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# Economic Consequences of Mandatory Auditor Reporting to Bank Regulators\*

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July 2021

## Abstract

We study the economic consequences of mandates that require bank auditors to report to bank regulators. Based on survey responses from the European Central Bank and all 28 national bank regulators within the European Union and a review of national banking regulations, we create a novel dataset on these mandates. Exploiting the cross-sectional and time-series variation in these mandates, we find evidence that auditor reporting to bank regulators reduces bank riskiness, as measured by counterparty risk and credit spreads. We also observe a decline in problem loans and risk-weighted assets, as well as improvements in timeliness of loan loss provisions. Additional analyses suggest that mandated auditor reporting increases the effectiveness of supervisory and monitoring efforts and improves market discipline of banks. However, mandated auditor reporting comes with costs: it reduces future lending growth, risky lending, and profitability, and increases audit fees paid by shareholders.

JEL classification: *G28, G34, G38*

Keywords: *banking; auditing; bank risk; regulation; bank regulation; supervision*

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# Economic Consequences of Mandatory Auditor Reporting to Bank Regulators

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## Abstract

We study the economic consequences of mandates that require bank auditors to report to bank regulators. Based on survey responses from the European Central Bank and all 28 national bank regulators within the European Union and a review of national banking regulations, we create a novel dataset on these mandates. Exploiting the cross-sectional and time-series variation in these mandates, we find evidence that auditor reporting to bank regulators reduces bank riskiness, as measured by counterparty risk and credit spreads. We also observe a decline in problem loans and risk-weighted assets, as well as improvements in timeliness of loan loss provisions. Additional analyses suggest that mandated auditor reporting increases the effectiveness of supervisory and monitoring efforts and improves market discipline of banks. However, mandated auditor reporting comes with costs: it reduces future lending growth, risky lending, and profitability, and increases audit fees paid by shareholders.

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## 1. Introduction

The global financial crisis of 2007–2009 raised concerns about risk management processes and governance in banks (BIS, 2014; Härle et al., 2016), resulting in a trend toward increased regulation (e.g., Basel III). This study focuses on the Basel Committee’s recommendation that external auditors share information about bank risk and health with bank regulators.<sup>1</sup> This recommendation aims to expand information exchange and help strengthen relationships between external auditors and bank regulators (BIS, 2014).

In accordance with this recommendation, several EU countries developed mandates that increased the role auditors play in bank oversight. Many regulators argue that such requirements reduce bank risk and enhance the effectiveness of supervision.<sup>2</sup> However, the efficacy of these mandates is unclear, and they may have unintended consequences and costs for banks and the broader economy. Critics view Basel regulations as regulatory overreach that may hamper risk-taking and, by extension, lending, investment, and future economic growth; decrease shareholder value; and reduce system stability vis-à-vis shadow banking (Allen et al., 2012). Additional concerns include implementation and adjustment costs as well as privacy issues related to auditor-client confidentiality (Chalmers, 2017; JWG, 2016).

This study investigates the potential benefits and costs for a sample of EU countries that have mandated auditor reporting to bank regulators. We attempt to provide insights into the potential consequences of these mandates for bank risk, in addition to documenting evidence of the costs these mandates impose on bank lending and profitability.

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<sup>1</sup> Basel Core Principle 27 refers to prudential regulations and requirements for banks in relation to external audits.

<sup>2</sup> For example, the Basel Committee sent a letter to the International Auditing and Assurance Standards Board (IAASB) in March 2013 recommending enhancements to the auditing standards and the international standard on quality control. The IAASB strategy for 2015–2019 includes some of these recommendations. In addition, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency indicated their support for the principles and expectations set forth in the Basel Committee’s guidance. See OCC Bulletin: <https://www.occ.gov/news-issuances/bulletins/2016/bulletin-2016-2.html> (accessed on 23-Dec-2019).

Ex ante, the effects of mandatory auditor reporting to bank regulators on bank risk and health are unclear. On the one hand, such requirements may generate benefits by reducing bank risk via three channels: (i) regulation-based monitoring, (ii) supervision and review efforts by bank regulators, and (iii) market discipline. First, auditors can observe more closely and frequently many financial measures that regulators use, and, provide assurance on such numbers. For example, when assessing loan loss provisions for statutory audit purposes, auditors examine the risk of default within loan portfolios and can potentially uncover information that improves the accuracy of the risk weights used in regulatory reporting. Second, information from auditors can help regulators proactively monitor banks. For example, to the extent that auditors help identify high-risk areas, regulators can better design their on-site examinations for more effective assessments. Regulators can also benefit from the auditor's assistance in verifying the information used for their analyses (BIS, 2002). Third, auditors can work with regulators to induce banks to improve the information available to stakeholders, allowing for better market discipline. There is also a significant indirect effect: mandatory auditor reporting to regulators disciplines bank behavior because the perception of enhanced scrutiny—from both auditors and regulators—deters managers from risk-taking and reduce overall bank risk.

On the other hand, increased auditor input and reporting to bank regulators may not result in the benefits intended by the regulatory mandates for several reasons. Auditors' objectives are different from those of regulators. While the auditor's focus is on the financial health and performance of a given bank, regulators' primary concern is the health of the banking system. Hence, information generated by the auditing process may not be directly relevant or useful to bank regulators. Moreover, an audit firm is a commercial enterprise paid by the companies it audits; hence, there is potential for conflict of interest. And much of the information received by auditors in conducting their procedures is sensitive; thus, confidentiality obligations may prohibit or reduce the openness of reporting and dialog between auditors and regulators. Likewise, any

compromise to confidentiality (actual or perceived) may negatively impact the information exchange between auditors and banks and, by extension, the integrity and effectiveness of the auditing process. Non-compliance by auditors may also reduce the effectiveness of these mandates.<sup>3</sup> Finally, increased auditor involvement may reduce the efficacy of regulatory monitoring and supervision of banks if regulators overly rely on the inputs from auditors instead of their own assessments and on-site examinations. Overall, the effect of mandated auditor reporting to bank regulators on bank risk is an open empirical question.

The economic consequences of these mandates on banks and the economy is complex, as they likely extend beyond bank risk to a broad set of stakeholders. An excessive regulatory drive to reduce bank risk impairs banks' lending activity and profitability (e.g., Granja and Leuz, 2019). These effects are detrimental to shareholder value and potentially to the real economy (Granieri and Renda, 2012). Shareholders may also have to bear the cost of auditors' efforts.

To study these issues, we perform a difference-in-differences analysis that exploits the staggered adoption of laws mandating auditor reporting to bank regulators across all 28 EU countries from 2009 to 2018. To identify the adopting countries and the nature of the adoption regime, we survey national bank regulators of all EU member states and the European Central Bank (ECB). We inquire whether auditors provide the regulator with (i) specific *private* information; and (ii) explicit assurance on capital ratios, solvency ratios, or any other regulatory indicators. Our treatment sample includes bank-year observations from countries that mandated external auditors to do either (i) or (ii).<sup>4</sup>

Banks are subject to a variety of risks that regulators monitor and to which they may limit exposure, including credit risk, market risk, liquidity and funding risk, operational risk, legal risk,

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<sup>3</sup> We note that all regulators with whom we discussed this matter stated they have not experienced any instances of non-compliance with respect to increased auditor involvement in the supervisory process. In the UK for example, Rule 7.11 of the Auditor Part of the Prudential Regulation Authority (PRA rulebook) explicitly requires auditors to cooperate with the PRA in the discharge of its reporting requirements.

<sup>4</sup> To verify the nature and timing of the adoption we examine a variety of legislation and central bank annual reports.

and reputational risk (BIS, 2014). Arguably, “*the most significant . . . is the risk that a customer or counterparty will not settle an obligation for full value*” (BIS, 2014). Accordingly, to capture bank risk, we use a reported measure closely monitored by regulators: Counterparty risk. This measure captures the risk of economic losses attributable to a wide range of bank transactions in addition to the traditional notion of credit risk (e.g., transactions involving collateral, including over-the-counter derivatives and repurchase agreements). Especially after the financial crisis, regulators and investors closely monitor counterparty risk, which also serves as an essential input to capital ratio requirement calculations. The computation of counterparty risk is complex, requiring the bank to accurately estimate four critical parameters: the probability of default, exposure at default, loss given default, and maturity.

In addition, we examine a measure of bank risk derived from market expectations. For the subset of banks with credit default swaps (CDS) we examine changes in CDS spreads, which reflect the market-based assessment of the effect of these mandates on banks’ overall riskiness. Taken together, these measures capture the risks underpinning banks’ activities, as reported by banks themselves and as perceived by market participants.

Using a comprehensive sample of 16,927 bank-years (3,161 banks) from across the EU between 2009 and 2018, we find a significant decline in both bank risk measures, after controlling for various bank-level and country-level factors, as well as bank and time fixed effects. These effects are economically significant. For example, banks’ counterparty risk declines by approximately 6.4%, while CDS spreads fall by approximately 40 basis points—in excess of 20%—following the reforms. The results hold when using a propensity-score matched control sample of 2,457 bank-years (392 banks), and we also observe that pre-regulation trends in our risk measures are statistically similar for treatment and control banks.

As with other cross-country, regulation-based studies, a common empirical concern is that other concurrent regulations may be driving the variation in the dependent variable—mandating



auditor reporting to bank regulators could be just one part of broader regulatory initiatives that reduce bank risk. We attempt to address this concern in three ways. First, we review the regulations in our treatment countries. Although this does not mean that concurrent reforms do not exist, we find no evidence of other reforms accompanying the mandated auditor reporting. Second, in addition to various country-level variables (capturing concurrent changes in regulatory stringency, credit reforms, and country-specific economic trends), we control for the Basel reporting regime for each bank-year. This accounts for the staggered implementation of Basel reforms in different countries, as well as individual banks' voluntary adoption of these rules. Third, we conduct a within-country analysis, focusing specifically on the UK, where the mandate only applies to banks with assets greater than £50 billion. Using this size-based cutoff, we show that the effect exists only for banks required to comply with the regulations. Unless other concurrent regulations exist for large banks, specifically around this threshold, this test should mitigate the concern about the confounding effects of concurrent reforms.

We then undertake several robustness tests, which suggest that our results are not sensitive to individual treatment countries, inclusion of additional country-year controls that capture bank sector health and performance, and alternative clustering specifications for standard errors. We also conduct additional analyses to further test our inferences. In particular, we expect our results to be more pronounced among banks with certain conditions: those for which 1) regulators are at a plausible information disadvantage; and 2) there exist significant negative externalities in the event of a failure. To capture and study these conditions, we partition our sample based on bank size. We do not expect results to be pronounced among small banks with less significant externality effects or large banks that are already heavily regulated and scrutinized. Consistent with these arguments, we find stronger results for medium-sized banks. Consequently, while our results may generalize to medium-sized banks, we caution against extrapolating these findings to a broader population of banks or the banking sector in a different economy outside our sample.

Finally, we examine two metrics related to bank risk where auditors' role is more identifiable and where they may have better information and insight than regulators. First, we examine loan loss reserves, and find that treatment banks' loan loss provisioning becomes timelier following mandated auditor reporting. Next, we examine a measure of the amount of loans that have not yet been impaired but require close monitoring ("problem loans" as reported by banks). Consistent with heightened scrutiny, we find that the amount of problem loans increases in the two years immediately following the adoption of the reporting mandate but declines in the long term. Given the subjectivity and audit effort involved in the assessment of loan loss provisions and problem loans, we interpret these findings as evidence that improved audit outputs enhance the monitoring of bank risk.

We next examine *how* the mandates may have contributed to the observed reduction in bank risk through the three channels discussed earlier. To capture the efficacy of these mandates, vis-à-vis our first channel, regulation-based monitoring, we examine the risk-weights used by banks for their assets which is a key determinant of capital ratios. While of keen interest to regulators, risk-weighted assets (RWAs) typically fall outside the scope of financial statement audits, allowing us to cleanly identify the incremental role of auditors in the supervision and monitoring of banks. The increased auditor effort—owing to the mandates—to assess risk-weights should make RWA measurement more accurate. Ex ante, however, the direction of the effect on RWAs is unclear. It may be positive if the mandate curtails prior underreporting of risk weights; or negative if the mandate corrects prior overreporting errors or if banks' asset quality improves. We find that mandatory auditor reporting is associated with a 2.3 percentage point decline in RWAs.

The second channel we examine is the supervision and review process. While detailed data on regulator effort is not publicly available, we provide three pieces of evidence that support this channel's efficacy in contributing to a reduction in bank risk. First, we document a decrease in the

number of on-site examinations performed by national regulators in treated countries, which is consistent with our argument that additional auditor information reduces the need for as many on-site examinations (a point further supported by the survey responses we received from national regulators). Second, we observe that bank risk declines relatively more for banks in countries that also mandate auditor-regulator meetings, in keeping with the notion that formal communication channels facilitate the transfer of information useful for regulators in their examinations.<sup>5</sup> Third, we find a larger reduction in bank risk when regulators are more resource-constrained, and are likely to benefit more from auditor inputs.

The third channel we examine is market discipline. To the extent that these mandates improve the information environment, this should enhance stakeholders' monitoring and, thus, discipline management. We assess the quality of the information environment using the ratio of short-term CDS spreads to long-term CDS spreads. Motivated by Duffie and Lando (2001), this parsimonious metric isolates the magnitude of information imprecision for a given level of credit risk. We find a significant decline in information imprecision for treatment banks, which is consistent with the mandates' improving (CDS) investors' evaluation of banks' risk profiles.

While a decrease in bank risk may be a positive development from the regulators' perspective, such reductions could engender economic costs. For example, the observed reduction in risk may be achieved by curtailing risky lending or shifting towards safer lending. In turn, this may diminish shareholder value. Consistent with this view, we find that banks' loan growth declines following the mandates. Moreover, we observe a shift in asset composition towards safer lending. Specifically, we find an increase in shorter maturity loans and residential mortgage loans, along with a reduction in year-ahead non-performing loans.<sup>6</sup> In keeping with these inferences, our evidence also suggests that bank profitability declines in the three years following the mandates.

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<sup>5</sup> We collect this information via our survey, which is discussed in detail in the Online Appendix.

<sup>6</sup> This suggests that documented main result of a reduction in bank risk is driven, at least in part, by changes in lending.

Finally, we provide evidence that mandatory auditor reporting triggers an increase in the fees paid to auditors, which suggests that banks bear at least some of the additional costs. Taken together, these findings indicate that the reduction in bank risk comes at a cost to bank shareholders. Therefore, although we find a decrease in individual bank risk, it remains unclear whether this decline is desirable for banks' shareholders or the overall stability of the banking system.<sup>7</sup>

Our study contributes to the literature on the role of accounting in bank supervision and regulation. While several studies examine how accounting (e.g., loan loss provisioning or fair value accounting) contributes to bank supervision vis-à-vis its impact on capital ratios (e.g., Beatty et al., 1995; Collins et al., 1995; Beatty and Liao, 2014; Acharya and Ryan, 2016; Amel-Zadeh et al., 2017; Laux and Rauter, 2017), we focus on the role of external auditors in bank supervision. Only a small number of studies focus on auditors and regulators. Nicoletti (2018) documents that external auditors and bank regulators have differential effects on loan loss recognition timeliness. Ghosh et al. (2019) examine auditors' behavior in the presence (or absence) of bank supervision and find that bank regulation can be a substitute for auditing. Gopalan et al. (2019) find that third-party verifications, in the form of FDICIA-related internal control audits, are imperfect substitutes for supervision by bank regulators. Unlike these studies, which focus on the distinct effects of auditor and regulator functions, we explore the interplay and cooperation between auditors and regulators. We examine a setting in which both auditors and bank regulators are present, and we study the effects of mandatory information flow from auditors to regulators and the associated impacts on bank risk.<sup>8</sup>

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<sup>7</sup> For example, our findings of a contraction in lending activity suggest banks reduce lending to risky borrowers, but the demand for this risky credit does not cease. In fact, non-bank institutions may step in, which is likely at higher costs and greater risk. Our findings may also suggest regulatory overreach. For example, Granieri and Renda (2012) argue that over-regulation in the EU reduces innovation and risk-taking.

<sup>8</sup> In the context of our study, the economics of the EU setting is not fundamentally different from the U.S. landscape. Given that several European countries have addressed the call for increased dialogue before the U.S., we believe we can learn from this evidence on the consequences of such mandatory requirements.

The implications of our study extend beyond the banking literature. The ways in which regulators and oversight bodies interact with auditors and how these interactions affect the functioning of markets is an important policy issue. In the U.S., the SEC and PCAOB regularly interact with auditors. While such interactions can improve market functioning, the special nature of the auditor-regulator relationship could also have adverse effects, such as auditors performing more mechanical procedures (i.e., a narrow “check-box” approach) rather than exercising professional judgment. For example, Stuber and Hogan (2021) cast doubt on the efficacy of PCAOB inspections in improving the accuracy of loan loss allowances, suggesting that audit firms are managing inspection risk which is reducing overall audit quality. Our study adds to this literature by examining the consequences of a particular form of engagement—mandated information sharing between bank regulators and auditors—and documents the costs and benefits of such interactions. Moreover, our study contributes to the auditing literature (e.g., Tepelagul and Lin, 2015; Kausar et al., 2015; Lisowsky et al., 2017) by investigating the relatively unexplored demand for audit services from an external stakeholder, namely, bank regulators.

## **2. Background and Theoretical Underpinnings: Auditors’ Role in Bank Supervision**

The objective of bank regulators is to identify and remediate conditions that could threaten banks’ immediate health, long-term viability, or both. Due to potential externalities of bank failures, regulators seek to reduce bank risk. This involves a wide range of activities that support traditional efforts to ensure compliance with law and regulation as well as more modern, “prudential” work to monitor for unsafe or unsound business practices in banks (i.e., supervision).

Bank regulators primarily assess the safety and soundness of banks through monitoring and examinations, and use the information gleaned to request corrective actions. Forward-looking assessments of risk management and internal controls require both the quantitative analysis of hard information (i.e., reported data) and subjective evaluation of soft information. Regulators obtain

verifiable data on bank risk and collect information about a bank's actions through costly monitoring. For example, regulators may meet with bank management to discuss specific issues regarding firm activities as well as general perspectives on the industry environment and economic outlook. Since such communications are noisy, and regulatory monitoring and intervention are costly, regulators typically prioritize their efforts and allocate their limited resources to banks that have a higher likelihood of failing or those that threaten financial stability.

Regulators often rely on external auditors' outputs to assess and understand bank performance and the quality of reported information. In these interactions, auditors are expected to comment on issues related to valuation, quality of earnings, key accounting judgments, and their observations on the quality of the systems and controls relevant to the preparation of the financial statements. Given the increased reporting and interactions, auditors may focus more effort on aspects of the financial statement audit that matter to regulators, and in turn resource-constrained regulators may be able to improve the efficacy of their monitoring efforts (e.g., FDIC, 1997; Eisenbach et al., 2017). As regulators already receive a great deal of information from banks through regulatory reporting, the usefulness of auditors' information is likely to come from areas involving a high level of judgment. For example, additional information on metrics such as non-performing loans (NPL) is likely less relevant to regulators given that the classification of NPL is rule-based with minimal discretion. In contrast, auditors' inputs in areas such as problem loans (i.e., loans that are not yet impaired but require monitoring), assessment of level 2 and level 3 fair values of assets and liabilities, adequacy and subjectivity in loan loss reserves and uncertain tax exposures can prove critical for regulators given the judgment and discretion involved. Regulators can also benefit from additional information from auditors about certain transactions that are material at an entity level but not deemed material at the consolidated group level, or transactions

that remain off-balance sheet. Thus, regulators could use the information gleaned from auditors to uncover previously unknown or “hidden” risks and improve overall bank risk assessment.<sup>9</sup>

We conducted surveys and in-person discussions with regulators from all EU countries (including the UK) and the ECB to understand the nature of auditor-regulator relationships, any requirements for auditor reporting, the information obtained, and its usefulness. Drawing from survey responses, we consider the following three ways in which mandatory auditor-regulator reporting can affect banks’ riskiness.

***Regulation-based monitoring***—Regulatory activities encompass compliance with regulations designed to ensure bank health. To monitor banks using regulations, regulators depend on the verification of pertinent information. However, verification is costly. In their communications with auditors, regulators can request further information and verification of important regulatory inputs. With verified information, regulators can take more decisive regulation-driven actions. For example, the Basel Committee on Banking Supervision expects the auditor to attend to (and potentially report on) key areas such as loan loss provisioning, financial instruments measured at fair value, liabilities, disclosures, and the assessment of going concern (BIS, 2014). Supporting this notion, Doogar et al. (2015) find that as the recent financial crises unfolded, auditors shifted their attention to the adequacy of loan charge-offs and risks associated with loan distribution activities, which is consistent with auditors responding to shifts in banks’ risk.

***Supervision and review process***—Beyond regulatory compliance, regulators use a variety of hard and soft information to identify shortcomings in banks’ governance and risk management. If an assessment by bank regulators identifies shortcomings, regulators pursue a range of responses to require the firm to rectify the problems, from formal enforcement actions and rating downgrades, which constrain bank activities, to more subtle warnings that work via moral persuasion. Such

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<sup>9</sup> Increased interactions with auditors may also help regulators gain general perspectives on the industry environment and outlook (e.g., Eisenbach et al., 2017).

regulatory activities hinge on interim signals and soft information. Since auditors work closely with client banks and continuously monitor bank operations, they are positioned to possess valuable soft information on a bank's soundness. Auditors can provide regulators with timely and relevant information signals that facilitate effective intervention, such as when to intervene and how to best focus their supervisory efforts. For example, on-site examinations are an assessment based on examining areas of highest risk. To the extent that auditors help identify high-risk areas, they make such examinations more effective. Multiple national regulators in our survey (e.g., Estonia, Germany, and Slovenia) indicated that they use auditor inputs to better design and plan their off-site as well as on-site examinations and to understand what areas to focus on in their examinations.

***Improved market discipline***—Since mandatory auditor reporting can improve the quality of the information environment, it can also enhance market discipline. Prior work finds that regulations that strengthen market discipline can enhance bank lending, especially in jurisdictions with sound legal institutions (Beck et al., 2006). In addition, mandatory auditor reporting to bank regulators can improve audit function and overall audit outputs. For example, a regulator may provide an assessment in areas relevant to the audit; the auditor may obtain helpful information and insights from the assessment; and the auditor may then focus attention on areas of regulator concerns (BIS, 2014). Thus, the improved information environment of banks—facilitated by auditor-regulator relationships and communications—may enhance monitoring by stakeholders and mitigate bank risk.

While the above arguments indicate that an increase in auditor reporting should reduce bank risk, there are also reasons to believe increased auditor involvement may have no effect or even increase bank risk. First, agency problems among regulators, banks, and auditors could diminish the effectiveness of any mandatory auditor reporting. For instance, regulators may act in a self-serving manner. When faced with a problem bank, reputational concerns may drive



regulators to hide the problems for as long as possible. Whatever their cause, problem bank situations often lead to forbearance, under which mandated auditor reporting to regulators could merely reflect a form of window-dressing with no measurable impact on banks' riskiness. Regulators may use their powers to benefit favored constituent banks (Barth et al., 2004). And given that banks pay auditors, auditors may prioritize bank client interests over regulator interests; therefore, relying on auditors' information may hurt the efficiency of supervision.

Second, auditors and regulators focus on different concerns when examining a bank. While the regulator assesses the long-term viability of a given bank and the banking system overall, the auditor is mainly concerned with the quality and accuracy of a bank's financial statements (i.e., reported financial position and performance). The auditor also evaluates the bank's continuing viability (often for about one year from the balance sheet date) to support the going-concern basis on which the financial statements are prepared. A regulator cannot assume that the auditor's evaluation for the purposes of audit would necessarily be relevant or adequate for regulatory purposes. This disparity may lead the regulator to place weight on erroneous information in regulatory decisions.

Third, the auditor may not have sufficient knowledge of the intricacies of the banking industry and competence to respond to additional regulatory requirements important to bank regulators. For example, regulators examine whether credit risk is adequately diversified (BIS, 2014). Such an exercise requires extensive knowledge of the bank's activities, complexities, exposures, and correlations within and across the banking and private sector that the auditors may not have.

Based on the above arguments, the effect of auditor reporting to bank regulators with respect to reducing bank risk is an open empirical question.

### 3. Empirical Design and Measures

#### 3.1. *Measuring Mandatory Auditor Reporting*

There is little structured information on how auditors interact with bank regulators and what requirements exist across the world. To understand the extent of the mandatory auditor reporting to bank regulators, we surveyed bank regulators within each of the 28 EU member states and the ECB's regulatory authority, i.e., the Single Supervisory Mechanism (SSM). In particular, we ask: (i) whether auditors provide specific detailed private information (e.g., a long-form audit report) to the regulator; (ii) whether auditors provide the regulator with explicit assurance on capital ratios, solvency ratios, or any other specific item; and (iii) the extent to which auditors and regulators meet regularly to discuss the bank's performance. Following their responses, we held follow-up discussions to obtain further context and allow respondents to elaborate on their answers. We asked regulators open-ended questions to better understand the nature of the interactions, the specific regulation that mandated these requirements, and why the regulator did, or did not, adopt certain requirements. In conjunction with the survey responses, we conducted a review of banking regulations in each of our sample countries to determine and verify the dates of the relevant mandates. This effort allows us to construct a database containing official information about the legal requirements regulators impose on bank auditors.<sup>10</sup> The Online Appendix details the survey and regulator responses.

Table 1 summarizes the years in which each country enacted the regulations. We observe that of the 13 countries that mandate auditor reporting to bank regulators, nine countries passed these reforms during our sample period. These include Belgium, Croatia, Estonia, Hungary, Luxembourg, the Netherlands, Slovenia, Spain, and the UK. For example, Luxembourg enacted

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<sup>10</sup> In several cases, the regulators themselves provided a reference to the law, act, or decree. In those cases, we confirmed the year that the current regulation was enacted and ensured that no previous regulations existed that might already have required auditor involvement.

additional reporting requirements for auditors in 2013, while the UK did so in 2016. Four countries already adopted similar reforms before the start of our sample period: Austria (1994), Germany (1998), Portugal (2008), and Slovakia (2001).

Turning to assurance over capital ratios, we observe a significant overlap in the countries—and in the timing of these regulations—with those who enact additional reporting requirements. Nine of the 28 EU member states require assurance over capital ratios, with seven of these overlapping with additional reporting requirements (i.e., Austria, Belgium, Croatia, Estonia, Germany, Hungary, and Spain). Only the Netherlands and Lithuania reported that auditors are required to give assurance over capital ratios but do not require any additional reporting (such as a long-form audit report) to the bank regulator.<sup>11</sup> Due to the significant overlap between countries that mandate additional reporting and those that require ratio assurance, we focus on both in our empirical analysis.

### 3.2 Research Design

To test for the effects of mandatory auditor reporting in the banking sector, we adopt a difference-in-differences framework similar to the approach in Bertrand and Mullainathan (2003), and estimate the following:

$$Risk_{i,t} = \beta_1 \text{Mandatory Auditor Reporting}_{c,t} + \Theta \text{Controls} + v_i + \mu_t + \varepsilon_{i,t}. \quad (1)$$

In the above model, the subscript  $c$  denotes countries,  $i$  denotes individual banks, and  $t$  denotes years. Each observation is a bank-year. We employ the full sample of European banks (16,927 bank-years) during our sample period of 2009–2018 to estimate this model. In light of the fixed effects structure (bank and year), *Mandatory Auditor Reporting* effectively captures the

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<sup>11</sup> We do not include Lithuania in our list of treatment countries given we were unable to independently verify any regulation/legislation that mandated the assurance over capital ratios. However, in sensitivity tests we ensure our results are not sensitive to the inclusion or exclusion of Lithuanian observations as a treatment banks (n=37 bank-years).

traditional difference-in-differences estimator (i.e.,  $Post \times Treatment$ ). Given the nature of the regulations we examine, *Treatment* is measured at the country level; however, this term is omitted in the presence of bank fixed effects. Since *Post* switches on for treatment countries only and equals zero for all banks in control countries, it is identical to  $Post \times Treatment$ , and therefore only one term will be identified when estimated.<sup>12</sup> For ease of interpretation, we re-label this term *Mandatory Auditor Reporting*. Therefore, our independent variable of interest, *Mandatory Auditor Reporting*, is an indicator variable that switches on for banks in treatment countries, following the year of the reform (13 countries: Austria 1994, Belgium 2012, Croatia 2014, Estonia 2014, Germany 1998, Hungary 2014, Luxembourg 2013, Netherlands 2014, Portugal 2008, Slovakia 2001, Slovenia 2015, Spain 2011, and the UK 2016).

Our primary proxy for bank risk (*Risk*) is *Counterparty risk*, a metric that has been used in prior literature to capture different aspects of the underlying risk of banks' activities (e.g., Arora et al., 2012; Basel, 2014; Gregory, 2010). *Counterparty risk* is calculated by banks as the economic loss if a counterparty to a contract defaults before the final settlement of the cash flows. Counterparty risk encompasses traditional credit risk, as well as risks related to derivatives transactions, repurchase commitments, stock and commodities lending, long-settlement transactions, and financing of guarantees that can constitute a substantial fraction of the bank's assets. An increase in information for regulators can enhance their ability to supervise and proactively monitor banks' risk-taking activities. Moreover, even the possibility of improved oversight may alter banks' incentives to hold higher-quality assets (Houston et al., 2010).

We also employ a second measure of bank risk, *CDS Spread*, which is the year-end percentage spread of the five-year CDS contract of a bank. CDS spreads provide a timely and

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<sup>12</sup> In alternative models that rely on matching, *Post* will be non-degenerate for control-bank observations, and thus, *Post* and  $Post \times Treatment$  will be different and individually estimated. We discuss this alternative model in Section 5 when we describe our PSM tests.

liquid measure of the market view of bank risk. However, a drawback of this straightforward market-based metric is the small sample size.<sup>13</sup>

Our vector of controls includes several bank-level and country-level variables that account for factors that are potentially associated with bank risk. Each of these variables is lagged by one year. Bank-level controls include logged total assets (*Size*), equity-to-assets ratio (*Capital*), return-on-equity ratio (*Profitability*), loan-to-assets ratio (*Loan intensity*), year-over-year growth in lending (*Loan growth*), provisions-to-loans ratio (*Loan loss provisions*), the natural logarithm of the number of employees (*Employees*), the ratio of operating expenses to operating income (*Cost-to-income ratio*). At the macroeconomic level, we account for the country's economic growth (*GDP growth*), the concentration of the banking sector (*Bank concentration*), and the volatility of the financial markets (*Market volatility*). We also control for legal and institutional developments in a country to better identify our main effect: *Legal rights*, *Credit information*, *Insolvency resolution*, and *Significant reform dummy*. Finally, we include several fixed effects. Bank fixed effects absorb any time-invariant bank-level heterogeneity (e.g., Laux and Rauter, 2017; Balakrishnan and Ertan, 2019), and *Basel* fixed effects capture the regulatory reporting regime at the bank-time level (e.g., Basel I, Basel II, Basel II Pillar 3, Basel III). This will also account for concurrent changes in other regulations related to bank supervision. Lastly, year fixed effects control for EU-wide macroeconomic trends. Detailed variable definitions appear in the Appendix.

We cluster our standard errors at the country-year level, given the decision to adopt mandatory auditor reporting requirements are made at the country level (as opposed to the bank level) and to avoid small cluster concerns.<sup>14</sup> However, in sensitivity analysis, we re-estimate our

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<sup>13</sup> Bank risk is a multi-faceted construct that could be explored in various ways, including equity-based measures, systemic-risk proxies (Acharya et al. 2013), or time-varying volatility of loan portfolio risk (Lee et al. 2020). We prioritize our measures due to data limitations with our international sample.

<sup>14</sup> While Gow et al. (2010) and Cameron et al. (2011) have highlighted a role for multi-way clustering, multi-way clustering estimators also suffer from drawbacks (see Conley et al. (2018) for discussion). In particular, the consistency of multi-way clustering relies on stringent conditions that require, at a minimum, that the smallest number of groups along any of the dimensions along which one is clustering is sufficiently large. Therefore, in our

empirical model with alternative clustering structures, such as by bank only, by country only, and various double-clustering (e.g., by bank and year, and by country and year), see Table C3 in the Online Appendix.

#### 4. Data and Sample

We conduct our tests on a dataset of bank financial characteristics merged with the country-specific details of banks' audit regulation. Bank-specific controls and risk measures come from SNL Financial, except for *CDS Spread*, which we obtained from Markit. Our country-level macroeconomic variables are from the World Bank's Global Financial Development Database and Doing Business Surveys (Djankov, 2016). Due to SNL's limited time-series coverage of European data, the sample period begins in 2009 and ends in 2018.

Table 2 presents descriptive statistics for our full sample. In Panel A, we observe that *Mandatory Auditor Reporting* is switched on for 61% of bank-year observations. The average bank has *Counterparty risk* of \$742 million ( $= \exp(13.516) \times 1,000$ ) and *CDS spread* of 163 bps. While the average (median) bank has total assets of \$1.59 billion (\$1.10 billion), the mean *Capital* and *Profitability* ratios are 9.73% and 3.35%, respectively. Loans constitute more than half of total assets for the average bank (*Loan intensity*), while the annual growth rate in lending (*Loan growth*) is almost 5.4%. The average GDP growth is only 0.26% during the sample period, consistent with sluggish growth among EU member states in the 2010s, but with a wide variation (8.4% standard deviation). The mean and median value for *Bank concentration* is 80%; the top five banks in the respective countries constitute a significant majority of the total banking system.

Panel B presents a sample breakdown by country and year. We observe that Germany constitutes a large proportion of our sample. However, we mitigate concerns regarding this sample

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panel where the number of years of data is close to ten, a two-way clustering standard error estimator may not be consistent.

imbalance by (1) removing Germany from our analysis, and (2) undertaking a PSM approach, both of which ensure a more balanced sample (see Section 5.2.1).

## 5. Empirical Results

### 5.1 Main Results: Analysis of Bank Risk

Table 3 presents the results from the estimation of Equation (1). We find a significant reduction in both bank risk proxies for treatment banks following the passage of mandated auditor reporting to bank regulators. Beginning with column (1), the relative decline in *Counterparty risk* of treatment banks is -0.066 and statistically significant. This suggests a 6.4% decline ( $= \exp(-0.066) - 1$ ) in the counterparty risk of banks following the mandated involvement of auditors in bank supervision.<sup>15</sup> Controlling for time trends (year fixed effects) and time-invariant bank-specific features (bank fixed effects) mitigate the concern that macroeconomic trends or time-invariant national or corporate factors drive our results (Christensen et al., 2016). We note that *Size*, *Capital*, and *Loan intensity* are significantly associated with *Counterparty risk*, in keeping with the idea that large and well-capitalized banks, as well as banks with greater relative lending, engage in more risky activities.

The estimates in column (2) shed light on how outside stakeholders (CDS market participants) view the enhanced reporting and communication between bank auditors and regulators, and more specifically, the market's perception of mandatory auditor involvement in the regulatory process. We find that *CDS spreads* for treatment banks fall by about 40 basis points—more than 20%—following the passage of reforms. This finding is economically meaningful, given the sample standard deviation of *CDS spreads* of 155 basis points. Overall, these inferences

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<sup>15</sup> In untabulated results we re-estimate this model with an alternative measure of Counterparty risk, scaled by total equity. We find similarly strong results.

suggest that banks reduce risk following the passage of regulations that require auditor reporting to bank regulators.<sup>16</sup>

## 5.2 Analyses to Mitigate Identification Concerns and Robustness

As with all regulation-based empirical research, our study faces identification challenges. In this subsection, we discuss several such concerns that may cast doubt on our inferences and perform several tests to mitigate them.

### 5.2.1 Selection

The decision to introduce a regulation is susceptible to selection at the country level and may lead to significant differences between our treatment and control groups. To mitigate this concern, we examine a PSM sample of 2,457 bank-years (392 banks). For each regulation, we conduct a propensity score matching in the year before the treatment (only once per regulation). This allows us to find a matched control bank for each treatment bank. After determining these treatment-control pairs, we keep the sample stable over time. We consider banks in countries that enacted legislation before the sample period as part of our control sample. Table 4 reports the results for our PSM analysis. *Treatment* is an indicator variable that switches on only if the bank is from a country that mandates auditor reporting to bank regulators during our sample period 2009–2018, i.e., a subset of the treatment countries from our main empirical regression (Belgium, Croatia, Estonia, Hungary, Luxembourg, Netherlands, Slovenia, Spain, and the UK only, due to their mandates occurring during our sample period). *Post* switches on for years after the treatment, and for control observations, this is the year of their respective matched bank. That is, we define a ‘synthetic’ *Post* variable for control observations.

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<sup>16</sup> In Table C3 of the Online Appendix we re-estimate significance levels for our main results (i.e. those reported in Table 3) using alternative one-way clustering (e.g., by country only, and by bank only), and double-clustering (e.g., by country and year, and by bank and year). We find our inferences hold across all alternatives.



We report descriptive statistics in Panels A and B. The properties of our PSM sample vary slightly compared to our full sample, with the PSM sample of banks being slightly larger, better capitalized, and more profitable. Panel B suggests that our PSM sample is more evenly distributed across countries than the full sample. Panel C reports results from the first-stage estimation, while Panel D reports the differences in variable means between our treatment and matched sample at the year of estimation. That we find no significant differences between our treatment and control banks adds credibility to our matching procedure.

Panel E presents the main estimation results using the PSM sample, including bank and year fixed effects. In column (1), we explore *Counterparty risk* and find statistically similar results to those reported in Table 3 for the full sample. The coefficient of interest, *Mandatory Auditor Reporting*, is -0.085 and significant at the 1% level. Economically, this coefficient suggests an 8.1% decline in the counterparty risk of treatment banks. We also observe a reduction in *CDS Spread* after the adoption of reforms, with the coefficient estimate suggesting a significant decline of 46 basis points. Overall, these results are qualitatively similar to our main findings reported using the full sample.<sup>17</sup>

Further, the PSM analysis allows us to examine our main effects year by year. Figure 1 presents regression coefficients in event-time surrounding the adoption of mandated auditor reporting. It shows that the pre-treatment trend for our main dependent variable (*Counterparty Risk*) is similar across treatment and control banks. This observation adds credibility to our difference-in-difference estimation. The figure also shows a sustained decline post-regulation, suggesting that the risk effects of auditor reporting do not disappear in the medium term.<sup>18</sup>

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<sup>17</sup> In untabulated tests, we limit our control sample to only banks in countries that are never treated. Our inferences remain unchanged; we continue to find a statistically significant decline in bank risk. In addition, we rerun our analysis within treatment countries only, i.e. we use only treated countries and use a staggered design that exploits the different timing in increased auditor-bank regulator interactions. We find our inferences are unchanged.

<sup>18</sup> Figure 1 is based on our PSM sample. However, we also conduct analysis to account for pre-regulation trends in our main sample (i.e. results reported in Table 3) by accounting for *pre-mandate*  $\times$  *treatment*. We verify that the

### 5.2.2 Other concurrent regulations

Another identification concern common in regulation-based empirical research is that the regulation of interest may be part of a larger package of concurrent regulations. To understand the extent of this concern, we adopt a systematic approach to review specific regulations for our treatment countries, and search for other circulars, directives, or regulations both nationally and from the ECB. First, we reviewed the specific reforms cited by regulators and performed a keyword search for all mentions of “Auditor,” “Supervisor,” “Regulator,” “Assurance,” and “Bank” to ensure we reviewed all requirements relating to the auditor. We found no systematic trends of any similar auditor-related bank reforms enacted around the same time as our treatment.<sup>19</sup> Second, we searched the websites of the national regulators for our treatment countries to find information (e.g., Annual Reviews/Reports) on any concurrent banking reforms enacted in or around our treatment years. We focused our review on regulations pertaining to bank auditors and liquidity and capital requirements, and found no instances of other auditor-related reforms during our treatment years. Third, we reviewed the Basel Committee on Banking Supervision (BCBS) periodic global progress reports on the adoption of the Basel regulatory framework.<sup>20</sup> Focusing on the adoption status of relevant regulations (e.g., regulatory capital, liquidity, and disclosures on RWAs and capital composition), we noted no significant changes within treatment countries during the same year as our auditor reforms.<sup>21</sup>

Furthermore, we address this concern empirically in several ways. First, all specifications include a set of indicator variables that capture a given bank’s Basel reporting regime (i.e., Basel

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parallel trends assumption holds, i.e., the coefficient on *Pre-mandate* is indistinguishable from zero, while our inferences remain unchanged.

<sup>19</sup> This is not to say that EU countries did not enact bank specific regulations during this time. For example, in Belgium, the Banking Act on the status and supervision of credit institutions (25 April 2014) transposed several EU directives into national law. However, requirements for enhanced auditor reporting were adopted two years prior, in 2012.

<sup>20</sup> For example, see “Sixteenth progress report on adoption of the Basel regulatory framework” at: <https://www.bis.org/bcbs/publ/d464.pdf>.

<sup>21</sup> Specifically, we searched for instances where Basel reforms were implemented (i.e. final rule in force) or the adoption has moved from in process to completed during the treatment years for our treatment countries.

I, Basel II, Basel II Pillar 3, Basel III) over time. This accounts for the staggered implementation of Basel reforms across different countries and individual banks' voluntary adoption of these rules. Second, we control for country-level indices that track concurrent changes in regulatory stringency, credit reforms, and country-specific economic trends. As can be seen in our main specifications presented in Tables 3 and 4, we include these four additional country-year variables: *Legal rights* is an index made up of 10 aspects related to the legal rights in collateral law and two aspects related to bankruptcy law; *Credit information* is an index that measures rules and practices affecting the coverage, scope, and accessibility of credit information available in a given country; *Insolvency resolution* is an index based on the commencement of proceedings, management of debtor's assets, reorganization proceedings, and creditor participation; and *Significant reform dummy* is an indicator variable that equals 1 for country-years with an increase in *Credit information*, *Insolvency resolution*, or *Legal rights*. We find that our estimates remain significant after the inclusion of these variables.

Finally, we exploit the UK setting, which allows us to mitigate country-level time-varying confounds, where rules regarding the extent of auditor reporting to bank regulators are based on bank-size thresholds.<sup>22</sup> Auditors of UK banks are required to provide additional reporting to the national regulator if their client banks have at least £50 billion in assets. This yields a natural treatment group (banks with total assets greater than £50 billion) and a control group (banks with total assets less than £50 billion). We exploit the UK setting to provide within-country evidence.<sup>23</sup>

Our variable of interest, *Mandatory Auditor Reporting*, is equivalent to a traditional difference-in-difference estimator, i.e.,  $Post_t \times UK\ Treatment_i$ . In this model, *Post* switches on after 2016, which is the year of adoption within the UK. *UK Treatment* is defined at the bank level,

<sup>22</sup> The main and PSM analyses do not include UK banks for which mandatory auditor reporting was not implemented. We made this choice to ensure that *Treatment* and *Mandatory Auditor Reporting* remains invariant within each country. Including these banks to the main analysis does not affect our inferences.

<sup>23</sup> As an additional within country test, in an untabulated analysis, we find that the main effect holds for private banks. This inference mitigates the concern that some concurrent changes to securities regulation is driving the finding.

rather than the country level, switched on for banks above the size-threshold for the requirements. The control variables and fixed-effect structure mirror those in our main analysis. Due to the inclusion of bank and year fixed effects, both *Treatment* and *Post* main effects are omitted from the final estimation, thus for ease of interpretation we re-label this interaction term *Mandatory Auditor Reporting*. Since we rely on a single-country setting, we cluster standard errors by bank.

Panel A of Table 5 presents the descriptive statistics for the UK sample, which suggests that the UK banks are fairly similar to the PSM sample in terms of several key variables like *Counterparty risk*, *Size*, *Capital*, and *Basel*. Panel B of Table 5 presents the estimation results. We find an economically and statistically significant reduction in both of our risk proxies: *Counterparty risk* (column 1), *CDS spread* (column 2). Overall, these findings corroborate our main results in a within-country setting.

### 5.2.3 Other identification and robustness tests

We carry out three sets of additional analyses and robustness tests. First, we partition our sample based on bank size. We expect our results to be more pronounced among banks for which regulators are at a plausible information disadvantage and among those with significant negative externalities. Although large banks inflict significant negative externalities in the event of a failure, these entities also receive more scrutiny (e.g., in some cases, regulators are physically located in the largest banks to obtain information directly). Thus, we expect our results to be weaker for this group. Similarly, while regulators are at an information disadvantage concerning small banks, their externality effect is much smaller, and they are less complex. Typically, small bank failures are swiftly handled. Overall, we expect to find our results to be pronounced for medium-sized banks. In keeping with this idea, the results in Panel A of Table 6 suggest that counterparty risk declines more for medium-sized banks, while *CDS Spreads* decline for both medium and large banks. Thus, auditors play a more significant role when the information asymmetry between regulators and banks is high. To further corroborate these findings, we partition our sample into “systemically

important financial institutions” (“SIFI”) designated banks and non-SIFI banks. In untabulated tests, we find markedly stronger results among non-SIFI banks.<sup>24</sup>

Second, we re-estimate our main results (reported in Table 3 and Table 4) after including three additional country-year control variables that capture the health, performance, and capitalization of the banking sector. We report our full sample results in columns (1) and (2) and PSM results in columns (3) and (4) of Panel B, Table 6. While we note a slight reduction in sample size due to data availability, our inferences are unchanged; we find consistent and similar results in the presence of these additional country-specific control variables.

Finally, to assess whether particular countries drive our main results, we re-estimate equation (1) for *Counterparty risk* on subsamples that omit each of our nine treatment countries individually. We limit our sensitivity analysis to main risk metric (*Counterparty risk*), given the limited sample size available for *CDS Spread*. Panel C of Table 6 reports results. Across each specification, the coefficient on our variable of interest (*Mandatory Auditor Reporting*) is negative and significant, ranging from -0.052 to -0.084, consistent with our main results reported in Table 3. Overall, these findings provide comfort that our main results are not isolated to any one country.

### 5.3. Main Results: Evidence on the Role of Auditors

In this section, we provide additional evidence corroborating our main findings that mandatory auditor reporting reduces bank risk. In particular, we examine two metrics related to bank risk where the auditors’ role is more identifiable as they may have better information and insights than regulators. First, we examine whether mandatory auditor reporting to bank regulators improves the timeliness of loan-loss provisions, which would be consistent with improvements in audit effort and quality. We measure *Loan loss provisions* as the current year’s loan loss

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<sup>24</sup> These results also mitigate the concern that our findings may be due to the on-going SSM requirements in treatment countries, however these efforts are isolated to the largest banks within each country, i.e., those deemed “significant” in terms of size or cross-border activities. The fact that we find our results to be strongest among medium-sized banks (not the largest banks), and among non-SIFI designated banks, casts doubt on the SSM as an alternative explanation.

provisions, scaled by total loans and presented in percentage points. In the spirit of Bushman and Williams (2012), we estimate a variant of equation (1) with *Loan loss provisions* as the dependent variable and include the change in current NPLs ( $\Delta NPL_t$ ), future NPLs ( $\Delta NPL_{t+1}$ ), and interaction terms with our *Mandatory Auditor Reporting*. Conceptually, future NPLs in this specification captures the extent to which current provisions anticipate future deteriorations in the performance of a banks' loan portfolio (Bushman and Williams, 2012). We report the regression results in Table 7, Panel A. Specifically, we find the interaction term *Mandatory Auditor Reporting*  $\times$   $\Delta NPL_{t+1}$  is negative and significant, before and after controlling for lagged *Loan loss provisions* (columns 1 and 2).<sup>25</sup> Consistent with the main message of our paper, this finding suggests that the predictive ability of provisions for future NPLs rises following enhanced auditor reporting to regulators.

Second, we examine banks' self-reported measure of the amount of loans that have not yet been impaired but require close monitoring (*Problem loans*). We estimate the effect of mandated auditor reporting on this metric over the short term (t+1 and t+2) and long term (from t+3 onward). Given the need for well-defined windows following the mandate, we perform this analysis using our PSM sample. We report results in Panel B of Table 7. Consistent with increased auditor effort and scrutiny alleviating the underreporting of problem loans, we find that the amount of problem loans increases in the initial two years immediately following the adoption of mandatory reporting requirements (column 2) and subsequently declines (column 3). Given that assessment of loan loss provisions and problem loans are subjective and involve significant audit effort, we interpret these findings as evidence that improved audit outputs enhance the monitoring of bank risk.

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<sup>25</sup> We caveat that the coefficient on the future changes in NPLs is potentially biased as the future changes in NPLs are likely endogenous. In (untabulated) alternative specifications we regress future changes in NPLs on *Mandatory Auditor Reporting* and *LLP* and their interaction. We find a positive and significant coefficient on the interaction term (*Mandatory Auditor Reporting*  $\times$  *LLP*), consistent with our inference that the timeliness of loan loss provisioning improves following the mandated auditor reporting.

#### *5.4. Mandatory Auditor Reporting and Reductions in Bank Risk: Channels*

This section provides evidence on the channels through which mandatory auditor reporting reduces bank risk. We provide empirical tests of our three main channels: (i) regulation-based monitoring, (ii) supervision and review process, and (iii) market discipline.

##### *5.4.1 Regulation-based monitoring*

To shed light on whether mandatory auditor reporting influences banks' risk through better regulatory enforcement, we focus on RWAs, which are critical inputs for assessing capital adequacy, a key regulatory requirement. Capital regulations are a primary pillar of prudential regulation, as put forth in the Basel Accord. Most countries have minimum capital requirements for the establishment of new banks, and capital adequacy tests are typically a core component of bank regulation and monitoring. Capital adequacy, assessed by comparing a bank's assets with its capital resources, is designed to reflect the relative riskiness of the various categories of assets or off-balance-sheet items, such as RWAs. Currently, RWAs are beyond the scope of financial statement audits. When regulators mandate assurance on this measure, it is likely that auditors are placing additional scrutiny on the review on the assignment of assets to certain risk categories and the associated risk-weights. This may result in auditors uncovering new hidden dimensions of risk that can change the overall risk assessment by the regulator and may trigger changes in the risk management of banks, i.e., a reduction in risky lending. Moreover, improved regulation and monitoring of these buffers should make the measurement of RWAs more accurate. We predict that if mandatory auditor reporting impacts bank risk through more effective regulatory enforcement then we should observe a change in RWAs.

Ex ante, the directional effect of mandated auditor reporting to bank regulators on RWAs is unclear. On the one hand, this mandate may curtail the underreporting of RWAs by banks, which would increase RWAs. In contrast, we may observe a reduction in RWAs if they fix overestimation errors or if they trigger improvements in lending quality.

The dependent variable is *Risk-weighted assets*, which is measured as the percentage ratio of total RWAs to total assets. Table 8, column (1) details our main specification, while column (2) also includes a term to account for pre-regulation trends. In columns (3) and (4), we further incorporate the change in NPLs to control for the quality of the loan portfolio. Thus, in columns (3) and (4), we interpret the coefficient on *Mandatory Auditor Reporting* as the accuracy in the estimation of risk-weights. RWAs decline by about 2.3 percentage points following the adoption of reforms increasing auditor involvement in bank supervision. These figures are meaningful, given the sample standard deviation of *Risk-weighted assets* of 16.3 percentage points. We interpret this evidence as consistent with the assurance of RWAs as part of the mandatory auditor reporting requirements reducing bank risk.<sup>26</sup>

#### 5.4.2 Market discipline

Next, we examine the market discipline channel. Regulators' closer relationship with auditors and mandated reporting channels may also increase the quality of audit output and result in a better information environment, improving market discipline. To shed light on this channel, we examine *Information imprecision*, which we measure as the ratio of short-term CDS spreads to long-term CDS spreads (Duffie and Lando, 2001; Arora et al., 2014). This computation helps us isolate the magnitude of information imprecision for a given level of credit risk because both the short-term and long-term spreads have the same level of credit risk. Table 9 reports the regression results. We estimate equation (1) with *Information imprecision* as our dependent variable, and find a significant reduction, even when controlling for pre-regulation trends—in column (2), the coefficient on *Mandatory Auditor Reporting* is -0.075 and significant (relative to a sample standard

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<sup>26</sup> In untabulated analysis, we re-estimate our main results in Table 3 on a sample that consists only of treatment countries and redefine the treatment variable, *Mandatory Auditor Reporting*, to switch on for banks whose auditors are required to give ratio assurance. We continue to find a significant decline in *Counterparty risk*, which we view as further evidence that ratio assurance requirements reduce risk. However, we acknowledge that we cannot isolate the independent effects of ratio assurance almost all treatment countries also have an additional reporting requirement.



deviation of 0.307). These findings suggest that auditor reporting to regulators disciplines overall bank risk, and conditional on the level of risk-taking, enables debt-market investors to better assess banks' risk profiles.

#### *5.4.3 Supervision and review process*

Our third channel relates to the supervision and review process, wherein regulators can benefit from discussions with auditors in planning and executing the bank reviews. It is a challenge to ascertain the effect of these mandates on the efforts of bank regulators because the transfer of soft information in communications between auditors and regulators is unobservable and because an all-encompassing measure of regulators' supervisory and monitoring effort is hard to obtain. We aim to provide suggestive evidence on this channel by performing three tests. First, we collect information on the annual number of on-site examinations regulators conduct—for all sample countries except for Cyprus, Greece, Ireland, Netherlands, and Sweden, which did not share the pertinent data. Table 10, Panel A reports the results from our country-level regressions of on-site examinations. We find that mandated auditor reporting to bank regulators lowers the number of on-site inspections. This evidence suggests that information obtained from the auditor may enable resource-constrained regulators to better tailor their bank assessments and reduce their on-site examination. This finding is also consistent with our survey responses. Some national regulators stated that increased auditor reporting allowed them to perform more off-site supervision and to design their on-site examinations more efficiently.

Second, we examine whether the risk reductions we observe are more pronounced in jurisdictions that also require mandatory meetings between auditors and bank regulators. We partition our treatment banks into two sub-samples: those where the regulator requires annual

auditor-regulator meetings, and those that don't, based on our survey responses (see Table 1).<sup>27</sup> We then re-estimate our main specification within each sub-sample and report our results in Panel B of Table 10. Given the partition relates only to treatment firms, it is not immediately clear which banks to include as controls; therefore, we undertake two approaches. First, in columns (1) and (2) we present results where all non-treatment banks are included as controls for both sub-samples (each sub-sample includes the same control banks). Second, in columns (3) and (4) we report results based on our PSM sample, in which each treatment bank is paired with a designated control bank. We find that the observed reduction in risk associated with mandatory auditor reporting is significantly stronger for banks in countries that also mandate meetings.

Third, we investigate whether auditor reporting to regulators reduces bank risk more when regulators are resource-constrained. This test is predicated on the notion that resource-constrained regulators are likely to rely more heavily on auditors for soft information and cues on when to intervene. We follow the empirical design we adopt for meetings above and estimate our model within sub-samples of resource-constrained and non-resource-constrained banks. We define resource-constrained regulator when the bank regulators' employee per regulated bank is below-median. We report results in Panel C. In columns (1) and (2) we report results for the full sample, and in columns (3) and (4) we report results for the PSM sample. We find that the observed reduction in bank risk (*Counterparty risk*) attributable to mandatory auditor reporting is significantly stronger for banks whose regulators are resource-constrained. This observation is in line with mandatory auditor reporting benefiting resource-constrained regulators more, which can be interpreted as auditors playing a role in the supervision and monitoring of banks.

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<sup>27</sup> We note that some countries require meetings during on-site examinations. The following treatment countries require annual auditor-regulator meetings or site exams: Austria, Croatia, Estonia, Germany, Hungary, Slovenia, Spain, and the UK.

### 5.5 Bank Lending and Profitability

Supervision relies on judgment, and regulators could be excessively conservative in their assessments of bank risks. There is an inherent tradeoff between achieving stability and growth. Consequently, while a decrease in bank risk may be a positive development from regulators' perspective, such reductions could engender economic costs. For example, the reduction in risk may be driven by lower lending activity and a shift towards safer lending, which may hamper bank profitability. That is, excessive regulatory actions and scrutiny based on increased information from auditors could slow down bank operations—in terms of both profitability and lending (i.e., risk-taking). Although still inconclusive, prior work provides some evidence that bank regulation can reduce bank efficiency (e.g., Barth et al., 2013). Regulatory concerns about risk management could force banks to make investments in technology and data infrastructure with significant upfront costs, depressing near-term profits. The empirical literature also suggests that regulatory stringency is associated with slower loan growth (e.g., Peek and Rosengren, 1995).

Accordingly, we assess the impact of mandated auditor regulations on lending and profitability. First, we re-estimate equation (1) for three measures that capture a shift in asset composition towards safer lending: *Loan type*, measured as the ratio of residential mortgage loans to total loans, *loan maturity* measured as the ratio of loans with less than one-year maturity to total loans, and *future NPLs* measured as the ratio of one-year ahead loans to total loans.<sup>28</sup> We report results in Panel A of Table 11. We find a positive and significant shift towards safer lending and a reduction in future NPLs.

Next, we examine lending growth, *Loan growth* (the annual percentage change in loans) and *Profitability* (the percentage return on equity). We examine these metrics over one, two and three years following the mandate. Table 11 Panels B and C report the regression results for *Loan*

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<sup>28</sup> Collateralized and standardized forms of credit are typically viewed as less risky for banks (e.g., Chakraborty et al., 2020)

*growth* and *Profitability*, respectively. We find a significant reduction in lending of approximately 3.2–4.6 percentage points (Panel B) and a decline in profitability of about one percentage point (Panel C). Taken together, the results in Table 11 suggested that the documented main result of a reduction in bank risk is driven, at least in part, by changes in lending, coupled with a decline in future profitability. These findings indicate that the reduction in bank risk comes at a cost to shareholder value.

Finally, to shed more light on this issue, we examine a direct cost. Given the mandatory requirements to report to bank regulators, audit firms will likely have to expend additional resources and effort. This raises the question of who bears the additional cost burden. To shed light on this issue, we examine the audit fees for banks after the commencement of regulator-auditor collaboration. Specifically, we re-estimate a modification of Equation (1) with audit fees as the dependent variable. We use the natural log of audit fees to proxy for the audit effort, given that prior studies have found fees and audit hours are highly correlated (e.g., Aobdia, 2019).

Table 12 presents the results of this analysis. Panel A lists our variable definitions for this analysis as we use FactSet data exclusively for this analysis due to its considerably more extensive coverage of audit fees than SNL. Panel B reports our results; column (1) omits macro-level controls, and column (2) includes our macro-level controls. Subject to data availability, we base our empirical model based on those used in prior audit fee literature. The coefficient for the diff-in-diff estimator (in column (2)) suggests a rise in audit fees—the estimate of 0.259 corresponds to an approximate increase in audit fees of 29%, which is an economically meaningful increase in these costs. Our findings suggest that banks bear (at least some of) the cost of mandated auditor reporting. We note also that this finding provides some validation for our main inferences, in that it is consistent with auditors expending additional effort in light of these mandates.

## 6. Conclusion

Regulators are resource-constrained and use imperfect information to monitor banks and proactively intervene to prevent bank failures. This study focuses on the role of bank auditors in the supervision of banks. In particular, we examine the economic consequences of mandatory reporting of auditors to bank regulators for bank risk and bank health. By using survey inputs from national regulators and legislative documents, we construct a novel dataset of the adoption of laws mandating auditor reporting to bank regulators across all 28 EU countries during the 2009–2018 period. We find evidence that bank risk—as measured by counterparty risk and CDS Spreads—declines after this mandate. In addition, we also observe a decline in problem loans, risk-weighted assets and improvements in timeliness of loan loss provisions, which are areas in which auditor inputs may be more useful for bank regulators.

We provide evidence on three channels through which auditor reporting to regulators reduces bank risk. First, we find a decline in risk-weighted assets, which we interpret as evidence for improved regulation-based supervision. Second, in keeping with enhanced market discipline, we observe an improvement in the information environment—measured by the term structure of credit spreads. Third, we also find evidence consistent with improvements to the regulatory review process. In addition to our investigation of the underlying mechanisms, we also study the costs these risk reductions could entail. We find that following mandated auditor reporting to bank regulators, banks shift towards safer lending and exhibit reduced loan growth and profitability. Therefore, although we find a decrease in individual bank risk, it remains unclear whether this decline is desirable for banks' shareholders or the overall stability of the banking system.

We leave several questions for future research. Our risk measures come mainly from regulatory and financial disclosures. Since many of these mandates were adopted recently, a full examination of their long-term impact on banks' performance volatility (e.g., Hodder et al., 2006), on credit ratings (Barth et al., 2012), on bank failures, and on systemic risk appears to be a logical

next step (Leuz and Wysocki, 2016). Moreover, researchers could examine institutional features that mediate the choice and extent of auditor involvement in bank supervision as well as the consequences of that involvement.

### Appendix A. Variable Definitions

Variable Name	Definition	Source and field code
<i>Mandatory Auditor Reporting</i>	Indicator that switches on for banks in countries that have implemented auditor-regulator reforms.	Survey (Table 1)
<i>Bank concentration</i>	Assets of five largest banks as a share of total commercial banking assets (%).	World Bank: GFDD.OI.06
<i>Basel</i>	Set of indicator variables that capture a bank's Basel reporting regime (e.g. Basel I, Basel II, Basel II pillar 3, Basel III). We also include an indicator to capture non-Basel reporters.	SNL: #225203
<i>Capital</i>	The ratio of equity to assets (%).	SNL: #131939 and #132264
<i>Cost-to-income ratio</i>	Operating expenses divided by operating income (%).	SNL: #226949
<i>Counterparty risk</i>	Natural logarithm of the risk of financial loss if a customer or counterparty fails to meet an obligation. †	SNL: #225242
<i>CDS spread</i>	Index that measures rules and practices affecting the coverage, scope and accessibility of credit information available in the country.	Doing Business: Depthofcreditinformation
<i>Credit risk</i>	Five-year average annual CDS spread (%).	Markit: spread5y
<i>Employees</i>	The number of full-time-equivalent employees working for the company and its subsidiaries.	SNL: #134875
<i>GDP growth</i>	Year-over-year growth in gross domestic product (%).	World Bank: NY.GDP.MKTP.CD
<i>Information risk</i>	The ratio of the one-year CDS spread to the five-year CDS spread.	Markit: spread1y and spread5y
<i>Insolvency resolution</i>	Index based on commencement of proceedings, management of debtor's assets, reorganization proceedings, and creditor participation.	Doing Business: ResolvingInsolvencyDTF
<i>Legal rights</i>	Index that includes 10 aspects related to legal rights in collateral law and 2 aspects in bankruptcy law.	Doing Business: Strengthoflegalrightsindex
<i>Loan growth</i>	Year-over-year growth in loans (%).	SNL: #131923
<i>Loan intensity</i>	The ratio of loans to assets (%).	SNL: #132264 and #131923
<i>Loan loss provisions</i>	Loan loss provisions divided by total loans (%).	SNL: #131958 and #132264
<i>Market volatility</i>	Stock price volatility is the average of the 360-day volatility of the national stock market index.	World Bank: GFDD.SM.01
<i>NPL</i>	The ratio of nonperforming loans to total loans (%).	SNL: #243681 and #131923
<i>Post</i>	Indicator that switches on only if the observation is after the implementation of the audit-regulator reform.	Survey (Table 1)
<i>Problem loans</i>	Loans and leases that have not yet been impaired but warrant close monitoring (including substandard and watchlist) divided by total loans (%).	SNL: #265323 and #132264

<i>Profitability</i>	Return on equity (%).	SNL: #132006
<i>Risk-weighted assets</i>	The ratio of total risk-weighted assets to total assets (%).	SNL: #248884 and #132264
<i>Safe lending (future NPLs)</i>	The ratio of year-ahead nonperforming loans to total loans (%).	SNL: #243681 and #132264
<i>Safe lending (loan maturity)</i>	The ratio of loans with less than one-year maturity to total loans (%).	SNL: #243760 and #132264
<i>Safe lending (loan type)</i>	The ratio of residential mortgage loans to total loans (%).	SNL: #225061 and #132264
<i>Significant reform dummy</i>	Equals one for country-years with an increase in <i>Credit information</i> , <i>Insolvency resolution</i> , or <i>Legal rights</i> .	Doing Business
<i>Size</i>	Natural log of total assets.	SNL: #132264
<i>Treatment</i>	Indicator that switches on only for countries that implement audit-regulator reforms in the sample period.	Survey (Table 1)

† SNL collects this information from Pillar III disclosures. This amount is the charge that banks calculate for all exposures that give rise to counterparty credit risk, including over-the-counter derivatives, exchange-traded derivatives, long settlement transactions, and securities financing transactions.

The Basel Committee's official definition is as follows: Counterparty credit risk (CCR) is the risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows. An economic loss would occur if the transactions or portfolio of transactions with the counterparty has a positive economic value at the time of default. Unlike a firm's exposure to credit risk through a loan, where the exposure to credit risk is unilateral and only the lending bank faces the risk of loss, CCR creates a bilateral risk of loss: the market value of the transaction can be positive or negative to either counterparty to the transaction. The market value is uncertain and can vary over time with the movement of underlying market factors.

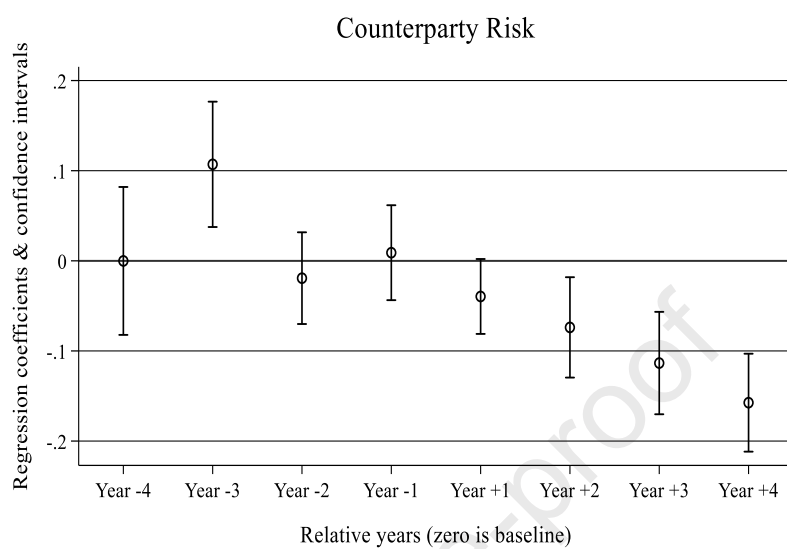


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**Figure 1: Coefficients in event time**

**Figure 1:** This figure shows the annual coefficients for our *Counterparty Risk* measure, and associated confidence intervals, in event time for our main variable of interest '*Mandatory Auditor Reporting*' in the eight years surrounding the mandate.

**Table 1. Results from the Survey on Mandatory Auditor Reporting to Bank Regulators**

Country	Additional reporting	Ratio assurance	Meetings	Verified regulatory source (re. additional reporting mandate)
Austria	1994	1994	Annual <sup>1</sup>	Federal Banking Act (Bankwesengesetz - BWG)
Belgium	2012	2014	Annual <sup>2</sup>	Circular 9th June 2017 / Annual Report 2014
Bulgaria	No	No	Ad-hoc	
Croatia	2014	2014	Annual <sup>1</sup>	Credit Institutions Act - Article 172 and 174
Cyprus	No	No	Annual <sup>1</sup>	
Czech Rep.	No	No	Annual <sup>1</sup>	
Denmark	No	No	Annual <sup>3</sup>	
Estonia	2014	2014	Annual <sup>1</sup>	Credit Institutions Act (1999) - Article 93
Finland	No	No	Annual <sup>3</sup>	
France	No	No	Site Exams <sup>4</sup>	
Germany	1998	1998	Annual <sup>1</sup>	Banking Act (Kreditwesengesetz, KWG) of 1998 - Section 29
Greece	No	No	Annual <sup>1</sup>	
Hungary	2014	2014	Site Exams <sup>5</sup>	Act CCXXXVII of 2013 on Credit Institutions and Financial Enterprises – S.263
Ireland	No	No	Annual <sup>1</sup>	
Italy	No	No	No <sup>6</sup>	
Latvia	No	No	Annual <sup>1</sup>	
Lithuania	No	2004	Semi-annual	
Luxembourg	2013	No	Annual <sup>3</sup>	CSSF Circular 01/27
Malta	No	No	Ad-hoc	
Netherlands	No	2014	Varying <sup>7</sup>	
Poland	No	No	Site Exams <sup>8</sup>	
Portugal	2008	No	Annual <sup>1</sup>	"Banking Law (1992)" - amendments to Article 120 and 121
Romania	No	No	Annual/Quarterly	
Slovakia	2001	No	No <sup>6</sup>	Act No. 483/2001 ("Act on Banks") - Article 40
Slovenia	2015	No	Annual <sup>1</sup>	Banking Act (Zban-2 amendment)
Spain	2011	2011	Annual <sup>1</sup>	Eighth Additional Provision of the Royal Decree 1517/2011 of 31 October 2011
Sweden	No	No	Annual <sup>1</sup>	
UK	2016	No	Annual/Semi-annual	Supervisory Statement SS1/16 (Jan 2016)

**Notes:**

<sup>1</sup> Annual meeting held (at the minimum), with ad-hoc meetings on a case by case basis, i.e., for special issues that arise

<sup>2</sup> At least twice a year for systemically important institutions, at least once a year for all other banks.

<sup>3</sup> For large/systemically important banks meeting with auditors are required at least annually. Ad-hoc meetings for other banks

<sup>4</sup> As part of site examinations, there is contact with the auditors. In addition, as part of alert mechanisms, auditors can ask for meetings.

<sup>5</sup> In the case of Hungary, the meetings occur as part of comprehensive onsite examinations.

<sup>6</sup> No formal rule specifying the frequency of meetings. In the case of Italy, the Bank of Italy organizes (twice a year) meetings with the association of audit firms to discuss general issues related to the banking industry. In Slovakia, it is on an ad-hoc basis when issues arise.

<sup>7</sup> In the case of the Netherlands, regulators meet with bank auditors several times a year for large banks, and once every two/three years for small banks. Meetings with industry groups are scheduled 3 times a year. Audit firms are once a year.

<sup>8</sup> In the case of Poland, the PFSA will meet with the bank's board and auditor. Bilateral meetings between PFSA and auditor are held when necessary.

**Table 2. Descriptive Statistics**

This table presents the sample statistics for the main estimation samples. Each observation is a bank-year, except for *Number of on-site examinations*, which we observe at the country-year level. Panel A presents the sample statistics, Panel B presents a breakdown of the sample by country and year. Variable definitions appear in the Appendix. All bank-level control variables are winsorized at the 1% and 99%.

**Panel A. Summary statistics**

	Mean	stdev	p10	p50	p90	N
<i>Mandatory Auditor Reporting</i>	0.610	0.488	0.000	1.000	1.000	16,927
<i>Counterparty risk</i>	13.516	2.134	11.051	13.221	16.529	16,927
<i>CDS Spread</i>	1.628	1.550	0.514	1.176	3.278	600
<i>Size</i>	21.187	2.211	18.672	20.818	24.332	16,927
<i>Capital</i>	9.731	5.767	5.142	8.685	14.453	16,927
<i>Profitability</i>	3.355	8.326	0.161	3.165	10.033	16,927
<i>Loan intensity</i>	58.057	18.591	33.758	60.553	78.960	16,927
<i>Loan growth</i>	5.374	18.373	-5.598	3.308	14.599	16,927
<i>Loan loss provisions</i>	0.586	1.609	-0.390	0.270	1.946	16,927
<i>Employees</i>	5.290	1.879	3.135	5.069	7.857	16,927
<i>Cost-to-income ratio</i>	67.048	17.633	47.933	67.277	83.168	16,927
<i>GDP growth</i>	0.258	8.424	-12.821	2.632	9.524	16,927
<i>Bank concentration</i>	80.205	8.847	71.025	80.860	91.823	16,927
<i>Market volatility</i>	21.541	5.745	14.440	20.493	27.659	16,927
<i>Legal rights</i>	5.730	1.926	2.500	6.000	7.500	16,927
<i>Credit information</i>	6.091	1.438	4.500	6.000	8.000	16,927
<i>Insolvency resolution</i>	80.570	14.030	62.440	84.780	91.930	16,927
<i>Significant reform dummy</i>	0.799	0.401	0.000	1.000	1.000	16,927
<i>Risk-weighted assets</i>	54.287	16.301	32.289	55.531	73.722	16,679
<i>Information risk</i>	0.545	0.307	0.208	0.491	0.929	542
<i>Loan growth t+1</i>	4.957	14.527	-5.181	3.652	14.579	13,905
<i>Profitability t+1</i>	3.364	6.284	0.278	2.865	9.260	13,905
<i>Loan growth t+2</i>	5.159	14.600	-4.949	3.846	15.062	11,032
<i>Profitability t+2</i>	3.382	6.178	0.310	2.810	9.298	11,032
<i>Loan growth t+3</i>	5.391	15.190	-4.737	4.093	15.587	8,402
<i>Profitability t+3</i>	3.435	5.932	0.302	2.774	9.249	8,402
<i>Safe lending (loan type)</i>	49.438	25.168	14.576	49.153	83.813	1,979
<i>Safe lending (loan maturity)</i>	19.425	15.316	8.282	12.497	39.373	9,590
<i>Safe lending (loan future NPLs)</i>	6.497	8.030	0.635	3.202	18.832	9,590
<i>Number of on-site examinations*</i>	3.388	1.321	1.609	3.434	5.255	171

\* Unit of observation is a country-year.

**Panel B.** Sample distribution by country and year

<b>By country</b>				<b>By year</b>	
Austria	612	Ireland	109	2009	312
Belgium	112	Italy	2,998	2010	335
Bulgaria	129	Latvia	73	2011	339
Croatia	186	Lithuania	37	2012	2,099
Cyprus	50	Luxembourg	194	2013	2,485
Czech Republic	153	Malta	60	2014	2,621
Denmark	539	Netherlands	188	2015	2,649
Estonia	62	Poland	207	2016	2,526
Finland	505	Portugal	404	2017	2,446
France	540	Slovakia	60	2018	1,115
Germany	8,404	Slovenia	117	<b>Total</b>	<b>16,927</b>
Greece	110	Spain	343		
Hungary	102	Sweden	518		
Ireland	109	United Kingdom	115		



**Table 3. Mandatory Auditor Reporting and Bank Risk: Main Results**

This table presents the results from bank-year-level regressions for our main dependent variables: *Counterparty risk* and *CDS Spread*. We measure *Counterparty risk* as the natural logarithm of the counterparty risk obtained by SNL from regulatory disclosures. This metric is the charge that banks calculate for all exposures that give rise to counterparty risk, including risks associated with the credit portfolio, over-the-counter derivatives, exchange-traded derivatives, long settlement transactions, and securities financing transactions. *CDS Spread* is the five-year annual CDS spread (%) at year-end. *Mandatory Auditor Reporting* takes the value of 1 for bank-years that are in countries that passed additional reporting requirements (e.g., LFAR) or Ratio Assurance requirement (see Table 1), following the year of the reform (Austria 1994, Belgium 2012, Croatia 2014, Estonia 2014, Germany 1998, Hungary 2014, Luxembourg 2013, Netherlands 2014, Portugal 2008, Slovakia 2001, Slovenia 2015, Spain 2011, and the UK 2016). This variable is set to zero for banks from these countries prior to the reform as well as for banks in non-reform countries throughout the sample period. Variables definitions are in the Appendix. *T*-statistics presented in parentheses are computed using standard errors clustered within country-year and robust to heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
	<i>Counterparty risk</i>	<i>CDS Spread</i>
<i>Mandatory Auditor Reporting</i>	-0.066*** (-2.93)	-0.400* (-1.68)
<i>Size</i>	0.639*** (10.18)	-0.191 (-0.42)
<i>Capital</i>	0.010*** (3.93)	-0.086** (-2.50)
<i>Profitability</i>	0.000 (0.81)	-0.030*** (-3.30)
<i>Loan intensity</i>	0.010*** (9.06)	0.015 (1.20)
<i>Loan growth</i>	0.000 (0.86)	0.001 (0.18)
<i>Loan loss provisions</i>	-0.001 (-0.50)	0.036 (0.44)
<i>Employees</i>	0.076*** (2.61)	-0.420 (-1.42)
<i>Cost-to-income ratio</i>	-0.000 (-1.18)	-0.007** (-1.99)
<i>GDP growth</i>	-0.002* (-1.73)	-0.022 (-1.43)
<i>Bank concentration</i>	-0.002 (-1.26)	-0.040* (-1.91)
<i>Market volatility</i>	-0.000 (-0.02)	0.078** (2.15)



**Table 3—continued**

<i>Legal rights</i>	0.039*** (3.88)	-0.134 (-0.82)
<i>Credit information</i>	-0.015 (-1.07)	-0.021 (-0.08)
<i>Insolvency resolution</i>	0.000 (0.27)	-0.005 (-0.62)
<i>Significant reform dummy</i>	0.012 (1.36)	-0.037 (-0.23)
Observations	16,927	600
Within R-squared	35.8%	20.4%
Bank, Basel, and Year FE	Yes	Yes

**Table 4. Mandatory Auditor Reporting and Bank Risk: PSM Sample**

This table presents the results from bank-year-level regressions for the propensity-score-matched (PSM) sample, where *Treatment* is an indicator variable that switches on only if the bank is from a country that mandates auditor reporting to bank regulators during the sample period (see Table 1). *Post* switches on for years after the treatment; for control observations, this is the year of their respective matched bank. For consistency, we relabel  $Treatment \times Post$  as *Mandatory Auditor Reporting*. Panels A and B present the descriptive statistics for this sample. Panels C and D show evidence on the validity of the matching procedure; the former panel includes the results from the first-stage estimation (which is performed year by year), while the latter contains the differences in the variable means between treatment and matched firms as at the year of estimation. Panel E presents the main estimation results using the PSM sample. *T*-statistics presented in parentheses are computed using standard errors clustered within country-year and robust to heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A. Descriptive statistics (PSM sample)**

	Mean	stdev	p10	p50	p90	N
<i>Mandatory Auditor Reporting</i>	0.218	0.413	0.000	0.000	1.000	2,457
<i>Counterparty risk</i>	14.864	2.544	11.453	14.694	18.282	2,457
<i>CDS spread</i>	1.373	1.170	0.474	1.049	2.818	260
<i>Size</i>	22.797	2.684	19.224	22.647	26.767	2,457
<i>Capital</i>	9.771	8.517	3.570	7.905	15.940	2,457
<i>Profitability</i>	3.629	14.142	-5.684	4.950	14.594	2,457
<i>Loan intensity</i>	49.886	24.005	10.775	54.279	77.322	2,457
<i>Loan growth</i>	6.185	33.693	-13.322	2.780	22.924	2,457
<i>Loan loss provisions</i>	1.435	6.274	-0.114	0.311	2.503	2,457
<i>Employees</i>	6.358	2.306	3.555	6.114	9.805	2,457
<i>Cost-to-income ratio</i>	64.655	27.794	34.815	63.217	89.468	2,457
<i>GDP growth</i>	0.382	8.246	-12.821	2.632	9.524	2,457
<i>Bank concentration</i>	79.164	13.093	65.826	78.543	94.117	2,457
<i>Market volatility</i>	20.664	7.298	13.381	19.633	28.921	2,457
<i>Legal rights</i>	5.737	1.964	3.000	6.000	8.000	2,457
<i>Credit information</i>	5.131	2.032	3.000	5.000	7.000	2,457
<i>Insolvency resolution</i>	72.300	20.278	42.140	78.840	93.810	2,457
<i>Significant reform dummy</i>	0.697	0.460	0.000	1.000	1.000	2,457
<i>Treatment <math>\times</math> Post</i>	0.218	0.413	0.000	0.000	1.000	2,457

**Panel B. By country breakdown of the PSM sample**

PSM treatment	Belgium	Croatia	Estonia	Hungary	Luxem.	Nether.	Spain	Slovakia	UK
Number of obs.	98	173	54	100	185	172	71	93	63
PSM control	Austria	Czech	Denmark	Finland	France	Germany	Italy	Sweden	Other
Number of obs.	65	69	105	70	120	530	187	68	234

Table 4—continued

## Panel C. First-stage results of PSM

	(1)	(2)	(3)	(4)	(5)	(6)
	Adoption year 2011	Adoption year 2012	Adoption year 2013	Adoption year 2014	Adoption year 2015	Adoption year 2016
	<i>Mandatory Auditor Reporting</i>	<i>Mandatory Auditor Reporting</i>	<i>Mandatory Auditor Reporting</i>	<i>Mandatory Auditor Reporting</i>	<i>Mandatory Auditor Reporting</i>	<i>Mandatory Auditor Reporting</i>
<i>Size</i>	-0.345 (-1.41)	0.324*** (2.70)	0.348*** (4.20)	0.327*** (4.30)	-3.286*** (-6.14)	1.368*** (3.51)
<i>Capital</i>	-0.100 (-1.28)	0.016 (0.95)	0.022* (1.79)	0.037*** (3.17)	-0.317*** (-3.24)	-0.226 (-1.33)
<i>Profitability</i>	-0.008 (-0.31)	0.046** (2.14)	0.045*** (3.18)	-0.022** (-2.50)	-0.122*** (-3.35)	-0.091 (-1.27)
<i>Loan intensity</i>	0.017 (1.16)	-0.029*** (-4.09)	-0.048*** (-9.39)	-0.004 (-0.87)	0.005 (0.31)	0.006 (0.37)
<i>Loan growth</i>	-0.004 (-0.18)	0.010* (1.84)	0.006* (1.72)	0.009** (2.04)	0.007 (0.49)	-0.017 (-0.41)
<i>Loan loss provisions</i>	-0.299 (-0.96)	-0.017 (-0.23)	-0.092 (-1.53)	0.125*** (2.63)	-0.367* (-1.86)	-0.827 (-1.14)
<i>Employees</i>	0.648*** (2.62)	-0.151 (-1.03)	-0.393*** (-3.79)	-0.037 (-0.41)	3.278*** (6.29)	0.322 (1.25)
<i>Cost-to-income ratio</i>	-0.068*** (-3.23)	0.009 (0.92)	-0.001 (-0.14)	0.007 (1.49)	-0.127*** (-4.32)	0.019 (0.91)
Observations	402	2,986	3,093	3,136	2,998	2,866

## Panel D. Differences in means

	Differences in mean	t-stat
<i>Size</i>	0.126	(0.61)
<i>Capital</i>	0.355	(0.46)
<i>Profitability</i>	-0.265	(-0.22)
<i>Loan intensity</i>	0.300	(0.13)
<i>Loan growth</i>	-2.930	(-1.11)
<i>Loan loss provision</i>	0.136	(0.76)
<i>Employees</i>	-0.036	(-0.20)
<i>Cost-to-income ratio</i>	-0.888	(-0.39)

**Table 4—continued****Panel E. Main results (PSM sample)**

	(1)	(2)
	<i>Counterparty risk</i>	<i>CDS Spread</i>
<i>Mandatory Auditor Reporting</i>	-0.085*** (-3.67)	-0.464* (-1.75)
<i>Post</i>	0.047** (2.50)	0.248** (2.12)
<i>Size</i>	0.711*** (11.43)	0.250 (0.49)
<i>Capital</i>	0.014*** (3.51)	-0.035 (-0.85)
<i>Profitability</i>	-0.000 (-0.07)	-0.032** (-2.42)
<i>Loan intensity</i>	0.011*** (8.22)	0.031* (1.84)
<i>Loan growth</i>	0.000 (0.30)	-0.001 (-0.09)
<i>Loan loss provisions</i>	-0.002 (-0.87)	-0.071 (-0.49)
<i>Employees</i>	-0.002 (-0.04)	-0.529 (-1.39)
<i>Cost-to-income ratio</i>	-0.001 (-1.27)	-0.004 (-0.91)
<i>GDP growth</i>	-0.003** (-2.12)	-0.009 (-0.82)
<i>Bank concentration</i>	0.000 (0.26)	-0.110*** (-3.93)
<i>Market volatility</i>	0.001 (0.25)	0.127*** (2.80)
<i>Legal rights</i>	0.006 (0.60)	-0.182 (-1.46)
<i>Credit information</i>	-0.022* (-1.79)	0.002 (0.01)
<i>Insolvency resolution</i>	0.002* (1.73)	0.001 (0.09)
<i>Significant reform dummy</i>	0.004 (0.31)	-0.293** (-2.50)
Observations	2,457	260
Within R-squared	48.4%	41.4%
Bank, Basel, and Year FE	Yes	Yes

**Table 5: Within-Country Analysis: Evidence from the UK**

This table repeats the main analysis in a within-country specification. Panel A includes the sample statistics, and Panel B presents the regression results. *Mandatory Auditor Reporting* equals one for banks with total assets above £50 billion, and zero for banks with assets less than £50 billion, from 2016 onward (i.e. equivalent to  $Treatment \times Post$ ). We note that *Post*, *Treatment*, and macroeconomic controls (*GDP growth*, *Bank concentration*, and *Market volatility*) do not appear in the table since these terms are dropped from the model in a single-country sample estimation that includes bank and year fixed effects. All other variables are as defined in the Appendix. *T*-statistics presented in parentheses are computed using standard errors that are robust to within-bank correlation and heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A. Descriptive statistics**

	Mean	stdev	p10	p50	p90	N
<i>Mandatory Auditor Reporting</i>	0.037	0.190	0.000	0.000	0.000	749
<i>Counterparty risk</i>	14.397	2.415	11.562	14.160	18.148	749
<i>Nonperforming loans</i>	4.512	12.603	0.271	1.976	5.882	140
<i>CDS spread</i>	1.325	0.843	0.490	1.094	2.273	104
<i>Size</i>	22.292	2.555	19.419	21.810	26.591	749
<i>Capital</i>	9.525	7.390	4.446	7.274	16.819	749
<i>Profitability</i>	5.059	9.931	-3.011	5.500	13.980	749
<i>Loan intensity</i>	57.391	25.339	16.768	66.706	83.517	749
<i>Loan growth</i>	12.255	39.143	-11.431	4.804	37.518	749
<i>Loan loss provisions</i>	0.765	2.653	-0.051	0.124	1.586	749
<i>Employees</i>	6.242	2.465	3.466	5.666	10.143	749
<i>Cost-to-income ratio</i>	70.953	23.651	43.260	69.244	96.705	749

**Table 5—continued****Panel B.** Replication of main results in UK setting

	(1)	(2)
	<i>Counterparty risk</i>	<i>CDS Spread</i>
<i>Mandatory Auditor Reporting</i>	-0.126*** (-2.82)	-0.466** (-2.30)
<i>Size</i>	0.797*** (11.81)	0.795 (1.44)
<i>Capital</i>	0.017*** (2.66)	0.107 (1.45)
<i>Profitability</i>	-0.004** (-2.11)	0.008 (0.64)
<i>Loan intensity</i>	0.009*** (3.84)	-0.046*** (-3.46)
<i>Loan growth</i>	0.000* (1.95)	0.006*** (3.81)
<i>Loan loss provisions</i>	-0.013*** (-2.98)	0.270** (2.36)
<i>Employees</i>	0.094 (1.33)	0.523 (1.48)
<i>Cost-to-income ratio</i>	-0.003*** (-3.52)	-0.006 (-0.91)
Observations	749	102
Within R-squared	0.612	0.574
Bank, Basel, and Year FE	Yes	Yes

**Table 6. Mandatory Auditor Reporting and Bank Risk: Identification and Robustness**

This table presents the results of several additional identification and robustness tests. In Panel A, we report our main specification (from Table 3) across different subsamples based on bank size (small, medium, and large). In Panel B we report our main specification (from Table 3 and Table 4, respectively) with additional country-year controls for the performance of the national bank sector: *Bank sector health* (Z-score); *Bank sector performance* (ROE), and *Bank sector capitalization* (Tier 1). In columns (1) and (2) we report results for the full sample, in columns (3) and (4) we report results from our PSM sample. In Panel C, we replicate the main results (i.e., Table 3) by removing treatment countries one by one. *T*-statistics presented in parentheses are computed using standard errors clustered by country-year and robust to heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Partitions by Bank Size**

	(1)	(2)	(3)		(4)	(5)	(6)
	Conditioning variable: Bank size				Conditioning variable: Bank size		
	Small	Medium	Large		Small	Medium	Large
	<i>Counterparty risk</i>	<i>Counterparty risk</i>	<i>Counterparty risk</i>		<i>CDS Spreads</i>	<i>CDS Spreads</i>	<i>CDS Spreads</i>
<i>Mandatory Auditor Reporting</i>	-0.101 (-1.57)	-0.105*** (-3.25)	-0.015 (-0.46)		-0.315 (-0.63)	-0.805* (-1.70)	-0.378** (-2.46)
Observations	4,521	8,410	3,996		146	274	180
Within R-squared	20.5%	42.6%	36.4%		22.0%	27.4%	36.0%
All lower order terms	Y	Y	Y		Y	Y	Y
All previous controls	Y	Y	Y		Y	Y	Y
Bank, Basel, and Year FE	Y	Y	Y		Y	Y	Y

Table 6—continued

## Panel B. Additional (country-year) bank sector controls

	(1)	(2)	(3)	(4)
	Full Sample		PSM Sample	
	<i>Counterparty risk</i>	<i>CDS Spread</i>	<i>Counterparty risk</i>	<i>CDS Spread</i>
<i>Mandatory Auditor Reporting</i>	-0.057** (-2.36)	-0.626** (-1.98)	-0.079*** (-3.46)	-0.706** (-2.20)
<i>Bank sector health (Z-Score)</i>	0.011*** (4.47)	-0.048 (-0.77)	0.000 (0.13)	-0.049 (-0.77)
<i>Bank sector performance (ROE)</i>	-0.002*** (-2.65)	-0.011 (-0.40)	-0.000 (-0.45)	-0.005 (-0.21)
<i>Bank sector capitalization (Tier 1)</i>	-0.006*** (-2.73)	-0.125** (-2.14)	-0.001 (-0.41)	-0.065 (-1.25)
Observations	15,639	529	2,210	230
All previous controls	Y	Y	Y	Y
Bank, Basel, and Year FE	Y	Y	Y	Y



**Table 6—continued****Panel C. Counterparty risk, removing each treatment country**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Excluding Belgium	Excluding Croatia	Excluding Estonia	Excluding Hungary	Excluding Luxembourg	Excluding Netherlands	Excluding Slovenia	Excluding Spain	Excluding UK
<i>Mandatory Auditor Reporting</i>	-0.076*** (-3.24)	-0.063** (-2.48)	-0.066*** (-2.82)	-0.052** (-2.20)	-0.064*** (-2.72)	-0.084*** (-3.63)	-0.065*** (-2.71)	-0.069*** (-2.83)	-0.052** (-2.33)
Observations	16,841	16,842	16,888	16,875	16,806	16,835	16,884	16,632	16,899
All previous terms	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table 7. Mandatory Auditor Reporting and Bank Risk: Timeliness of Provisions and Problem Loans**

This table presents regression results relating to the timeliness of *Loan Loss Provisions* (Panel A) and the short-term and long-window movements in *Problem Loans* (Panel B). In Panel A, we define *Loan Loss Provisions* as reported loan loss provisions divided by total loans (%), as reported in SNL. We use the full sample of firms in this analysis, and report results with prior year LLP (column 2) and without (column 1). In Panel B, we define *Problem Loans* based on the SNL definition of loans that have not yet been impaired by require close monitoring, based on banks' reports. This specification is estimated using the PSM sample because we require well defined event-time windows over which to measure future *Problem Loans*, i.e. we can examine matched treatment and control firms in post-years. All variables are defined in the Appendix. T-statistics presented in parentheses are computed using standard errors that are robust to within country and year correlation and heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A. Timeliness of loan loss provisions**

	(1)	(2)
	<i>Loan loss provisions</i>	<i>Loan loss provisions</i>
<i>Mandatory Auditor Reporting</i> $\times \Delta NPL_{t+1}$	0.192** (2.06)	0.172* (1.90)
<i>Mandatory Auditor Reporting</i> $\times \Delta NPL_t$	-0.041 (-1.15)	-0.044 (-1.26)
<i>Mandatory Auditor Reporting</i>	-0.741** (-2.13)	-0.307 (-0.99)
$\Delta NPL_{t+1}$	-0.004 (-0.36)	0.007 (0.50)
$\Delta NPL_t$	0.059*** (3.10)	0.047** (2.16)
<i>Loan loss provisions (t-1)</i>		0.635*** (6.74)
Controls	Yes	Yes
Observations	10,151	10,151
Adj. R-squared	4.8%	7.1%
Basel and Year FE	Yes	Yes

**Table 7—continued****Panel B. Problem Loans (PSM sample)**

	(1)	(2)
	Short window t+1 and t+2	Long window t+3 onwards
	<i>Problem loans</i>	<i>Problem loans</i>
<i>Mandatory Auditor Reporting</i>	1.935** (2.06)	-0.682 (-0.36)
<i>Post</i>	-0.463 (-0.99)	-1.069 (-1.32)
<i>Size</i>	0.112 (0.08)	-2.808* (-1.76)
<i>Capital</i>	-0.485 (-1.18)	-0.520* (-1.69)
<i>Profitability</i>	0.099* (1.89)	0.258* (1.87)
<i>Loan intensity</i>	-0.077 (-0.71)	-0.109* (-1.97)
<i>Loan growth</i>	-0.008 (-0.80)	-0.004 (-0.39)
<i>Loan loss provisions</i>	0.948 (1.34)	1.725 (1.58)
<i>Employees</i>	-4.290* (-1.94)	-6.158 (-1.30)
<i>Cost-to-income ratio</i>	0.016 (0.61)	0.085* (1.76)
<i>GDP growth</i>	0.027 (0.37)	0.023 (0.27)
<i>Bank concentration</i>	-0.022 (-0.29)	0.065 (0.91)
<i>Market volatility</i>	0.050 (0.54)	0.029 (0.40)
<i>Legal rights</i>	1.616*** (3.30)	1.432** (2.10)
<i>Credit information</i>	0.187 (0.17)	-1.479 (-1.11)
<i>Insolvency resolution</i>	-0.008 (-0.31)	0.010 (0.37)
<i>Significant reform dummy</i>	-0.212 (-0.34)	0.666 (0.96)
Observations	410	432
Within R-squared	19.2%	85.0%
Bank, Basel, and Year FE	Yes	Yes

**Table 8. Regulatory Supervision Channel**

This table presents regression results relating to the role of supervision in mediating our findings. The dependent variable is *Risk-weighted assets*, the ratio of total risk-weighted assets to total assets in percentage points. All variables are defined in the Appendix. T-statistics presented in parentheses are computed using standard errors that are robust to within country and year correlation and heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	<i>Risk-weighted assets</i>	<i>Risk-weighted assets</i>	<i>Risk-weighted assets</i>	<i>Risk-weighted assets</i>
<i>Mandatory Auditor Reporting</i>	-2.184*** (-3.21)	-2.314*** (-3.13)	-2.270*** (-3.32)	-2.388*** (-3.22)
<i>Pre-interaction</i>		-0.534 (-0.63)		-0.488 (-0.57)
<i>Size</i>	-3.069*** (-3.97)	-3.075*** (-3.97)	-3.099*** (-4.19)	-3.104*** (-4.20)
<i>Capital</i>	0.402*** (4.98)	0.402*** (4.98)	0.396*** (5.00)	0.396*** (5.01)
<i>Profitability</i>	0.010 (0.72)	0.010 (0.69)	0.010 (0.74)	0.010 (0.72)
<i>Loan intensity</i>	0.315*** (10.55)	0.315*** (10.53)	0.315*** (10.58)	0.315*** (10.57)
<i>Loan growth</i>	-0.007 (-1.50)	-0.007 (-1.50)	-0.007 (-1.51)	-0.007 (-1.52)
<i>Loan loss provisions</i>	0.135* (1.82)	0.134* (1.82)	0.115 (1.63)	0.115 (1.62)
<i>Employees</i>	2.303*** (2.81)	2.309*** (2.82)	2.352*** (2.84)	2.358*** (2.85)
<i>Cost-to-income ratio</i>	-0.007 (-0.75)	-0.007 (-0.75)	-0.006 (-0.66)	-0.006 (-0.66)
<i>GDP growth</i>	0.014 (0.37)	0.016 (0.42)	0.010 (0.28)	0.012 (0.33)
<i>Bank concentration</i>	-0.166*** (-2.79)	-0.166*** (-2.80)	-0.160*** (-2.71)	-0.161*** (-2.72)
<i>Market volatility</i>	0.138** (2.08)	0.136** (2.05)	0.135** (2.03)	0.132** (2.00)
<i>Legal rights</i>	0.554* (1.68)	0.554* (1.67)	0.582* (1.76)	0.582* (1.75)
<i>Credit information</i>	-1.006* (-1.93)	-0.989* (-1.93)	-0.995* (-1.92)	-0.979* (-1.92)
<i>Insolvency resolution</i>	-0.006 (-0.31)	-0.007 (-0.31)	-0.004 (-0.21)	-0.004 (-0.21)
<i>Significant reform dummy</i>	-0.308 (-0.76)	-0.288 (-0.71)	-0.337 (-0.84)	-0.319 (-0.79)
<i>Change in nonperforming loans</i>			0.057*** (3.24)	0.057*** (3.24)
Observations	16,679	16,679	16,587	16,587
Within R-squared	14.0%	14.0%	14.1%	14.1%
Bank, Basel, and Year FE	Yes	Yes	Yes	Yes

**Table 9. Market Discipline Channel**

This table presents regression results relating to the role of market discipline in mediating our findings. The unit of observation is a bank-year and the dependent variable is *Information imprecision*, the ratio of the one-year CDS spread to five-year CDS spread. All variables are defined in the Appendix. *T*-statistics presented in parentheses are computed using standard errors clustered by country-year and robust to heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
	<i>Information imprecision</i>	<i>Information imprecision</i>
<i>Mandatory Auditor Reporting</i>	-0.090** (-2.12)	-0.075* (-1.96)
<i>Pre-interaction</i>		0.057 (1.43)
<i>Size</i>	0.082 (0.57)	0.084 (0.58)
<i>Capital</i>	0.007 (0.73)	0.007 (0.71)
<i>Profitability</i>	-0.003* (-1.96)	-0.003* (-1.96)
<i>Loan intensity</i>	0.004 (1.49)	0.004 (1.49)
<i>Loan growth</i>	-0.001 (-0.98)	-0.001 (-0.96)
<i>Loan loss provisions</i>	0.017 (1.06)	0.019 (1.14)
<i>Employees</i>	-0.005 (-0.07)	-0.010 (-0.16)
<i>Cost-to-income ratio</i>	-0.001 (-0.98)	-0.001 (-1.01)
Observations	542	542
Within R-squared	18.7%	19.0%
Macro controls	Yes	Yes
Bank, Basel, and Year FE	Yes	Yes

**Table 10. Regulatory Review Process Channel**

This table presents the results from regressions pertaining to the effects of broader supervision. In Panel A, the unit of observation is a country-year. The dependent variable, *Number of on-site examinations* is the natural logarithm of the number of on-site bank inspections the regulator conducts during the year. In the remaining panels, the unit of observation is a bank-year. In Panel B, we partition the treatment sample into Meetings vs. non-Meetings based on whether the country carries out annual auditor-regulator meetings or site inspections. (Countries with meetings: Austria, Croatia, Estonia, Germany, Hungary, Slovenia, Spain, and the UK.) In Panel C, we carry out a similar sample split based on regulators' resource constraints. (Resource-constrained countries: Austria, Croatia, Estonia, Luxembourg, Portugal, and Slovenia.) In columns (1) and (2) of Panels B and C, we include all observations from our full sample. In columns (3) and (4) of Panels B and C, control observations are paired with their respective treatment observation (i.e. PSM sample). We include all previous controls, whose coefficient estimates are suppressed for brevity, include *Size*, *Capital*, *Profitability*, *Loan intensity*, *Loan growth*, *Loan loss provisions*, *Employees*, *Cost-to-income ratio*, *Basel*, *GDP growth*, *Bank concentration*, *Market volatility*, *Legal Rights*, *Credit Information*, *Insolvency Resolution*, and *Significant Reform Dummy*. All variables, including these controls, are defined in the Appendix. T-statistics presented in parentheses are computed using standard errors that are robust to within-country-year correlation and heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A. Country-level on-site bank inspections by regulators**

	<i>Number of on-site examinations</i>
<i>Mandatory Auditor Reporting</i>	-0.257* (-1.79)
<i>GDP growth</i>	0.008 (0.61)
<i>Bank concentration</i>	-0.011 (-1.23)
<i>Market volatility</i>	0.000 (0.03)
<i>Legal rights</i>	0.090 (1.38)
<i>Credit information</i>	-0.127* (-1.85)
<i>Significant reform dummy</i>	0.146 (1.51)
Observations	171
Within R-squared	10.0%
Country FE and Year FE	Yes

**Table 10—continued****Panel B. Mandated meetings**

	(1)	(2)	(3)	(4)
	Full sample		PSM sample	
	Meetings	No Meetings	Meetings	No Meetings
	<i>Counterparty risk</i>	<i>Counterparty risk</i>	<i>Counterparty risk</i>	<i>Counterparty risk</i>
<i>Mandatory Auditor Reporting</i>	-0.101*** (-3.96)	0.005 (0.14)	-0.086*** (-3.66)	-0.012 (-0.20)
Observations	15,969	6,986	1,731	726
All lower order terms	Y	Y	Y	Y
All previous controls	Y	Y	Y	Y
Bank, Basel, and Year FE	Y	Y	Y	Y

**Panel C. Resource Constrained Regulators**

	(1)	(2)	(3)	(4)
	Full sample		PSM sample	
	Relatively constrained	Relatively unconstrained	Relatively constrained	Relatively unconstrained
	<i>Counterparty risk</i>	<i>Counterparty risk</i>	<i>Counterparty risk</i>	<i>Counterparty risk</i>
<i>Mandatory Auditor Reporting</i>	-0.081*** (-2.85)	-0.047 (-1.44)	-0.123*** (-3.52)	-0.084** (-2.56)
Observations	7,603	15,352	1,283	1,174
All lower order terms	Y	Y	Y	Y
All previous controls	Y	Y	Y	Y
Bank, Basel, and Year FE	Y	Y	Y	Y

**Table 11. Bank Lending and Profitability**

This table presents the results from bank-year-level regressions of measures of *Safe Lending* (Panel A), *Loan growth* (Panel B) and *Profitability* (Panel C). In Panel A we report results for three measures of *Safe Lending*. In column (1) *Safe lending (loan type)*, measured as percentage ratio of residential mortgage loans to all loans, in column (2) *Safe lending (loan maturity)*, measured as the percentage ratio of loans with less than one year maturity to all loans, and in column (3) *Safe lending (future NPLs)*, is the percentage ratio of one-year ahead nonperforming loans to total loans. In Panel B and C, we measure *Loan Growth* and *Profitability* one year, two years, and three years into the future. All variables are defined in Appendix A, and we include all bank-level and macro level control variables including in our main analysis. *T*-statistics presented in parentheses are computed using standard errors robust to within country-year correlation and heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A. Safe Lending**

	(1)	(2)	(3)
	<i>Safe lending (loan type)</i>	<i>Safe lending (loan maturity)</i>	<i>Safe lending (future NPLs)</i>
<i>Mandatory Auditor Reporting</i>	2.294** (2.13)	2.484* (1.77)	-1.388* (-1.72)
<i>Size</i>	-5.414** (-2.39)	2.538** (2.48)	1.916* (1.79)
<i>Capital</i>	0.001 (0.01)	0.072 (0.86)	0.010 (0.22)
<i>Profitability</i>	0.004 (0.21)	0.053*** (2.88)	-0.059** (-2.50)
<i>Loan intensity</i>	0.093 (1.33)	0.033 (0.98)	-0.002 (-0.05)
<i>Loan growth</i>	-0.042 (-1.61)	-0.003 (-0.39)	-0.010* (-1.88)
<i>Loan loss provisions</i>	0.602** (2.50)	-0.155 (-1.58)	0.150** (2.05)
<i>Employees</i>	2.494 (1.38)	-2.101* (-1.91)	-0.361 (-0.82)
<i>Cost-to-income ratio</i>	-0.026** (-2.54)	0.034*** (2.70)	-0.049*** (-3.85)
Macro Controls	Yes	Yes	Yes
Observations	1,979	9,590	9,590
Within R-squared	7.6%	5.4%	7.4%
Bank, Basel, and Year FE	Yes	Yes	Yes



**Table 11—continued****Panel B. Future bank lending**

	(1)	(2)	(3)
	<i>Loan growth</i> <i>t+1</i>	<i>Loan growth</i> <i>t+2</i>	<i>Loan growth</i> <i>t+3</i>
<i>Mandatory Auditor Reporting</i>	-3.202** (-2.29)	-4.160** (-2.45)	-4.643** (-2.20)
<i>Size</i>	-1.399*** (-5.08)	-1.671*** (-4.73)	-1.906*** (-5.14)
<i>Capital</i>	-0.105** (-1.98)	-0.165** (-2.46)	-0.202** (-2.53)
<i>Loan intensity</i>	-0.053** (-2.37)	-0.058** (-2.22)	-0.047 (-1.48)
<i>Loan loss provisions</i>	-0.380** (-2.42)	-0.211 (-1.25)	-0.049 (-0.20)
<i>Employees</i>	0.670** (2.46)	0.847*** (2.70)	0.998*** (2.97)
<i>Cost-to-income ratio</i>	-0.035** (-2.57)	-0.073*** (-4.85)	-0.098*** (-4.45)
<i>GDP growth</i>	0.391 (1.62)	0.037 (0.18)	0.592** (2.13)
<i>Bank concentration</i>	0.054 (1.34)	0.024 (0.46)	0.069 (1.30)
<i>Market volatility</i>	-0.143 (-1.37)	-0.198** (-2.37)	-0.039 (-0.34)
<i>Legal rights</i>	-0.103 (-0.33)	-0.164 (-0.54)	-0.297 (-0.67)
<i>Credit information</i>	0.457 (1.45)	0.913** (2.26)	0.867 (1.62)
<i>Insolvency resolution</i>	-0.009 (-0.29)	0.005 (0.15)	-0.027 (-0.79)
<i>Significant reform dummy</i>	0.967 (1.03)	-1.618 (-1.17)	2.030** (2.26)
Observations	13,905	11,032	8,402
Adj. R-squared	4.8%	5.6%	7.3%
Basel and Year FE	Yes	Yes	Yes

**Table 11—continued****Panel C: Profitability**

	(1)	(2)	(3)
	<i>Profitability</i> <i>t+1</i>	<i>Profitability</i> <i>t+2</i>	<i>Profitability</i> <i>t+3</i>
<i>Mandatory Auditor Reporting</i>	-0.423 (-1.07)	-0.982** (-2.33)	-0.997** (-2.17)
<i>Size</i>	0.104 (0.78)	0.144 (0.99)	0.313** (2.30)
<i>Capital</i>	0.007 (0.40)	-0.003 (-0.14)	-0.019 (-0.88)
<i>Loan intensity</i>	-0.026*** (-2.73)	-0.022** (-2.27)	-0.019* (-1.82)
<i>Loan loss provisions</i>	-0.362*** (-2.68)	-0.298** (-2.34)	-0.076 (-0.77)
<i>Employees</i>	0.059 (0.46)	0.008 (0.06)	-0.099 (-0.70)
<i>Cost-to-income ratio</i>	-0.091*** (-13.80)	-0.073*** (-11.07)	-0.062*** (-9.49)
<i>GDP growth</i>	0.113* (1.72)	0.109* (1.91)	0.144** (2.28)
<i>Bank concentration</i>	0.080*** (4.06)	0.082*** (3.83)	0.088*** (3.69)
<i>Market volatility</i>	-0.137** (-2.19)	-0.150** (-2.38)	-0.182*** (-2.77)
<i>Legal rights</i>	0.192 (1.57)	0.211* (1.79)	0.194 (1.54)
<i>Credit information</i>	-0.351** (-1.98)	-0.416** (-2.09)	-0.510** (-2.46)
<i>Insolvency resolution</i>	-0.032** (-2.01)	-0.030* (-1.86)	-0.029* (-1.76)
<i>Significant reform dummy</i>	0.707 (1.43)	0.567 (1.17)	1.249** (2.45)
Observations	13,905	11,032	8,402
Adj. R-squared	12.2%	11.0%	12.0%
Basel and Year FE	Yes	Yes	Yes

**Table 12. Costs of Mandatory Auditor Reporting: Audit Fees**

This table explores the tests of audit fees. Panel A provides the pertinent variable definitions. Panel B reports the regression results. The dependent variable is the natural logarithm of audit fees. *T*-statistics presented in parentheses are computed using standard errors clustered within country-year and robust to heteroscedasticity. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A. Variable definitions for audit fees**

Variable Name	Definition	Source and field code
<i>Mandatory Auditor Reporting</i>	Indicator that switches on for banks in countries that have implemented audit-regulator reforms.	Survey (Table 1)
<i>Audit fees</i>	Annual fees to paid to auditors for all statutory audit and audit related services (transformed to natural logarithm form in the tests).	FactSet: FF_AUD_FEES
<i>Bank concentration</i>	Assets of five largest banks as a share of total commercial banking assets (%).	World Bank: GFDD.OI.06
<i>Capital adequacy</i>	Capital adequacy ratio (%).	FactSet: FF_CAP_RATIO_TOT
<i>Credit information</i>	Index that measures rules and practices affecting the coverage, scope and accessibility of credit information available in the country.	Doing Business: Depthofcreditinformation
<i>GDP growth</i>	Year-over-year growth in gross domestic product (%).	World Bank: NY.GDP.MKTP.CD
<i>Insolvency resolution</i>	Index based on commencement of proceedings, management of debtor's assets, reorganization proceedings, and creditor participation.	Doing Business: ResolvingInsolvencyDTF
<i>Legal rights</i>	Index that includes 10 aspects related to legal rights in collateral law and 2 aspects in bankruptcy law.	Doing Business: Strengthoflegalrightsindex
<i>Loan growth</i>	Year-over-year growth in loans (%).	FactSet: FF_LOAN_GR
<i>Loan intensity</i>	The ratio of loans to assets (%).	FactSet: FF_LOAN_ASSETS
<i>Loan loss provisions</i>	Loan loss provisions divided by total loans (%).	FactSet: FF_LOAN_LOSS_PROV_PCT
<i>Loss Indicator</i>	Indicator variable that switches on if net income is negative for the current year	Factset: FF_NET_INCOME
<i>Market volatility</i>	Stock price volatility is the average of the 360-day volatility of the national stock market index.	FactSet: FF_ACTG_STANDARD
<i>Profitability</i>	Return on equity (%).	FactSet: FF_NET_INCOME & FF_SHLDRS_EQ
<i>Public</i>	Indicator variable that switches on for publicly traded banks, i.e. those with market valuation and ISIN.	FactSet: FF_MKT_VAL & FF_ISIN
<i>Significant reform dummy</i>	Equals one for country-years with an increase in <i>Credit information</i> , <i>Insolvency resolution</i> , or <i>Legal rights</i> .	Doing Business
<i>Size</i>	Natural log of total assets.	FactSet: FF_ASSETS
<i>Treatment</i>	Indicator that switches on only for countries that implement audit-regulator reforms in the sample period.	Survey (Table 1)

**Panel B. Regression results**

	(1)	(2)
	log ( <i>Audit fees</i> )	log ( <i>Audit fees</i> )
<i>Mandatory Auditor Reporting</i>	0.328** (2.12)	0.259* (1.90)
<i>Treatment</i>	0.151 (0.95)	0.112 (0.77)
<i>Size</i>	0.697*** (67.78)	0.697*** (63.57)
<i>Big Four Auditor</i>	-0.172** (-2.54)	-0.145** (-2.06)
<i>Public firm</i>	0.105** (2.38)	0.121*** (2.81)
<i>Loss firm</i>	0.004 (0.04)	-0.049 (-0.53)
<i>Local GAAP</i>	-0.634*** (-10.06)	-0.663*** (-10.70)
<i>Loan loss provisions</i>	0.163*** (3.37)	0.150*** (3.17)
<i>Loan intensity</i>	-0.017*** (-10.20)	-0.017*** (-9.91)
<i>Capital ratio</i>	-0.004 (-0.47)	-0.007 (-0.91)
<i>Profitability</i>	0.001 (0.78)	0.001 (0.55)
<i>Loan growth</i>	-0.001 (-0.43)	-0.001 (-0.62)
Observations	1,675	1,663
Within R-squared	83.0%	83.2%
Macro controls	No	Yes
Year FE	Yes	Yes