# Audit Effort in Global Systemic Banks

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## Abstract

This study provides evidence of a significant increase in audit effort for European banks following their designation as Global Systemically Important Banks (G-SIBs) by the Financial Stability Board in 2011. The increase is mainly concentrated in European countries with less powerful banking supervisors, which suggest a substitution effect between auditors and banking supervisors. Additional analysis of the U.S. banking industry supports the finding of no significant change in audit effort for large banks designed as G-SIBs in a country with a more powerful banking supervisor. Lastly, we document that the increased audit effort translates into higher financial reporting quality in European countries with less powerful banking supervisors.



**Keywords:** Audit effort, Global systemically important banks, Banking supervisory power, Financial reporting quality.

**JEL Classifications:** G21; G28; M41; M42; M48.

# Audit Effort in Global Systemic Banks

## 1. Introduction

We investigate whether audit effort increased after the designation of large European banks as Global Systemically Important Banks (G-SIBs) by the Financial Stability Board (FSB) in 2011. G-SIBs are defined as "*financial institutions whose distress or disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity*" (FSB 2011, p.1). Our study is motivated by two facts. First, auditors faced severe criticisms after the global financial crisis of 2007-2008. For instance, the 2010 Green Paper on Audit Policy by the European Commission indicates that "*the fact that numerous banks revealed huge losses from 2007 to 2009 on the positions they had held both on and off balance sheet raises [-] the question of how auditors could give clean audit reports to their clients for those periods*" (European Commission 2010, p. 3). This statement and other similar statements suggest that policymakers and regulators are seriously concerned about audit effort in the banking industry. Second, bank managers' accounting choices can have systemic risk implications (Bushman and Williams 2015). Because auditors can influence these choices (Nicoletti 2018; Ghosh et al., 2020), it is particularly important to understand auditors' role in large banks' financial reporting.

After the global financial crisis, the Financial Stability Board (FSB)[1] and the Basel Committee on Banking Supervision (BCBS) decided to reduce the too-big-to-fail problem. The largest banks, designated as G-SIBs, were notably required to hold a higher level of regulatory capital compared to non-systemic banks,[2] and the FSB also recommended expansion of the list

[1] The FSB was established in April 2009 by the G20. It promotes global financial stability by coordinating the development of regulatory, supervisory, and other financial sector policies.
[2] The FSB issued the final total loss-absorbing capacity (TLAC) standard for 30 GSIBs from November 2015, and Basel III requires that all identified GSIBSs operate with a minimum total capital adequacy ratio before March 2018.

of required supervisory powers.[3] We posit that the increased regulation combined with the intensified scrutiny from various stakeholders incentivized auditors to expend additional effort (DeFond and Zhang 2014; Riccardi et al. 2018). We also posit that the power of banking supervisors could influence the auditors' response (Ghosh et al. 2020; Nicoletti 2018). However, it is unclear *ex-ante* whether banking supervisory power would increase or decrease the potential change in audit effort. On the one hand, greater supervisory power could curb opportunistic accounting choices by bank managers (e.g., Hirtle et al. 2020). Ghosh et al. (2020) argue that supervisors pay close attention to banks' internal controls, accounting processes, and financial statement numbers, which could lead auditors to exert less effort in auditing their clients. If so, the increased supervisory power may serve as a substitute for auditor effort. On the other hand, stricter monitoring by the banking supervisor could increase auditors' litigation risk and the risk of being sanctioned by banking supervisors (Riccardi et al. 2018).[4] Consequently, auditors could have stronger incentives to increase their effort to avoid corrective actions by supervisors. This alternative suggests that supervisory power and auditor effort may complement one other. Our empirical analysis helps distinguish which of these two arguments is consistent with the empirical evidence.

To address our research question, we use a difference-in-differences research design that examines auditors' responses to the disclosure of the first FSB list of G-SIBs published in 2011. The fact that this list did not detail additional capital constraints makes a comparable response across banks more likely (Degryse et al. 2020). Our analysis is based on a sample of 106 large European banks, including 11 G-SIBs and a control group of 95 non G-SIBs. We focus on large banks because bank size is a key determinant for being designated as a G-SIB.

[3] 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

[4] A World Bank survey indicates that 31% of the European supervisors have the legal ability to revoke or suspend the external auditor (World Bank Group 2015).

The selected banks are economically very significant as they represent 56% of the total assets of all European banks.[5]

The European setting is interesting because banks share several characteristics and constraints, such as application of the Basel rules, use of IFRS, and composition of the audit committee (Cameran and Perotti 2014; Poretti et al. 2018). However, because banks are supervised at the national level, the cross-country variation allows us to better capture the influence of supervisory power on audit effort. In this context, it is important to note that our difference-in-differences approach allows us to control for other concurrent institutional and economic changes that may affect all European banks. In line with prior literature, we use audit fees to capture audit effort (e.g., Simunic and Stein 1996; Ghosh et al., 2020), and the official supervisory power index based on the 2011 Bank Regulation and Supervision Survey from the World Bank (Barth et al. 2013) to measure the degree to which the country's banking supervisor has the authority to take specific actions.

We document the following results. First, audit fees significantly increased after 2011 for European G-SIBs as compared to other large European banks. The average change of about 14% is economically significant. Second, we document that the increase in audit fees for G-SIBs is concentrated in banks domiciled in countries with less powerful banking supervisors. This finding suggests a substitution effect between auditors and banking supervisors.

To gain further insight into the influence of supervisory power on changes in audit effort for banks designated as G-SIBs, we also analyze 60 large bank holding companies in the U.S., where the banking supervisor holds considerable power (Barth et al. 2013). Given that U.S. banks face different constraints and use different accounting standards, we do not mix European and U.S. banks, but provide separate results. We find that audit effort for U.S. G-SIBs does not significantly change following the disclosure of the G-SIB list by the FSB in 2011. This result

[5] Panel B of Table 1 provides additional descriptive statistics about the importance of G-SIBs in the European banking industry.

supports our finding of no increased audit effort for European G-SIBs domiciled in countries with more powerful banking supervisors.

To strengthen confidence in our results, we also investigate the financial reporting quality of banks. We posit that the increased audit effort for G-SIBs in countries with less powerful banking supervisors should translate into higher audit quality and, therefore, into improved financial reporting quality. For this investigation, we use two proxies of financial reporting quality widely used in prior literature, which capture earnings management in banks: abnormal loan loss provisions (LLPs) and income smoothing. Both measures reflect the negotiation process in which the auditors influence clients on within-GAAP manipulation. In line with Beatty and Liao (2014) and DeFond and Zhang (2014), we posit that lower abnormal LLPs and lower income smoothing reflect greater financial reporting quality and plausibly increased audit effort.

We find that abnormal LLPs and income smoothing did not reliably change, on average, after 2011 for European G-SIBs as compared to other large European banks. However, we find a significant improvement in financial reporting quality for G-SIBs incorporated in countries with less powerful supervisors, as indicated by lower abnormal LLPs and lower income smoothing. Consistent with these results, we find no significant change in abnormal LLPs and income smoothing for U.S. G-SIBs. Overall, these findings support our conclusion of improved audit effort after 2011 for large banks designated as G-SIBs and incorporated in countries with a less powerful banking supervisor.

By documenting that the power of banking supervisors influences the audit fees paid by large systemic banks (G-SIBs), which face additional legal constraints since 2011, we contribute to the scant literature on the influence of banking supervisors on auditor effort (Balakrishnan et al. 2021; Bratten et al. 2019; Ghosh et al. 2020; Nicoletti 2018). In a concurrent paper, Ghosh et al. (2020) suggest the existence of a substitution effect between banking

regulation and audit effort in the US, and therefore conclude that banking regulatory intervention changes the auditor-client contracting equilibrium. Our cross-country investigation highlights, however, that a new regulation does not necessarily alter that equilibrium in all countries. Indeed, the G-SIB regulation alters the equilibrium in countries with a weaker banking supervisor, but not in countries with a powerful banking supervisor. Thus, we do not find any change of the contracting equilibrium in the US after the designation of some large banks as Global Systemically Important Banks (G-SIBs) by the Financial Stability Board in 2011. The difference between the two papers is possibly due to the fact that there is less variance in the supervision power in a within-country study than a cross-country study. Moreover, Ghosh et al. (2020) compare banks to non-banks, whereas our research design takes advantage of a new regulation affecting one group of banks. Our approach therefore allows us to exercise greater control over institutional features affecting both groups of banks, to provide convincing evidence on the importance of the banking supervisor to the auditor-client contracting equilibrium.

Since we also find that increased auditor effort is associated with less earnings management in banks from countries with less powerful supervisors, we conclude that the designation of large banks as G-SIBs had some positive consequences. Thus, our findings also contribute to the public debate about the economic consequences of the new regulations that took place after the global financial crisis of 2007-2008.

The remainder of the paper is organized as follows. Section two discusses the related literature and develops the hypotheses. Section three presents the research design. Section four discusses the main empirical findings and Section five presents the results of additional analyses. Section six concludes the paper.

## 2. Literature review and hypotheses

### *Audit effort in the banking industry and change in regulation*

Auditors provide reasonable assurance that financial statements are free of material misstatements. To provide such assurance, auditors must assess audit risk, which is the product of three specific risks: (1) inherent risk (i.e., the susceptibility of an assertion to a misstatement before consideration of any related controls); (2) control risk (i.e., the risk that a misstatement will not be prevented or detected on a timely basis by the company's internal control); (3) detection risk (i.e., the risk that the procedures performed by the auditor will not detect a misstatement that exists and that could be material). When audit risk is high (low), the auditor must design more (less) substantive audit procedures to maintain audit risk at an acceptable level. More (less) substantive procedures naturally require more (less) audit effort. In this paper, we investigate whether some new regulations passed after the global financial crisis in 2007-2008 affect audit effort.

In cooperation with the BCBS, the FSB made several recommendations to reduce the moral hazard and address the systemic risk posed by large banks.[6] The BCBS notes that "*the rationale for adopting additional policy measures for G-SIBs is based on the 'negative externalities' (i.e., adverse side effects) created by systemically important banks which current regulatory policies do not fully address*." (BCBS 2011, p. 1). Specifically, the FSB recommended that G-SIBs should: (1) have loss absorption capacity in excess of the minimum international standards by the end of 2016; (2) meet requirements related to recovery and resolution planning by the end of 2012; and (3) be subject to more intense, more effective, and more reliable supervision.[7] A question of interest is whether these additional requirements led to additional audit effort as a result of auditors modifying their assessment of audit risk.

[6] Moenninghoff et al. (2015) provide an overview of the complete process of G-SIB regulation.
[7] See Bongini et al. (2015) for a detailed description of these features.

Specifically, the question we ask is: did auditors adjust their effort for large banks labelled as G-SIBs in 2011 by the FSB? This question is relevant, as auditors are likely to play an important role in improving the financial reporting quality of systemic banks from the banking regulators' point of view. Indeed, as these banks can benefit from an implicit guarantee, which allows them to take more risk (Argimón, Dietsch, and Estrada 2018), financial reporting quality is an important prerequisite for market participants to be able to effectively monitor bank risk-taking and to exert effective market discipline (Bushman 2016).

The lack of research on the audit of G-SIBs is surprising given that the FSB explicitly acknowledged the role of external audit as a possible driver of financial reporting quality and, ultimately, financial stability. The FSB therefore proposed to enhance audit effectiveness by: (1) "improving the information that external audits provide to prudential supervisors and regulators, including systemically important financial institutions"; and (2) "reinforcing the effectiveness of audit regulation, particularly for external audits of financial institutions, to improve audit quality" (FSB 2012, p. 1). In the same vein, the Basel III framework (BCBS 2019) also emphasizes the key role of the external audit in financial reporting quality.

Overall, the identification of G-SIBs by the FSB in 2011 could have one of two opposite effects. On the one hand, auditors may increase their effort, because they perceive higher inherent risk though two plausible channels. First, changes in regulation may alter banks' behavior. In fact, higher regulatory constraints and scrutiny may push banks to engage in opportunistic accounting choices (Beatty and Liao 2014; García Osma et al. 2019; Curcio et al. 2017). Consequently, the increased audit risk should lead auditors to implement more rigorous substantive tests to reduce the level of audit risk. Second, the G-SIB regulation may change preparation and certification costs, as well as auditors' reputational risk and litigation risk in case of audit failure or deficiencies of these systemic banks (i.e., no detection of a material misstatement or no issuance of a going concern opinion if a G-SIB is in financial distress).

Ghosh et al. (2020) note that auditor's loss function is highly sensitive to such risks. On the other hand, it is also possible that the designation of banks as G-SIBs does not fundamentally change the audit risk, notably because supervisors will assume the additional tasks as auditors and regulators pursue different objectives.[8] Audit procedures should therefore not fundamentally change as the key underlying economic characteristics of these large (opaque and complex) systemic banks are unchanged. Given these competing arguments, we formulate the first hypothesis in the null form as follows:

> HYPOTHESIS 1: *Ceteris paribus, there is no change in audit effort for systemic banks from before to after their designation as G-SIBs.*

***The influence of banking supervisors on audit effort***

Our first hypothesis does not consider the influence of formal and informal institutions on audit effort. This is a key issue as research documents that audit effort is highly dependent on the institutional context (Francis and Wang 2008; Choi et al. 2008; Kanagaretnam et al. 2010).

In particular, several studies provide evidence that banking supervisors can shape financial reporting outcomes of banks (e.g., García Osma et al. 2019), suggesting that supervisors interfere with auditors work.[9] Gebhardt and Novotny-Farkas (2011) find, for instance, that the consequences of mandatory IFRS adoption on accounting quality are sensitive to the power of banking supervisors. More powerful supervisors prefer larger impairment recognition and smoother income streams. Dal Maso et al. (2018) show that accounting enforcement reduces earnings management, and that bank regulation complements the effect of accounting enforcement on bank earnings quality.

[8] Bank regulators and supervisors ensure banks' safety and soundness, whereas auditors provide assurance on banks' compliance with internal control and accounting requirements.

[9] For instance, in the U.S. to evaluate the adherence of banks' accounting to Regulatory Accounting Principles (which may be different from Generally Accepted Accounting Principles), bank supervisors conduct: 1) on-site examinations of banks every 12 to 18 months (Nicoletti 2018), and 2) off-site monitoring of banks' safety and soundness using a wide range of information (Ghosh et al., 2020). See also World Bank Group (2015) for international comparisons.

Recent literature specifically investigates the interactions between banking supervisors and external auditor activities on accounting practices. In the U.S., Nicoletti (2018) provides evidence of conflicting effects on the timeliness of loan loss provisions (LLP) between external auditors and banking supervisors, suggesting the pursuit of different objectives. Ghosh et al. (2020) show that auditors make less effort in audits of banks than in audits of nonbanks. Nonetheless, banks do not provide financial information of lower quality than nonbanks, which implies that bank regulation and supervision alter the auditor-client contracting equilibrium.

Overall, prior literature suggests that potential changes in audit effort are sensitive to the level of bank supervision. Nevertheless, it is not clear *ex ante* how the power of supervisors can affect audit effort. First, activities of bank supervisors (who monitor various prudential risk metrics derived from financial statements) may complement those of auditors. For example, banking supervisors understand the economics of individual banks plausibly better than auditors, and bank auditors understand the application and limitations of accounting matters better than banking supervisors (Nicoletti 2018). Consequently, powerful supervisors might pressure auditors to exert more effort if it contributes to financial stability. Second, audit effort might be higher for banks that operate in countries characterized by a less powerful supervisor. Ghosh et al. (2020) highlight such substitution effect. They report that audit effort is higher for U.S. banks operating in states with more lenient supervisors, suggesting that auditors assess higher control risk for these banks. Alternatively, it can also suggest that banks operating in a weak supervisory environment may hire high-quality audit firms to signal market participants that they produce credible and high-quality financial information (Durnev and Kim 2005). Finally, powerful banking supervisors might influence bank accounting practices in a way that might ultimately lower financial transparency (e.g., García Osma et al. 2019). Given these competing arguments, we formulate the second hypothesis in the null form as follows:

HYPOTHESIS 2: *Ceteris paribus, the power of the banking supervisor is unrelated to the change in audit effort for systemic banks from before to after their designation as G-SIBs.*

## 3. Data and methodology

### *The sample*

To build our sample, we start by selecting from the Audit Analytics database all publicly-listed banks incorporated in countries from the European Union and members of the OECD, for the period 2007-2014 (i.e., four years before the G-SIB designation by the FSB and four years after). The length of our sample period (2007–2014) does not include changes in regulation that could affect our inferences.[10] The implementation of a difference-in-differences design limits the issues related to this inclusion of the financial crisis (years 2007-2008) in our sample, as all banks from our treated group and from our control group are impacted by the crisis. We exclude bank-year observations with missing data and require banks to have at least one observation in each of the pre- and the post-2011 periods. We also exclude G-SIBs that are not consistently included in all lists disclosed by the FSB from 2011 to 2014,[11] as well as countries with only one bank.[12] Overall, these sample-selection procedures yield a sample of 784 bank-year observations for 106 large banks located in 15 European countries. Appendix A summarizes the sample-selection process.

We present the sample distribution by country in Panel A of Table 1. Italy has the largest number of observations (133) and Slovenia has the lowest (11). In our sample, 11 of the 106 banks are classified as G-SIBs. Two countries (France and the U.K.) have 3 G-SIBs each, while there are eight countries without G-SIBs. Finally, the official supervisory power, which

[10] We acknowledge that IFRS 9 was published in 2014, and that the ECB implemented the Single Supervisory Mechanism the same year. However, our difference-in-differences design should mitigate concerns surrounding the influence of such events as banks in our control group are also targeted by these changes.
[11] These banks are Dexia, Commerz Bank, BBVA, Lloyds and Standard Chartered.
[12] The countries are Belgium, Czech Republic, Portugal, Slovokia and Slovenia.

captures the power of the banking supervisor (Barth et al. 2013), ranges from 5 in Finland to 14 in Slovenia.[13] In our analyses, we use a normalized official supervisory power index (*SP*), which varies between 0 to 1. Panel B of Table 1 shows that these 106 large banks represent 56% of the total assets of all European banks (i.e., more than 20 trillion euros), with G-SIBs and non-G-SIBs holding 40% and 16%, respectively, of all bank assets.

**[Insert Table 1]**

***Empirical models***

We implement a difference-in-differences design to remove the effects of contemporaneous changes in economic conditions (e.g., the financial crisis of 2007-2008) that may affect audit effort from the effects of being classified as a G-SIB. This approach allows a comparison of the differences across a treatment group (*G-SIB*) and a control group (*non G-SIB*), before and after the designation of banks as G-SIBs.

Generally, we expect that concurrent regulations are unlikely to significantly affect our inferences. For instance, the European Banking Authority (EBA) decided on October 2011 to launch a "Capital Exercise" on 61 financial institutions. Our sample includes 11 G-SIBs and 19 non-G-SIBs that are part of this exercise. The EBA recommended that 27 financial institutions (EBA shortfall institutions) build additional capital by the end of June 2012. Our sample includes 13 EBA shortfall institutions (5 G-SIBs and 8 non-G-SIBs). The fact that EBA

[13] This Supervisory Power Index is computed from answers to the following questions: (a): (1) Does the supervisory agency have the right to meet with external auditors to discuss their report without the approval of the bank? (2) Are auditors required by law to communicate directly to the supervisory agency any presumed involvement of bank directors or senior managers in illicit activities, fraud, or insider abuse? (3) Can supervisors take legal action against external auditors for negligence? (4) Can the supervisory authority force a bank to change its internal organizational structure? (5) Are off-balance sheet items disclosed to supervisors? (6) Can the supervisory agency order the bank's directors or management to constitute provisions to cover actual or potential losses? (7) Can the supervisory agency suspend the directors' decision to distribute: (a) Dividends? (b) Bonuses? (c) Management fees? (8) Can the supervisory agency legally declare – such that this declaration supersedes the rights of bank shareholders – that a bank is insolvent? (9) Does the Banking Law give authority to the supervisory agency to intervene that is, suspend some or all ownership rights – a problem bank? (10) Regarding bank restructuring and reorganization, can the supervisory agency or any other government agency do the following: (a) Supersede shareholder rights? (b) Remove and replace management? (c) Remove and replace directors?

shortfall banks are included in both the treated (G-SIB) and control (non-G-SIB) groups helps in identifying the separate effect of the G-SIB status. In Section 5, we provide additional analyses on a subsample of countries that did not implement national requirements on mandatory auditor reporting to bank regulators identified in Balakrishnan et al. (2021).

*Audit fees*

Prior research considers that more extensive audits require auditors to work more hours, thereby increasing audit fees (e.g., Simunic and Stein 1996; Ghosh et al. 2020). We therefore use audit fees as a proxy for audit effort. Based on prior audit fee models applied in the banking industry (e.g., Fields et al. 2004; Ettredge et al. 2014), we use the following model to test our first hypothesis (H1) :

$$LOGFEE_{it} = \beta_0 + \beta_1 GSIB_i * POST_t + CONTROLS + Fixed\ Effects + \varepsilon_{it} \quad \text{(eq. 1)}$$

where *LOGFEE* is the natural logarithm of audit fees (in € millions) paid by bank *i* at the end of year *t*;[14] *GSIB* is a dummy variable equal to 1 if the bank is labelled as a G-SIB in 2011, and 0 otherwise*;* and *POST* is a dummy variable equal to 1 for the years 2011 to 2014, and 0 otherwise. Given that the fixed effect structure renders the coefficients on *GISB* and *POST* redundant for estimation, they are excluded from Equation (1). A coefficient $\beta_1 \neq 0$ would indicate rejection of H1 that there is no change in audit effort for systemic banks from before to after their designation as G-SIBs.

*CONTROLS* is a vector of control variables that includes bank-specific, audit, and country-specific determinants of audit fees. Specifically, we include *SECURITIES* (liquidity risk), the ratio of total securities to total assets; *DEPOSIT* (funding structure), the ratio of total deposits to total assets; *LOANS* (lending activity), the ratio of total gross loans to total assets; *NPL* credit risk), the ratio of non-performing loans to total loans; *INTANG* (intangible assets),

[14] Audit fees were extracted from Audit Analytics and manually checked to adjust some inconstancies. Further, we also hand-collected in annual reports audit fees when they were missing in Audit Analytics.

the ratio of intangible assets to total assets; *LOSS*, a dummy variable that equals one if the net income is negative, and zero otherwise; *EFFICIENCY*, a measure of bank efficiency; *CAPRATIO* (solvency risk), the Total Regulatory Capital Ratio; *SIZE*, the natural logarithm of beginning-of-year total assets (in € millions); *ΔAUD* (auditor rotation), a dummy variable that equals one if the audit firm rotates, and zero otherwise; *ΔGDP*, the GDP percentage growth over the year. Lastly, to account for institutional differences between the 15 countries in our sample, we include *INST*, which captures the overall level of institutional development (Beck et al. 2006). To construct this proxy, we use the first principal component of the following six underlying indicators: voice and accountability, government effectiveness, political stability, regulatory quality, rule of law, and control of corruption (Kaufmann et al. 2011). These indicators are retrieved from the World Bank's website. *Fixed Effects* represents year, auditor-year,[15] and bank fixed effects. Appendix B provides detailed variable definitions. In all tests, we base statistical inferences on standard errors clustered by bank. Panel A of Table 2 presents descriptive statistics of the main variables used in the analysis of European banks. The average audit fees paid by banks over the sample period is €5.04 million.

*The influence of banking supervisory power on audit effort*

To test our second hypothesis (H2), regarding the influence of the institutional context on audit effort for G-SIBs, we interact our variables of interest *GSIB* and *POST G*in Equation (1) with a proxy capturing the power of banking supervisors (*SP*). *SP* measures the power of supervisors to demand information and/or take legal action against auditors, to take prompt corrective action, to restructure or reorganize troubled banks, and to require provisions for potential losses

[15] We classify audit firms as follows: EY, Deloitte, KPMG, PWC, and others. This fixed-effect structure captures yearly changes in pricing strategies across these auditors, and also controls for audit fees premium (i.e., the bank is audited by a Big 4 or not (Choi et al. 2008). In case of a joint audit, we use the audit fee paid to the main auditor.

(Barth et al. 2013). This measure of supervisory power is widely used in the banking literature (e.g., Bushman and Williams 2012; García Osma et al. 2019).

Our second model is specified as follows:

$$LOGFEE_{it} = \beta_0 + \beta_1 GSIB_i * POST_t + \beta_2 POST_t * SP_i + \beta_3 GSIB_i * POST_t * SP_i + CONTROLS + Fixed\ Effects + \varepsilon_{it} \quad \text{(eq. 2)}$$

A coefficient $\beta_3 \neq 0$ would indicate rejection of H2 that the power of the banking supervisor is unrelated to the change in audit effort for systemic banks from before to after their designation as G-SIBs in 2011.

## 4. Main results

### *Audit effort in European G-SIBs*

Table 3 reports some descriptive statistics of the changes in audit fees from before to after the designation of large banks as G-SIBs. Panel A shows an increase of EUR 1.614 million for European banks labelled as G-SIB, compared to an increase of € 0.082 million for other large banks that were not labelled as G-SIBs. As the total assets of a bank is a key driver of the audit fees, we also follow Ghosh et al. (2020) and deflate audit fees by the square root of total assets. The results in Panel B show an increase of about 6.1% for G-SIBs, whereas audit fees adjusted for the size of the bank decrease by 4.15% for non-G-SIBs. These numbers suggest an abnormal increase in audit effort for systemic banks after their designation as G-SIBs in 2011.

**[Insert Table 3]**

Table 4 reports the results of our regressions with audit fees (*LOGFEE*) as a dependent variable. Column 1, which does not include bank fixed-effects, shows that G-SIBs were paying larger audit fees than other banks prior to their designation as G-SIBs (*GSIB*), even after controlling for bank size and other control variables. The positive and statistically significant coefficient on the interaction term $GSIB * POST$ indicates that audit fees significantly increased after 2011 for G-SIBs. The inclusion of bank fixed-effects in Column 2 supports our previous

findings, as the coefficient on the interaction variable $GSIB * POST$ remains positive and significant. Thus, we reject hypothesis H1. In economic terms, the coefficient on $GSIB * POST$ in Column 2 implies that the pre-post change in audit fees for G-SIBs is about 14% higher than the corresponding change for non-G-SIBs.

In Column 3 of Table 4, we analyze the influence of banking supervisory power on audit fee changes. The coefficient on $GSIB * POST$ is positive and significant, supporting the idea that G-SIBs exhibit a larger pre-post increase in audit fees (i.e., a larger increase in audit effort) relative to non-G-SIBs when the banking supervisory power is lowest. In economic terms, the coefficient on $GSIB * POST$ indicates that, for banks operating in a weak supervisory environment (i.e., when $SP$ is at its 5$^{th}$ percentile), the pre-post change in audit fees for G-SIBs is 37% higher than the corresponding change for non-G-SIBs.[16] The coefficient on $GSIB * POST * SP$ is negative and significant, suggesting that the difference between the pre-post increase in audit fees for G-SIBs and non-G-SIBs is significantly smaller for the highest relative to the lowest banking supervisory power countries. In other words, the difference in the pre- to post-2011 change in audit effort between G-SIBs and non-G-SIBs decreases as banking supervisory power increases. In economic terms, the coefficient on $GSIB * POST * SP$ indicates that the difference between G-SIBs and non-G-SIBs in the pre-post change in audit fees is 69% lower for a stronger (i.e., when $SP$ is at its 95$^{th}$ percentile) versus a weaker (i.e., when $SP$ is at its 5$^{th}$ percentile) banking supervisory environment. Moreover, the last line of Table 4 shows that the sum of the coefficients on $GSIB * POST$ and $GSIB * POST * SP$ is not significantly different from zero, indicating that the increase in audit fees for G-SIBs from before to after 2011 is not different in countries with strong banking supervisory power from the corresponding change for non-G-SIBs. Figure 1 presents aggregate coefficient values of

[16] We estimate the economic magnitude of the increase in mean audit fees as $e^{\beta} - 1$, where $\beta$ represents the sum of the coefficients $\beta_1$ and $\beta_3 * 0.11$ obtained from estimating Equation (1).

GSIB (95% confidence intervals) on audit fees based on the regression output obtained from estimating Equation (2) and by setting *GSIB* and *POST* at 1.

**[Insert Table 4]**

**[Insert Figure 1]**

***Audit effort in U.S. G-SIBs***

To gain further insight into changes in audit effort for systemic banks after the designation as G-SIBs, we replicate our analysis using a sample of U.S. bank holding companies (BHCs). We exploit the fact that the banking supervisor is powerful in the U.S., as the official supervisory power index is equal to 13 out of a maximum score of 14 (Barth et al. 2013).[17] Thus, the U.S. context allows us to control that no change in audit effort occurred after the disclosure of the G-SIB list by the FSB in 2011 in countries with a powerful supervisor.

The U.S. banks were selected using the same criteria as the European banks, but we restricted the number of banks in the control group to large BHCs of similar size across the U.S. and the European samples. In total, we investigate changes in audit effort across 60 large U.S. BHCs, including 6 banks designated as G-SIBs in 2011 by the FSB. Panel C of Table 1 shows that the assets of these 60 banks represent 68% of all U.S. BHCs that file a FRY-9C report. Panel B of Table 2 shows that the average audit fees amount to USD 7.21 million. Descriptive statistics presented in Panels C and D of Table 3 show no significant change in audit effort for G-SIBs after their designation by the FSB.

We also control for the existence of concurrent regulations that might have occurred during this period. One potential concern is the U.S. Stress Test, which has been implemented since

[17] Large U.S. banks were subject to stress tests under the SCAP in 2009.This program became afterward the Comprehensive Capital Analysis and Review. Although stress tests do not apply exclusively to G-SIBs (i.e., it applies to all banks referred as domestic systemically important banks), these largest banks experienced a higher level of scrutiny in the U.S. In fact, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 imposed numerous prudential regulations on the largest financial institutions, including decreasing their credit exposure concentration, requiring them to establish risk committees, and enhancing public disclosure requirements.

2009. In this test, the Federal Reserve (FED) selects the largest U.S. BHCs and evaluates the capital planning and capital adequacy of these banks in stressed economic environments. The list of selected banks was identical throughout 2009-2013 and includes 19 BHCs. In 2014, the FED added 12 BHCs. From the original 19 BHCs, 15 BHCs (6 G-SIBs and 9 non-G-SIBs) are included in our sample. As stress tests encompass both treated and control banks, this event should not impact our results.

Table 5 reports the results of estimating Equation (1) using the sample of U.S. BHCs. In Column 1, which does not include bank fixed effects, we find that U.S. G-SIBs pay significantly larger audit fees than non-G-SIBs. Columns 1 and 2 show an insignificant coefficient on the interaction term $GSIB * POST$, which suggests that audit effort did not increase for systemic banks following their designation as G-SIBs in a country where the banking supervisor holds considerable power.

**[Insert Table 5]**

***Dynamic difference-in-differences (DiD)***

To validate the inferences from the DiD approach, it is important to demonstrate that the dependent variables exhibit parallel trends, i.e., that the average change for the control group does not differ from the change in the treatment group in the absence of treatment (Angrist and Pischke 2009). Although the parallel-trends assumption is fundamentally untestable, we follow Chen and Garriott (2020) and employ an event-study approach. In our context, this approach estimates the impact of the G-SIB regulation on multiple increments of the pre- and post-period. It is used to estimate the progressive response of audit fees over time, and to verify that the data are not trending before the enactment of the G-SIB regulation. For this analysis, we replace the variable $POST$ with a set of year dummies ($YEAR$) in Equations (1) and (2). If the interaction $GSIB * YEAR$ is statistically insignificant in all the pre-period increments, then the assertion of parallel trends is plausible. As a corollary, if this interaction variable is statistically significant

in all the post-period data, then it would strengthen confidence that the observed increase in audit fees is attributable to the designation of large banks as G-SIBs.

Table 6 presents the regression results with 2007 as the reference year. We report the results for European banks in columns 1 and 2, and for US banks in Columns 3 and 4. We find that the parallel trends assumption underlying our DiD design is plausible, as the coefficients on $GSIB * 2008$ and $GSIB * 2009$ are not consistently significant across columns 1 and 2, while $GSIB * 2011$, $GSIB * 2012$, $GSIB * 2013$ and $GSIB * 2014$ are always significant at conventional levels. However, we find a significant coefficient on the interaction variable $GSIB * 2010$ in both columns, suggesting that auditors began increasing their effort for G-SIBs from 2010. This result suggests that auditors may have anticipated that their clients would be officially designated as G-SIBs and adapted their effort in consequence. This anticipation effect is plausible as two unofficial lists of G-SIBs were published by the Financial Times in November 2009 and 2010 (Moenninghoff et al. 2015). Moreover 9 out of the 11 G-SIBs included in our sample were part of these unofficial lists, indicating little surprise in the G-SIB designation. Figure 2 supports the idea of a more prominent increase in audit fees in countries with less powerful banking supervisors ($Weak\ SP$). Figure 2a presents the results for the full period, whereas figure 2b focuses on the years 2009-2014, that is after the financial crisis, which render the parallel trends more plausible.

**[Insert Table 6]**

**[Insert Figure 2a and Figure 2b]**

## 5. Additional analyses

### *Financial reporting quality in European and US G-SIBs*

Given that audit effort has increased for G-SIBs in countries with weak banking supervision, a question of interest is whether this additional effort has an influence on audit quality and, ultimately, on financial reporting quality (FRQ). We address this issue by using the two

commonly employed measures of FRQ in the banking literature: abnormal loan loss provisions (LLP) and income smoothing.

*Measures of financial reporting quality*

Our first measure is abnormal LLP. *LLP* is the largest and most important accrual for banks and bank managers have considerable discretion in estimating LLP.[18] Under the assumption that high quality auditing constrains opportunistic earnings management, we therefore posit that abnormal loan loss provision (*ALLP*) is a relevant proxy for financial reporting quality.[19]

We compute *ALLP* as the absolute value of the residuals from Equation (3) multiplied by 100 (for each bank *i* and year *t*).[20]

$$LLP_{ijt} = \beta_0 + \beta_1 \Delta NPL_{ijt} + \beta_2 \Delta NPL_{ijt-1} + \beta_3 \Delta LOANS_{ijt} + \beta_4 SIZE_{ijt-1} + \beta_5 \Delta GDP_{jt} + \beta_6 \Delta UNEMP_{jt} + \beta_7 AHPI_{jt} + Fixed\ Effects + \varepsilon_{ijt} \quad (3)$$

where $LLP_{ijt}$ is the ratio of loan loss provision for fiscal year *t* to beginning-of-year total gross loans for bank *i* headquartered in country *j*; $\Delta NPL$ is the change in non-performing loans divided by beginning-of-year total gross loans; $\Delta LOANS$ is the change in total gross loans divided by beginning-of-year total loans; *SIZE* is the natural logarithm of total assets (in € millions); $\Delta GDP$ is the GDP percentage growth over the year; $\Delta UNEMP$ is the change in unemployment rate over the year; $AHPI$ is the return on the analytical house price indicators over the year; *Fixed Effects* represents year and auditor-year fixed effects.

Our second measure of FRQ is related to income smoothing behavior. This measure captures bank managers' decision to lower the risk perceived by stakeholders (e.g., Kanagaretnam et al. 2004; García Osma et al. 2019). The findings usually support the

[18] Empirical evidence usually supports the idea of capital management or earnings management through discretionary LLP (e.g., Ahmed et al. 1999; Wahlen 1994).
[19] Beatty and Liao (2014) show that the abnormal LLP proxy has a positive correlation with restatement/comment letter incidents.
[20] *ALLP* is estimated after removing outliers with absolute studentized residuals greater than 3.

hypothesis framed by Berger et al. (2008) and Dinger and Vallascas (2016) that risky banks are more likely to smooth earnings to avoid regulatory scrutiny and reduce market discipline. Because greater income smoothing suggests lower financial reporting quality as it obscures the underlying risk attributes of a bank's loan portfolio (Bushman and Williams 2012), we investigate changes in income smoothing behavior by G-SIBs.[21] For this analysis, we augment Equation (3) by including and interacting earnings before taxes and loan loss provision ($EBTLLP$), which is a measure of pre-managed earnings, with our variables of interest (i.e., $GSIB$, $POST$, $SP$). To smooth earnings, banks use their discretion to increase LLP when pre-managed earnings ($EBTLLP$) are high and to decrease LLP when pre-managed earnings ($EBTLLP$) are low. Therefore, the coefficient on $EBTLLP$ measures the extent to which banks increase (decrease) LLPs to smooth earnings, without reference to information about the loan portfolio.

*Results for financial reporting quality of European G-SIBs*

The inferences drawn from Table 7 are consistent with those of Table 4.[22] In Panel A, the results for abnormal LLP in Europe show a significant negative coefficient on the interaction term $GSIB * POST$ in Column 1. In Column 2, the interaction term $GSIB * POST$ is not significant anymore, after the inclusion of bank fixed-effects. Nonetheless, the magnitude remains similar.[23] The results in Column 3 show a significantly negative coefficient on $GSIB * POST$. This result implies that, when the banking supervisory power is lower, G-SIBs exhibit a larger pre-post decrease in $ALLP$ (i.e., a larger increase in FRQ) relative to non-G-SIBs. In economic terms, the coefficient on $GSIB * POST$ indicates that, for banks operating in a weak supervisory

[21] This analysis also mitigates concerns about the use of residual-based measures as dependent variables as it may lead to incorrect inferences (Chen, Hribar and Melessa 2018).
[22] Appendix C reports the results for the first-step regression estimation of abnormal LLP.
[23] An unreported Chow test reveals that the difference in the magnitude of the coefficients on the interaction term $GSIB * POST$ is statistically insignificant across Columns 1 and 2.

environment (i.e., when $SP$ is at its 5th percentile), the pre-post change in abnormal LLP for G-SIBs is 0.57% lower than the corresponding change for non-G-SIBs. Column 3 also shows a significantly positive coefficient on the interaction term $GSIB * POST * SP$. Thus, the difference in the pre- to post-2011 change in FRQ between G-SIBs and non-G-SIBs decreases as banking supervisory power increases. In economic terms, the coefficient on $GSIB * POST * SP$ implies that the the difference in the pre-post change in abnormal LLP between G-SIBs and non-G-SIBs is 0.77% greater for stronger (i.e., when $SP$ is at its 95th percentile) versus weaker banking supervisory environment (i.e., when $SP$ is at its 5th percentile). The last row of Table 4 shows that the sum of the coefficients on $GSIB * POST$ and $GSIB * POST * SP$ is not significant, indicating that in countries with the highest banking supervisory power, the change in abnormal LLP from before to after 2011 is not different for G-SIBs than the corresponding change for non-G-SIBs.

**[Insert Table 7]**

Panel B of Table 7 presents the results investigating changes in income smoothing behavior across G-SIBs and non-G-SIBs. We report that G-SIBs are likely to smooth their income more than non-G-SIBs before the enactment of the G-SIB regulation compared to other banks, as suggested by the positive and significant coefficient on the interaction term $EBTLLP * GSIB$ in Column 1. However, we do not find evidence of a statistically significant incremental difference between G-SIBs and non-G-SIBS in income smoothing behavior from before to after the designation of G-SIBs, as evidenced by the statistically insignificant coefficient on the interaction term $EBTLLP * GSIB * POST$. Moreover, the sum of the coefficients on $EBTLLP * GSIB$ and $EBTLLP * GSIB * POST$ is not significantly different from zero, indicating no difference between G-SIBs and non-G-SIBs regarding income smoothing after the enactment of the G-SIB regulation. By including bank fixed-effects in Column 2, the results highlight a

significant negative coefficient on $EBTLLP * GSIB * POST$, indicating a larger reduction in income smoothing for G-SIBs relative to non-G-SIBs from before to after 2011.

Finally, in Column 3, we investigate whether the relations in Column 2 differ across banks in countries with different levels of banking supervisory power. In the last row, the sum of the coefficients on $EBTLLP * GSIB * POST$ and $EBTLLP * GSIB * POST * SP$ is not significantly different from zero, suggesting that, in countries with the highest banking supervisory power, the change in income smoothing for G-SIBs from before to after 2011 is not different from the corresponding change for non-G-SIBs. However, the negative and significant coefficient on $EBTLLP * GSIB * POST$ indicates that the decrease in income smoothing for G-SIBs is attributable to G-SIBs in countries with low banking supervisory power. Overall, our results are consistent with an increase in financial reporting quality for G-SIBs operating in countries with a less powerful supervisor.

*Results for financial reporting quality of US G-SIBs*

Table 8 reports the results for U.S. G-SIBs with our two measures of FRQ: abnormal LLP (Panel A)[24] and income smoothing (Panel B). The insignificant coefficients on the interaction term $GSIB * POST$ in Columns 1 and 2 of Panel A suggest no reliable change in abnormal LLP after 2011 for the U.S. G-SIBs, which supports our findings on European banks. Panel B of Table 8 presents the results for income smoothing. The insignificant coefficients on $EBTLLP * GSIB * POST$ in Columns 1 and 2 suggest that G-SIBs do not change their income smoothing behavior after the enactment of the G-SIB regulation in 2011. Overall, we detect no change in FRQ for U.S. systemic banks, as abnormal LLP and income smoothing have not decreased since 2011 for these banks. This result supports our findings of no increased FRQ for European G-SIBs domiciled in countries with more powerful banking supervisors.

[24] Appendix C reports the results for the first-step regression estimation of abnormal LLP.

**[Insert Table 8]**

***Robustness tests***

*Asymmetric loan loss provision models*

Basu et al. (2020) argue that not including the asymmetry attributable to net loan charge-offs in LLP models can affect inferences related to FRQ. Although the theoretical framework applied in this study is somewhat controversial (Beatty and Liao 2020), we replicate our results by taking into account the asymmetry attributable to net loan charge-offs as in model 5 of Basu et al. (2020, p.7). Specifically, we use the following equation:

$$\begin{aligned} LLP_{ijt} = {} & \beta_0 + \beta_1 \Delta NPL_{ijt} + \beta_2 D\Delta NPL_{ijt} * \Delta NPL_{ijt} + \beta_3 D\Delta NPL_{ijt} \\ & + \beta_4 \Delta NPL_{ijt-1} + \beta_5 \Delta LOANS_{ijt} + \beta_6 NCO_{ijjt} \\ & + \beta_7 SIZE_{ijt-1} + \beta_8 \Delta GDP_{jt} + \beta_9 \Delta UNEMP_{jt} + \beta_{10} AHPI_{jt} \\ & + Fixed\ Effects + \varepsilon_{ijt} \end{aligned} \quad (4)$$

with $D\Delta NPL$ a dummy variable that equals 1 if $\Delta NPL_{it} < 0$, and 0 otherwise; $NCO$, the net charge-offs scaled by beginning-of-year total loans. The other variables are already defined in Equation 3.

Table 9 provides the results of this sensitivity analysis to the asymmetry attributable to net loan charge-offs in the LLP models for European banks in Panels A and B. Overall, the results support the idea of an increase in audit effort for G-SIBs operating in countries with weaker banking supervisors, which leads auditors to curb bank managers' discretionary accounting choices.

Panels C and D of Table 9 provide the results for U.S. banks. In general, this additional analysis strengthens our previous findings. First, we do not report changes in abnormal LLP as shown by the non-significant coefficient on $GSIB * POST$ in both columns of Panel C. Second,

we also find that the enactment of the G-SIB regulation does not modify the income smoothing behavior across U.S. G-SIBs.

**[Insert Table 9]**

*Analysis of sub-samples*

We also investigate whether the domination of several countries in Europe in terms of observations impacts our results. Specifically, we exclude successively the banks incorporated in Denmark, France and Italy. Our (untabulated) results remain similar when imposing these restrictions on our sample. We also exclude The Netherlands, Portugal and Spain, because Balakrishnan et al. (2021) show that these countries implemented mandatory auditor reporting to bank regulators during the period under investigation (2007-2014). Because these changes apply to treated and untreated banks, we believe that they should not affect our inference. Consistent with this expectation, our (untabulated) results remain similar when accounting for these concurrent institutional changes regarding the communication between auditors and supervisors. Overall, these additional analyses strengthen our confidence in the inferences from earlier analyses.

## 6. Conclusion

In this paper, we investigate the implications of the designation of large banks as G-SIBs by the FSB in 2011 for audit effort in Europe. We find an increase in audit effort after banks are designated as G-SIBs in European countries characterized by a less powerful supervisor. Additional analyses using U.S. banks shows that audit effort does not significantly change for the banks designated as G-SIBs in 2011. It thus supports the idea of no increase in audit effort as a result the G-SIB designation in European countries with a more powerful supervisor.

However, we acknowledge that there are some limitations. First, even if the home country supervisor retains ultimate supervisory authority over the consolidated G-SIB entity, it

is possible that other supervisors may influence auditor effort in subsidiaries operating in other countries. Thus, future research could try to better understand how multiple supervisors influence audit effort for the consolidated entity. Second, our analyses are based on the official supervisory power index compiled by Barth et al. (2013) using the World Bank survey. The choice was made because no other index is available for the full period for all selected countries. Thus, future research could try to develop new indices to verify that the institutional context (i.e., banking supervision) matters for audit effort and financial reporting quality for systemic banks. Third, as auditors have limited resources, it would be interesting to better understand how auditors reallocated their resources between G-SIB and non-G-SIB banks after 2011 in countries with weak banking supervisors. Without access to proprietary data from auditors, it is unfortunately very difficult to tackle this issue.

With these limitations in mind, we nevertheless conclude that the banking supervisory power, which is a formal institution specific to the banking industry, significantly influences audit effort for systemic banks (G-SIBs). Our results allow us to conclude that a substitution effect exists between auditors and banking supervisors in countries characterized by a less powerful supervisor, and that future regulations should consider such an effect.

## References


Ahmed, A. S., C. Takeda, and S. Thomas. 1999. Bank loan loss provisions: A reexamination of capital management, earnings management and signaling effects. *Journal of Accounting and Economics* 28 (1): 1–25.

Angrist, J. D., and J. S. Pischke. 2009. *Mostly harmless econometrics: An empiricist's companion*. *Princeton University Press*.

Argimón, I., M. Dietsch, and Á. Estrada. 2018. Prudential filters, portfolio composition at fair value and capital ratios in European banks. *Journal of Financial Stability* 39 (December 2018): 187–208.

Balakrishnan, K., E. T. De George, A. Ertan, and H. Scobie. 2021. Economic consequences of mandatory auditor reporting to bank regulators. *Journal of Accounting and Economics*, 72 (2-3): 101431.

Barth, J. R., G. Caprio, and R. Levine. 2013. Bank regulation and supervision in 180 countries from 1999 to 2011. *Journal of Financial Economic Policy* 5 (2): 111–219.

Barth, M. E., and W. R. Landsman. 2010. How did financial reporting contribute to the financial crisis? *European Accounting Review* 19 (3): 399–423.

Basu, S., J. Vitanza, and W. Wang. 2020. Asymmetric loan loss provision models. *Journal of Accounting and Economics* 70 (2–3): 101359.

BCBS. 2011. Global systemically important banks: assessment methodology and the additional loss absorbency requirement - Cover note. *Bank for International Settlements*. Available at https://www.bis.org/publ/bcbs207cn.pdf.

BCBS. 2019. The Basel framework. *Bank for International Settlements*. Available at https://www.bis.org/basel_framework/.

Beatty, A., and S. Liao. 2014. Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics* 58 (2–3): 339–83.

Beatty, A., and S. Liao. 2020. Alternative evidence and views on asymmetric loan loss provisioning. *Journal of Accounting and Economics* 70 (2–3): 101362.

Beck, T., A. Demirgüç-Kunt, and R. Levine. 2006. Bank supervision and corruption in lending. *Journal of Monetary Economics* 53 (8): 2131–63.

Berger, A. N., R. DeYoung, M. J. Flannery, D. Lee, and Ö. Öztekin. 2008. How do large banking organizations manage their capital ratios? *Journal of Financial Services Research* 34 (2–3): 123–49.

Bongini, P., L. Nieri, and M. Pelagatti. 2015. The importance of being systemically important financial institutions. *Journal of Banking & Finance* 50: 562–74.

Bratten, B., M. Causholli, and T. C. Omer. 2019. Audit Firm Tenure, Bank Complexity, and Financial Reporting Quality. *Contemporary Accounting Research* 36 (1): 295–325.

Bushman, R. M. 2016. Transparency, accounting discretion and bank stability. *Economic Policy Review* 22 (1): 129–49.

Bushman, R. M., and C. D. Williams. 2012. Accounting discretion, loan loss provisioning, and discipline of banks' risk-taking. *Journal of Accounting and Economics* 54 (1): 1–18.

Bushman, R. M., and C. D. Williams. 2015. Delayed expected loss recognition and the risk profile of banks. *Journal of Accounting Research* 53 (3): 511–53.

Cameran, M., and P. Perotti. 2014. Audit fees and IAS/IFRS adoption: Evidence from the

banking industry. *International Journal of Auditing* 18 (2): 155–69.
Chen, M., and C. Garriott. 2020. High-frequency trading and institutional trading costs. *Journal of Empirical Finance* 56: 74–93
Chen, W., P. Hribar, and S. Melessa. 2018. Incorrect inferences when using residuals as dependent variables" *Journal of Accounting Research* 56 (3): 751–96.
Choi, J.-H., J.-B. Kim, X. Liu, and D. A. Simunic. 2008. Audit pricing, legal liability regimes, and big 4 premiums: Theory and cross-country evidence. *Contemporary Accounting Research* 25 (1): 55–99.
Curcio, D., A. De Simone, and A. Gallo. 2017. Financial crisis and international supervision: New evidence on the discretionary use of loan loss provisions at Euro Area commercial banks. *The British Accounting Review* 49 (2): 181–93.
Dal Maso, L., K. Kanagaretnam, G. J. Lobo, and S. Terzani. 2018. The influence of accounting enforcement on earnings quality of banks: Implications of bank regulation and the global financial crisis. *Journal of Accounting and Public Policy* 37 (5): 402–19.
DeFond, M., and J. Zhang. 2014. A review of archival auditing research. *Journal of Accounting and Economics* 58 (2–3): 275–326.
Degryse, H., M. Mariathasan, and T. H. Tang. 2020. GSIB Status and Corporate Lending: An International Analysis. *SSRN Electronic Journal*, 1–76, https://doi.org/10.2139/ssrn.3642702.
Dinger, V., and F. Vallascas. 2016. Do banks issue equity when they are poorly capitalized? *Journal of Financial and Quantitative Analysis* 51 (5): 1575–1609.
Durnev, A., and E. H. Kim. 2005. To steal or not to steal: Firm attributes, legal environment, and valuation. *The Journal of Finance* 60 (3): 1461–93.
Ettredge, M. L., Y. Xu, and H. S. Yi. 2014. Fair value measurements and audit fees: Evidence from the banking industry. *Auditing: A Journal of Practice & Theory* 33 (3): 33–58.
European Commission. 2010. Green paper on audit policy: Lessons from the crisis. *Publications Office of the European Union*.
Fields, L. P., D. R. Fraser, and M. S. Wilkins. 2004. An investigation of the pricing of audit services for financial institutions. *Journal of Accounting and Public Policy* 23 (1): 53–77.
Francis, J. R., and D. Wang. 2008. The joint effect of investor protection and Big 4 audits on earnings quality around the world. *Contemporary Accounting Research* 25 (1): 157–91.
FSB. 2011. Policy measures to address systemically important financial institutions. *Financial Stability Board*. Available at https://www.fsb.org/wp-content/uploads/Policy-Measures-to-Address-Systemically-Important-Financial-Institutions.pdf.
FSB. 2012. Enhancing the contribution of external audit to financial stability, https://www.fsb.org/wp-content/uploads/pr_120315.pdf, retreived April 10, 2020.
García Osma, B., A. Mora, and L. Porcuna-Enguix. 2019. Prudential supervisors' independence and income smoothing in European banks. *Journal of Banking & Finance* 102: 156–76.
Gebhardt, G., and Z. Novotny-Farkas. 2011. Mandatory IFRS adoption and accounting quality of European banks. *Journal of Business Finance & Accounting* 38 (3–4): 289–333.
George, E. T. De, C. B. Ferguson, and N. A. Spear. 2013. How much does IFRS cost? IFRS adoption and audit Fees. *The Accounting Review* 88 (2): 429–62.
Ghosh, A., H. Jarva, and S. G. Ryan. 2020. Bank regulation/supervision and bank auditing. *SSRN Electronic Journal*, https://doi.org/10.2139/ssrn.3603346.

Hirtle, B., A. Kovner, and M. Plosser. 2020. The impact of supervision on bank performance. *Journal of Finance* 75 (5): 2765–2808.

Kanagaretnam, K., C. Y. Lim, and G. J. Lobo. 2010. Auditor reputation and earnings management: International evidence from the banking industry. *Journal of Banking & Finance* 34 (10): 2318–27.

Kaufmann, D., A. Kraay, and M. Mastruzzi. 2011. The worldwide governance indicators: Methodology and analytical issues. *Hague Journal on the Rule of Law* 3 (2): 220–46.

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: 221–36.

Nicoletti, A. 2018. The effects of bank regulators and external auditors on loan loss provisions. *Journal of Accounting and Economics* 66 (1): 244–65.

Poretti, C., A. Schatt, and L. Bruynseels. 2018. Audit committees' independence and the information content of earnings announcements in Western Europe. *Journal of Accounting Literature* 40: 29–53.

Riccardi, W. N., D. V. Rama, and K. Raghunandan. 2018. Regulatory Quality and Global Specialist Auditor Fee Premiums. *Auditing: A Journal of Practice & Theory* 37 (3): 191–210.

Simunic, D. A., and M. T. Stein. 1996. The impact of litigation risk on audit pricing: A review of the economics and the evidence. *Auditing: A Journal of Practice & Theory* 15 (2): 119–34.

World Bank Group. 2015. Banking supervisors and external auditors: Building a constructive relationship. World Bank, www.worldbank.org/cfrr.

**Appendix A: Sample selection**

| | Banks |
|---|---|
| Universe of EU-OECD banks in Audit Anaytics | 183 |
| Less 5 G-SIBs not included in 2011-2014 lists | 178 |
| Less 15 banks with missing observations | 163 |
| Less 20 banks that are not publicly listed during the period 2007-2014 | 143 |
| Less 32 banks without at least one observation in the pre- and post- 2011 period | 111 |
| Less 5 banks located in countries with 1 bank | 106 |
| *Total number of observations* | *784* |

## Appendix B: Variable definitions

| Variable | Definition | Sources |
|---|---|---|
| *LOGFEE* | Logarithm of audit fees in € millions | Audit Analytics / hand collected |
| *ALLP* | Abnormal loan loss provision computed as the absolute value of the residual from Equation (3) | Own calculation |
| *LLP* | Ratio of the loan loss provision to beginning-of-year total loans | S&P GMI |
| *GSIB* | Indicator variable that takes the value one if the bank is identified as a G-SIB by the FSB and zero otherwise | FSB lists 2011-2014 |
| *POST* | Indicator that equals one for years from 2011 to 2014 and zero otherwise | |
| *SP* | The normalized 'official supervisory power' index that takes a value between 0 and 1, by subtracting the mean score from the raw score, and by dividing then this difference by the range of scores (i.e., difference between the highest and the lowest score). | World Bank |
| *SECURITIES* | Ratio of total securities to total assets | S&P GMI |
| *DEPOSIT* | Ratio of total deposits to total assets | S&P GMI |
| *LOANS* | Ratio of total gross loans to total assets | S&P GMI |
| *NPL* | Ratio of non-performing loans to total loans | S&P GMI |
| *INTANG* | Ratio of intangible assets to total assets | S&P GMI |
| *LOSS* | Indicator variable that takes the value one if the bank reported a loss and zero otherwise | S&P GMI |
| *EFFICIENCY* | Efficiency ratio. This ratio is extracted from S&P Global Market Intelligence, and equal to noninterest expenses before foreclosed property expenses, amortization of intangibles, and goodwill impairments as a percent of net interest income (fully taxable equivalent, if available) and noninterest revenues, excluding only gains from securities transactions and nonrecurring items. For European banks, expenses include foreclosed property and amortization of intangibles and income includes security transactions. | S&P GMI |
| *CAPRATIO* | Total regulatory capital ratio | S&P GMI |
| *SIZE* | Logarithm of total assets in € millions (in $US millions for U.S. banks) | S&P GMI |
| *ΔAUD* | Indicator variable that takes the value one if the audit firm rotates and zero otherwise | Audit Analytics / hand collected |
| *INST* | Index of the overall level of institutional development* | Kaufmann et al. (2011) |
| *EBTLLP* | Ratio of earnings before taxes and loan loss provision to beginning-of-year total loans | S&P GMI |
| *ΔNPL* | Ratio of change non-performing loans to beginning-of-year total loans | S&P GMI |
| *ΔLOANS* | Ratio of change in gross loans to beginning-of-year total loans | S&P GMI |
| *ΔGDP* | GDP growth rate in % | S&P GMI |
| *UNEMP%* | Employment rate in % | S&P GMI |
| *AHPI* | The return on the analytical house price indicators over the year | OECD |

## Appendix C: First-stage regression for estimating abnormal LLPs

| **Dependent Variable: *LLP*** | |
|---|---|
| **Panel A: European banks** | |
| $\Delta NPL_t$ | 0.16*** |
| | (9.35) |
| $\Delta NPL_{t-1}$ | 0.12*** |
| | (6.79) |
| $\Delta LOANS_t$ | −0.01** |
| | (−2.41) |
| $SIZE_t$ | −0.00*** |
| | (−3.29) |
| $\Delta GDP_t$ | −0.00 |
| | (−0.38) |
| $UNEMP\%_t$ | −0.00 |
| | (−1.10) |
| $AHPI_t$ | −0.03*** |
| | (−3.84) |
| Year Fixed Effects | yes |
| Auditor-Year Fixed Effects | yes |
| Adjusted $R^2$ | 0.43 |
| N | 727 |
| **Panel B: U.S. banks** | |
| $\Delta NPL_t$ | 0.06 |
| | (1.13) |
| $\Delta NPL_{t-1}$ | 0.29*** |
| | (4.68) |
| $\Delta LOANS_t$ | 0.00 |
| | (0.36) |
| $SIZE_t$ | 0.00** |
| | (2.40) |
| Year Fixed Effects | yes |
| Auditor-Year Fixed Effects | yes |
| Adjusted $R^2$ | 0.52 |
| N | 452 |

Notes: This table reports the estimation of Equation (3). *, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. Robust *t*-statistics clustered by bank are shown in parentheses. Panel A includes 106 European banks for the period 2007−2014. Panel B includes 60 U.S. BHCs for the period 2007−2014. Appendix B summarizes variable definitions.

## Figure 1: Influence of the supervisory power

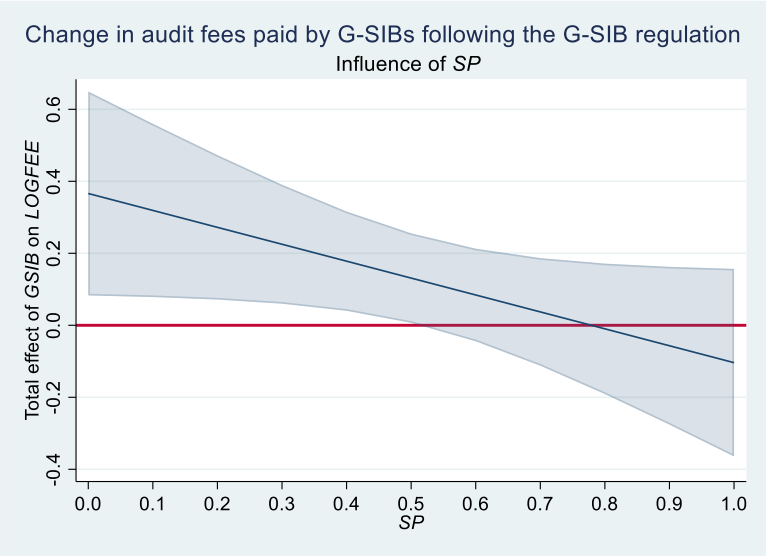


**Figure 1:** Change in audit fees following the identification of the European G-SIBs in 2011 across different supervisory regimes. This figure presents aggregate coefficient values of $GSIB$ (95% confidence intervals) on audit fees based on the regression output obtained from running Equation (2) and by setting $GSIB$ and $POST$ at 1.

## Figure 2: Parallel trends

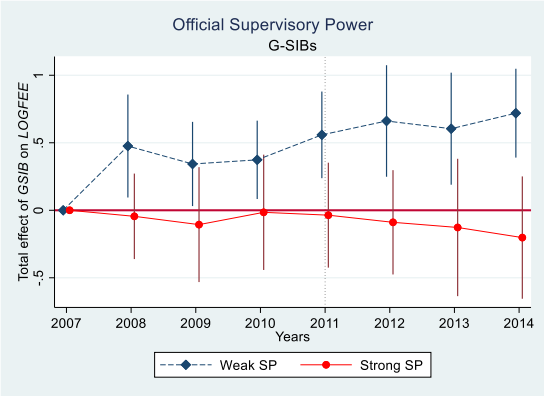


**Figure 2a (Base year 2007):** Audit Fees over time for European G-SIBs across different supervisory regimes. This figure presents aggregate coefficient values of $GSIB$ (95% confidence intervals) on audit fees based on the regression output obtained from running Equation (2), interacting it with dummy variables by year (in place of $POST$) and by setting $GSIB$ at 1, $SP$ at 0.11 ($Weak\ SP$) and at 0.89 ($Strong\ SP$). The dotted vertical line shows the enactment of the G-SIB regulation.

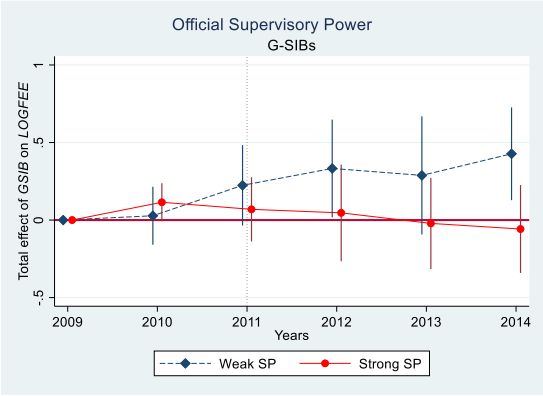


**Figure 2b (Base year 2009):** Audit Fees over time for European G-SIBs across different supervisory regimes. This figure presents aggregate coefficient values of $GSIB$ (95% confidence intervals) on audit fees based on the regression output obtained from running Equation (2), interacting it with dummy variables by year (in place of $POST$) and by setting setting $GSIB$ at 1, $SP$ at 0.11 ($Weak\ SP$) and at 0.89 ($Strong\ SP$). The dotted vertical line shows the enactment of the G-SIB regulation.

**TABLE 1**

**Sample description**

**Panel A: Banks per country**

| Countries | Bank-year observations | #Banks | #G-SIBs | Official Supervisory power | SP |
|---|---|---|---|---|---|
| Austria | 22 | 3 | 0 | 12 | 0.78 |
| Denmark | 154 | 20 | 0 | 11 | 0.67 |
| Finland | 20 | 3 | 0 | 5 | 0.00 |
| France (1) | 126 | 17 | 3 | 10 | 0.56 |
| Germany (2) | 62 | 8 | 1 | 11 | 0.67 |
| Greece | 19 | 3 | 0 | 6 | 0.11 |
| Ireland | 24 | 3 | 0 | 6 | 0.11 |
| Italy (3) | 133 | 18 | 1 | 13 | 0.89 |
| Netherlands (4) | 16 | 2 | 1 | 11 | 0.67 |
| Poland | 70 | 10 | 0 | 11 | 0.67 |
| Portugal | 13 | 2 | 0 | 12 | 0.78 |
| Slovenia | 11 | 2 | 0 | 14 | 1.00 |
| Spain (5) | 36 | 5 | 1 | 9 | 0.44 |
| Sweden (6) | 30 | 4 | 1 | 6 | 0.11 |
| United Kingdom (7) | 48 | 6 | 3 | 7 | 0.22 |
| (Total) Europe | 784 | 106 | 11 | - | - |
| United States of America | 462 | 60 | 6 | 13 | - |

**Panel B: Weight of the 106 large banks in Europe**

| | Total Assets EUR trillions | Assets | Total equity | Net loans | Net income |
|---|---|---|---|---|---|
| G-SIBs | 15.92 | 40% | 34% | 31% | 37% |
| Non G-SIBs | 6.48 | 16% | 17% | 19% | 14% |
| Total Europe | 39.41 | 100% | 100% | 100% | 100% |

**Panel C: Weight of the 60 large banks in U.S.**

| | Total Assets USD trillions | Assets | Total equity | Net loans | Net income |
|---|---|---|---|---|---|
| G-SIBs | 8.87 | 49% | 46% | 40% | 41% |
| Non G-SIBs | 3.50 | 19% | 21% | 27% | 27% |
| Total USA | 18.20 | 100% | 100% | 100% | 100% |

Panel A: The European G-SIBs are: (1) BNP Paribas, Crédit Agricole, Société Générale; (2) Deutsche Bank; (3) UniCredit; (4) ING Groep; (5) Banco Santander; (6) Nordea; (7) Barclays, HSBC, Royal Bank of Scotland Group. The U.S. G-SIBs are Bank of America Corporation, Bank of New York Mellon Corporation, Citigroup Inc., JPMorgan Chase & Co., State Street Corporation and Wells Fargo & Company. The "official supervisory power" index is drawn from Barth et al. (2013) and is measured using the 2011 Bank Regulation and Supervision Survey from the World Bank. Sweden did not participate to Survey in 2011; we therefore use the latest information from previous surveys (2003 and 2007) to compute the index. $SP$ is the 2011 "official supervisory power" index normalized to take a value between 0 and 1.

Panel B: Source: SNL (year end 2014) based on the 11 G-SIBs and 61 non-G-SIBs banks included in our sample whose. Total Europe includes listed and non-listed banks from the 15 European Countries included in Panel A of Table 1.

Panel C: Source: FRY-9C (year end 2014) based on the 6 G-SIBs and 54 non-G-SIBs banks included in our sample. Total USA includes all BHCs that fil FRY-9C reports.

**TABLE 2**

**Descriptive statistics**

| **Panel A : Europe** | | | | | |
|---|---|---|---|---|---|
| Variable | Mean | SD | Q1 | Median | Q3 |
| ***Dependent variable*** | | | | | |
| *FEE (in EUR millions)* | 5.04 | 10.91 | 0.18 | 0.53 | 2.90 |
| *LOGFEE* | −0.20 | 1.88 | −1.72 | −0.63 | 1.07 |
| *ALLP* | 0.55 | 0.45 | 0.22 | 0.45 | 0.75 |
| *LLP* | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 |
| ***Control variables*** | | | | | |
| *SECURITIES* | 0.24 | 0.15 | 0.13 | 0.20 | 0.29 |
| *DEPOSIT* | 0.50 | 0.20 | 0.33 | 0.51 | 0.64 |
| *LOANS* | 0.63 | 0.19 | 0.55 | 0.68 | 0.76 |
| *NONPERFORM* | 0.06 | 0.07 | 0.02 | 0.04 | 0.08 |
| *INTANG* | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 |
| *LOSS* | 0.15 | 0.36 | 0.00 | 0.00 | 0.00 |
| *EFFICIENCY* | 0.62 | 0.16 | 0.52 | 0.59 | 0.68 |
| *CAPRATIO* | 0.15 | 0.04 | 0.12 | 0.14 | 0.17 |
| *SIZE* | 10.13 | 2.35 | 8.77 | 10.01 | 11.82 |
| *ΔAUD* | 0.07 | 0.25 | 0.00 | 0.00 | 0.00 |
| *INST* | −0.16 | 3.37 | −3.36 | 0.15 | 3.30 |
| *GROWTH* | 0.03 | 0.12 | −0.03 | 0.02 | 0.08 |
| *EBTLLP* | 0.03 | 0.04 | 0.01 | 0.02 | 0.03 |
| *ΔNPL* | 0.01 | 0.02 | −0.00 | 0.00 | 0.02 |
| *ΔLOANS* | 0.05 | 0.14 | −0.03 | 0.03 | 0.09 |
| *ΔGDP* | 0.35 | 2.66 | −0.81 | 0.91 | 1.87 |
| *AHPI* | −0.02 | 0.05 | −0.05 | −0.02 | 0.02 |
| *UNEMP%* | 9.04 | 4.37 | 6.06 | 8.10 | 10.92 |

(*Continued on next page*)

**TABLE 2 (Continued)**

| **Panel B : U.S.** | | | | | |
|---|---|---|---|---|---|
| Variable | Mean | SD | Q1 | Median | Q3 |
| ***Dependent variable*** | | | | | |
| *FEE (in USD millions)* | 7.21 | 15.17 | 0.94 | 1.80 | 5.43 |
| *LOGFEE* | 0.94 | 1.25 | −0.06 | 0.59 | 1.69 |
| *ALLP* | 0.57 | 0.54 | 0.18 | 0.38 | 0.82 |
| *LLP* | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 |
| ***Control variables*** | | | | | |
| *SECURITIES* | 0.21 | 0.11 | 0.14 | 0.18 | 0.26 |
| *DEPOSIT* | 0.69 | 0.12 | 0.65 | 0.71 | 0.78 |
| *LOANS* | 0.07 | 0.16 | 0.01 | 0.02 | 0.04 |
| *NONPERFORM* | 0.02 | 0.02 | 0.01 | 0.02 | 0.03 |
| *INTANG* | 0.03 | 0.02 | 0.01 | 0.03 | 0.04 |
| *LOSS* | 0.13 | 0.34 | 0.00 | 0.00 | 0.00 |
| *EFFICIENCY* | 0.61 | 0.12 | 0.56 | 0.62 | 0.67 |
| *CAPRATIO* | 0.15 | 0.03 | 0.13 | 0.15 | 0.16 |
| *SIZE (in USD)* | 10.66 | 1.47 | 9.52 | 10.09 | 11.66 |
| *ΔAUD* | 0.04 | 0.20 | 0.00 | 0.00 | 0.00 |
| *INST* | 0.05 | 0.25 | −0.11 | −0.01 | 0.11 |
| *GROWTH* | 0.07 | 0.15 | 0.00 | 0.04 | 0.10 |
| *EBTLLP* | 0.03 | 0.03 | 0.02 | 0.03 | 0.04 |
| *ΔNPL* | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 |
| *ΔLOANS* | 0.07 | 0.16 | −0.01 | 0.05 | 0.11 |
| *ΔGDP* | 1.31 | 1.62 | 1.55 | 2.01 | 2.29 |
| *AHPI* | −0.02 | 0.05 | −0.06 | −0.03 | 0.02 |
| *UNEMP%* | 7.53 | 1.69 | 6.16 | 8.08 | 9.28 |

Notes: This table provides descriptive statistics for variables used in this study. All variables, except dummies and the "official supervisory power" index, are winsorized at the 1 and 99 percentiles. The sample includes 103 European banks for the period 2007−2014 in Panel A. The sample includes 60 U.S. BHCs for the period 2007−2014 in Panel B. Appendix B summarizes variable definitions.

**TABLE 3**

**Description of the change in audit fees**

| **Panel A: Europe - Audit fees** | | | |
|---|---|---|---|
| | Non-G-SIBs | G-SIBs | Difference |
| PRE | 1.526 | 31.676 | 30.150 |
| POST | 1.608 | 33.290 | 31.682 |
| Difference (Raw) | 0.082 | 1.614 | 1.532 |
| Difference in % | 5.38% | 5.10% | |
| **Panel B: Europe - Audit fees deflated by the square root of total assets (‰).** | | | |
| | Non-G-SIBs | G-SIBs | Difference |
| PRE | 0.190 | 0.818 | 0.628 |
| POST | 0.182 | 0.868 | 0.686 |
| Difference (Raw) | −0.008 | 0.050 | 0.058 |
| Difference in % | −4.15% | 6.10% | |
| **Panel C: U.S. - Audit fees** | | | |
| | Non-G-SIBs | G-SIBs | Difference |
| PRE | 2.635 | 39.076 | 36.440 |
| POST | 3.451 | 47.075 | 43.624 |
| Difference (Raw) | 0.816 | 8.000 | 7.184 |
| Difference in % | 30.94% | 20.47% | |
| **Panel D: U.S. - Audit fees deflated by the square root of total assets (‰).** | | | |
| | Non-G-SIBs | G-SIBs | Difference |
| PRE | 0.380 | 1.130 | 0.750 |
| POST | 0.438 | 1.284 | 0.846 |
| Difference (Raw) | 0.058 | 0.154 | 0.095 |
| Difference in % | 15.40% | 13.62% | |

Notes: Panel A shows the average values of audit fees in million EUR for European banks, before (PRE) and after (POST) the disclosure of the G-SIB list in 2011, for Non-G-SIBs and G-SIBs. Panel B shows the average values of audit fees in million EUR deflated by the square root of total assets (‰) for European banks, before (PRE) and after (POST) the disclosure of the G-SIB list in 2011, for Non-G-SIBs and G-SIBs. Panel C shows the average values of audit fees in million USD for U.S. BHCs, before (PRE) and after (POST) the disclosure of the G-SIB list in 2011, for Non-G-SIBs and G-SIBs. Panel D shows the average values of audit fees in million USD deflated by the square root of total assets (‰) for U.S. BHCs, before (PRE) and after (POST) the disclosure of the G-SIB list in 2011, for Non-G-SIBs and G-SIBs

**TABLE 4**

**Audit fees of European systemic banks**

| | | | Supervisory Power |
|---|---|---|---|
| Dependent Variable: *LOGFEE* | (1) | (2) | (3) |
| *GSIB* | 0.64*** | | |
| | (3.04) | | |
| *GSIB*POST* | 0.28*** | 0.13* | 0.37** |
| | (3.86) | (1.95) | (2.53) |
| *POST*SP* | | | 0.13 |
| | | | (0.94) |
| *GSIB*POST*SP* | | | −0.47* |
| | | | (−1.90) |
| *SECURITIES* | 0.60 | −0.22 | −0.32 |
| | (0.72) | (−0.88) | (−1.35) |
| *DEPOSIT* | 0.95** | −0.09 | −0.07 |
| | (2.48) | (−0.28) | (−0.24) |
| *LOANS* | −0.30 | 0.08 | 0.07 |
| | (−0.39) | (0.24) | (0.20) |
| *NPL* | 1.03 | 0.23 | 0.29 |
| | (1.58) | (0.51) | (0.65) |
| *INTANG* | 17.96** | 5.73 | 6.05 |
| | (2.39) | (1.50) | (1.54) |
| *LOSS* | 0.26*** | 0.05 | 0.04 |
| | (3.03) | (1.46) | (1.14) |
| *EFFICIENCY* | 0.66** | 0.10 | 0.12 |
| | (2.15) | (0.97) | (1.27) |
| *CAPRATIO* | −0.27 | −0.04 | 0.02 |
| | (−0.16) | (−0.06) | (0.03) |
| *SIZE* | 0.67*** | 0.22*** | 0.20** |
| | (16.96) | (2.68) | (2.58) |
| *ΔAUD* | −0.37*** | −0.31*** | −0.31*** |
| | (−3.42) | (−4.03) | (−4.04) |
| *INST* | 0.04* | −0.15*** | −0.15*** |
| | (1.95) | (−3.27) | (−3.35) |
| *ΔGDP* | 0.00 | −0.01 | −0.01 |
| | (0.03) | (−0.72) | (−0.73) |
| Year Fixed Effects | Yes | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes | Yes |
| Bank Fixed Effects | No | Yes | Yes |
| Adjusted $R^2$ | 0.90 | 0.98 | 0.98 |
| N | 784 | 784 | 784 |
| *GSIB*POST+ GSIB*POST*SP*=0 | | | −0.10 |
| | | | (−0.78) |

Notes: Columns 1 and 2 of the table reports the estimation of Equation (1). Column 3 of the table reports the estimation of Equation (2) using the logarithm of audit fees ($LOGFEE$) as dependent variables. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. Robust *t*-statistics clustered by bank are shown in parentheses. $SP$ is the 2011 "official supervisory power" index drawn from Barth et al. (2013). This score is normalized to take a value between 0 and 1. The sample includes 106 European banks for the period 2007−2014. Appendix B summarizes variable definitions.

**TABLE 5**

**Audit fees of U.S. systemic banks**

| Dependent Variable: *LOGFEE* | (1) | (2) |
|---|---|---|
| *GSIB* | 0.60*** | |
| | (3.59) | |
| *GSIB*POST* | −0.01 | 0.04 |
| | (−0.16) | (0.88) |
| Controls | Yes | Yes |
| Year Fixed Effects | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes |
| Bank Fixed Effects | No | Yes |
| Adjusted $R^2$ | 0.90 | 0.99 |
| N | 462 | 462 |

Notes: Columns 1 and 2 of the table reports the estimation of Equation (1). *, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. Robust *t*-statistics clustered by bank are shown in parentheses. The sample includes 60 U.S. BHCs for the period 2007−2014. Appendix B summarizes variable definitions.

**TABLE 6**

**Dynamic difference-in-differences in audit fees of European and US banks**

| | EUROPE | | US | |
|---|---|---|---|---|
| Dependent Variable: *LOGFEE* | (1) | (2) | (3) | (4) |
| *GSIB*2008* | 0.08 | 0.19** | 0.08 | 0.06 |
| | (0.70) | (2.26) | (0.58) | (0.62) |
| *GSIB*2009* | 0.20 | 0.08 | 0.20 | 0.27** |
| | (1.57) | (0.82) | (1.43) | (2.64) |
| *GSIB*2010* | 0.22** | 0.15* | 0.20 | 0.29** |
| | (1.99) | (1.74) | (1.22) | (2.52) |
| *GSIB*2011* | 0.32*** | 0.22** | 0.13 | 0.20* |
| | (3.10) | (2.61) | (0.88) | (1.94) |
| *GSIB*2012* | 0.41*** | 0.27*** | 0.11 | 0.20** |
| | (3.77) | (2.73) | (0.80) | (2.11) |
| *GSIB*2013* | 0.46*** | 0.22* | 0.11 | 0.20* |
| | (4.63) | (1.93) | (0.75) | (1.82) |
| *GSIB*2014* | 0.44*** | 0.24** | 0.08 | 0.19* |
| | (3.56) | (2.07) | (0.56) | (1.76) |
| Controls | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes | Yes | Yes |
| Bank Fixed Effects | No | Yes | No | Yes |
| Adjusted $R^2$ | 0.90 | 0.98 | 0.90 | 0.99 |
| N | 784 | 784 | 462 | 462 |

Notes: The table reports the estimation of variations of Equation (1). The variable $POST$ in Equation (1) is replaced by yearly dummies (for the period 2007-2014) using 2007 as the reference year. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. Robust *t*-statistics clustered by bank are shown in parentheses. Columns 1 and 2 includes 106 European banks for the period 2007−2014. Columns 3 and 4 includes 60 U.S. BHCs for the period 2007−2014 Appendix B summarizes variable definitions.

**TABLE 7**

**Financial Reporting Quality of European systemic banks**

| **Panel A: Abnormal Loan Loss Provisions** | | | |
|---|---|---|---|
| | | | Supervisory Power |
| Dependent Variable: *ALLP* | (1) | (2) | (3) |
| *GSIB* | 0.04 | | |
| | (0.31) | | |
| *GSIB*POST* | −0.18* | −0.17 | −0.67** |
| | (−1.79) | (−1.62) | (−2.39) |
| *POST*SP* | | | −0.37** |
| | | | (−2.58) |
| *GSIB*POST*SP* | | | 0.98** |
| | | | (2.08) |
| *LLP_LAG* | 8.40** | 5.71 | 5.20 |
| | (2.47) | (1.47) | (1.35) |
| *GROWTH* | 0.12 | 0.05 | 0.05 |
| | (0.69) | (0.25) | (0.24) |
| *EBTLLP* | 0.15 | 0.44 | 0.34 |
| | (0.28) | (0.45) | (0.36) |
| *SECURITIES* | 0.18 | 0.11 | 0.35 |
| | (1.19) | (0.35) | (1.14) |
| *DEPOSIT* | −0.01 | −0.19 | −0.27 |
| | (−0.06) | (−0.47) | (−0.65) |
| *INTANG* | 5.05* | 8.19* | 7.19* |
| | (1.79) | (1.95) | (1.79) |
| *LOSS* | 0.19*** | 0.20** | 0.22*** |
| | (2.87) | (2.61) | (2.79) |
| *CAPRATIO* | 0.56 | 0.74 | 0.58 |
| | (0.99) | (0.81) | (0.64) |
| *SIZE* | −0.03** | 0.22 | 0.25* |
| | (−2.01) | (1.54) | (1.82) |
| *ΔAUD* | 0.03 | −0.00 | −0.01 |
| | (0.42) | (−0.01) | (−0.08) |
| *INST* | 0.00 | −0.01 | 0.00 |
| | (0.67) | (−0.12) | (0.04) |
| Year Fixed Effects | Yes | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes | Yes |
| Bank Fixed Effects | No | Yes | Yes |
| Adjusted $R^2$ | 0.13 | 0.28 | 0.29 |
| N | 727 | 727 | 727 |
| *GSIB*POST+ GSIB*POST*SP*=0 | | | 0.31 |
| | | | (1.37) |

(*Continued on next page*)

**TABLE 7 (Continued)**

**Panel B: Income Smoothing**

| | | | Supervisory Power |
|---|---|---|---|
| Dependent Variable: *LLP* | (1) | (2) | (3) |
| $EBTLLP_t$ | −0.01* | 0.01 | 0.04 |
| | (−1.85) | (0.93) | (0.48) |
| $EBTLLP_t$*GSIB | 0.20** | 0.10** | 0.26* |
| | (2.41) | (2.08) | (1.88) |
| $EBTLLP_t$*POST | 0.01 | 0.02* | 0.12** |
| | (1.36) | (1.78) | (2.25) |
| ***$EBTLLP_t$*GSIB*POST*** | −0.14 | −0.29** | −0.45** |
| | (−1.05) | (−2.47) | (−2.31) |
| $EBTLLP_t$*SP | | | −0.04 |
| | | | (−0.42) |
| $EBTLLP_t$*GSIB*SP | | | −0.36* |
| | | | (−1.77) |
| $EBTLLP_t$*POST*SP | | | −0.15** |
| | | | (−2.01) |
| ***$EBTLLP_t$*GSIB*POST*SP*** | | | 0.38 |
| | | | (1.04) |
| Controls & Interaction Terms | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes | Yes |
| Bank Fixed Effects | No | Yes | Yes |
| Adjusted $R^2$ | 0.45 | 0.70 | 0.70 |
| N | 727 | 727 | 727 |
| *EBTLLP*GSIB+EBTLLP*GSIB*POST*=0 | 0.06 | −0.19* | |
| | (0.55) | (−1.78) | |
| *EBTLLP*GSIB*POST+EBTLLP*GSIB*POST*SP*=0 | | | −0.06 |
| | | | (−0.31) |

Notes: Panel A: Columns 1 and 2 of the table reports the estimation of variations of Equation (1) with abnormal LLP (*ALLP*) as dependent variable. As control we additionally include $LLP\_LAG$, the one-year lagged ratio of LLP to beginning-of-year total gross loans; $GROWTH$, the percentage growth in total assets from the beginning to the end of the year; $EBTLLP$, the ratio of earnings before taxes and loan loss provisions to beginning-of-year total gross loans. We exclude $LOANS$, $NPL$, $EFFICIENCY$ that are specific to the audit fee model and are not included in the abnormal LLP model. Column 3 of the table reports the estimation of Equation (2) with abnormal LLP (*ALLP*) as dependent variable. Control variables are the same as in Columns 2. Panel B: reports the estimation of variations of Equation (3) in which we include earnings before taxes and loan loss provision ($EBTLLP$), which is a measure of pre-managed earnings, that we interact with our variables of interest (i.e., $GSIB$ and $POST$ in Column 1 and 2; $GSIB$, $POST$ and $SP$ in Column 3). *, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. Robust *t*-statistics clustered by bank are shown in parentheses. *SP* is the 2011 "official supervisory power" index drawn from Barth et al. (2013). This score is normalized to take a value between 0 and 1. The sample includes 106 European banks for the period 2007−2014. Appendix B summarizes variable definitions.

**TABLE 8**

**Financial Reporting Quality of U.S. systemic banks**

| **Panel A: Abnormal Loan Loss Provisions** | | |
|---|---|---|
| Dependent Variable: *ALLP* | (1) | (2) |
| *GSIB* | 0.06 | |
| | (0.23) | |
| *GSIB*POST* | 0.02 | 0.02 |
| | (0.13) | (0.10) |
| Controls | yes | yes |
| Year Fixed Effects | yes | yes |
| Auditor-Year Fixed Effects | yes | yes |
| Bank Fixed Effects | no | yes |
| Adjusted $R^2$ | 0.32 | 0.49 |
| N | 452 | 452 |
| **Panel B: Income Smoothing** | | |
| Dependent Variable: *LLP* | (1) | (2) |
| $EBTLLP_t$ | −0.06 | −0.05 |
| | (−0.96) | (−0.85) |
| $EBTLLP_t$*GSIB | −0.03 | 0.07 |
| | (−0.40) | (1.18) |
| $EBTLLP_t$*POST | 0.07 | −0.00 |
| | (1.27) | (−0.10) |
| ***$EBTLLP_t$*GSIB*POST*** | −0.01 | 0.09 |
| | (−0.09) | (1.62) |
| Controls & Interaction Terms | Yes | Yes |
| Year Fixed Effects | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes |
| Bank Fixed Effects | No | Yes |
| Adjusted $R^2$ | 0.55 | 0.77 |
| N | 452 | 452 |
| *EBTLLP*GSIB+EBTLLP*GSIB*POST*=0 | −0.03 | 0.16*** |
| | (−0.87) | (3.87) |

Notes: Panel A: Columns 1 and 2 of the table reports the estimation of Equation (1) with abnormal LLP (*ALLP*) as dependent variables. As control we additionally include *LLP_LAG*, the one-year lagged ratio of LLP to beginning-of-year total gross loans; $GROWTH$, the percentage growth in total assets from the beginning to the end of the year; $EBTLLP$, the ratio of earnings before taxes and loan loss provisions to beginning-of-year total gross loans. We exclude $LOANS$, $NPL$, $EFFICIENCY$ that are specific to the audit fee model and are not included in the abnormal LLP model. Panel B: reports the estimation of Equation (3) in which we include earnings before taxes and loan loss provision ($EBTLLP$), which is a measure of pre-managed earnings, that we interact with our variables of interest (i.e., $GSIB$ and $POST$ in Columns 1 and 2). *, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. Robust *t*-statistics clustered by bank are shown in parentheses. $SP$ is the 2011 "official supervisory power" index drawn from Barth et al. (2013). This score is normalized to take a value between 0 and 1. The sample includes 60 U.S. BHCs for the period 2007−2014. Appendix B summarizes variable definitions.

**TABLE 9**

**Sensitivity test to asymmetric loan loss provision models**

| **Panel A: Europe – Abnormal Loan Loss Provisions** | | | |
|---|---|---|---|
| | | | Supervisory Power |
| Dependent Variable: *ALLP* | (1) | (2) | (3) |
| *GSIB* | −0.01 | | |
| | (−0.08) | | |
| *GSIB*POST* | −0.10* | −0.13** | −0.23* |
| | (−1.92) | (−2.10) | (−1.68) |
| *POST*SP* | | | −0.23* |
| | | | (−1.86) |
| *GSIB*POST*SP* | | | 0.16 |
| | | | (0.71) |
| *LLP_LAG* | 9.71*** | 3.88 | 3.69 |
| | (4.07) | (1.31) | (1.26) |
| *GROWTH* | −0.02 | 0.03 | 0.03 |
| | (−0.11) | (0.20) | (0.19) |
| *EBTLLP* | 0.78** | 1.09 | 1.06 |
| | (2.08) | (1.62) | (1.58) |
| *SECURITIES* | 0.18** | 0.11 | 0.22 |
| | (2.24) | (0.31) | (0.62) |
| *DEPOSIT* | −0.09 | −0.76* | −0.82** |
| | (−1.01) | (−1.96) | (−2.11) |
| *INTANG* | 5.91*** | 10.07*** | 9.09** |
| | (3.76) | (2.79) | (2.52) |
| *LOSS* | 0.22*** | 0.17*** | 0.17*** |
| | (4.43) | (2.71) | (2.78) |
| *CAPRATIO* | −0.39 | −1.15* | −1.27** |
| | (−1.03) | (−1.88) | (−2.11) |
| *SIZE* | −0.03*** | −0.05 | −0.04 |
| | (−3.24) | (−0.44) | (−0.40) |
| *ΔAUD* | 0.10** | 0.07 | 0.06 |
| | (2.07) | (1.26) | (1.22) |
| *INST* | 0.01 | −0.13** | −0.13** |
| | (1.27) | (−2.30) | (−2.41) |
| Year Fixed Effects | Yes | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes | Yes |
| Bank Fixed Effects | No | Yes | Yes |
| Adjusted $R^2$ | 0.22 | 0.28 | 0.28 |
| N | 695 | 694 | 694 |
| *GSIB*POST+ GSIB*POST*SP*=0 | | | −0.07 |
| | | | (−0.66) |

(*Continued on next page*)

**TABLE 9 (Continued)**

| **Panel B: Europe – Earnings Smoothing** | | | |
|---|---|---|---|
| | | | Supervisory Power |
| Dependent Variable: *LLP* | (1) | (2) | (3) |
| $EBTLLP_t$ | −0.01*** | 0.00 | 0.06 |
| | (−3.72) | (0.32) | (0.57) |
| $EBTLLP_t$*GSIB | 0.09** | 0.09** | 0.12 |
| | (2.17) | (2.17) | (0.88) |
| $EBTLLP_t$*POST | 0.01 | 0.02* | 0.11** |
| | (1.35) | (1.68) | (2.28) |
| ***$EBTLLP_t$*GSIB*POST*** | −0.07 | −0.22** | −0.29 |
| | (−0.78) | (−2.10) | (−1.56) |
| $EBTLLP_t$*SP | | | −0.07 |
| | | | (−0.57) |
| $EBTLLP_t$*GSIB*SP | | | −0.12 |
| | | | (−0.57) |
| $EBTLLP_t$*POST*SP | | | −0.14** |
| | | | (−2.03) |
| ***$EBTLLP_t$*GSIB*POST*SP*** | | | 0.16 |
| | | | (0.43) |
| Controls & Interaction Terms | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes | Yes |
| Bank Fixed Effects | No | Yes | Yes |
| Adjusted $R^2$ | 0.67 | 0.75 | 0.76 |
| N | 695 | 694 | 694 |
| *EBTLLP*GSIB+EBTLLP*GSIB*POST*=0 | 0.03 | −0.12 | |
| | (0.29) | (−1.25) | |
| *EBTLLP*GSIB*POST+EBTLLP*GSIB*POST*SP*=0 | | | −0.13 |
| | | | (−0.64) |

(*Continued on next page*)

**TABLE 9 (Continued)**

| **Panel C: U.S. – Abnormal Loan Loss Provisions** | | |
|---|---|---|
| Dependent Variable: *ALLP* | (1) | (2) |
| *GSIB* | 0.01 | |
| | (0.07) | |
| *GSIB*POST* | 0.05 | −0.01 |
| | (0.72) | (−0.13) |
| Controls | Yes | Yes |
| Year Fixed Effects | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes |
| Bank Fixed Effects | No | Yes |
| Adjusted $R^2$ | 0.27 | 0.33 |
| N | 449 | 449 |
| **Panel D: U.S. – Earnings Smoothing** | | |
| Dependent Variable: *LLP* | (1) | (2) |
| $EBTLLP_t$ | −0.05** | −0.05 |
| | (−2.65) | (−1.60) |
| $EBTLLP_t$**GSIB* | 0.02 | 0.06 |
| | (0.95) | (1.57) |
| $EBTLLP_t$**POST* | 0.06** | 0.04 |
| | (2.41) | (1.33) |
| ***$EBTLLP_t$*GSIB*POST*** | −0.01 | 0.01 |
| | (−0.48) | (0.28) |
| Other Controls & Interaction Terms | Yes | Yes |
| Year Fixed Effects | Yes | Yes |
| Auditor-Year Fixed Effects | Yes | Yes |
| Bank Fixed Effects | No | Yes |
| Adjusted $R^2$ | 0.91 | 0.91 |
| N | 449 | 449 |
| *EBTLLP*GSIB+EBTLLP*GSIB*POST*=0 | 0.01 | 0.07** |
| | (0.59) | (2.66) |

Notes: *, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. Robust t-statistics clustered by bank are shown in parentheses. SP is the 2011 "official supervisory power" index drawn from Barth et al. (2013). This score is normalized to take a value between 0 and 1. Panels A and B include 106 European banks for the period 2007−2014. Panel C and D includes 60 U.S. BHCs for the period 2007−2014. The sample size decreases because of missing values for net loan charge-offs. Panels A and C report the estimation of variations Equation (1) using ALLP as dependent variable in Columns 1 and 2. Panel A reports the estimation of variations Equation (2) using ALLP as dependent variable in Column 3. As control we additionally include LLP_LAG, the one-year lagged ratio of LLP to beginning-of-year total gross loans; GROWTH, the percentage growth in total assets from the beginning to the end of the year; EBTLLP, the ratio of earnings before taxes and loan loss provisions to beginning-of-year total gross loans. We exclude LOANS, NPL, EFFICIENCY that are specific to the audit fee model and are not included in the abnormal LLP model. Panels B and D reports the estimation of Equation (4) in which we include earnings before taxes and loan loss provision (EBTLLP), which is a measure of pre-managed earnings, that we interact with our variables of interest. Appendix B summarizes variable definitions.