in moral hazard associated with these banks. There are also papers investigating the methodology of determining GSIBs developed by the Basel Committee on Banking Supervision (BCBS) (Iwanicz-Drozdowska and Schab, 2014) or the level of capital surcharges imposed on GSIBs (Passmore and von Hafften, 2019). In particular, Iwanicz-Drozdowska and Schab (2014) distinguish 3 sub-types of GSIBs (i.e., actually global, operating in the European market, and concentrating on the home country market) and document considerable differences among those groups of G-SIBs, suggesting that “one size does not fit all”. Regarding the level of GSIB capital surcharges, Passmore and von Hafften (2019) find that the current levels are too small based on the experience of the 2008–09 financial crisis and suggest to raise capital surcharges by 5.50%-8.25% for banks currently identified as GSIBs.

Favara et al. (2019) and Behn and Schramm (2020) come closest to our work. The former use loan level data and study the impact of capital surcharges for GSIBs, as identified in the November 2014 announcement, on corporate loans of at least 1 million USD. They find that U.S. GSIBs reduce their loan exposure to corporate borrowers compared to U.S. non-GSIBs, that the effect is stronger for riskier borrowers, and that the reduced credit supply from GSIBs is offset with funding from less-affected banks. Different from their analysis, our focus is on the announcement of the initial GSIBs list on November 4, 2011 and the global syndicated loan market. That the initial GSIB list did not detail actual capital surcharges improves comparability across banks while focusing on the earlier date allows us to capture anticipation effects. Behn and Schramm (2020), instead, have in parallel been investigating a question similar to ours. Their result are broadly consistent with ours, but they seem to identify a less pronounced effect of GSIB designation on credit supply. We believe this has to do with differences in the length of the observation period (they consider 2010-18, while we focus on +/- one year around the first GSIB

designation on November 4, 2011) and the potential confounding from related events. Our focus on the announcement further means that we also capture the effect of stricter supervision. Favara et al. (2019) and Behn and Schramm (2020) instead focus solely on the role of capital regulation. Finally, the two papers do also not consider the FT leak which our results identify as important.

Our study contributes to the literature examining the effect of GSIBs on credit supply in several ways. First, we are one of only three papers using loan-level data to investigate the effect of the new GSIB framework on banks' lending behavior, and the only one to take into account announcement effects and the leakage of a preliminary GSIB list by the FT. That we observe a stronger effect for banks that were not on the FT's leaked list, suggests that estimates ignoring the leak underestimate the true effect of GSIB designation. Second, our findings on GSIBs' lending adjustment around the first official announcement of the GSIB list highlight the impact of stricter scrutiny imposed on GSIBs, more than the effect of de facto capital surcharges (which were not known at the time). Lastly, we provide evidence that banks' reaction is indeed aligned with the GSIB framework's intention. GSIBs respond to being officially identified as too big, too complex and too interconnected to fail, not by engaging in additional moral hazard, but – presumably because of the additional oversight – by reallocating their lending towards safer borrowers. In addition, the stricter supervisory scrutiny also does not seem to have unintended negative repercussions for the real economy, which is consistent with the observations in BIS (2011)<sup>5</sup>.

We further contribute to the literature on the impacts of bank supervision on bank lending. Hirtle, Kovner, and Plosser (2020), for instance, use bank balance sheet data and find that within each of 12 Federal Reserve districts, the largest institutions receive more supervisory attention than institutions that are not among the largest, leading to less risky loan portfolios pursued by the former. Granja and Leuz (2019) use bank-level data to study how the transition of several banks from a more lenient to a stricter supervisor under the Dodd-Frank Act affects these banks' lending

---

<sup>5</sup> See BIS (October 2011), *Assessment of the macroeconomic impact of higher loss absorbency for global systemically important banks* at <https://www.bis.org/publ/bcbs202.htm>

policies and local business activity. They find that increased supervision leads to an increase in small business lending, which might come from the fact that stricter supervision could help affected banks improve their governance, lending, and risk management practices. In a similar vein, Haselmann, Singla, and Vig (2019) examine the effect of such a transition of several German banks due to the establishment of the “Single Supervisory Mechanism” (SSM) but employ loan-level data. They find that SSM banks reduce their lending more than non-SSM banks to the same firm and this lending cut is concentrated mostly on high-risk borrowers, resulting in firms’ negative outcomes. Consistent with the findings by Haselmann et al. (2019), Ivanov and Wang (2019) employ U.S. loan-level data from the Shared National Credit Program, a supervisory program overseeing the syndicated loan market, and find that banks reduce loan commitments in response to heightened supervision. Bonfim, Cerqueiro, Degryse and Ongena (2020) exploit on-site bank inspections of the credit portfolios of the largest Portuguese banks and find that affected banks reduce their credit supply to zombie firms who are riskier than their non-zombie counterparts. Our study contributes to these studies by analyzing a new supervisory classification (the GSIB status) that affects banks globally. Using loan-level data, we document not only deleveraging by GSIB banks but also real effects for the riskiest firms.

The remainder of the paper is organized as follows: Section 2 provides an overview of the GSIB framework. Section 3 describes our sample and data. Section 4 presents the empirical design. Section 5 demonstrates the empirical results on credit supply. Section 6 discusses the real effects of the GSIB designation. Section 7 concludes the paper.

## **2. An overview of the GSIB framework**

The start of the GSIB-designation process is the call for appropriate regulation and oversight for too big, too complex and too interconnected to fail banks, by G20 leaders on November 17, 2008. The G20 established the FSB in April 2009 and tasked it with developing guidelines for the regulation and oversight of GSIBs. In September 2009, the FSB was then asked to establish a

policy framework to address systemic and moral hazard risks.<sup>6</sup> This framework was endorsed by during the Seoul Summit in October 2010.

Apart from higher capital requirements, the FSB framework also introduces more intense and effective supervision for GSIBs, more effective resolution mechanisms, and stronger financial market infrastructure. With respect to increased supervision, the FSB highlighted the “need for early intervention to be an element of the supervisor’s mandate” so that all national supervisors are able to “identify risks early and intervene to require changes within an institution, as needed, to prevent unsound practices and take appropriate counter-measures to safeguard against the additional systemic risks.” The FSB also emphasized that the “mandate should convey the point that the supervisory authority’s risk view of a firm will always reflect a higher degree of conservatism and will therefore often be a source of conflict when viewed against the respective risk appetites of the SIFI [Systemically Important Financial Institutions]’s senior management, board and shareholders.” In addition, the FSB recommended to expand the list of required supervisory powers of supervisors. Specifically, all national supervisors should have a full set of tools such as increased liquidity requirements, large exposure limits, imposing dividend cuts, or requiring additional capital based on the risks GSIBs pose to the financial system.<sup>7</sup>

GSIBs are identified based on the methodology developed by the Basel Committee on Banking Supervision (BCBS). The BCBS requires selected banks to annually report a large set of detailed indicators in order to calculate scores for the GSIB designation.<sup>8</sup> The introduction of the

---

<sup>6</sup> See FSB (September, 2009), *Improving financial regulation - Report of the Financial Stability Board to G20 Leaders* at [https://www.fsb.org/2009/09/r\\_090925b/](https://www.fsb.org/2009/09/r_090925b/)

<sup>7</sup> See FSB (November 2010), *Intensity and Effectiveness of SIFI Supervision: Recommendations for enhanced supervision* at <https://www.imf.org/external/np/mcm/financialstability/papers/sifisup.pdf>

<sup>8</sup> The identification of GSIBs follows an indicator-based approach consisting of 12 indicators grouped into 5 equally-weighted categories, namely *bank size, interconnectedness, the substitutability of their services, cross-border activities, and the complexity of their portfolios*. This approach uses a sample of the world’s largest banks as a proxy for the global banking sector. Apart from that, a bank can also be added to the sample by national supervisors using supervisory judgment. In each category, each bank is scored by dividing its amount by the aggregate amount across all banks included in the sample. Banks with scores exceeding a cutoff level are designated as GSIBs. Supervisory judgment is also used to add banks with scores below the cutoff to the list of G-SIBs. GSIBs are required to have additional capital requirements tailored to the impact of their default, which are expressed as a ratio of Common Tier 1 to Risk-Weighted Assets (CET1/RWA), ranging between 1% and 2.5%. The highest bucket of 3.5% has been kept empty all the time, aiming to provide a dissuasive effect. In addition, GSIBs are also subject to more intensive supervision through “stronger supervisory mandates, resources and powers, and higher supervisory expectations for risk management functions, data aggregation capabilities, risk governance and internal controls”.

GSIB framework was released by the FSB on November 4, 2011 with 29 banks identified as GSIB. We take this release as our event date. Since then the GSIB list has been updated annually and published in each November. When the GSIB framework was officially announced on November 4, 2011, there was no specific information about the level of additional capital buffers each GSIB-designated bank was expected to hold, although it was clear that capital requirements would increase. This event provides an ideal setting to test the effect of the new GSIB designation on bank lending behavior for several reasons: Firstly, the GSIB designation did not specify detailed requirements making treated banks more comparable in terms of the way they react to the designation. Secondly, there is no confounding from banks (also) being designated as Domestic Systemically Important Banks (DSIBs) as DSIB lists in several countries have only been announced since 2013.<sup>9</sup>

It is worth noting that at the beginning of the regulatory process, involved regulators ruled out any form of official GSIB designation, presumably to avoid ex-ante moral hazard.<sup>10</sup> This constructive ambiguity ended with the leak of a preliminary list of 24 GSIBs on November 30, 2009 and the re-printing of that list on November 10, 2010 by the FT. The market perceived these leaks as credible signals for the existence of such a list existed and in fact assumed that they had been intentionally leaked to the press (Moeninghof et al., 2015).<sup>11</sup> Of the 24 banks that appeared on the FT's GSIB list, 19 were officially designated as GSIBs in November 2011. In addition, the

---

<sup>9</sup> The idea about a similar framework applied to DSIBs to address the externalities posed by those banks was raised the first time by the BCBS in October 2012. A DSIB framework focuses on the impact that the distress or failure of banks will have on the domestic economy and thus is based on the assessment of local authorities. The key element of the DSIB framework is higher capital requirements applied to DSIB-identified banks. It was suggested that: "Given that the D-SIB framework complements the G-SIB framework, the Committee considers that it would be appropriate if banks identified as D-SIBs by their national authorities are required by those authorities to comply with the principles in line with the phase-in arrangements for the G-SIB framework, i.e. from January 2016." See Basel Committee, *A framework for dealing with domestic systemically important banks* at <https://www.bis.org/publ/bcbs233.pdf>

<sup>10</sup> For instance, as mentioned in Moeninghof et al. (2015), both Jaime Caruana, Chairman of the Bank for International Settlements, and Mario Draghi, the then Chairman of the FSB, initially stated that they did not think a list of GSIBs would be published. Likewise, Lord Adair Turner, Chairman of the British Financial Services Authority and Director at the Bank of England, reportedly said that an absolute definitive list of GSIBs would not be useful.

<sup>11</sup> An overview of the entire regulatory process can be found in Moeninghof et al. (2015).

official list also included 10 banks that were not on the FT list. This implies that the first official GSIB designation was likely more surprising for these 10 banks<sup>12</sup>.

Since the November 2012 update, GSIBs have been allocated into 4 equally-sized buckets, each corresponding to a different level of capital surcharges ranging from 1% to 2.5% (with an empty bucket of 3.5%). These surcharges began to be phased in from January 1, 2016 for the GSIBs identified in November 2014 with full implementation by January 1, 2019. Since then, the higher capital requirements for GSIBs have been identified in the annual update each November and applied as from January fourteen months later.

### **3. Sample, Empirical design, and Data**

#### **3.1. Sample**

Our sample period covers one post-treatment year starting from November 4, 2011 and one pre-treatment year prior to November 4, 2011 to avoid any overlap with the second announcement of the GSIBs list on November 1, 2012. For simplicity, we take the event date to be November 1, 2011. Our sample period thus ranges from November 1, 2010 to October 31, 2012. We examine the effect of the first GSIB designation on bank lending behavior using data on syndicated loans, retrieved from Thomson Reuters LPC's DealScan database. We collect the data on 4 loan terms: outstanding loans, whether a loan is secured, loans' remaining maturity, and all-in-drawn spread. We follow Gropp, Mosk, Ongena, and Wix (2019) to calculate all outstanding loans from a bank to a firm using the data on loan issuance and maturity and exclude all loans to financial firms.

To estimate banks' scores that ultimately determine GSIB designation, the BCBS chooses a sample of the world's largest banks on the basis of both size and supervisory judgement by Basel Committee member authorities every year. For the 2011 designation, this sample comprised 73 banks, but the list of banks has only been made publicly available since 2014. Our sample therefore

---

<sup>12</sup> Dexia is among the 10 "new GSIBs" but its Belgian subsidiary, Dexia Bank Belgium, was bought out from the Dexia group by the Belgian state in the same year and became Belfius afterwards, while the remaining part of the Dexia group was left in a "bad bank", being sold or wound down. Therefore, we exclude this bank from our sample.

covers 81 international bank holding companies that appeared at least once in the “Basel Committee’s sample” from 2014 to 2018, and that are active in DealScan over the entire sample period. From these 81 banks, 28 banks<sup>13</sup> were designated to be GSIBs in the November 2011 announcement (the treatment group). The other 53 banks (i.e. non-GSIBs) serve as control group banks in our difference-in-differences research design.

Our difference-in-differences specification further includes bank fixed effects allowing us to control for observed and unobserved heterogeneity across banks. Appendix A provides the list of all banks included in our sample and Table 1, Panel A presents the corresponding descriptive statistics. In general, GSIBs are larger, have a lower deposit ratio, a lower loan ratio and lower profitability.<sup>14</sup> Our initial sample contains 60,898 syndicated loans from all the banks in the sample to 18,766 corporate borrowers. DealScan provides full information on the share of syndicate members for about 23% of all loans in our sample. For the other 77%, we apply the allocation rule used by De Haas and Van Horen (2012) in which the loan volume is divided equally among all syndicate members.

<Insert Table 1 about here>

During our sample period, there are two potentially confounding events (Figure 1).<sup>15</sup> The first one is the European Banking Authority (EBA) Capital Exercise announced on October 26, 2011. The EBA requires 61 banks to build additional capital buffers to reach a 9% Tier 1 capital ratio<sup>16</sup> by the end of June 2012. Our sample includes 11 EBA shortfall banks identified in September 2011 (7 GSIBs and 4 non-GSIBs). The fact that EBA shortfall banks are included in both the treated (GSIB) and control (non-GSIB) group helps in identifying the separate effect of GSIB status. The second event is the U.S. Stress Test which has been implemented since 2009. In

---

<sup>13</sup> Excluding Dexia (see Footnote 12).

<sup>14</sup> Bank financial data is retrieved from SNL Financial database. We hand-merge loan facilities in DealScan with lender identifiers in SNL Financial.

<sup>15</sup> Another relevant event is the EBA’s EU-wide stress test which ran from 2009. For the stress test in 2011, the results were released on 15<sup>th</sup> July 2011, in which there were 8 banks who failed the stress test but none of them is included in our sample.

<sup>16</sup> According to Basel III, all banks are required to maintain a minimum Tier 1 capital ratio of 6% at all times since 2005.

this test, the Federal Reserve (FED) selects the largest U.S. bank holding companies and evaluates the capital planning and capital adequacy of those banks in stressed economic environments. In the results of the test, the FED announces whether a bank failed or passed the test, i.e., whether it has any objection to the increases in the capital distributions proposed in the bank's comprehensive capital plan. The list of selected banks was identical throughout 2009–2013, and included the 19 largest U.S. bank holding companies.<sup>17</sup> For the year 2011-2012, the Stress Test was announced on November 18, 2011 and its results were communicated individually to each bank by March 21, 2012. From these 19 banks, 11 banks (8 GSIBs and 3 non-GSIBs) are included in our sample. Again, these stress tests encompass both treated and control banks. In our model specification, we control for the potential confounding effects from these two events in order to appropriately identify the effect of the GSIB designation (see more details in Section 3.2).

<Insert Figure 1 about here>

## **3.2. Empirical design**

### *3.2.1. How do GSIB-designated banks adjust their loan terms around the GSIB designation announcement?*

The GSIB framework consists of two key elements: the capital surcharges and more stringent supervision imposed on GSIBs. Prior studies show that to improve their risk-adjusted capital ratio to meet higher capital requirements, banks tend to lower their risk-weighted assets (the denominator of the capital ratio) rather than to increase their levels of regulatory capital (the numerator of the capital ratio) (e.g., Gropp et al., 2019). In principle, banks can lower their risk-weighted assets in different ways: apart from strategic risk-modelling (Mariathasan and Merrouche, 2014; Begley, Purnanandam, and Zheng, 2017) they can replace riskier (higher-weighted) assets with safer ones or they can shrink their assets. Gropp et al. (2019), for example,

---

<sup>17</sup> MetLife Bank was dropped out from the list in 2012 because it ceased its banking and mortgage lending activities in that year. According to FED, the remaining 18 banks increased their Common Tier 1 ratio from 5.6% in Q4/2008 to 11.3% in Q4/2012.



examine the effect of the EBA Capital Exercise on banks' balance sheets and credit supply and find that banks are reluctant to increase their equity in response to higher capital requirements, and instead deleverage by lending less in the syndicated loan market. While capital surcharges lead to higher funding costs and thus lower credit availability, increased supervision also puts more pressure on banks' lending by increasing supervisory costs and thus discourage them to offer loans (Ivanov and Wang, 2019).

We investigate the first research question on how GSIB-designated banks adjust their loan characteristics at 3 levels of aggregation: Bank level, Bank-Country-Industry level, and Bank-Firm level. The dependent variables are the natural logarithm of total outstanding loans (Log Outstanding loans), the weighted average proportion of secured loans (Secured, measured in percentage), the weighted average of remaining maturity (Maturity, measured in months), and the weighted average of all-in-drawn spread (AISD, measured in basis points).

For the bank-level analysis, we estimate the following difference-in-differences regression specification:

$$Loan\ term_{b,t} = \beta_1 GSIB * Post + \beta_2 EBA\ Shortfall * Post + \beta_3 US\ Stress\ Test * Post + \eta_t + \eta_b + \varepsilon_{b,t} \quad (1)$$

where  $Loan\ term_{b,t}$  represents the dependent variables, calculated based on outstanding loans made by bank  $b$  to all firms in the period  $t$ . The dummy variable  $GSIB$  takes the value of 1 if the bank is identified as a GSIB in the November 2011 designation, and 0 otherwise. The dummy variable  $Post$  takes the value of 1 for the post-treatment period and 0 for the pre-treatment period. Our parameter of interest is  $\beta_1$ . We control for the potential confounding effects from the EBA Capital Exercise and the U.S. Stress Test by including the interaction of  $Post$  with  $EBA\ Shortfall$  and with  $US\ Stress\ Test$  as well as bank fixed effects ( $\eta_b$ ). The dummy  $EBA\ Shortfall$  takes the value of 1 if the bank is identified as an EBA shortfall bank in September 2011, and 0 otherwise. The dummy  $US\ Stress\ Test$  takes the value of 1 if the bank is selected in the U.S. Stress Test for

the year 2011-2012, and 0 otherwise. The *GSIB*, *EBA Shortfall*, and *US Stress Test* dummies as well as their interactions are absorbed by the bank fixed effects. In addition, the specification includes time fixed effects ( $\eta_t$ ) to absorb time-variant factors that impact all banks homogeneously. Following Bertrand, Duflo, and Mullainathan (2004), we collapse our data into a single pre- and a single post-treatment period and further cluster standard errors at the bank level to address the concern of serial correlation of the error terms. Panel B of Table 1 provides the descriptive statistics of all dependent variables measured at the bank level.

While using loan data at the bank level helps to provide a general view on how banks adjust their lending behavior in response to the GSIB designation, there might still be demand factors that drive responses by GSIBs versus non-GSIBs differentially. To tackle this problem, we aggregate firms into country-industry clusters (see Gropp, Mosk, Ongena and Wix, 2019, or Degryse, De Jonghe, Jakovljevic, Mulier, and Schepens, 2019 for a discussion on the use of different sets of firm-clusters to control for demand) and estimate the following difference-in-differences regression:

$$Loan\ term_{b,i,c,t} = \beta_1 GSIB * Post + \beta_2 EBA\ Shortfall * Post + \beta_3 US\ Stress\ Test * Post + X_k + \eta_b + \eta_t + \eta_{c,i} + \varepsilon_{b,i,c,t} \quad (2)$$

where  $Loan\ term_{b,i,c,t}$  represents the dependent variables, calculated based on outstanding loans made by bank  $b$  to all firms from industry  $i$  in country  $c$  during the pre- and post-treatment period ( $t$ ). Borrower industries are classified by using their 2-digit SIC code. We control for country-industry-specific credit demand by including country-industry fixed effects ( $\eta_{c,i}$ ) to address the concern that banks could be exposed differentially to different country-industry clusters. Additionally, in order to rule out the fact that the GSIB designation might not uniformly affect GSIBs due to differences in the stringency of bank regulation across countries, we control for heterogeneity across banks home countries by including a set of bank regulation indicators ( $X_k$ ). Following Karolyi and Taboada (2015), we make use of four bank regulation indexes from Barth,

Caprio, and Levine (2013): *Restrictions on bank activities, Stringency of capital regulation, Official supervisory power, and Private monitoring*. For each index, we construct a dummy equal to 1 if a country's index is above the median of the sample (i.e., a high-stringency country) and 0 otherwise (i.e., a low-stringency country). In this analysis, we focus on the intensive margin sample which includes only country-industries borrowing from the sample banks in both the pre- and post-treatment period (Khwaja and Mian, 2008). Panel C of Table 1 provides the descriptive statistics of all dependent variables measured at the bank-country-industry level.

It also worth noting that the adjustment in lending behavior of GSIBs might not be equal to all firms in the same country-industry cluster given the importance of firm characteristics. In order to rule out the fact that the decrease in GSIBs' lending at the country-industry level is driven by firm-specific demand, we use loan data at the firm level and estimate the following regression specification:

$$Loan\ term_{b,f,t} = \beta_1 GSIB * Post + \beta_2 EBA\ Shortfall * Post + \beta_3 US\ Stress\ Test * Post + X_k + \eta_t + \eta_b + \eta_f + \varepsilon_{b,f,t} \quad (3)$$

where  $Loan\ term_{b,f,t}$  represents the dependent variables, calculated based on outstanding loans made by bank  $b$  to firm  $f$  in the pre- and post-treatment period ( $t$ ). Firm fixed effects ( $\eta_f$ ) or firm-time fixed effects ( $\eta_{f,t}$ ) included in the model specification enable us to control for credit demand as well as unobserved firm or firm-time characteristics which might drive the results. We again focus on the intensive margin sample which includes only firms borrowing from the sample banks in both the pre- and post-treatment period. Panel D of Table 1 provides the descriptive statistics of all dependent variables measured at the bank-firm level.

### 3.2.2. Do GSIB-designated banks change the composition of their corporate lending?

As mentioned above, one option for banks that are subject to higher capital requirements is to lower their risk-weighted assets. In order to reduce risk-weighted assets, apart from deleveraging

by reducing loan exposures, banks can reallocate credit toward safer borrowers (De Jonghe, Dewachter, Mulier, Ongena, and Schepens, 2019).<sup>18</sup> Similarly, in response to heightened supervisory scrutiny which strongly focuses on reducing banks' risk-taking behavior, regulated banks might adjust the composition of their corporate lending in order to lower their risk profile. Therefore, in the second step of our empirical design, we examine how banks reallocate their lending across industries and firms based on borrowers' riskiness after being identified as a GSIB.

In order to measure borrowers' riskiness, we use the level of tangibility as a proxy for borrowers' riskiness at the industry level and O-score as a proxy for borrowers' riskiness at the firm level. Braun (2003) argues that a firm's tangible assets provide a protection for the financier (e.g., a bank) in the lending relationship, making it willing to provide funds in the first place. Indeed, tangible assets more easily remain with the firm's financier if the relationship breaks down. We follow Braun (2003) to estimate each industry's tangibility level as the median tangibility of all U.S.-based active firms in the industry (identified as 2-digit SIC code) in a 10-year period from 2001-2010. A firm's tangibility is defined as net property, plant and equipment divided by book value of total assets. Using U.S. data instead of constructing tangibility measures for each country is motivated by data availability and endogeneity concerns at a country level. A high (low) tangibility industry is identified if its tangibility level being in the top (bottom) tercile of the sample. Next, we estimate the regression specification (2) separately for two subsamples: high-tangibility vs. low-tangibility industries.

At the firm level, we calculate the O-score as a linear function of nine firm-level financial variables, measured in the year prior to the GSIB designation (2010), using the parameters originally estimated by Ohlson (Ohlson, 1980; Beck, Degryse, De Haas, and van Horen, 2018):

---

<sup>18</sup> In the calculation of credit risk-weighted assets, highly-rated corporates receive a lower risk weight than low-rated ones. To be more specific, according to Basel III, in the credit-risk standardized approach, for instance, corporates rated BBB+ to BBB- receive a risk weight of 75% while the ones rated AAA to AA- receive a risk weight of 20%.

$$\begin{aligned}
O\text{-score} = & -1.32 - 0.407 \log(\text{total assets adjusted for inflation}) + 6.03 \left( \frac{\text{total liabil.}}{\text{total assets}} \right) - \\
& 1.43 \left( \frac{\text{working capital}}{\text{total assets}} \right) + 0.076 \left( \frac{\text{current liabil.}}{\text{current assets}} \right) - 1.72(1 \text{ if total liabilities} > \\
& \text{total assets, 0 if otherwise}) - 2.37 \left( \frac{\text{net income}}{\text{total assets}} \right) - 1.83 \left( \frac{\text{pretax income} + \text{depreciation}}{\text{total liabil.}} \right) + \\
& 0.285(1 \text{ if income was negative for the last two years, 0 if otherwise}) - \\
& 0.521 \left( \frac{\text{income}_t - \text{income}_{t-1}}{|\text{income}_t| + |\text{income}_{t-1}|} \right)
\end{aligned} \tag{4}$$

To be able to estimate O-scores, we use firm-level financial data from Compustat and Bureau van Dijk's Amadeus Financials database. In the next step, we need to link information on corporate syndicated loans in DealScan with borrower financial data from the above-mentioned databases. We first make use of the available DealScan-Compustat Link by Chava and Roberts (2008) (updated in 2018). This link table matches loan facilities in DealScan with borrower identifiers in Compustat. For the remaining borrowers in our sample, we hand-merge DealScan with Compustat and Amadeus<sup>19</sup>, resulting in a sample of 9,410 firms. We additionally require that all necessary firm-level variables for the calculation of the O-score are non-missing, which leaves us with a sample of 5,648 firms. A high-risk firm is then identified as a firm whose pre-treatment O-score is in the top tercile of the sample and a low-risk firm is identified as a firm whose pre-treatment O-score is in the bottom tercile of the sample. Next, we estimate the regression specification (3) separately for two subsamples: high-risk vs. low-risk firms.

## 4. Results on credit supply

### 4.1. How do GSIB-designated banks adjust their loan terms around the first announcement?

#### 4.1.1 Bank level analysis

Table 2 reports the estimation results of Equation (1) which investigates the impact at the bank level. As mentioned before, this is only for illustrative reasons as such specifications may not

---

<sup>19</sup> We thank Thomas Mosk for the great support in this merging task.

control to a sufficient degree for firm demand. We find that, in general, GSIBs cut their lending in the syndicated loan market by 9.1% compared to non-GSIBs in response to their GSIB designation.

<Insert Table 2 about here>

#### 4.1.2 Bank-Country-Industry level analysis

To examine whether banks' lending behaviors are indeed driven by their GSIB designation, we employ loan data at the bank-country-industry level to improve our control for credit demand. Table 3 reports the results of the difference-in-differences regression from Equation (2). The first column shows that in general, the first announcement of the GSIBs list does not seem to affect lending of GSIB-designated banks to a specific industry compared to non-GSIB counterparts. With regards to other loan characteristics, GSIBs charge higher interest rates to their borrowers (by about 1.5 basis point) compared to non-GSIBs while we do not find any effect of being a GSIB on loan maturity and collateralization.

<Insert Table 3 about here>

We next deepen our analysis at the bank-country-industry level by investigating whether the first official GSIB designation has an identical effect across all GSIB-designated banks given the leak of a preliminary GSIBs list by the FT in 2009. The leaked list was published on November 30, 2009 and re-printed on November 10, 2010, and included 24 banks of which 19 were officially designated as a GSIB in November 2011. Using this heterogeneity, we create 3 dummies: *Old GSIB* takes the value of 1 if a bank is identified as a GSIB in both the leaked and the official GSIBs list, and 0 otherwise; *New GSIB* takes the value of 1 if a bank is newly identified as a GSIB in the official list, and 0 otherwise; and *FT Non-GSIB* takes the value of 1 if a bank is identified as a GSIB in the leaked list but not in the official list, and 0 otherwise.

Panel A of Table 4 reports the estimation results of Equation (2) where the dummy *GSIB* is replaced by 3 dummies: *Old GSIB*, *New GSIB*, and *FT Non-GSIB*. We find that newly and thus unexpectedly GSIB-designated banks do cut lending to a specific country-industry by 10.3% while

there is no effect documented for the expected GSIB-designated ones. The coefficients on *Old GSIB \* Post* and *New GSIB \* Post* are statistically different at the 5% level. This result implies that being designated as a GSIB does lead to the reduction in the bank's credit supply.<sup>20</sup>

<Insert Table 5 about here>

Given that “new GSIBs” are more likely to fall into the low buckets of capital surcharges (because they are more marginal GSIB candidates), the results on lending of old vs. new GSIBs pose a question whether the reduction in GSIBs' credit supply is induced by higher expected capital requirements or increased scrutiny or a combination of both. We therefore split GSIBs into *low- vs. high-bucket* group. Although there was no information about detailed buckets in the first GSIB designation, GSIBs might still form some expectation about which bucket they might fall into based on the BCBS's methodology for the GSIB identification. We use the detailed buckets in the second designation in November 2012 for this analysis: GSIBs that have to hold additional capital requirements of at least 2% are in the high-bucket group<sup>21</sup> while the rest are in the low-bucket group. Although it is not possible to claim causality, the results provide suggestive evidence on whether banks' reactions are driven by expected capital requirements or regulatory scrutiny. Panel B of Table 4 reports the results of this analysis and shows no significant effect for either of the groups. In an unreported analysis, we further split “old GSIBs” into high- and low-bucket groups and low-bucket GSIBs into “old GSIBs” and “new GSIBs”. We effect is only significant for “new GSIBs” and “new GSIBs” with low-bucket capital surcharges.

#### 4.1.3 Bank-Firm level analysis

The reduction in GSIBs' loan exposure shown in the bank-country-industry level analysis could still be driven by firm-specific characteristics. To address this concern, we repeat the bank-

---

<sup>20</sup> In Appendix F, we report the estimation results around the first leakage of the GSIBs list in November 2009. We do not find any effect of the announcement of this preliminary GSIBs list on lending of GSIB-identified banks compared to non-GSIBs, suggesting that banks seem to be cautious in response to the leaked list.

<sup>21</sup> The high-bucket group consists of 6 GSIBs: Citigroup, Deutsche Bank, HSBC, JP Morgan Chase, Barclays, and BNP Paribas.

country-industry level analysis at the bank-firm level and use firm fixed effects to control for credit demand and unobservable firm characteristics. The results are reported in Table 5. Compared to non-GSIBs, GSIBs reduce their outstanding loans in the syndicated loan market to a specific firm, on average, by 5.9% after being identified as a GSIB. In contrast, there is no effect of the GSIB designation on bank lending at the bank-country-industry level, suggesting that firm-specific characteristics seem to affect banks' lending decision.<sup>22</sup> As regards other loan characteristics, GSIBs charge higher interest rates (by about 3.4 basis points) and ask less collateral from the same firm compared to non-GSIBs.

<Insert Table 5 about here>

Similar to the bank-country-industry analysis, we split the GSIB group into the “old GSIBs” and the newly identified GSIBs and re-estimate Equation (3). The estimation results are reported in Panel A of Table 6 and once more confirm that the lending cut by GSIBs following the designation is mainly driven by the newly identified GSIBs. Compared to non-GSIBs, the “old GSIBs” reduce their credit supply to a specific firm, on average, by 4.9% which is lower than in the case of the “new GSIBs” (11.1%). These two coefficients are statistically different at the 5% level. In the model specifications using firm-time fixed effects, we document a reduction in lending of 4.8% from the “new GSIBs” but no effect in the case of the “old GSIBs”. Again, the two coefficients are statistically different at the 10% level.<sup>23</sup>

<Insert Table 6 about here>

We again split GSIBs into low- and high-bucket groups and find that low-bucket GSIBs cut their lending by 6.5% compared to non-GSIBs while no significant effect is documented in the case of high-bucket GSIBs (Panel B of Table 6). In an unreported analysis, we also split “old GSIBs” into high- and low-bucket groups and low-bucket GSIBs into “old GSIBs” and “new

---

<sup>22</sup> One could argue that GSIBs might simply cut lending to firms with a temporary lending relationship (i.e., transactional lending). In untabulated results, we find that there is no difference between GSIBs' lending to firms with and without prior relationship.

<sup>23</sup> Similar to the bank-country-industry analysis, in Appendix F, we report the estimation results around the first leakage of the GSIBs list in November 2009 at the bank-firm level. Again, we do not find any effect of the announcement of this preliminary GSIBs list on lending of GSIB-identified banks compared to non-GSIBs.



GSIBs”. Similar to the results from the bank-country-industry analysis, the impact of the GSIB designation is mainly driven by “new GSIBs” with low-bucket capital surcharges. These results together with the results for old vs. new GSIBs imply that the effect of anticipated scrutiny seems to outweigh the effect of higher capital requirements on bank credit supply. Our findings are consistent with Passmore and von Hafften (2019) who show that the GSIB capital surcharges of 1-2.5% are too small based on the experience of the 2008–09 financial crisis and suggest to raise the surcharges by 5.50-8.25%. Moreover, the CET1 ratio of all GSIB-designated banks in both 2010 and 2011 are already above the minimum requirements of 8.0-9.5%<sup>24</sup> and 15 of them reduced or kept their capital ratios almost stable in 2011 compared to 2010.

The negative effect of the GSIB designation on bank lending (e.g., a reduction of 11.1% for new GSIBs), seemingly induced by stricter scrutiny, is also in line with recent findings in the literature on bank supervision and credit supply (Haselmann et al., 2019; Ivanov and Wang, 2019). Finally, it is worth noting that the effect seems more pronounced than that documented in other contemporaneous studies that emphasize the impact of GSIB capital surcharges on bank lending (Favara et al., 2019; Behn and Schramm, 2020).

The expected extra supervision imposed on GSIBs might discourage other banks to contribute or join a syndicate where one or more GSIBs act as a lead bank, which in turn might lead to a higher lead share of GSIBs in a syndicate. In contrast, one might argue that a bank’s explicit too-big-too-fail status coming from its GSIB designation might lead to a reputation gain for that bank. As a result, the bank might be asked to contribute less in a syndicate. Delis, Iosifidi, Kokas, Xefteris, and Ongena (2020) posit that a reputation loss makes it more difficult for a lead bank to attract participants. The bank is thus forced to retain a larger share of the loan to motivate participant banks to join the project, suggesting that a reputation gain is associated with a lower

---

<sup>24</sup> Except for Swiss banks, the minimum CET1 ratio requirement is 10% proposed by the Swiss Commission of Experts on TBTF. For other banks, according to the GSIB framework, GSIB-designated banks have to hold a minimum CET1 ratio of 4.5% plus 2.5% as the capital conservation buffer requirement plus a GSIB capital surcharge. The GSIB capital surcharges range from 1% to 2.5%. Therefore, the CET1 ratio requirements for GSIBs range from 8.0% to 9.5%. The detailed information on GSIBs’ CET1 ratio is reported in Appendix C.

lead share in a syndicate. Following Delis, Iosifidi, Kokas, Xefferis, and Ongena (2020), we investigate how a bank's lead share (i.e., the share of a loan held by the lead lender) is affected by its GSIB designation and report the results in Appendix D. We find that compared to non-GSIB, GSIBs' lead shares increase by 0.5% after the GSIB designation, with the result driven by "new GSIBs". This suggests that the effect of stricter supervision dominates any reputational effects, although the economic effect appears to be modest (compared to the average lead share of 10%).

#### *4.1.4 Parallel trend assumption*

One of the key assumptions of the difference-in-differences design is the parallel trend assumption, i.e., whether banks in the treatment and control group would behave similarly or whether the treatment effects are not observed in the pre-treatment period. Figure 2 presents the evolution of outstanding loan at the bank-, bank-country-industry-, and bank-firm level relative to the pre-treatment year (November 2010 – October 2011) for different groups of banks. It shows that GSIBs and non-GSIBs experience an opposite trend in their lending behavior in the syndicated loan market before the GSIB designation compared to after the designation, suggesting that the treatment effects are not observed in the pre-treatment period. Up to November 2011, GSIBs (i.e., old and new GSIBs) exhibit higher loan growth than non-GSIBs (i.e., FT Non-GSIBs and pure non-GSIBs). However, the opposite trend is observed in the year after the designation. Interestingly, while "old GSIBs" have a lower loan growth rate than "new GSIBs" in the pre-treatment period, the opposite trend is also observed for these two groups in the post-treatment period.

<Insert Figure 2 about here>

There might be a concern that some certain GSIBs (e.g., GSIBs that can expect higher surcharges) probably adjusted their lending earlier than their peers. To address this concern, we employ two alternative events: the first and the second leakage of the GSIB list in November 2009 and November 2010, respectively. We then repeat our analysis at the bank-country-industry and

bank-firm level for these two events, focusing on lending behavior of old vs. new GSIBs and high- vs. low-bucket GSIBs. The results are reported in Appendix F, suggesting that GSIBs who may expect higher capital surcharges do not seem to adjust their lending earlier than other GSIBs.

#### **4.2. Do GSIB-designated banks change the composition of their lending?**

We now study whether or not GSIB designated banks uniformly pass on the credit supply shock across industries and borrowers characteristics. We focus on borrowers' riskiness, which might help banks to lower their risk profile in response to increased supervision as well as to adjust their risk-weighted assets and thus their capital ratios to meet higher capital requirements.<sup>25</sup>

Table 7 documents the reallocation of credit across industries. Both Panel A and Panel B show that in general, there is no difference between GSIBs and non-GSIBs in making lending decisions conditional on industry tangibility. Panel B shows the differential impact of the GSIB designation on bank lending of the “new GSIBs” to high and low tangibility industries. Particularly, compared to non-GSIBs, the “new GSIBs” reduce their loan exposure to low-tangibility industries by 10.2%, i.e. by more than the decrease in their lending to high-tangibility industries (7.7%). A high-tangibility industry can be perceived as a safer lending market for banks since tangible assets can be explicitly collateralized and thus more easily remain with banks in the case of credit default (Braun, 2003). However, these two coefficients are not statistically different from each other.

<Insert Table 7 about here>

---

<sup>25</sup> In an unreported analysis, we examine whether banks reallocate their lending across industries based on banks' industry specialization. De Jonghe, Dewachter, Mulier, Ongena and Schepens (2019) find that in response to a negative credit supply shock, banks reallocate credit toward industries where they are more specialized given their superior screening and monitoring skills in these industries. Focusing on industries in which banks have an information advantage can help them to reduce the risk that they fail to evaluate their borrowers' repayment ability. However, we find no difference between GSIBs and Non-GSIBs in making lending decision conditional on their predetermined industry specialization following the GSIB designation. In particular, both of them tend to cut lending to industries in which they are more specialized, which, in turn, may help them to reduce the risk associated with being over-specialized in some certain country-industries.

Although GSIBs seem to cut their lending across the board at the country-industry level, their lending decision to a specific firm might be driven by firm characteristics. Indeed, Panel A of Table 8 shows that compared to non-GSIBs, GSIBs cut their loan exposure mainly to risky firms by 8.5% while no significant result is documented in the case of less risky firms. This is mainly driven by the “old GSIBs”. Indeed, consistent with the results on industry tangibility, Panel B shows that the “new GSIBs” tend to cut their lending to all corporate borrowers regardless of borrower riskiness. The coefficients on *New GSIB\*Post* for the two subsamples are not statistically different. However, the “old GSIBs” react differently: they reduce their lending only to high-risk firms, by 5.7% compared to non-GSIBs while there is no difference between their lending and non-GSIBs’ lending to low-risk firms. With respect to the other loan terms, no differential effect is documented between low- and high-risk firms. When we split GSIBs into high- vs. low-bucket groups, as represented in Panel C, we document the differential effect of the GSIB designation on low-bucket GSIBs’ lending to risky vs. less risky borrowers while no significant effect is found for high-bucket GSIBs. Specifically, low-bucket GSIBs reduce their lending to risky firms by 9.7% vs. no significant effect for low-risk firms.

<Insert Table 8 about here>

We reinforce our borrower riskiness analysis at the firm level by classifying borrowers into zombie vs. non-zombie firms, with zombie firms being riskier than their non-zombie counterparts. Following Acharya, Eisert, Eufinger, and Hirsch (2019) and Bonfim et al. (2020), we define a zombie firm as one falling into one of the following categories: (i) a negative equity in the previous year; (ii) a low interest coverage. A firm has a low interest coverage if its interest coverage, computed as net profits over interest expenses, is in the bottom tercile of the sample; (iii) a high probability of default. A firm’s probability of default is computed based on its O-score (Beck et al., 2018):  $\exp(\text{O-score}) / 1 + \exp(\text{O-score})$ . We define a firm with a high probability of default if this value is in the top tercile of the sample. We then estimate the regression specification (3) separately for two subsamples: zombie vs. non-zombie firms. Consistent with the results of the

borrower riskiness analysis, as reported in Appendix E, we find that GSIBs cut lending to zombie firms by 6.4% compared to non-GSIBs while no significant effect is observed for non-zombie firms (Panel A). Furthermore, “new GSIBs” tend to cut lending across the board (Panel B).

### 4.3. Extensive margin analysis

Focusing on the intensive margin helps to provide evidence on how GSIB-designated banks adjust terms of loans to clients who continued to borrow after the GSIB designation. In order to examine how banks discontinue/start providing loans to both existing and new clients, we extend our analysis to the extensive margin sample. At the bank-country-industry level, we construct two dummy variables: *Exit* is 1 if bank *b* stops lending to industry *i* in country *c* in the post-treatment period and 0 otherwise; *Entry* is 1 if bank *b* starts lending to industry *i* in country *c* after the GSIB designation, and 0 otherwise. The results are presented in Panel A of Table 9, and show that a GSIB designation motivates banks to reduce credit to new country-industry clusters, but to keep lending relationships with existing borrowers. These results are mainly driven by the “old GSIBs” while there is no effect for newly identified GSIBs. When GSIBs are split into high- vs. low-bucket group, we find that both groups are less likely to lend to new customer clusters while there is no significant effect on the likelihood of terminating lending relationship toward existing customer clusters.

<Insert Table 9 about here>

We then repeat the analysis at the bank-firm level, as presented in Panel B of Table 9, we do not document any significant effect of being a GSIB on bank lending to existing or new corporate borrowers. We next deepen our analysis to see whether borrower riskiness affects bank lending decisions at the extensive margin. Panel C of Table 9 shows that GSIBs are more likely to stop lending to existing borrowers and less likely to start lending to new borrowers only with high-risk firms while no significant effect is observed in the case of low-risk firms. These results are mainly driven by either “new GSIBs” or low-bucket GSIBs.

In a nutshell, in response to the first official GSIB designation, the unexpectedly-designated GSIBs (i.e., the “new GSIBs”) cut their credit supply across the board at the intensive margin but show less willingness to provide loans for high-risk firms at the extensive margin. In contrast, the expectedly-designated GSIBs (i.e., the “old GSIBs”) reduce their lending mainly to high-risk borrowers at the intensive margin while no differential effect is shown at the extensive margin. These lending adjustments are likely induced by increased supervisory scrutiny imposed on GSIBs under the new GSIB framework.

## 5. Real effects of GSIB designation

The extent to which the decrease in credit supply of GSIBs might have an effect on the real economy at the firm level should depend on how they reallocate credit across different categories of borrowers. Until now, we have documented that GSIBs reduce their credit supply by cutting lending to risky borrowers and by shifting credit towards low-risk ones in the year following the first GSIB designation. Therefore, there is probably no average effect of the GSIBs’ credit reduction on the real economy. However, a negative impact might be observed in the case of high-risk borrowers unless other banks, who are not facing higher capital requirements, or public debt markets would pick up the slack. To test this proposition, we link the lending adjustment of GSIBs to real outcomes at the firm level. Particularly, we focus on firms that are more dependent on credit supply from GSIBs in the syndicated loan market. Following Gropp et al. (2019), we calculate the share of a firm  $j$ ’s borrowing from GSIBs in its total borrowing from all banks in the pre-treatment period (01/11/2010-31/10/2011):

$$GSIB \text{ Borrowing Share}_j = \frac{\sum_{b[GSIB]} Outstanding \ Loans_{j,b}}{\sum_{b[All \ banks]} Outstanding \ Loans_{j,b}} \quad (5)$$

If a firm was not borrowing in the pre-treatment period but in the post-treatment period in the syndicated loan market, its *GSIB Borrowing Share* is set to zero. We then divide our firm sample into *GSIB-dependent firms* who have a *GSIB Borrowing Share* above the median of the

sample (the treatment group) and *non-GSIB-dependent firms* who have a *GSIB Borrowing Share* below the median of the sample (the control group). Using the same method, we also define *EBA Shortfall-dependent firms* and *U.S. Stress Test-dependent firms*.

### 5.1 Firm-level overall lending

We first investigate whether firms could substitute the reduction of credit supply from GSIBs by funding from other banks that are not subject to higher capital requirements in the syndicated loan market. To do so, we aggregate lending at the firm level and estimate the following regression specification:

$$\Delta Y_f = \beta_1 GSIB\_dep + \beta_2 EBA\ Shortfall\_dep + \beta_3 US\ Stress\ Test\_dep + \eta_{c,i} + \varepsilon_f \quad (6)$$

where  $\Delta Y_f$  is the log change of firm  $f$ 's total borrowing from all banks in the sample in the syndicated loan market between the pre- and post-treatment period ( $\Delta \text{Log Firm outstanding borrowing}$ ). The dummy variable *GSIB\_dep* takes the value of 1 if the firm is a *GSIB-dependent firm*, and 0 otherwise. The dummy variable *EBA Shortfall\_dep* takes the value of 1 if the firm is a *EBA Shortfall-dependent firm*, and 0 otherwise. The dummy variable *US Stress Test\_dep* takes the value of 1 if the firm is a *US Stress Test-dependent firm*, and 0 otherwise.  $\eta_{c,i}$  are country-industry fixed effects.<sup>26</sup> Standard errors are clustered at the firm country level to address the concern of serial correlation of the error terms.

Table 10 reports the results of this analysis, which reinforce our findings at the bank-firm level. In general, GSIB-dependent firms experience a decrease of 5.1% in credit supply in the syndicated loan market (Column 3). Especially, firms depending on funding from “new GSIBs” suffer from a larger lending cut than the ones depending on funding from “old GSIBs” (6.1% vs. 4.5%). Columns 5-8 report the estimation results for two subsamples: high- vs. low-risk firms,

---

<sup>26</sup> In an unreported analysis, we also include estimated firm fixed effects from the loan analysis regression at the bank-firm level (Equation 3) to control for unobserved firm credit demand as in Jiménez, Mian, Peydró, and Saurina (2020) and Banerjee, Sette, and Gambacorta (2017). Our results remain qualitatively unchanged.

showing that risky firms whose funding is dependent on GSIBs exhibit a reduction of 13.1% in its aggregate borrowing. Furthermore, risky firms dependent on old GSIBs' funding suffer from a larger reduction in credit supply than the ones dependent on new GSIBs' funding (11.4% vs. 8.6%). These results work against the argument that the shortage of funding caused by GSIBs' lending adjustment in the syndicated loan market is replaced by credit from other banks.

<Insert Table 10 about here>

## **5.2 Real effects of GSIB designation**

In the next step, we collect data on several firm variables including Log Total Assets, Tangibility, Cash Flow Ratio, Net Worth, EBITDA Ratio, and Leverage to study the impact of GSIB designation on firm outcomes.<sup>27</sup> Only firms with available information on all of these variables are included in the firm sample for the real effect analysis, which leaves us a sample of 5,874 firms. Table 11 provides the descriptive statistics of these variables measured in the pre-treatment period of the two subsamples, suggesting that firms in the treatment group differ from firms in the control group along several important characteristics. We use t-test and Wilcoxon rank sum test to test for differences in means and medians, respectively, between two groups. GSIB-dependent firms on average have a higher cash flow ratio, a higher ratio of EBITDA to total assets, a higher leverage ratio, and a lower net worth. To reduce the differences between the two subgroups, we follow Gropp et al. (2019) and match firms on country of incorporation, industry (defined by the 2-digit SIC code), whether the firm is publicly listed, and pre-treatment levels of all above mentioned firm characteristics, using kernel matching based on the Mahalanobis distance of all the matching covariates.

<Insert Table 11 about here>

The firm outcomes variables are the change in the logarithms of total assets, fixed assets as a measure of firms' investment (Campello and Larrain, 2016; Gropp et al., 2019), and sales

---

<sup>27</sup> See Appendix B for the definition of all variables.



between the year before the GSIB designation (2010) and after the GSIB designation (2012). All variables are winsorized at the 5% level (Gropp et al., 2019; Acharya, Eisert, Eufinger, and Hirsch, 2018). Figure 3 presents the evolution of the logarithm of total assets, fixed assets, and sales relative to 2010 for high-risk GSIB-dependent firms and low-risk GSIB-dependent firms. Up to 2010, the year prior to the GSIB designation, high-risk firms exhibit higher asset-, investment-, and sales growth than low-risk firms. However, starting from 2011, the opposite trend is observed for asset- and investment growth while the sales growth rates of two groups stay closely to each other.

<Insert Figure 3 about here>

We then estimate the following difference-in-differences regression for the matched sample to measure the treatment (i.e., GSIB dependence) effect on the firm outcome variables:

$$\Delta Y_f = \beta_1 GSIB\_dep + \beta_2 EBA\ Shortfall\_dep + \beta_3 US\ Stress\ Test\_dep + \delta X_{f,2010} + \eta_{c,i} + \varepsilon_f \quad (7)$$

where  $\Delta Y_f$  is the change in the outcome variables of firm  $f$ . The model specification includes all firm-level control variables  $X_{f,2010}$  (i.e. Log Total Assets, Tangibility, Cash Flow Ratio, Net Worth, EBITDA Ratio, Leverage, Listed Firm) and firm country-industry fixed effects ( $\eta_{c,i}$ ).<sup>28</sup> Standard errors are clustered at country level to address the concern of serial correlation of the error terms. To examine whether firm riskiness affects firm outcomes differently between borrowers who are dependent on GSIBs' credit supply and those who are not dependent on funding from GSIBs, we re-estimate Equation (7) separately for two subsamples: low- vs. high-risk firms.

<Insert Table 12 about here>

Table 12 reports the results of difference-in-difference regressions using the matched sample to examine whether firms depending on funding from GSIBs are hit by the reduction in GSIBs' credit supply. Panel A suggests that in general, there is no effect of a firm's dependence on funding from GSIBs on its asset-, investment-, and sales growth. However, risky borrowers

---

<sup>28</sup> See Footnote 28.

who are dependent on GSIBs' credit supply experience a lower asset growth by 2.2% and a lower investment growth by 5.4% compared to non-GSIB-dependent counterparts with a similar level of riskiness (Panel B). Interestingly, consistent with the previous findings, Panel C shows that risky borrowers that are dependent on funding from the "old GSIBs" exhibit lower asset growth by 1.6%, a lower investment growth by 5.7%, and a lower sales growth by 2.3% compared to non-GSIB-dependent counterparts. These results once more confirm our result that the lack of funding caused by GSIBs' lending reduction in the syndicated loan market is unlikely to be replaced by loans from other banks.

## **6. Conclusion**

We exploit the first GSIB designation on 4<sup>th</sup> November, 2011 to examine how GSIB-designated banks adjust their lending behavior and whether this adjustment has any effect on the real economy. Overall, we find that the GSIB designation causes a decrease in corporate lending in the syndicated loan market at the intensive margin and induces GSIBs to stop lending to some borrowers at the extensive margin. The lending cut seems to occur across industries, but is concentrated among risky corporate borrowers, implying a lower risk profile in response to stricter supervision imposed on GSIBs under the new GSIB framework. Our findings therefore suggest a decrease of GSIBs' risk-taking in the corporate loan market, which is in line with the intended effect of the policy, namely to reduce ex-ante moral hazard among systemically important banks.

The success of the policy, with respect to stabilizing the financial system, comes at the cost of lower asset-, investment- and sales growth among those riskier firms that experience reduced credit supply from GSIBs and are seemingly unable to substitute their borrowing with funding from other sources.

## References

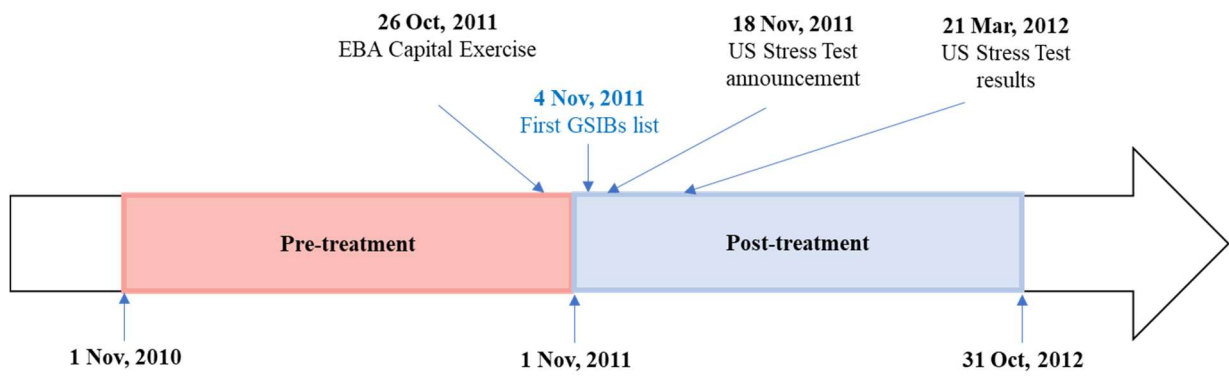
- Abreu, J.F. and M.A. Gulamhussen (2013). The stock market reaction to the public announcement of a supranational list of too-big-to-fail banks during the financial crisis. *Journal of International Financial Markets, Institutions and Money*, 25: 49-72.
- Acharya, V.V., T. Eisert, C. Eufinger, and C. Hirsch (2018). Real effects of the sovereign debt crisis in Europe: Evidence from syndicated loans. *Review of Financial Studies*, 31(8): 2855–2896.
- Acharya, V.V., T. Eisert, C. Eufinger, and C. Hirsch (2019). Whatever it takes: The real effects of unconventional monetary policy. *Review of Financial Studies*, 32(9): 3366–3411.
- Admati, A., P. DeMarzo, M. Hellwig, and P. Pfleiderer (2018). The leverage ratchet effect. *Journal of Finance*, 73(1):145–98.
- Banerjee, R., E. Sette, and L. Gambacorta (2017). The real effects of relationship lending. *Bank of Italy*, Working paper.
- Barth, J. R., G. Caprio, and R. Levine (2013). Bank regulation and supervision in 180 countries from 1999–2011. Working paper.
- Beck, T., H. Degryse, R. De Haas, and N. van Horen (2018). When arm’s length is too far: Relationship banking over the credit cycle. *Journal of Financial Economics*, 127: 174–196
- Begley, T., A. Purnanandam, and K. C. Zheng (2017). The strategic under-reporting of bank risk. *Review of Financial Studies*, 30(10): 3376–3415.
- Behn, M. and A. Schramm (2020). The impact of G-SIB identification on bank lending: evidence from syndicated loans. *European Central Bank*, Working paper.
- Behn, M., R. Haselmann, and P. Wachtel (2015). Procyclical capital regulation and lending. *Journal of Finance*, 71(2): 919-956.
- Behn, M., G. Mangiante, L. Parisi, and M. Wedow (2019). Does the G-SIB framework incentivize window-dressing behaviour? Evidence of GSIBs and reporting banks. *European Central Bank*, Working paper.
- Bertrand, M., E. Duflo, and S. Mullainathan (2004). How much should we trust difference-in-differences estimates?. *Quarterly Journal of Economics*, 119(1): 249–75.
- Bonfim, D., G. Cerqueiro, H. Degryse, and S. Ongena (2020). On-site inspecting zombie lending. Working paper.
- Braun, M. (2003). Financial Contractibility and Assets’ Hardness. Working paper.
- Campello, M., and M. Larrain (2016). Enlarging the contracting space: Collateral menus, access to credit, and economic activity. *Review of Financial Studies*, 29(2):349–83.
- Chava, S., and M. R. Roberts (2008). How does financing impact investment? The role of debt covenants. *Journal of Finance*, 63: 2085–2121.
- Cohen, B.H. and M. Scatigna (2016). Banks and capital requirements: channels of adjustment. *Journal of Banking & Finance*, 69(1): S56-S69.

- De Haas, R., and N. Van Horen (2012). Running for the exit? International bank lending during a financial crisis. *Review of Financial Studies*, 26(1):244–85.
- De Jonghe, O., H. Dewachter, K. Mulier, S. Ongena, and G. Schepens (2019). Some Borrowers Are More Equal than Others: Bank Funding Shocks and Credit Reallocation. *Review of Finance*, 24(1): 1–43.
- Degryse, H., A. Karapetyan, and S. Karmakar (2020). To Ask or not to ask: Bank capital requirements and loan collateralization, forthcoming in *Journal of Financial Economics*.
- Degryse, H., O. De Jonghe, S. Jakovljevic, K. Mulier, and G. Schepens (2019). Identifying Credit Supply Shocks with Bank-Firm Data: Methods and Applications. *Journal of Financial Intermediation*, 40: 100813.
- Delis, M. D., M. Iosifidi, S. Kokas, D. Xefteris, and S. Ongena (2020). Enforcement actions on banks and the structure of loan syndicates. *Journal of Corporate Finance*, 60: 1-29.
- Favara, G., I. Ivanov, and M. Rezende (2019). GSIB Surcharges and Bank Lending: Evidence from U.S. Corporate Loan Data. Working paper, available at <http://www.giovanfavara.com/research>
- Goel, T., U. Lewrick, and A. Mathur (2019). Playing it safe: global systemically important banks after the crisis. *BIS Quarterly Review*, September 2019.
- Granja, J., and C. Leuz (2019). The death of a regulator: Strict supervision, bank lending and business activity. Working paper.
- Gropp, R., T. Mosk, S. Ongena, and C. Wix (2018). Banks response to higher capital requirements: Evidence from a quasi-natural experiment. *Review of Financial Studies*, 32(1): 266-299.
- Haselmann, R., S. Singla, and V. Vig (2019). Supra(National) Supervision. Working paper.
- Ivanov, I., and J. Wang (2019). The impact of bank supervision on corporate credit. Working paper.
- Ivashina, V. (2009). Asymmetric Information Effects on Loan Spreads. *Journal of Financial Economics*, 92(2): 300–319.
- Iwanicz-Drozdowska, M. and I. Schab (2014). Capital Regulation of G-SIBS: Does One Size Fit All?. Available at SSRN 2450529.
- Jiménez, G., A. Mian, J. Peydró, and J. Saurina (2020). The real effects of the bank lending channel. *Journal of Monetary Economics*, 115(C): 162-179.
- Juelsrud, E. R., and E. G. Wold (2020). Risk-Weighted capital requirements and portfolio rebalancing. *Journal of Financial Intermediation*, 41: 1-12.
- Karolyi, G. A. and A. G. Taboada (2015). Regulatory Arbitrage and Cross-Border Bank Acquisitions. *Journal of Finance*, 70(6): 2395-2450.
- Khwaja, A., and A. Mian (2008). Tracing the impact of bank liquidity shocks: Evidence from an emerging market. *American Economic Review*, 98(4): 1413–42.
- Mariathasan, M., O. Merrouche, and C. Wergedal (2014). Bailouts and Moral Hazard: How Implicit Government Guarantees Affect Financial Stability. *CEPR DP 10311*.

- Moenninghoff, S. C., S. Ongena, and A. Wieandt (2015). The perennial challenge to counter Too-Big-to-Fail in banking: Empirical evidence from the new international regulation dealing with Global Systemically Important Banks. *Journal of Banking & Finance*, 61: 221-236.
- Ohlson, J.A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 18 (1): 109–131 .
- Passmore, W. and A. H. von Hafften (2019). Are Basel's Capital Surcharges for Global Systemically Important Banks Too Small?. *International Journal of Central Banking*, 15(1): 107-156.
- Violon, A., D. Duranty, and O. Toaderz (2017). The impact of the identification of GSIBs on their business model. *Banque de France*, Working paper.

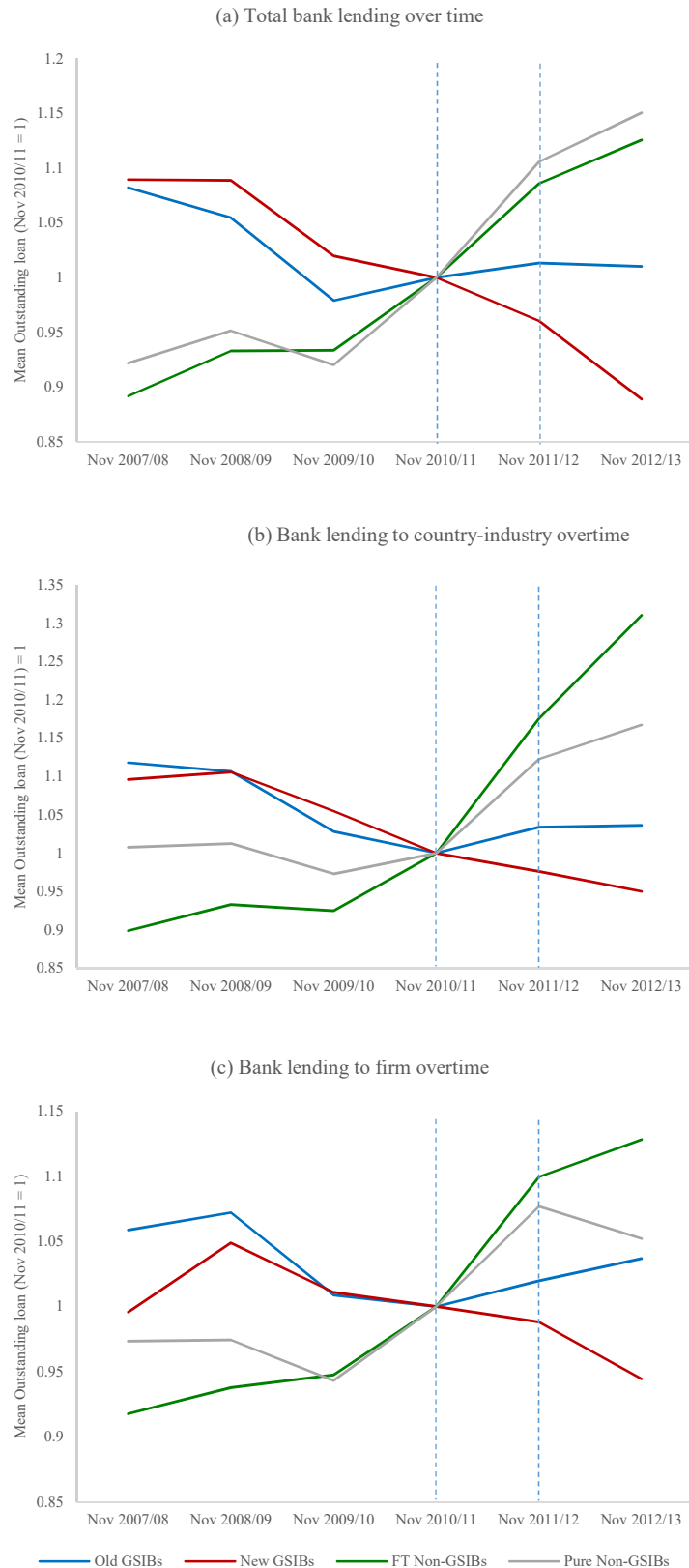
### Figure 1: The first GSIB designation, relevant events and the sample period

This figure shows the timeline of the first GSIB designation and the two relevant events. It also illustrates the pre- and post-treatment period used in the paper.



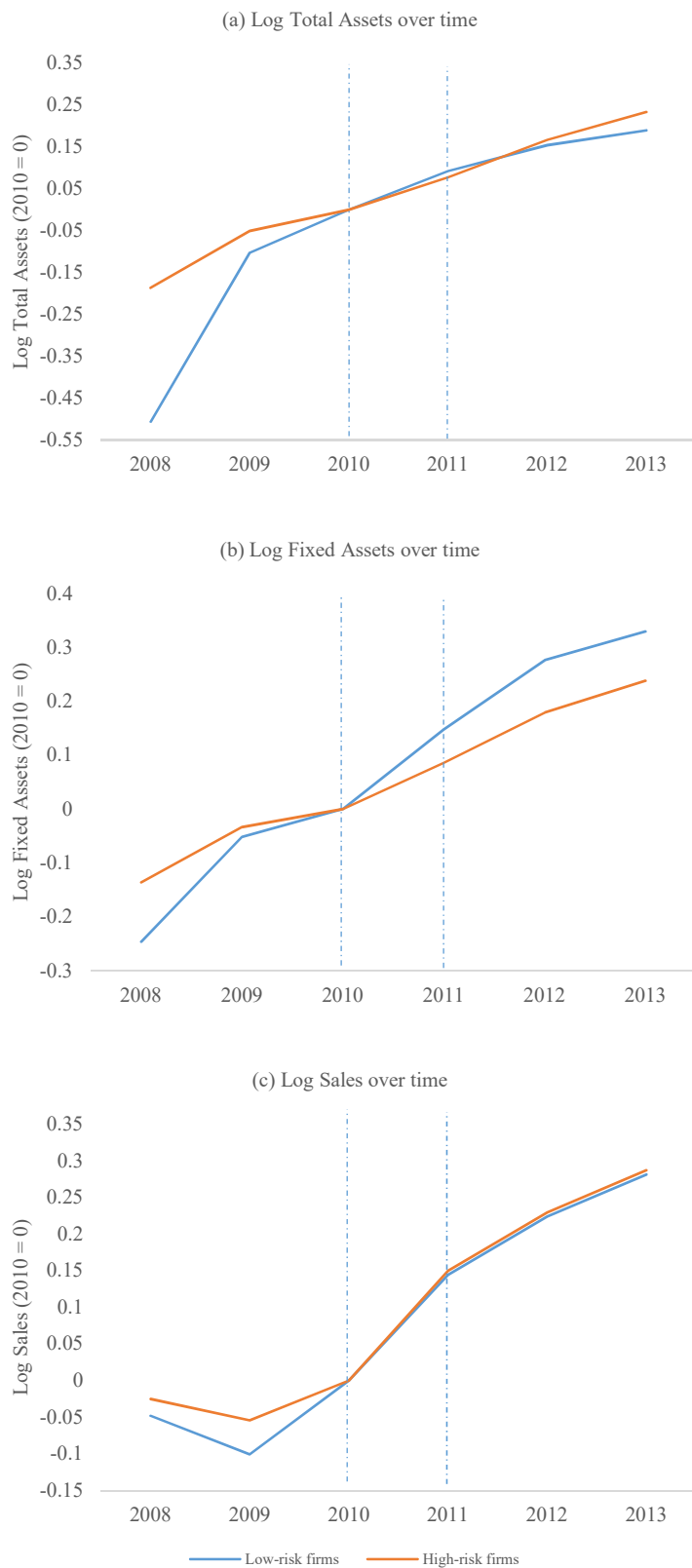
## Figure 2: Bank lending in the syndicated loan market over time

This figure shows the evolution of the mean of the logarithm of outstanding loan calculated at the bank level (Panel A), the bank-country-industry level (Panel B), and the bank-firm level (Panel C) for Old GSIBs (solid blue line), New GSIBs (solid red line), FT Non-GSIBs (solid green line), and Pure Non-GSIBs (solid grey line). Two dashed vertical lines mark the year right before (November 2010 – November 2011) and after (November 2011 – November 2012) the first GSIB designation.



### Figure 3: Firm-level outcomes over time

This figure shows the evolution of the mean of the logarithm of total assets (Panel A), fixed assets (Panel B), and sales (Panel C) for 969 high-risk GSIB-dependent firms (solid red line) and 941 low-risk GSIB-dependent firms (solid blue line). A high (low)-risk firm is a firm whose pre-treatment O-score is in the top (bottom) tercile of the sample. A firm is GSIB-dependent if it has a GSIB Borrowing Share above the median of the sample. Two dashed vertical lines mark the year right before (2010) and after (2012) the first GSIB designation.





**Table 1: Summary statistics**

This table presents the descriptive statistics of the bank characteristics as of end-2010 (Panel A) and the loan characteristics measured at the bank level (Panel B), the country-industry level (Panel C), and the firm level (Panel D). All variables are defined in Appendix B.

*Panel A: Bank characteristics*

	GSIBs				Non-GSIBs			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
Log Total assets	28	14.134	14.266	0.649	53	12.856	12.802	0.632
Deposit ratio	28	0.416	0.403	0.175	53	0.579	0.613	0.196
Loan ratio	28	0.371	0.387	0.171	53	0.543	0.554	0.148
ROA (%)	28	0.468	0.420	0.359	53	0.819	0.850	0.502

*Panel B: Loan characteristics - Bank level*

	Full sample				GSIBs				Non-GSIBs			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
Log Outstanding loan	162	10.196	10.706	2.327	56	12.133	12.380	1.139	106	9.173	9.727	2.137
Secured	160	74.627	75.684	15.785	56	70.884	75.789	14.423	104	76.643	74.104	16.181
Maturity	162	37.578	31.880	20.846	56	30.910	29.864	7.416	106	41.101	34.613	24.521
AISD	160	195.600	186.859	59.487	56	202.358	198.078	48.171	104	191.962	176.807	64.694

*Panel C: Loan characteristics - Bank-Country-Industry level*

	Full sample				GSIBs				Non-GSIBs			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
Log Outstanding loan	38,580	4.616	4.710	1.900	25,090	4.839	4.909	1.862	13,490	4.202	4.354	1.901
Secured	25,134	72.802	100.000	39.407	16,874	72.493	100.000	38.940	8,260	73.433	100.000	40.338
Maturity	38,580	34.925	24.859	37.532	25,090	34.772	25.174	36.425	13,490	35.210	24.228	39.508
AISD	30,808	184.954	168.474	117.521	20,283	187.684	170.613	119.522	10,525	179.693	162.708	113.384

*Panel D: Loan characteristics - Bank-Firm level*

	Full sample				GSIBs				Non-GSIBs			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
Log Outstanding loan	134,362	3.593	3.962	2.154	95,126	3.650	4.066	2.248	39,236	3.455	3.757	1.899
Secured	78,365	71.885	100.000	44.039	57,011	71.320	100.000	44.217	21,354	73.393	100.000	43.527
Maturity	134,362	32.055	22.567	39.947	95,126	31.314	22.326	38.986	39,236	33.850	23.267	42.133
AISD	98,491	208.908	192.352	138.960	70,537	210.103	195.279	138.607	27,954	205.891	186.763	139.804

**Table 2: Bank lending behavior following the GSIB designation: Bank level**

This table reports the estimation results of loan terms around the first GSIB designation from Equation (1) in Section 3:

$$Loan\ term_{b,t} = \beta_1 GSIB * Post + \beta_2 EBA\ Shortfall * Post + \beta_3 US\ Stress\ Test * Post + \eta_t + \eta_b + \varepsilon_{b,t}$$

where  $Loan\ term_{b,t}$  represents the dependent variables (i.e., Log Outstanding loan, Secured, Maturity, AISD), calculated based on outstanding loans made by bank  $b$  to all firms in the period  $t$ . All variables are defined in Appendix B. All models are estimated with time fixed effects ( $\eta_t$ ) and bank fixed effects ( $\eta_b$ ), but their estimates are suppressed for brevity. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	Log Outstanding loan	Secured	Maturity	AISD
GSIB * Post	-0.091*** (0.024)	-1.101* (0.639)	0.212 (0.715)	-3.044 (5.177)
EBA Shortfall* Post	-0.045 (0.030)	0.597 (0.525)	-0.751 (0.646)	-0.422 (4.411)
US Stress Test* Post	0.028 (0.033)	-0.046 (0.824)	2.422** (0.977)	-4.481 (4.290)
Time FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Number of observations	162	158	162	160
Adjusted R2	0.998	0.968	0.979	0.821

**Table 3: Bank lending behavior following the GSIB designation: Bank-Country-Industry level**

This table reports the estimation results of loan terms around the first GSIB designation from Equation (2) in Section 3:

$$Loan\ term_{b,i,c,t} = \beta_1 GSIB * Post + \beta_2 EBA\ Shortfall * Post + \beta_3 US\ Stress\ Test * Post + X_k + \eta_b + \eta_t + \eta_{c,i} + \varepsilon_{b,i,c,t}$$

where  $Loan\ term_{b,i,c,t}$  represents the dependent variables (i.e., Log Outstanding loan, Secured, Maturity, AISD), calculated based on outstanding loans made by bank  $b$  to all firms from industry  $i$  in country  $c$  during the pre- and post-treatment period ( $t$ ). The sample includes only country-industries borrowing from the sample banks in both the pre- and post-treatment period. Borrower industries are classified by using their 2-digit SIC code. All models include bank regulation indicators in bank home countries ( $X_k$ ), bank fixed effects ( $\eta_b$ ), time fixed effects ( $\eta_t$ ), and country-industry fixed effects ( $\eta_{c,i}$ ), but their estimates are suppressed for brevity. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	Log Outstanding loan	Secured	Maturity	AISD
GSIB * Post	-0.036 (0.032)	-0.249 (0.215)	0.381 (0.535)	1.501* (0.871)
EBA Shortfall * Post	-0.029 (0.034)	-0.197 (0.221)	-1.110** (0.476)	-0.525 (0.977)
US Stress Test * Post	0.021 (0.040)	-0.543 (0.335)	1.307* (0.695)	-1.859 (1.156)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	38,580	25,116	38,580	30,788
Adjusted R2	0.585	0.612	0.584	0.592

**Table 4: Bank lending behavior following the GSIB designation at Bank-Country-Industry level: GSIB heterogeneity**

This table reports the estimation results of lending around the first GSIB designation from Equation (2) in Section 3, in which the dummy *GSIB* is replaced by 3 dummies: *Old GSIB*, *New GSIB*, and *FT Non-GSIB* (Panel A) or by 2 dummies: *High-bucket GSIB* and *Low-bucket GSIB* (Panel B). The sample includes only country-industries borrowing from the sample banks in both the pre- and post-treatment period. Borrower industries are classified by using their 2-digit SIC code. All models include bank regulation indicators in bank home countries, bank fixed effects, time fixed effects, and country-industry fixed effects, but their estimates are suppressed for brevity. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Old vs. New GSIBs*

	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.028 (0.035)	-0.178 (0.252)	0.672 (0.584)	2.496*** (0.919)
New GSIB * Post	-0.103*** (0.036)	-0.148 (0.268)	0.014 (0.609)	1.450 (0.970)
FT Non-GSIB * Post	-0.044 (0.061)	0.369 (0.375)	0.784 (1.210)	3.810* (2.113)
EBA Shortfall * Post	-0.029 (0.032)	-0.217 (0.226)	-1.201** (0.467)	-0.864 (0.890)
US Stress Test * Post	0.013 (0.041)	-0.537 (0.336)	1.232* (0.728)	-1.962* (1.129)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	38,580	25,116	38,580	30,788
Adjusted R2	0.585	0.612	0.584	0.592

*Panel B: Low- vs. High-bucket GSIBs*

	Log Outstanding loan	Secured	Maturity	AISD
High-bucket GSIB * Post	-0.028 (0.045)	-0.400 (0.255)	0.901 (0.589)	3.333*** (1.087)
Low-bucket GSIB * Post	-0.039 (0.033)	-0.201 (0.226)	0.217 (0.569)	0.931 (0.852)
EBA Shortfall * Post	-0.030 (0.034)	-0.169 (0.228)	-1.209*** (0.431)	-0.850 (0.872)
US Stress Test * Post	0.018 (0.041)	-0.503 (0.316)	1.141 (0.703)	-2.410** (0.997)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	38,580	25,116	38,580	30,788
Adjusted R2	0.585	0.612	0.584	0.592

**Table 5: Bank lending behavior following the GSIB designation: Bank-Firm level**

This table reports the estimation results of loan terms around the first GSIB designation from Equation (3) in Section 3:

$$Loan\ term_{b,f,t} = \beta_1 GSIB * Post + \beta_2 EBA\ Shortfall * Post + \beta_3 US\ Stress\ Test * Post + X_k + \eta_t + \eta_b + \eta_f + \varepsilon_{b,f,t}$$

where  $Loan\ term_{b,f,t}$  represents the dependent variables (i.e., Log Outstanding loan, Secured, Maturity, AISD), calculated based on outstanding loans made by bank  $b$  to firm  $f$  in the pre- and post-treatment period ( $t$ ). The sample includes only firms borrowing from the sample banks in both the pre- and post-treatment period. All models include bank regulation indicators in bank home countries ( $X_k$ ), time fixed effects ( $\eta_t$ ), bank fixed effects ( $\eta_b$ ), and firm fixed effects ( $\eta_f$ ), but their estimates are suppressed for brevity. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
GSIB * Post	-0.059** (0.024)	-0.218** (0.087)	0.460 (0.396)	3.369*** (0.523)	-0.023 (0.016)	-0.122 (0.078)	0.686*** (0.185)	2.017*** (0.343)
EBA Shortfall * Post	-0.018 (0.027)	-0.160 (0.110)	-1.245*** (0.368)	-0.889 (0.551)	-0.0160 (0.017)	-0.16 (0.097)	-0.436*** (0.137)	-0.587 (0.370)
US Stress Test * Post	-0.005 (0.024)	0.1120 (0.087)	2.979*** (0.481)	1.340** (0.553)	0.012 (0.018)	-0.097 (0.083)	1.710*** (0.370)	1.635*** (0.567)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	134,362	78,270	134,362	98,412	126,900	74,831	126,900	94,673
Adjusted R2	0.855	0.940	0.853	0.863	0.843	0.942	0.837	0.844

**Table 6: Bank lending behavior following the GSIB designation at Bank-Firm level: GSIB heterogeneity**

This table reports the estimation results of lending around the first GSIB designation from Equation (3) in Section 3, in which the dummy *GSIB* is replaced by 3 dummies: *Old GSIB*, *New GSIB*, and *FT Non-GSIB* (Panel A) or by 2 dummies: *High-bucket GSIB* and *Low-bucket GSIB* (Panel B). The sample includes only firms borrowing from the sample banks in both the pre- and post-treatment period. All models include bank regulation indicators in bank home countries, time fixed effects, bank fixed effects, and firm fixed effects, but their estimates are suppressed for brevity. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Old vs. New GSIBs*

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.049** (0.024)	-0.269*** (0.089)	0.65 (0.442)	3.529*** (0.592)	-0.013 (0.016)	-0.177** (0.084)	0.717*** (0.225)	2.219*** (0.402)
New GSIB * Post	-0.111*** (0.028)	-0.252* (0.133)	0.286 (0.697)	3.340*** (0.887)	-0.048** (0.021)	-0.131 (0.105)	0.753* (0.402)	1.671*** (0.575)
FT Non-GSIB * Post	-0.006 (0.065)	-0.23 (0.139)	0.663 (0.782)	0.608 (0.646)	0.013 (0.040)	-0.215 (0.138)	0.192 (0.256)	0.441 (0.558)
EBA Shortfall * Post	-0.019 (0.027)	-0.143 (0.103)	-1.308*** (0.357)	-0.951* (0.557)	-0.0200 (0.017)	-0.145 (0.093)	-0.445*** (0.148)	-0.653* (0.358)
US Stress Test * Post	-0.002 (0.023)	0.104 (0.082)	3.014*** (0.493)	1.366** (0.539)	0.014 (0.018)	-0.108 (0.082)	1.717*** (0.371)	1.681*** (0.581)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	134,362	78,270	134,362	98,412	126,900	74,831	126,900	94,673
Adjusted R2	0.855	0.940	0.853	0.863	0.843	0.942	0.837	0.844

Panel B: Low- vs. High-bucket GSIBs

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
High-bucket GSIB * Post	-0.039 (0.030)	-0.212** (0.105)	0.890** (0.438)	3.395*** (0.711)	-0.017 (0.020)	-0.139 (0.100)	0.797*** (0.244)	2.240*** (0.436)
Low-bucket GSIB * Post	-0.065** (0.025)	-0.220** (0.092)	0.316 (0.436)	3.359*** (0.535)	-0.025 (0.016)	-0.116 (0.081)	0.648*** (0.223)	1.937*** (0.396)
EBA Shortfall * Post	-0.023 (0.027)	-0.162 (0.110)	-1.361*** (0.321)	-0.896 (0.563)	-0.018 (0.018)	-0.155 (0.099)	-0.467*** (0.140)	-0.651 (0.396)
US Stress Test * Post	-0.009 (0.024)	0.111 (0.087)	2.902*** (0.482)	1.336** (0.573)	0.011 (0.018)	-0.094 (0.080)	1.691*** (0.379)	1.602*** (0.598)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	134,362	78,270	134,362	98,412	126,900	74,831	126,900	94,673
Adjusted R2	0.855	0.940	0.853	0.863	0.843	0.942	0.837	0.844

**Table 7: Bank lending behavior following the GSIB designation: Industry tangibility**

This table reports the estimation results of loan terms around the first GSIB designation from Equation (2) in Section 3 separately for two subsamples: *high-tangibility* vs. *low-tangibility industries*. Each industry's tangibility level is measured as the median tangibility of all U.S.-based active firms in the industry in a 10-year period from 2001-2010. A high (low)-tangibility industry is an industry whose tangibility level is in the top (bottom) tercile of the sample. The sample includes only country-industries borrowing from the sample banks in both the pre- and post-treatment period. All the dependent variables (i.e., Log Outstanding loan, Secured, Maturity, AISD) are calculated based on outstanding loans made by bank *b* to all firms from industry *i* in country *c* during the pre- and post-treatment period (*t*). Borrower industries are classified by using their 2-digit SIC code. All models include bank regulation indicators in bank home countries, bank fixed effects, time fixed effects, and country-industry fixed effects, but their estimates are suppressed for brevity. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Whole GSIB group*

	High tangibility				Low tangibility			
	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
GSIB* Post	-0.013 (0.035)	0.309 (0.359)	0.759 (0.730)	1.621 (1.184)	-0.029 (0.034)	-1.494*** (0.539)	0.179 (0.557)	1.087 (1.449)
EBA Shortfall * Post	-0.029 (0.037)	-0.697 (0.428)	-1.360* (0.736)	-0.189 (1.573)	-0.026 (0.035)	0.809 (0.600)	-0.635 (0.545)	0.204 (1.333)
US Stress Test * Post	-0.007 (0.038)	-1.021** (0.415)	0.528 (0.899)	-0.042 (1.138)	0.071 (0.049)	-0.326 (0.762)	1.537* (0.784)	-1.273 (1.601)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	15,114	10,338	15,114	12,071	11,786	7,455	11,786	9,428
Adjusted R2	0.575	0.636	0.575	0.619	0.580	0.593	0.510	0.581



Panel B: Old vs. New GSIBs

	High tangibility				Low tangibility			
	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	0.0001 (0.041)	0.4280 (0.415)	1.098 (0.791)	3.009** (1.323)	-0.008 (0.035)	-1.550** (0.630)	0.506 (0.624)	1.492 (1.606)
New GSIB * Post	-0.077* (0.044)	0.141 (0.523)	-0.185 (0.818)	1.566 (1.203)	-0.102*** (0.031)	-0.830 (0.772)	-0.029 (0.663)	2.632 (1.638)
FT Non-GSIB * Post	-0.017 (0.049)	0.274 (0.605)	0.330 (1.597)	5.459* (3.031)	0.001 (0.090)	0.501 (0.763)	1.110 (1.069)	3.229 (3.423)
EBA Shortfall * Post	-0.033 (0.037)	-0.731* (0.430)	-1.457** (0.721)	-0.647 (1.563)	-0.031 (0.034)	0.815 (0.628)	-0.746 (0.521)	0.009 (1.268)
US Stress Test * Post	-0.017 (0.038)	-1.055** (0.424)	0.365 (0.941)	-0.214 (1.176)	0.062 (0.049)	-0.261 (0.749)	1.483* (0.816)	-1.164 (1.588)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	15,114	10,338	15,114	12,071	11,786	7,455	11,786	9,428
Adjusted R2	0.575	0.635	0.575	0.619	0.580	0.593	0.510	0.581

**Table 8: Bank lending behavior following the GSIB designation: Firm riskiness**

This table reports the estimation results of loan terms around the first GSIB designation from Equation (3) for two subsamples: *high-risk* vs. *low-risk* firms. A high (low)-risk firm is a firm with pre-treatment O-score in the top (bottom) tercile of the sample. The sample includes firms borrowing from the sample banks in both the pre- and post-treatment period. All the dependent variables (i.e., Log Outstanding loan, Secured, Maturity, AISD) are calculated based on outstanding loans made by bank *b* to firm *f* in the pre- and post-treatment period. All variables are defined in Appendix B. All models include bank regulation indicators in bank home countries, time fixed effects, bank fixed effects, and firm fixed effects, but their estimates are suppressed for brevity. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Whole GSIB group*

	Low-risk firms								High-risk firms							
	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
GSIB * Post	-0.018 (0.040)	-0.1400 (0.291)	0.96 (0.588)	3.253*** (0.748)	-0.012 (0.029)	-0.16 (0.315)	1.098*** (0.387)	2.700*** (0.935)	-0.085** (0.035)	-0.034 (0.192)	1.298*** (0.471)	4.053*** (0.983)	-0.042 (0.029)	-0.0990 (0.183)	1.315*** (0.309)	4.208*** (1.023)
EBA Shortfall * Post	-0.027 (0.039)	-0.09 (0.340)	-1.627** (0.654)	-0.637 (0.669)	-0.0270 (0.027)	0.014 (0.265)	-0.263 (0.430)	0.069 (0.695)	-0.022 (0.034)	-0.389* (0.201)	-1.666*** (0.508)	-2.222** (0.877)	-0.011 (0.034)	-0.024 (0.256)	-0.959*** (0.267)	-2.121*** (0.785)
US Stress Test * Post	0.077* (0.046)	0.554** (0.243)	4.007*** (0.774)	1.977* (1.056)	0.02 (0.034)	-0.261 (0.318)	2.343*** (0.650)	2.992** (1.289)	0.003 (0.032)	0.403* (0.228)	3.062*** (0.552)	0.526 (1.365)	0.014 (0.031)	0.062 (0.243)	2.043*** (0.478)	1.588 (1.517)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes
Number of observations	18,242	9,091	18,242	12,740	17,760	8,846	17,760	12,498	20,422	14,849	20,422	16,685	19,856	14,458	19,856	16,341
Adjusted R2	0.846	0.943	0.625	0.824	0.845	0.947	0.613	0.811	0.721	0.927	0.753	0.775	0.703	0.93	0.725	0.761

*Panel B: Old vs. New GSIBs*

	Low-risk firms								High-risk firms							
	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.020 (0.041)	-0.3410 (0.297)	1.140* (0.656)	3.175*** (0.794)	-0.011 (0.032)	-0.224 (0.350)	1.114** (0.434)	2.875*** (0.990)	-0.057* (0.033)	-0.013 (0.219)	1.572*** (0.537)	4.182*** (1.147)	-0.018 (0.024)	-0.2120 (0.211)	1.393*** (0.369)	4.634*** (1.202)
New GSIB * Post	-0.083* (0.050)	-0.0490 (0.453)	0.557 (1.097)	5.793*** (1.713)	-0.040 (0.037)	-0.348 (0.430)	1.273** (0.599)	5.062*** (1.345)	-0.129*** (0.046)	-0.324 (0.367)	0.788 (0.723)	3.312*** (1.223)	-0.072* (0.041)	-0.121 (0.292)	1.023* (0.600)	3.890*** (1.429)
FT Non-GSIB * Post	-0.068 (0.101)	-0.757 (0.731)	0.531 (0.764)	2.087** (0.985)	-0.023 (0.064)	-0.451 (0.710)	0.252 (0.600)	2.877*** (0.985)	0.069 (0.113)	-0.189 (0.223)	0.595 (0.684)	-0.177 (2.326)	0.062 (0.100)	-0.451 (0.342)	0.019 (0.508)	1.320 (2.062)
EBA Shortfall * Post	-0.022 (0.038)	-0.024 (0.343)	-1.674*** (0.632)	-0.684 (0.819)	-0.0270 (0.028)	0.031 (0.288)	-0.27 (0.431)	-0.017 (0.782)	-0.029 (0.036)	-0.385* (0.204)	-1.734*** (0.471)	-2.239** (0.900)	-0.017 (0.035)	0.011 (0.254)	-0.981*** (0.271)	-2.256*** (0.728)
US Stress Test * Post	0.078* (0.046)	0.529** (0.235)	4.036*** (0.790)	1.975** (0.882)	0.02 (0.033)	-0.275 (0.315)	2.350*** (0.650)	3.027** (1.212)	0.009 (0.030)	0.415* (0.225)	3.124*** (0.554)	0.574 (1.399)	0.021 (0.028)	0.032 (0.251)	2.069*** (0.477)	1.711 (1.584)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes
Number of observations	18,242	9,091	18,242	12,740	17,760	8,846	17,760	12,498	20,422	14,849	20,422	16,685	19,856	14,458	19,856	16,341
Adjusted R2	0.846	0.943	0.625	0.824	0.845	0.947	0.613	0.811	0.721	0.927	0.753	0.775	0.703	0.93	0.725	0.761

Panel C: High vs. Low bucket GSIBs

	Low-risk firms								High-risk firms							
	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
High bucket GSIB*Post	-0.014 (0.049)	-0.1670 (0.293)	0.899 (0.722)	2.862*** (0.826)	-0.011 (0.031)	-0.019 (0.345)	1.098** (0.549)	2.749** (1.064)	-0.057 (0.042)	0.203 (0.220)	1.821*** (0.420)	4.389*** (1.067)	-0.031 (0.035)	-0.0640 (0.244)	1.680*** (0.247)	4.556*** (0.959)
Low bucket GSIB*Post	-0.020 (0.042)	-0.1290 (0.317)	0.981 (0.647)	3.420*** (0.847)	-0.013 (0.031)	-0.22 (0.321)	1.098*** (0.407)	2.680*** (0.991)	-0.097*** (0.036)	-0.134 (0.208)	1.084** (0.540)	3.912*** (1.155)	-0.046 (0.030)	-0.113 (0.200)	1.176*** (0.382)	4.074*** (1.197)
EBA Shortfall*Post	-0.028 (0.040)	-0.084 (0.355)	-1.609*** (0.607)	-0.538 (0.653)	-0.0270 (0.027)	-0.023 (0.264)	-0.263 (0.425)	0.055 (0.646)	-0.029 (0.034)	-0.452** (0.220)	-1.800*** (0.441)	-2.317** (0.897)	-0.014 (0.033)	-0.035 (0.265)	-1.064*** (0.243)	-2.233*** (0.813)
US Stress Test*Post	0.076* (0.044)	0.558** (0.245)	4.022*** (0.719)	2.052* (1.120)	0.02 (0.034)	-0.279 (0.302)	2.344*** (0.617)	2.983** (1.299)	-0.001 (0.033)	0.377* (0.215)	2.997*** (0.544)	0.485 (1.403)	0.013 (0.031)	0.059 (0.248)	2.001*** (0.492)	1.548 (1.568)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes
Number of observations	18,242	9,091	18,242	12,740	17,760	8,846	17,760	12,498	20,422	14,849	20,422	16,685	19,856	14,458	19,856	16,341
Adjusted R2	0.846	0.943	0.625	0.824	0.845	0.947	0.613	0.811	0.721	0.927	0.753	0.775	0.703	0.93	0.725	0.761

**Table 9: Bank lending behavior following the GSIB designation: Extensive margin**

This table reports the estimation results of lending around the first GSIB designation at the extensive margin at the bank-country-industry level (Panel A) from the following regression specification:

$$Y_{b,i,c} = \beta_1 GSIB + \beta_2 EBA\ Shortfall + \beta_3 US\ Stress\ Test + X_{b,2010} + X_k + \eta_{c,i} + \varepsilon_{b,i,c}$$

where  $Y_{b,i,c}$  is  $Exit_{b,i,c}$  ( $Entry_{b,i,c}$ ) which takes the value of 1 if bank  $b$  stop (start) lending to industry  $i$  in country  $c$  in the post-treatment period and 0 otherwise. Panel B presents the results at the bank-firm level from the following regression specification:

$$Y_{b,f} = \beta_1 GSIB + \beta_2 EBA\ Shortfall + \beta_3 US\ Stress\ Test + X_{b,2010} + X_k + \eta_f + \varepsilon_{b,f}$$

where  $Y_{b,f}$  is  $Exit_{b,f}$  ( $Entry_{b,f}$ ) which takes the value of 1 if bank  $b$  stop (start) lending to firm  $f$  after the GSIB designation and 0 otherwise.  $X_{b,2010}$  includes bank characteristics as of end-2010 (i.e., Log Total assets, Deposit ratio, Loan ratio, and ROA),  $X_k$  includes bank regulation indicators in bank home countries,  $\eta_{c,i}$  is country-industry fixed effects, and  $\eta_f$  is firm fixed effects, but their estimates are suppressed for brevity. Panel C reports the estimation results separately for two subsamples: high-risk vs. low-risk firms. A high (low)-risk firm is a firm whose pre-treatment O-score is in the top (bottom) tercile of the sample. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Bank-country-industry level*

	Exit	Exit	Exit	Entry	Entry	Entry
GSIB	-0.014 (0.011)			-0.017 (0.011)		
GSIB Old FT		-0.028** (0.013)			-0.024** (0.011)	
GSIB New		-0.007 (0.012)			-0.018 (0.011)	
Non-GSIB FT		-0.007 (0.011)			-0.010 (0.014)	
High-bucket GSIB			-0.019 (0.015)			-0.026* (0.013)
Low-bucket GSIB			-0.015 (0.011)			-0.018* (0.011)
EBA Shortfall	0.006 (0.006)	0.008 (0.007)	0.006 (0.006)	-0.009* (0.005)	-0.008* (0.005)	-0.008 (0.005)
US Stress Test	-0.003 (0.014)	-0.004 (0.013)	-0.002 (0.015)	0.004 (0.014)	0.002 (0.014)	0.006 (0.013)
Bank and bank country characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	20,519	20,519	20,519	20,291	20,291	20,291
Adjusted R2	0.330	0.331	0.330	0.306	0.306	0.306

Panel B: Bank-firm level

	Exit	Exit	Exit	Entry	Entry	Entry
GSIB	0.01 (0.014)			-0.007 (0.008)		
GSIB Old FT		-0.002 (0.014)			-0.003 (0.010)	
GSIB New		0.017 (0.016)			-0.006 (0.009)	
Non-GSIB FT		0.005 (0.012)			0.005 (0.012)	
High-bucket GSIB			0.013 (0.016)			-0.008 (0.010)
Low-bucket GSIB			0.011 (0.014)			-0.008 (0.008)
EBA Shortfall	0.008 (0.007)	0.011 (0.007)	0.007 (0.007)	-0.004 (0.004)	-0.005 (0.005)	-0.004 (0.004)
US Stress Test	-0.027** (0.013)	-0.029** (0.013)	-0.027** (0.013)	-0.029*** (0.007)	-0.028*** (0.007)	-0.029*** (0.007)
Bank and bank country characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	71,429	71,429	71,429	71,177	71,177	71,177
Adjusted R2	0.624	0.625	0.624	0.630	0.630	0.630

Panel C: Firm riskiness

	Low-risk firms						High-risk firms					
	Exit	Exit	Exit	Entry	Entry	Entry	Exit	Exit	Exit	Entry	Entry	Entry
GSIB	0.006 (0.019)			-0.003 (0.011)			0.034* (0.019)				-0.021* (0.011)	
GSIB Old FT		-0.012 (0.019)			0.010 (0.013)			0.010 (0.025)				-0.023 (0.015)
GSIB New		0.012 (0.021)			-0.003 (0.010)			0.038* (0.021)				-0.023* (0.012)
Non-GSIB FT		-0.007 (0.017)			0.013 (0.022)			0.001 (0.020)				-0.005 (0.017)
High-bucket GSIB			0.002 (0.020)			-0.002 (0.015)			0.027 (0.025)			
Low-bucket GSIB			0.005 (0.018)			-0.003 (0.011)			0.032 (0.020)			
EBA Shortfall	0.017 (0.011)	0.020* (0.012)	0.018 (0.011)	-0.008 (0.006)	-0.01 (0.007)	-0.008 (0.007)	0.009 (0.012)	0.014 (0.014)	0.01 (0.011)	-0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)
US Stress Test	-0.011 (0.017)	-0.014 (0.017)	-0.011 (0.016)	-0.044*** (0.012)	-0.041*** (0.013)	-0.044*** (0.013)	-0.063*** (0.019)	-0.068*** (0.019)	-0.062*** (0.019)	-0.019 (0.012)	-0.019 (0.013)	-0.018 (0.012)
Bank and bank country characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	9,681	9,681	9,681	9,910	9,910	9,910	10,913	10,913	10,913	10,809	10,809	10,809
Adjusted R2	0.466	0.466	0.466	0.555	0.555	0.555	0.419	0.420	0.419	0.452	0.452	0.452

**Table 10: Lending to bank-dependent firms following the GSIB designation**

This table reports the estimation results of loan terms around the first GSIB designation from Equation (6) in Section 5:

$$\Delta Y_f = \beta_1 GSIB\_dep + \beta_2 EBA\ Shortfall\_dep + \beta_3 US\ Stress\ Test\_dep + \eta_{c,i} + \varepsilon_f$$

where  $\Delta Y_f$  is the change of the logarithm of a firm's total borrowing in the syndicated loan market between the pre- and post-treatment period ( $\Delta \text{Log Firm outstanding borrowing}$ ). A high (low)-risk firm is a firm whose pre-treatment O-score is in the top (bottom) tercile of the sample. All the dependent variables (i.e., Log Outstanding loan, Secured, Maturity, AISD) are calculated based on outstanding loans made by bank  $b$  to firm  $f$  in the pre- and post-treatment period ( $t$ ). All variables are defined in Appendix B. All models are estimated with country-industry fixed effects ( $\eta_{c,i}$ ), but their estimates are suppressed for brevity. Borrower industries are classified by using their 2-digit SIC code. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

<i>ΔLog Firm outstanding borrowing</i>	Whole sample	Whole sample	Whole sample	Whole sample	High-risk firms		Low-risk firms	
GSIB_dep firm	-0.049*** (0.012)		-0.051*** (0.012)		-0.131*** (0.033)		-0.076 (0.066)	
OldGSIB_dep firm		-0.042*** (0.015)		-0.045** (0.017)		-0.114*** (0.032)		-0.062 (0.071)
NewGSIB_dep firm		-0.060** (0.023)		-0.061** (0.026)		-0.086*** (0.030)		-0.062 (0.041)
EBAshortfall_dep firm			0.052*** (0.012)	0.054*** (0.014)	-0.019 (0.035)	-0.018 (0.036)	0.075 (0.059)	0.075 (0.063)
US Stress Test_dep firm			-0.009 (0.021)	-0.001 (0.029)	-0.044* (0.023)	-0.044 (0.030)	0.092* (0.046)	0.098** (0.044)
Borrower country * Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	14,585	14,585	14,585	14,585	1,458	1,458	1,317	1,317
Adjusted R2	0.020	0.020	0.020	0.021	0.032	0.031	0.009	0.007

**Table 11: Pre-treatment firm characteristics**

This table reports the descriptive statistics of all firm-level variables for *non-GSIB-dependent* and *GSIB-dependent* firms in the pre-treatment period. GSIB-dependent (non-GSIB-dependent) firms are firms with an above (below) median share of their borrowing from GSIBs in the pre-treatment period. All variables are defined in Appendix B. The last two columns present the *p*-values of a parametric and non-parametric two-group comparison test.

	non-GSIB-dependent firms				GSIB-dependent firms				<i>p</i> -value on <i>t</i> -test	<i>p</i> -value on Wilcoxon test
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.		
Log Total assets	2,937	8.2014	7.4986	2.5624	2,937	8.3003	7.9937	2.2382	0.115	0.000
Tangibility	2,937	0.5118	0.5068	0.2363	2,937	0.502	0.4996	0.229	0.106	0.123
Cash flow ratio	2,937	0.0734	0.0682	0.0589	2,937	0.0791	0.0747	0.0575	0.000	0.000
Net worth	2,937	0.3104	0.315	0.1918	2,937	0.2966	0.3043	0.1873	0.005	0.010
EBITDA/Total assets	2,937	0.102	0.096	0.0648	2,937	0.1134	0.106	0.0645	0.000	0.000
Leverage	2,937	0.9037	0.9516	0.1187	2,937	0.9377	0.979	0.0935	0.000	0.000
Listed firms	2,937	0.7525	1.000	0.4317	2,937	0.8291	1.000	0.3765	0.000	0.000

**Table 12: Real effect of the GSIB designation**

This table reports the estimation results of the change of firm outcomes around the first GSIB designation. Panel A reports the estimation results from Equation (7) in Section 5 :

$$\Delta Y_f = \beta_1 GSIB\_dep + \beta_2 EBA\ Shortfall\_dep + \beta_3 US\ Stress\ Test\_dep + \delta X_{f,2010} + \eta_{c,i} + \varepsilon_f$$

where  $\Delta Y_f$  is the change in the outcome variables of firm  $f$  (i.e.,  $\Delta$  Log Total Assets,  $\Delta$  Log Fixed Assets,  $\Delta$  Log Sales) between the year before the GSIB designation (2010) and after the GSIB designation (2012).  $X_{f,2010}$  includes all firm-level controls, including Log Total Assets, Tangibility, Cash Flow Ratio, Net Worth, EBITDA Ratio, Leverage, Listed Firm. All other variables are defined in Appendix B. All models are estimated with country-industry fixed effects ( $\eta_{c,i}$ ) but their estimates are suppressed for brevity. Borrower industries are classified by using their 2-digit SIC code. Standard errors are clustered at the firm country level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: GSIB dependence and firm outcomes*

	$\Delta$ Log Total Assets	$\Delta$ Log Fixed Assets	$\Delta$ Log Sales	$\Delta$ Log Total Assets	$\Delta$ Log Fixed Assets	$\Delta$ Log Sales
GSIB-dependent firm	-0.007 (0.009)	-0.014 (0.008)	-0.002 (0.011)			
OldGSIB_dep firm				-0.012 (0.009)	-0.020* (0.011)	-0.005 (0.011)
NewGSIB_dep firm				-0.015 (0.011)	-0.021* (0.012)	0.0004 (0.009)
EBAshortfall-dep firm	-0.021* (0.012)	-0.018 (0.020)	-0.005 (0.014)	-0.019 (0.012)	-0.015 (0.021)	-0.005 (0.014)
US Stress Test-dep firm	0.006 (0.011)	0.003 (0.018)	0.003 (0.008)	0.009 (0.012)	0.007 (0.019)	0.003 (0.008)
Firm-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country * Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	4,956	4,935	4,723	4,956	4,935	4,723
Adjusted R2	0.162	0.145	0.145	0.162	0.145	0.145



*Panel B: GSIB dependence, firm riskiness, and firm outcomes*

	Low-risk firms			High-risk firms		
	$\Delta$ Log Total Assets	$\Delta$ Log Fixed Assets	$\Delta$ Log Sales	$\Delta$ Log Total Assets	$\Delta$ Log Fixed Assets	$\Delta$ Log Sales
GSIB-dependent firm	0.003 (0.012)	-0.019 (0.014)	-0.004 (0.021)	-0.022* (0.011)	-0.054*** (0.017)	-0.021 (0.015)
EBAShortfall-dep firm	-0.012 (0.029)	0.008 (0.032)	0.021 (0.030)	-0.026 (0.018)	-0.007 (0.033)	-0.014 (0.021)
US Stress Test-dep firm	-0.007 (0.014)	-0.036 (0.027)	0.019 (0.016)	-0.024** (0.008)	-0.018* (0.010)	-0.018* (0.009)
Firm-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country * Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,435	1,430	1,358	1,365	1,362	1,295
Adjusted R2	0.172	0.146	0.192	0.155	0.157	0.133

*Panel C: GSIB dependence, firm riskiness and firm outcomes: Old vs. New GSIBs*

	Low-risk firms			High-risk firms		
	$\Delta$ Log Total Assets	$\Delta$ Log Fixed Assets	$\Delta$ Log Sales	$\Delta$ Log Total Assets	$\Delta$ Log Fixed Assets	$\Delta$ Log Sales
OldGSIB_dep firm	-0.014 (0.013)	-0.033 (0.023)	-0.0190 (0.020)	-0.016* (0.009)	-0.057*** (0.011)	-0.023** (0.010)
NewGSIB_dep firm	-0.001 (0.012)	-0.044* (0.022)	-0.007 (0.027)	-0.02 (0.029)	-0.018 (0.034)	-0.004 (0.015)
EBAShortfall-dep firm	-0.008 (0.030)	0.014 (0.036)	0.024 (0.029)	-0.026 (0.019)	-0.006 (0.033)	-0.013 (0.022)
US Stress Test-dep firm	-0.003 (0.015)	-0.029 (0.027)	0.023 (0.016)	-0.022* (0.013)	-0.019 (0.014)	-0.019* (0.010)
Firm-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country * Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,435	1,430	1,358	1,365	1,362	1,295
Adjusted R2	0.172	0.149	0.193	0.155	0.158	0.133

## Appendix A: List of banks

No.	Bank	Total assets (million USD)	Country	Old GSIB	New GSIB	FT Non- GSIB	EBA Shortfall	US Stress Test
<b>GSIBs</b>								
1	UBS Group AG	1,408,000	CH	•				
2	Credit Suisse Group AG	1,105,000	CH	•				
3	Bank of China Ltd.	1,584,000	CN		•			
4	Deutsche Bank AG	2,556,000	DE	•			•	
5	Commerzbank AG	1,012,000	DE		•		•	
6	Banco Santander, SA	1,632,000	ES	•			•	
7	BNP Paribas SA	2,680,000	FR	•			•	
8	Crédit Agricole Group	2,322,000	FR		•			
9	Société Générale SA	1,519,000	FR	•			•	
10	Groupe BPCE	1,406,000	FR		•		•	
11	HSBC Holdings Plc	2,455,000	GB	•				
12	Barclays Plc	2,333,000	GB	•				
13	Royal Bank of Scotland Group Plc	2,276,000	GB	•				
14	Lloyds Banking Group Plc	1,553,000	GB		•			
15	UniCredit SpA	1,247,000	IT	•			•	
16	Mitsubishi UFJ Financial Group, Inc.	2,184,000	JP	•				
17	Mizuho Financial Group, Inc.	1,672,000	JP	•				
18	Sumitomo Mitsui Financial Group, Inc.	1,318,000	JP	•				
19	ING Groep NV	1,673,000	NL	•				
20	Nordea Bank Abp	779,100	SE		•			
21	Bank of America Corporation	2,265,000	US	•				•
22	JPMorgan Chase & Co.	2,118,000	US	•				•
23	Citigroup Inc.	1,914,000	US	•				•
24	Wells Fargo & Company	1,258,000	US		•			•
25	Goldman Sachs Group, Inc.	911,300	US	•				•
26	Morgan Stanley	807,700	US	•				•
27	Bank of New York Mellon Corporation	247,500	US		•			•
28	State Street Corporation	160,500	US		•			•
<b>Non-GSIBs</b>								
29	National Australia Bank Ltd.	664,300	AU					
30	Westpac Banking Corporation	598,800	AU			•		
31	Commonwealth Bank of Australia	545,900	AU					
32	Australia and New Zealand Banking Group Ltd.	514,900	AU					
33	Banco do Brasil SA	483,300	BR					
34	Itaú Unibanco Holding SA	437,700	BR					
35	Banco Bradesco SA	363,000	BR					
36	Royal Bank of Canada	712,700	CA			•		
37	Toronto-Dominion Bank	608,000	CA					
38	Bank of Nova Scotia	516,800	CA					
39	Bank of Montreal	404,000	CA					
40	Canadian Imperial Bank of Commerce	345,500	CA					
41	Industrial and Commercial Bank of China Ltd.	2,038,000	CN					
42	China Construction Bank Corporation	1,637,000	CN					
43	Agricultural Bank of China Ltd.	1,565,000	CN					
44	Bank of Communications Co., Ltd.	598,300	CN					
45	China Merchants Bank Co., Ltd.	363,700	CN					
46	Shanghai Pudong Development Bank Co., Ltd.	331,800	CN					
47	China CITIC Bank Corporation Ltd.	315,100	CN					

48	Industrial Bank Co., Ltd.	280,000	CN					
49	China Minsheng Banking Corp., Ltd.	276,100	CN					
50	China Everbright Bank Company Ltd.	224,700	CN					
51	Hua Xia Bank Co., Ltd.	157,500	CN					
52	China Guangfa Bank Co., Ltd.	123,300	CN					
53	Bank of Beijing Co., Ltd.	111,000	CN					
54	Ping An Bank Co., Ltd.	110,100	CN					
55	DZ Bank AG	514,400	DE				•	
56	Landesbank Baden-Württemberg	502,300	DE					
57	Bayerische Landesbank AöR	424,400	DE					
58	Danske Bank A/S	578,700	DK					
59	Banco Bilbao Vizcaya Argentaria, SA	741,400	ES			•	•	
60	CaixaBank, SA	366,200	ES				•	
61	Crédit Mutuel Group	793,200	FR					
62	Standard Chartered Plc	516,600	GB					
63	Nationwide Building Society	290,700	GB					
64	State Bank of India	322,700	IN					
65	Intesa Sanpaolo SpA	883,600	IT			•		
66	Norinchukin Bank	734,800	JP					
67	Nomura Holdings, Inc.	344,900	JP			•		
68	Sumitomo Mitsui Trust Holdings, Inc.	160,300	JP					
69	Shinhan Financial Group Co., Ltd.	237,500	KR					
70	KB Financial Group Inc.	228,800	KR					
71	Woori Financial Group Inc.	202,100	KR					
72	Hana Financial Group Inc.	139,700	KR					
73	ABN AMRO Group NV	506,100	NL					
74	DNB ASA	320,000	NO				•	
75	PAO Sberbank of Russia	282,500	RU					
76	Skandinaviska Enskilda Banken AB (publ.)	324,600	SE					
77	Svenska Handelsbanken AB (publ)	320,600	SE					
78	DBS Group Holdings Ltd.	221,600	SG					
79	U.S. Bancorp	307,800	US					•
80	PNC Financial Services Group, Inc.	264,200	US					•
81	Capital One Financial Corporation	197,500	US					•

## Appendix B: Variable definition

Name	Definition
<b><i>Dependent variables</i></b>	
Log Outstanding loan	Natural logarithm of the total outstanding loans.
Secured	Weighted average proportion of secured loans (in percentage).
Maturity	Weighted average of remaining maturity (measured in months).
AISD	Weighted average of all-in-drawn spread (measured in basis points).
<b><i>Explanatory variables</i></b>	
GSIB	Dummy = 1 if the bank is identified as a GSIB in the November 2011 designation, and 0 otherwise.
GSIB_FT	Dummy = 1 if a bank is identified as a GSIB in the leaked list published by the <i>Financial Times</i> in November 2009, and 0 otherwise.
Old GSIB	Dummy = 1 if a bank is identified as a GSIB in both the leaked list of the <i>Financial Times</i> and the first official GSIB list, and 0 otherwise.
New GSIB	Dummy = 1 if a bank is identified as a GSIB in the first GSIB official list but not in the leaked list of the <i>Financial Times</i> , and 0 otherwise.
FT Non-GSIB	Dummy = 1 if a bank is identified as a GSIB in the leaked list of the <i>Financial Times</i> but not in the first official GSIB list, and 0 otherwise.
EBA Shortfall	Dummy = 1 if the bank is identified as an EBA shortfall bank in September 2011, and 0 otherwise.
US Stress Test	Dummy = 1 if the bank is selected in the U.S. Stress Test for the year 2011-2012, and 0 otherwise
Post	Dummy = 1 for the post-treatment period (01/11/2010-31/10/2011), and 0 for the pre-treatment period (01/11/2011-31/10/2012).
<b><i>Bank-level variables</i></b>	
Log Total Assets	Natural Logarithm of Total Assets
Deposit ratio	Total deposits/Total assets
Loan ratio	Customer Loans / Total Assets
ROA	Returns on Average Total Assets
<b><i>Bank-country variables</i></b>	
Restrictions on bank activities	an index measuring regulatory impediments to banks engaging in securities market activities, insurance activities, and real estate.
Stringency of capital regulation	an index measuring how much capital banks must hold and the sources of funds that count as regulatory capital.
Official supervisory power	an index measuring whether supervisory authorities have the power to take actions to prevent or correct problems.
Private monitoring	an index measuring whether there are incentives for the private monitoring of firms.
<b><i>Firm-level variables</i></b>	
GSIB Borrowing Share	Share of a firm's borrowing from GSIBs in its total borrowing from all banks in the syndicated loan market in the pre-treatment period (01/11/2010-31/10/2011).

GSIB-dependent firm	Dummy = 1 if the firm has a GSIB Borrowing Share above the median of the sample, and 0 otherwise.
Log Total Assets	Natural Logarithm of Total Assets
Log Fixed Assets	Natural Logarithm of Fixed Assets
Log Sales	Natural Logarithm of Firm Sales
Tangibility	Fixed Assets / Total Assets
Cash flow ratio	Cash Flow / Total Assets
Net worth	(Total Shareholder Funds & Liabilities - Current & Non-Current Liabilities - Cash)/Total Assets
EBITDA/Total Assets	EBITDA / Total Assets
Leverage	(Total Assets - Total Shareholder Funds: Capital)/Total Assets
Listed firms	Dummy = 1 if the firm is publicly listed, and 0 otherwise.

---

### Appendix C: Common Equity Tier 1 (CET1) ratio of GSIBs designated in 2011

No.	Country	Bank	2010 (%)	2011 (%)
1	CH	UBS Group AG	15.30	14.10
2	CH	Credit Suisse Group AG	12.18	10.74
3	CN	Bank of China Ltd.	10.09	10.08
4	DE	Deutsche Bank AG	8.66	9.52
5	DE	Commerzbank AG	9.99	9.91
6	ES	Banco Santander, SA	8.80	10.02
7	FR	BNP Paribas SA	9.23	9.60
8	FR	Crédit Agricole Group	10.05	10.19
9	FR	Société Générale SA	8.50	9.00
10	FR	Groupe BPCE	8.31	9.12
11	GB	HSBC Holdings Plc	10.53	10.13
12	GB	Barclays Plc	10.77	11.01
13	GB	Royal Bank of Scotland Group Plc	10.70	10.60
14	GB	Lloyds Banking Group Plc	10.20	10.80
15	IT	UniCredit SpA	8.58	8.40
16	JP	Mitsubishi UFJ Financial Group, Inc.*	10.63	11.33
17	JP	Mizuho Financial Group, Inc.*	9.09	11.93
18	JP	Sumitomo Mitsui Financial Group, Inc.*	12.47	12.28
19	NL	ING Groep NV	9.62	9.60
20	SE	Nordea Bank Abp	10.30	11.20
21	US	Bank of America Corporation	8.60	9.86
22	US	JPMorgan Chase & Co.	9.77	10.07
23	US	Citigroup Inc.	10.75	11.80
24	US	Wells Fargo & Company	8.30	9.46
25	US	Goldman Sachs Group, Inc.	13.30	12.10
26	US	Morgan Stanley	10.50	13.00
27	US	Bank of New York Mellon Corporation	11.75	13.43
28	US	State Street Corporation*	20.50	18.80

Source: SNL Financial and Bank Annual Reports.

(\*) For these banks, the figure reported is Tier 1 capital ratio, which was always above the bank's target based on the information in their annual reports. To be more specific, for Mitsubishi UFJ Financial Group, Inc., Mizuho Financial Group, Inc., and Sumitomo Mitsui Financial Group, Inc., the target of Tier 1 capital ratio was 8% in 2010-2011. For State Street Corporation, the minimum requirement of Tier 1 capital ratio was said at 6%.

## Appendix D: GSIB designation and bank lead share in the syndicated loan market

This table reports the estimation results of bank lead share around the first GSIB designation from the following regression specification:

$$\text{Lead share}_{b,l} = \beta_1 \text{GSIB} * \text{Post} + \beta_2 \text{EBA Shortfall} * \text{Post} + \beta_3 \text{US Stress Test} * \text{Post} \\ + \text{Lead\_borrower\_relationship}_{b,f} + X_l + X_k + \eta_t + \eta_b + \eta_f + \eta_j + \varepsilon_{b,l}$$

where  $\text{Lead share}_{b,l}$  is the share of the loan (facility) held by the lead lender;  $\text{Lead\_borrower\_relationship}_{b,f}$  is a dummy variable equal to one if the lead arranger lent to the same borrower in the past five years and zero otherwise;  $X_l$  is a set of loan variables including Facility amount (the natural logarithm of the loan amount), Maturity (the natural logarithm of remaining maturity in months), Secured (a dummy variable equal to one if the loan is secured with collateral and zero otherwise); and  $X_k$  is a set of bank regulation indicators. All models are estimated with time- ( $\eta_t$ ), bank- ( $\eta_b$ ), firm ( $\eta_f$ ), and loan type- ( $\eta_j$ ) fixed effects, but their estimates are suppressed for brevity. Borrower industries are classified by using their 2-digit SIC code. Standard errors are clustered at the bank and firm level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

<i>Dependent variable: Lead share (%)</i>	(1)	(2)
GSIB*Post	0.466* (0.266)	
Old GSIB*Post		0.487 (0.324)
New GSIB*Post		0.669** (0.316)
FT Non-GSIB*Post		0.269 (0.422)
EBA Shortfall*Post	-0.567** (0.247)	-0.571** (0.256)
US Stress Test*Post	0.444** (0.222)	0.452** (0.215)
Lead-borrower relationship	17.251*** (0.543)	17.251*** (0.543)
Facility amount	-0.930*** (0.103)	-0.930*** (0.103)
Maturity	0.531*** (0.113)	0.530*** (0.112)
Secured	-0.0002 (0.662)	0.0003 (0.662)
Bank regulation controls	Yes	Yes
Time FE	Yes	Yes
Bank FE	Yes	Yes
Firm FE	Yes	Yes
Loan type FE	Yes	Yes
Number of observations	174,129	174,129
Adjusted R2	0.73	0.73

## Appendix E: Bank lending behavior following the GSIB designation: Zombie vs. Non-zombie firms

This table reports the estimation results of loan terms around the first GSIB designation from Equation (3) for two subsamples: *zombie vs. non-zombie firms*. The sample includes firms borrowing from the sample banks in both the pre- and post-treatment period. All the dependent variables (i.e., Log Outstanding loan, Secured, Maturity, AISD) are calculated based on outstanding loans made by bank *b* to firm *f* in the pre- and post-treatment period. All variables are defined in Appendix B. All models include bank regulation indicators in bank home countries, time fixed effects, bank fixed effects, and firm fixed effects, but their estimates are suppressed for brevity. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Whole GSIB group

	Non-zombie firms								Zombie firms							
	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
GSIB * Post	-0.021 (0.029)	-0.481*** (0.158)	1.082** (0.512)	3.395*** (0.541)	-0.018 (0.024)	-0.199 (0.129)	1.123*** (0.301)	2.349*** (0.539)	-0.064** (0.029)	-0.043 (0.180)	1.014** (0.440)	3.193*** (0.906)	-0.036 (0.023)	-0.0030 (0.162)	1.052*** (0.275)	3.102*** (0.834)
EBA Shortfall * Post	-0.004 (0.033)	-0.11 (0.215)	-1.067** (0.480)	-1.100** (0.498)	-0.0120 (0.026)	-0.25 (0.188)	-0.910* (0.269)	-1.100** (0.475)	-0.002 (0.030)	-0.391* (0.203)	-1.721*** (0.478)	-2.024*** (0.729)	-0.017 (0.029)	-0.065 (0.229)	-0.687*** (0.234)	-1.675** (0.736)
US Stress Test * Post	0.068** (0.032)	-0.0020 (0.155)	4.403*** (0.730)	2.328*** (0.672)	0.026 (0.028)	-0.373** (0.163)	2.516*** (0.504)	2.535*** (0.692)	0.012 (0.030)	0.234 (0.175)	2.988*** (0.555)	0.096 (1.273)	0.02 (0.027)	-0.149 (0.186)	1.840*** (0.427)	1.034 (1.372)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes			
Firm FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes
Number of observations	41,466	24,272	41,466	31,430	40,446	23,685	40,446	30,872	29,148	20,571	29,148	23,009	28,258	19,982	28,258	22,473
Adjusted R2	0.822	0.931	0.641	0.809	0.818	0.935	0.623	0.801	0.751	0.919	0.818	0.778	0.734	0.921	0.8	0.761

Panel B: Old vs. New GSIBs

	Non-zombie firms								Zombie firms							
	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.012 (0.031)	-0.542*** (0.161)	1.212** (0.585)	3.290*** (0.609)	-0.005 (0.026)	-0.245 (0.148)	1.061*** (0.346)	2.427*** (0.601)	-0.043 (0.030)	-0.123 (0.190)	1.281** (0.502)	3.471*** (1.032)	-0.021 (0.022)	-0.1570 (0.177)	1.164*** (0.325)	3.530*** (0.961)
New GSIB * Post	-0.088** (0.035)	-0.466** (0.204)	1.071 (1.007)	3.961*** (1.226)	-0.060** (0.028)	-0.284* (0.159)	1.308** (0.524)	2.739*** (0.986)	-0.107*** (0.038)	-0.177 (0.288)	0.558 (0.736)	2.731** (1.214)	-0.069** (0.032)	0.134 (0.218)	0.844 (0.581)	2.823** (1.111)
FT Non-GSIB * Post	-0.021 (0.065)	-0.229 (0.421)	0.576 (0.733)	0.105 (0.781)	0.012 (0.050)	-0.26 (0.196)	-0.078 (0.529)	0.669 (0.599)	0.042 (0.086)	-0.409 (0.293)	0.611 (0.557)	0.622 (2.114)	0.028 (0.071)	-0.429 (0.349)	0.226 (0.355)	1.317 (1.705)
EBA Shortfall * Post	-0.003 (0.032)	-0.089 (0.222)	-1.118** (0.472)	-1.081** (0.538)	-0.0160 (0.026)	-0.235 (0.191)	-0.149 (0.277)	-0.945* (0.496)	-0.007 (0.033)	-0.361* (0.191)	-1.790*** (0.445)	-2.109*** (0.745)	-0.021 (0.030)	-0.019 (0.216)	-0.720*** (0.234)	-1.806** (0.731)
US Stress Test * Post	0.070** (0.032)	-0.0120 (0.151)	4.420*** (0.736)	2.307*** (0.629)	0.028 (0.027)	-0.384** (0.164)	2.506*** (0.502)	2.550*** (0.679)	0.016 (0.029)	0.22 (0.170)	3.032*** (0.569)	0.15 (1.288)	0.024 (0.026)	-0.191 (0.188)	1.867*** (0.430)	1.141 (1.417)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes			
Firm FE	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes
Number of observations	41,466	24,272	41,466	31,430	40,446	23,685	40,446	30,872	29,148	20,571	29,148	23,009	28,258	19,982	28,258	22,473
Adjusted R2	0.822	0.931	0.641	0.809	0.818	0.935	0.623	0.801	0.751	0.919	0.818	0.778	0.734	0.921	0.8	0.761



## Appendix F: Parallel trend tests

**Table F1: Bank lending behavior following the first leakage of the GSIBs list (November 2009)**

This table reports the estimation results of loan terms around the first leakage of the GSIBs list by the *Financial Times* in November 2009. Panel A reports the results at the bank-country-industry level, Panel B reports the results at the bank-firm level. *GSIB\_FT* is the dummy equal to 1 if a bank is identified as a GSIB in the leaked list published by the *Financial Times* in November 2009, and 0 otherwise. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Bank-country-industry level*

	Log Outstanding loan	Secured	Maturity	AISD
GSIB_FT * Post	-0.024 (0.019)	-0.567 (0.379)	0.386 (0.271)	0.804 (0.861)
US Stress Test * Post	-0.041** (0.019)	1.074*** (0.329)	-0.355 (0.330)	2.417* (1.358)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	38,144	23,360	38,144	31,937
Adjusted R2	0.593	0.547	0.610	0.558

*Panel B: Bank-firm level*

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
GSIB_FT * Post	-0.001 (0.018)	0.013 (0.093)	0.464** (0.203)	1.107** (0.476)	-0.005 (0.009)	0.188** (0.072)	0.293* (0.149)	1.109** (0.502)
US Stress Test * Post	-0.055*** (0.016)	0.592*** (0.079)	0.415* (0.210)	2.675*** (0.604)	0.006 (0.011)	0.264*** (0.093)	0.660*** (0.178)	1.986*** (0.688)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	132,198	74,529	132,198	101,335	124,934	71,148	124,934	97,487
Adjusted R2	0.863	0.924	0.872	0.854	0.846	0.925	0.857	0.842

**Table F2: Bank lending behavior following the first leakage of the GSIBs list (November 2009): Old vs. New GSIBs**

This table reports the estimation results of loan terms around the first leakage of the GSIBs list by the *Financial Times* in November 2009. Panel A reports the results at the bank-country-industry level, Panel B reports the results at the bank-firm level. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Bank-country-industry level*

	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.039* (0.020)	-0.819* (0.483)	0.396 (0.299)	0.723 (1.047)
New GSIB * Post	-0.042 (0.038)	-0.641 (0.481)	0.086 (0.514)	-0.147 (1.442)
FT Non-GSIB * Post	-0.023 (0.024)	-0.655 (1.100)	0.549 (0.636)	0.98 (1.928)
US Stress Test * Post	-0.037* (0.019)	1.117*** (0.338)	-0.344 (0.333)	2.451* (1.369)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	38,144	23,360	38,144	31,937
Adjusted R2	0.593	0.547	0.610	0.558

*Panel B: Bank-firm level*

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.025 (0.021)	-0.0030 (0.122)	0.38 (0.254)	1.130* (0.611)	-0.020** (0.009)	0.220** (0.096)	0.399*** (0.149)	1.282*** (0.482)
New GSIB * Post	-0.048* (0.028)	-0.0580 (0.112)	-0.241 (0.303)	-0.249 (0.770)	-0.028* (0.015)	0.094 (0.118)	0.193 (0.258)	0.267 (0.837)
FT Non-GSIB * Post	0.009 (0.034)	-0.284 (0.245)	0.289 (0.314)	0.398 (0.844)	0.004 (0.016)	0.207 (0.219)	0.065 (0.192)	1.044 (0.757)
US Stress Test * Post	-0.048*** (0.018)	0.579*** (0.081)	0.524** (0.223)	2.655*** (0.606)	0.0100 (0.011)	0.255*** (0.093)	0.586*** (0.188)	1.762*** (0.661)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes		Yes	Yes
Number of observations	132,184	74,574	132,184	101,378	124,892	71,185	124,892	97,522
Adjusted R2	0.860	0.925	0.865	0.820	0.843	0.925	0.848	0.794

**Table F3: Bank lending behavior following the first leakage of the GSIBs list (November 2009): High- vs. Low-bucket GSIBs**

This table reports the estimation results of loan terms around the first leakage of the GSIBs list by the *Financial Times* in November 2009. Panel A reports the results at the bank-country-industry level, Panel B reports the results at the bank-firm level. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Bank-country-industry level*

	Log Outstanding loan	Secured	Maturity	AI SD
High bucket GSIB * Post	-0.035 (0.021)	-0.940** (0.452)	0.520* (0.299)	1.228 (1.019)
Low bucket GSIB * Post	-0.036* (0.020)	-0.555 (0.470)	0.128 (0.311)	0.054 (0.985)
US Stress Test * Post	-0.037* (0.019)	1.192*** (0.341)	-0.414 (0.342)	2.247 (1.393)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	38,144	23,360	38,144	31,937
Adjusted R2	0.593	0.547	0.610	0.558

*Panel B: Bank-firm level*

	Log Outstanding loan	Secured	Maturity	AI SD	Log Outstanding loan	Secured	Maturity	AI SD
High-bucket GSIB * Post	-0.036** (0.016)	0.102 (0.148)	0.212 (0.219)	1.181* (0.662)	-0.016 (0.011)	0.230* (0.125)	0.377** (0.161)	1.286** (0.564)
Low-bucket GSIB * Post	-0.029 (0.022)	0.013 (0.114)	0.216 (0.261)	0.616 (0.586)	-0.025*** (0.009)	0.126 (0.099)	0.333** (0.146)	0.718 (0.476)
US Stress Test * Post	-0.049*** (0.016)	0.584*** (0.082)	0.474** (0.224)	2.519*** (0.643)	0.008 (0.012)	0.228** (0.097)	0.568*** (0.187)	1.596** (0.681)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	132,184	74,574	132,184	101,378	124,892	71,185	124,892	97,522
Adjusted R2	0.860	0.925	0.865	0.820	0.843	0.925	0.848	0.794

**Table F4: Bank lending behavior following the second leakage of the GSIBs list (November 2010)**

This table reports the estimation results of loan terms around the first leakage of the GSIBs list by the *Financial Times* in November 2010. Panel A reports the results at the bank-country-industry level, Panel B reports the results at the bank-firm level. *GSIB\_FT* is the dummy equal to 1 if a bank is identified as a GSIB in the leaked list published by the *Financial Times* in November 2009, and 0 otherwise. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Bank-country-industry level*

	Log Outstanding loan	Secured	Maturity	AISD
GSIB_FT * Post	0.013 (0.026)	-0.144 (0.394)	0.856** (0.403)	2.236** (1.064)
US Stress Test * Post	-0.010 (0.031)	1.215** (0.540)	0.800 (0.585)	1.840 (1.732)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	37,970	24,287	37,970	31,097
Adjusted R2	0.596	0.574	0.603	0.571

*Panel B: Bank-firm level*

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
GSIB_FT * Post	0.006 (0.019)	-0.281** (0.113)	0.574* (0.300)	1.655*** (0.597)	0.015 (0.013)	-0.175* (0.088)	0.467* (0.259)	1.825*** (0.602)
US Stress Test * Post	-0.031 (0.022)	0.520*** (0.122)	2.074*** (0.346)	4.471*** (0.656)	-0.006 (0.019)	-0.083 (0.126)	1.140*** (0.381)	3.192*** (0.715)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	131,088	76,566	131,088	98,560	123,670	73,119	123,670	94,780
Adjusted R2	0.855	0.931	0.861	0.824	0.842	0.935	0.851	0.801

**Table F5: Bank lending behavior following the second leakage of the GSIBs list (November 2010): Old vs. New GSIBs**

This table reports the estimation results of loan terms around the first leakage of the GSIBs list by the *Financial Times* in November 2010. Panel A reports the results at the bank-country-industry level, Panel B reports the results at the bank-firm level. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Bank-country-industry level*

	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.010 (0.031)	-0.279 (0.461)	0.681 (0.495)	3.138** (1.275)
New GSIB * Post	-0.054 (0.041)	-0.321 (0.699)	-0.263 (0.564)	1.855 (1.468)
FT Non-GSIB * Post	0.038 (0.039)	-0.099 (0.816)	1.434*** (0.498)	0.764 (1.422)
US Stress Test * Post	-0.002 (0.031)	1.246** (0.549)	0.891 (0.596)	1.505 (1.749)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	37,970	24,287	37,970	31,097
Adjusted R2	0.596	0.574	0.603	0.571

*Panel B: Bank-firm level*

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
Old GSIB * Post	-0.029 (0.020)	-0.313** (0.128)	0.512 (0.381)	2.718*** (0.660)	-0.004 (0.013)	-0.161 (0.115)	0.652** (0.256)	2.615*** (0.500)
New GSIB * Post	-0.083** (0.034)	-0.0500 (0.141)	-0.181 (0.466)	1.923** (0.874)	-0.040 (0.025)	0.073 (0.133)	0.38 (0.438)	1.218 (1.111)
FT Non-GSIB * Post	0.026 (0.042)	-0.168 (0.166)	0.437 (0.607)	-0.696 (0.602)	0.031 (0.028)	0.08 (0.210)	0.255 (0.276)	-0.761 (0.551)
US Stress Test * Post	-0.020 (0.023)	0.534*** (0.124)	2.084*** (0.355)	4.060*** (0.596)	-0.0004 (0.019)	-0.072 (0.121)	1.079*** (0.368)	2.835*** (0.620)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	131,088	76,566	131,088	98,560	123,670	73,119	123,670	94,780
Adjusted R2	0.855	0.931	0.861	0.824	0.842	0.935	0.851	0.801

**Table F6: Bank lending behavior following the second leakage of the GSIBs list (November 2010): High- vs. Low-bucket GSIBs**

This table reports the estimation results of loan terms around the first leakage of the GSIBs list by the *Financial Times* in November 2010. Panel A reports the results at the bank-country-industry level, Panel B reports the results at the bank-firm level. All variables are defined in Appendix B. Standard errors are clustered at the bank level and reported between parentheses. The symbols \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

*Panel A: Bank-country-industry level*

	Log Outstanding loan	Secured	Maturity	AISD
High bucket GSIB * Post	-0.018 (0.033)	-1.125*** (0.409)	0.662 (0.531)	5.338*** (1.234)
Low bucket GSIB * Post	-0.029 (0.029)	0.032 (0.440)	0.063 (0.462)	1.827* (1.088)
US Stress Test * Post	-0.001 (0.032)	1.452*** (0.392)	0.823 (0.583)	0.872 (1.833)
Bank regulation controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Borrower country*Industry FE	Yes	Yes	Yes	Yes
Number of observations	37,970	24,287	37,970	31,097
Adjusted R2	0.596	0.574	0.603	0.571

*Panel B: Bank-firm level*

	Log Outstanding loan	Secured	Maturity	AISD	Log Outstanding loan	Secured	Maturity	AISD
High-bucket GSIB * Post	-0.036 (0.023)	-0.326* (0.180)	0.605 (0.447)	2.996*** (0.707)	-0.013 (0.018)	-0.239 (0.144)	0.564* (0.292)	2.944*** (0.614)
Low-bucket GSIB * Post	-0.046** (0.021)	-0.189 (0.118)	0.201 (0.358)	2.564*** (0.626)	-0.018 (0.014)	-0.086 (0.099)	0.545** (0.242)	2.300*** (0.522)
US Stress Test * Post	-0.026 (0.022)	0.565*** (0.149)	1.985*** (0.345)	4.022*** (0.579)	-0.004 (0.019)	-0.049 (0.136)	1.049*** (0.356)	2.737*** (0.622)
Bank regulation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes				
Firm FE	Yes	Yes	Yes	Yes				
Firm*Time FE					Yes	Yes	Yes	Yes
Number of observations	131,088	76,566	131,088	98,560	123,670	73,119	123,670	94,780
Adjusted R2	0.855	0.931	0.861	0.824	0.842	0.935	0.851	0.801