Banks' Financial Reporting Frequency and Asset Quality[*]

Karthik Balakrishnan,
London Business School
kbalakrishnan@london.edu

Aytekin Ertan,
London Business School
aertan@london.edu

ABSTRACT

We examine the effects of banks' financial reporting frequency from 2000 to 2014 and find that quarterly reporting improves their loan portfolio quality. Sample banks experience a relative decrease of about 11 percent in their nonperforming loans after switching to quarterly financial disclosures. Consistent with market discipline enhancing lending practices, these results are stronger in regimes with weaker depositor insurance and external monitoring, and in those with stronger capital markets. We also find that banks that provide quarterly financial information experience lower deposit interest rates and credit default swap spreads. Collectively, our findings suggest that quarterly reporting reduces banks' risk-taking.

JEL Classifications: G21, G28, G32, M41, M48

Keywords: financial reporting frequency, banking, regulation, asset quality, lending

INTRODUCTION

We examine the effects of financial reporting frequency on the quality of banks' loan portfolios. The frequency at which firms provide financial reports to capital markets has long been an important policy issue for accounting standard setters across the world (Gigler, Kanodia, Sapra, and Venugopalan 2014). In the United States, public firms including banks have been required to release quarterly financial statements since 1970, although many companies opted for interim disclosures of financial performance before then (Butler, Kraft, and Weiss 2007). Internationally, reporting requirements have been transient. In the European Union (EU), quarterly reporting was intermittently adopted in the last decade.[1] However, the EU has recently redacted the interim reporting requirements.[2] This reduction in reporting frequency diverges from the current banking regulatory environment, which demands a significant amount of financial information from banks (e.g., Copelovitch, Gandrud, and Hallerberg 2015). The frequent amendments to the reporting requirements are signs that policymakers are uncertain about the optimal reporting frequency. Our study attempts to offer insights into the effects of changing reporting frequency by examining how quarterly reporting affects bank behavior.

In theory, the effects of bank reporting frequency on banks' risk-taking behavior are mixed. On the one hand, more frequent reporting is beneficial because the anticipation of periodic performance reports has a disciplining effect on managers' ex ante investment decisions, which makes them less likely to engage in inefficient investments. More frequent reporting could also increase the effectiveness and timeliness of market discipline. It would enable market participants

---

[1] Adopted in 2004, Transparency for Listed Companies Directive (2004/109/EC) requires a higher frequency of financial reports based on the premise that more information about company performance over the financial year is possible with a higher frequency of interim information.

[2] Transparency Directive Amending Directive (2013/50/EU), abolished effective from November 2015 the requirement to publish interim financial statements in order to reduce the reporting burden, especially for small- and medium-sized firms, and to encourage corporate long-termism.

to better ascertain bank risk exposures, impounding this information into market prices. Higher price efficiency will, in turn, deter insiders from engaging in excessive risk-taking to appease equity and debt investors, whose funds would allow banks to lend more to the real economy (Goldstein and Sapra 2014). On the other hand, escalating the frequency of reporting could distort operational decisions by inducing banks to engage in window dressing, as well as to undertake inefficient investments and asset sales. Frequent reporting can cause bank managers to take myopic actions that enhance short-term performance at the expense of long-run value (Gigler et al. 2014; Kraft, Vashishtha, and Venkatachalam 2017). In banking, one of the easiest ways to boost short-term profitability is to take more risk. For example, banks may relax lending standards, which increases the current yield on their loans but may also lead to subsequent defaults (Falato and Scharfstein 2016). Given that the periodicity of financial information releases can either discipline or distort banks' behavior, the effect of financial reporting frequency on banks' risk-taking is ultimately an empirical question.

To address this question, we focus on the effects of banks' reporting frequency on their asset quality using nonperforming loans as a proxy for asset quality. Loan performance is closely linked to economic cycles and financial stability (Beatty and Liao 2011; Golin and Delhaise 2013). Nonperforming loans were also a focal point for regulators during the global financial crisis and the subsequent low-yield environment (Bholat, Lastra, Markose, Miglionico, and Sen 2016). In addition to nonperforming loans, we examine the impact of frequent reporting on banks' credit risk—the response by depositors and credit default swap (CDS) holders to a switch to quarterly reporting. These measures of external funding costs provide a perspective on banks' risk-taking activities from the liability side of the balance sheet.

Our primary analysis focuses on a sample of 417 public banks from 32 European countries

2

during the 2000–2014 period. The European setting offers several advantages over the U.S. setting. Banks in Europe have been changing their reporting frequency in more recent years and exhibit cross-sectional as well as time-series variation in these changes. In contrast, banks in the U.S. have reported quarterly since the 1970s. Besides enhancing the relevance of our results, our focus on a more recent period permits us to exploit recently available financial data, such as CDS spreads. Further, investigating an international setting helps us use the cross-sectional variation in institutional characteristics to provide additional insights.

Using Worldscope data, we identify a bank's reporting frequency based on the number of reports with quantitative information (e.g., net earnings) and obtain data on bank financials from Bankscope. To account for the possibility that variation in some unobservable firm characteristics is driving the results, we include bank fixed effects in addition to a vector of control variables. These fixed effects rule out time-invariant bank characteristics that may lead to the choice of reporting frequency and at the same time have an impact on the quality of the loan portfolio. From an econometric viewpoint, this design restricts the analysis to banks that switch to/from quarterly reporting at least once during our sample period.

Our loan quality tests yield the following results. Relative to banks that report less frequently, quarterly reporters' nonperforming loans decline by about 0.8 percent, which represents over 10 percent of the sample standard deviation of nonperforming loans. We also observe that the effects of quarterly reporting on nonperforming loans are long-lasting, the influence growing stronger over two to three years after the switch to quarterly reporting. Our finding holds for alternative metrics of loan portfolio quality. We document similar declines for loan loss reserves (an ex ante measure of risk) and the ratio of unreserved nonperforming loans to equity (a measure of equity exposure to unexpected loan losses). The link between quarterly

3

reporting and lower nonperforming loans is also robust to various samples that are limited to banks reporting under International Financial Reporting Standards (IFRS) or to those audited by the Big Four, to years other than the recent global financial crisis, and to countries other than Greece, Ireland, Italy, Portugal, and Spain—which were unable to refinance their government debt or to bail out over-indebted banks during the crisis. Further, we examine the variation in the relation between quarterly reporting and nonperforming loans with country-level institutional characteristics. Our findings are more pronounced in jurisdictions with less stringent banking supervision and less well-funded deposit insurance funds and in countries with more developed equity markets (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998), which is consistent with increased reporting frequency improving bank behavior through capital market discipline.

While these findings indicate a strong association between (switching to) quarterly reporting and lending quality, we recognize the possibility that unobservable endogenous assignment could drive our results. That is, firms that opt for quarterly financial reporting might be different around the time of adoption from companies that do not, in ways other than financial reporting frequency. To mitigate this concern about bank-level time-varying confounding variables, we exploit European countries' staggered adoption of the Transparency Directive (TD), which required listed companies in the EU to release qualitative or quantitative interim management statements (IMSs) of financial position and performance (Christensen, Hail, and Leuz 2016; Ernstberger, Link, Stich, and Vogler 2017). We focus on firms that changed the number of quantitative IMS reports they submit and find that banks that switched to providing quantitative quarterly IMS reports (treatment banks) experience a decline in nonperforming loans relative to those that did not switch (control banks), following the adoption of the TD but not before adoption. Economically, treatment banks experience over a 2 percent decline in nonperforming loans,

4

corresponding to about one-third of the sample standard deviation of nonperforming loans.[3]

We examine two additional shocks to mandatory reporting frequency from Japan and Singapore where listed companies are required by law to provide full-fledged financial reports. In our tests of these settings, we find that, relative to a control group, banks that switch to mandatory quarterly reporting experience improvements in their loan portfolios. Our findings from the two Asian markets not only add credibility to our TD results but also highlight the relative generalizability of the link between reporting frequency and loan portfolio quality.[4]

Finally, we explore the liability side of the balance sheet. Because banks' deposits and debts constitute the largest portion of their capital structure (the average bank leverage is about 90 percent), we explore depositor and creditor response to increased reporting frequency. Decreased risk-taking by banks will result in a reduction in funding costs. We find a significant decline in the average deposit interest rate (about 24 bps or 9 percent of the sample standard deviation) and CDS spreads (about 45 bps or 16 percent of the sample standard deviation) for banks that increase the frequency of their financial reporting. We attribute this reduction in credit risk to decreased risk-taking after greater financial reporting frequency.

Our paper contributes to the literature on the real effects of financial reporting in the banking sector.[5] There are relatively few studies on the economic consequences of disclosure regulations and accounting transparency in the financial sector. Prior work has shown that transparency induces banks to choose higher capital buffers (Nier and Baumann 2006). Studies

---

[3] Although the TD setting poses advantages over the association tests, one of its drawbacks is banks' self-selection into providing qualitative or quantitative statements (Nallareddy, Pozen, and Rajgopal 2016; Kraft et al. 2017). Also, IMS reports—even if they contain financial information, such as earnings—are not full-fledged quarterly reports.

[4] We observe convincing pre-treatment parallel trends in our outcome variables for control and treatment banks, which allays the possibility that nonperforming loans affected the adoption of the regulation. Moreover, we examine the adoption notices issued by the EU, as well as the central banks of several European countries, and find no anecdotal evidence suggesting that reporting frequency regulation was introduced because of the health of the banks.

[5] See Beatty and Liao (2014), Bushman (2014), and Acharya and Ryan (2016) for reviews of this literature.

also document that timelier loan loss provisioning mitigates pro-cyclicality in lending (Beatty and Liao 2011) and is associated with enhanced risk-taking discipline (Bushman and Williams 2012). In the context of mandated regulations, Granja (2016) finds that disclosure regulation alleviates bank failures in the National Banking Era. We extend this strand of the literature by documenting the real effects of regulations that alter financial reporting frequency.

Our paper also adds to the literature on financial reporting frequency. Researchers have provided evidence that increased reporting frequency is associated with lower levels of information asymmetry (Cuijpers and Peek 2010), lower cost of capital (Fu, Kraft, and Zhang 2012), and more timely earnings (Butler et al. 2007). Others argue that frequent financial reporting is an institutional feature that can encourage myopic managerial behavior (Ernstberger et al. 2017; Kraft et al. 2017). Our work complements this literature by examining the effects of reporting frequency in the financial sector. There are at least four reasons why findings for the nonfinancial sector are not directly applicable to banks. First, banks experience supervisory regulation that alters the costs and benefits of disclosure.[6] Second, banks' reporting environment provides greater tension for the cost and benefits of disclosure compared to that of nonfinancial firms (Goldstein and Sapra 2014). Third, banks are unique because their investors impose substantial externalities on each other—a feature that creates additional costs to disclosure, potentially affecting bank behavior. Fourth, the implications of theories relating reporting frequency to bank behavior are different from those focusing on the behavior of nonfinancial firms.[7] Perhaps due to all of these factors, our conclusions on the effects of reporting frequency differ from those for nonfinancial

---

[6] For example, examining the interplay between supervisory regulation and disclosure, Dang, Gorton, Holmström, and Ordonez (2017) suggest that increasing transparency in countries with strong supervision may be ineffective or even detrimental to bank behavior while increasing transparency in countries with weak supervision will be useful.

[7] For instance, in the context of managerial myopia, nonfinancial firms are expected to take too little risk because long-term risky undertakings like research and development projects lower short-run profitability. However, banks can increase short-run profitability by taking more risk.

companies (Ernstberger et al. 2017; Kraft et al. 2017).

Some caveats are in order. First, we only examine the loan quality of banks and focus on bank-level risk taking. There could be other effects associated with greater reporting frequency, such as a reduction in credit to a particular class of borrowers, which could adversely affect economic growth. Further, by design, we do not evaluate aggregate effects such as the stability of the financial system. Accordingly, our results concerning reporting frequency should not be interpreted as always good for the functioning of the financial system. Nor can we make such arguments at the company level—certain stakeholders could bear the costs of greater reporting frequency. Finally, regarding our tests on reporting regulation, we recognize that these decisions are not made in a vacuum and undertake several tests to mitigate the likelihood of concurrent changes driving our results.

BACKGROUND AND HYPOTHESES DEVELOPMENT

Real Effects of Bank Reporting Frequency

More frequently disseminated financial information allows market participants to have better insight into the functioning of a bank. Anticipating potential disciplinary effects, bank managers would be deterred from engaging in excessive risk-taking. In keeping with this view, Kanodia and Lee (1998) and Gigler et al. (2014) show that the anticipation of periodic performance reports has a disciplining effect on managers' ex ante investment decisions, thus reduce over-investment.

In addition to the discipline exerted by market participants, frequent reporting can also improve supervisory discipline, which could also affect banks' ex ante incentives (Stephanou 2010). Regulators can use the price movements of bank securities as an intervention (Hovakimian and Kane 2000; Kane 2004; Flannery and Thakor 2006). Further, the increased reporting allows market participants to exert pressure on bank regulators to intervene in troubled banks (Rochet

2005). Overall, the increase in the disciplinary force exercised by market participants and regulators due to greater financial reporting frequency could result in banks extending better quality loans and not indulging in excessive risk-taking ("disciplining effect").

In contrast to the above arguments, increasing the frequency of financial reporting could lead managers to make myopic decisions. Stein (1989) suggests that managers may be tempted to boost short-term stock prices at the expense of long-term profitability. Banks face pressure to maintain high stock prices not only from capital markets but also from regulators who may use observed prices to intervene. Banks operate in environments in which the actions they take are opaque, hard to verify, and susceptible to risk-shifting.

Therefore, banks may choose opportunistic portfolios to meet the expectations of capital markets or regulators, but these actions may reduce their long-term value.[8] In banking, a convenient way to increase short-run profitability is to take more risk. Banks can relax lending standards, which increases the yield on their loans but also impacts default rates (Ertan 2017). This suggests that increasing reporting frequency may cause banks to provide loans to risky borrowers that would result in short-term income but affect long-term balance sheet strength ("myopic effect").[9]

---

[8] Supporting this view, Edmans, Heinle, and Huang (2016) show that increasing the level of quantitative and verifiable "hard" information may improve price efficiency, but reduce investment efficiency in the presence of non-verifiable "soft" information. While incorporating more hard information into prices increases total information, it also distorts the relative amount of hard versus soft information. This imbalance skews the manager's decisions toward improving hard measures of performance at the expense of soft measures of performance. Another related channel that increases the cost of reporting frequency is that accounting measurement errors would become more severe if the measurement window is shortened due to more frequent disclosures. Kanodia and Mukherji (1996) and Kanodia, Sapra, and Venugopalan (2004) show how such measurement errors distort market pricing and create price pressure to forgo desirable investments that are not directly observable.

[9] A natural question that arises in the context of any voluntary reporting setting such as this study is if there are benefits to increased reporting frequency, why managers would not do so. One reason why we do not observe a corner solution is that the myopic effect may dominate the discipline effect in some banks. A shareholder value-maximizing manager in such banks will prefer to avoid the costs of myopia. In addition to the specific costs of increased reporting frequency, there are two other (possibly second-order) reasons why firms may choose lower levels of reporting frequency: Managers may trade-off proprietary costs of increased reporting frequency or may choose to report at a lower-than-optimal frequency due to agency issues.

Another downside of greater reporting frequency for banks is that it could lead to inefficient bank runs driven by coordination failures among depositors and short-run creditors (Diamond and Dybvig 1983). While depositors care about how well-capitalized or solvent a bank is, they are also mindful of what other market participants believe about the bank's financial condition. Thus, frequent reporting could impair market discipline (Holmström 2015; Gorton 2015). A setting like this leads each market participant to assign too much importance to public reports (Morris and Shin 2002), which provide an indication not only of the level of economic fundamentals but also about what other market participants know and will likely do. Thus, more frequent reporting could exacerbate inefficient bank runs.

Overall, greater reporting frequency can improve bank loan quality ("disciplining effect") or induce excessive risk-taking ("myopic effect").[10] We test these predictions using observable measures of lending quality and the capital provider's assessment of risk. Our first hypothesis can be formally stated as follows:

Hypothesis 1 (null): Bank reporting frequency has no effect on the quality of the loan portfolio.

We are also interested in examining the channels through which the disciplining and myopic effects operate. Specifically, one can attribute the disciplining effect to capital markets (depositors, creditors, and equityholders) or supervisors. We rely on cross-sectional analyses that our setting facilitates to ascertain the underlying channel. Customer deposits are the primary source of capital

---

[10] There is an alternative channel by which transparency and reporting regulations could affect firm behavior. Specifically, the regulations to increase the frequency of reports could boost the amount of information available to decision-makers inside the firm, which in turn improves the investment behavior of firms (Shroff 2017). Bhat, Ryan, and Vyas (2017) show that banks' credit risk modeling disclosures are positively associated with their provision for loan loss timeliness and negatively associated with their loan origination pro-cyclicality, consistent with a positive relation between these disclosures and banks' understanding of their credit risks. As such, we do not expect regulations related to changes in reporting frequency to operate through this channel. Specifically, reporting frequency in itself may not create an avenue for any new information to the managers since bank managers have more up-to-date information on bank performance. Moreover, our findings do not support this channel.

in banks. Depositors are likely to monitor the banks less when their claims are protected. Accordingly, we expect that market discipline would be stronger in settings where depositors have weak insurance. Similarly, the extent of regulatory supervision varies by country and over time, which allows us to examine the role of regulatory discipline. If the supervisory channel is operative, then we expect the relation between reporting frequency and loan quality to be greater in countries where regulatory monitoring is typically high.

The benefit of frequent reporting in reducing bank's risk-taking translates into a decline in credit risk. More frequently obtained insights into the bank's health can reduce unwarranted panic and rollover risk by mitigating the solvency concerns of liquidity providers (Gorton and Huang 2006; Ratnovski 2013). The primary concern of depositors and lenders is getting back their claims in full. This issue may result in a bank run or debt recall. Thus, the provision of more frequent reports about a bank's economic well-being should mitigate the concern of bank depositors and creditors as long as the bank is solvent. Greater reporting frequency could also reduce uncertainty and improve depositors' ability to ascertain the bank's health. Such effects would result in lower interest rates on deposits and lower spreads on credit instruments, such as CDSs.

Hypothesis 2 (null): Bank reporting frequency has no effect on deposit interest rates

or CDS spreads.

Reporting Environment in Europe and the Transparency Directive

The European economic market has evolved dramatically since the turn of the century, and banks' financial reporting and regulatory reporting policies are no exception. On the financial reporting front, in numerous jurisdictions, banks have been mandated to report on an annual or semi-annual basis. Though, some banks have been voluntarily reporting on a quarterly basis.

In addition to financial reporting to the public, banks also report to national bank regulators.

10

With the advent of the EU, two levels of regulatory authority supervise the banking system in Europe. The higher level of supervision arises from the banking regulator for the entire EU, the Committee of European Banking Supervisors (CEBS) (later renamed the European Banking Authority or EBA), established in 2004.[11] The second level of regulatory supervision is conducted by national central banks. The EBA collects information from supervised institutions and publishes aggregated data on the performance of the financial systems. The EBA requires annual regulatory reporting by individual banks but gives significant discretion to national regulators as to the extent and frequency of these reports. Hence, regulatory information is likely available to national regulators at differing frequencies.

Regulatory reporting is unique to the banking industry and poses two identification challenges. First, changes in this alternative set of reporting may confound the inferences that we attribute to financial reporting frequency. Second, central banks could make data on banks publicly available.[12] By the extent to which this information overlaps with the data provided in the financial reports, the role of financial reports could be marginalized.[13] We perform an extensive search to determine for each country the frequency of regulatory reporting and whether data on individual banks are made public. Because there is no central repository for this information, we gather the material directly (e.g., central bank employees) or indirectly (e.g., banking acts, regulator

---

[11] As an independent committee of European banking supervisors, CEBS/EBA has been responsible for promoting the consistent implementation of European Commission directives and convergence of supervisory practices in the member states and enhancing supervisory cooperation.

[12] For example, in the U.S., every national bank, state member bank, and insured non-member bank is required by the Federal Financial Institutions Examination Council (FFIEC) to file a call report as of the close of business on the last day of each calendar quarter. The specific reporting requirements depend on the size of the bank and whether or not it has any foreign offices. These reports have been required since 1935 and are made publicly available.

[13] Consistent with regulators reliance on financial reports, the federal financial supervisory authority in Germany (BaFin) states: "In addition to institutions' annual financial statements, the banking supervisors' main sources of information include the audit reports which external auditors or audit associations produce as part of their auditing of the annual financial statements." (BaFin and the Deutsche Bundesbank share banking supervision in Germany.)

https://www.bafin.de/EN/DieBaFin/AufgabenGeschichte/Bankenaufsicht/bankenaufsicht_node_en.html

websites). Overall, our search indicates that banks report to national supervisors on a regular basis but at differing frequencies. For example, the Banking Law in Germany requires annual reporting, but German banks need to disclose certain events on an as-and-when-it-happens basis. Moreover, no EU country makes regulatory reporting data on individual banks public.

Taken together, the regulatory and financial reporting landscape for European banks during our sample period has the following implications for our empirical analysis. First, country-level regulators do not publish data on credit institutions that would crowd out the effects of financial reporting. Second, the varying frequency of supervisory reporting may generate different effects of financial reporting on bank behavior. In particular, increasing financial reporting frequency in countries with strong supervision and a high frequency of regulatory reporting may be ineffective or even detrimental to bank behavior (Dang, Gorton, Holmström, and Ordonez 2017). In countries where supervisory reporting is sparse, increasing financial reporting frequency may not only improve direct market discipline by market participants but also enhance the disciplinary prowess of the country regulators.[14]

Transparency Directive

The EU Transparency Directive (TD) issued in 2004 required listed firms in member countries to issue IMS reports that contain (at least) a description of their financial position and performance in the first and third quarters, usually including earnings information. Member countries adopted the new reporting requirements, which entered into force in different years (2007–2009).[15] As Christensen et al. (2016) and Ernstberger et al. (2017) show, the adoption year

---

[14] EBA's supervisory regulation is unlikely to affect our identification. During our sample period, the EBA had little direct oversight on the banks, and has no additional data over and beyond that of national central banks. Further, the EBA has not required an increase in the frequency of reporting. Moreover, the EBA does not publish bank-level data, thus investors and stakeholders do not get financial reporting information from the EBA.

[15] Even though the adoption year is not selected randomly by member countries, our research on the events around the regulation does not suggest that this choice has anything to do with the asset quality of publicly traded banks.

by the EU-15 countries are as follows: Austria, Denmark, Finland, France, Germany, Greece, Ireland, Portugal, Spain, Sweden, and the U.K. (2007); Belgium and Luxembourg (2008); and Italy and Netherlands (2009). For the purpose of promoting a long-term corporate focus and of reducing the burden of preparing rather frequently released financial reports, regulators issued an amendment directive that abolished the quarterly reporting requirement, effective from November 2015 (Nallareddy et al. 2016).

An important feature of the TD was that it applied to all listed firms (not only to banks). Thus, it is unlikely for bank performance to have driven the adoption of these regulations. This alleviates a significant concern with regulation-based studies that the regulation decisions are not made in a vacuum and may not be completely exogenous to firm performance.

Mandated Quarterly Reporting in Japan and Singapore

A key issue in the context of the TD is that the directive does not require IMS reports to be full-fledged financial reports. These disclosures should include a discussion of material events and transactions that happened during the reporting period, as well as a description of the firm's performance and position. While we take into account this feature of the TD in our analyses by focusing on changes in the frequency of quantitative statements, the fact that the regulation gives banks the choice to provide quantitative or qualitative statements still leaves room for selection issues.

To deal with this issue, we also examine changes in mandated reporting frequency in Japan and Singapore to verify our findings and determine the importance of full-fledged financial reports. Regulators in Japan and Singapore required listed companies release financial reports on a quarterly basis (e.g., Stoumbos 2017). Before the quarterly reporting regulations, public companies publish financial statements twice a year in most of Japan. The Tokyo Stock Exchange required

listed firms to disclose full-scale quarterly financial statements from fiscal year April 2004 (Kubota and Takehara 2016). In Singapore, quarterly reporting rules went into effect in 2003 and applied to public firms with a market capitalization of over 75 million Singaporean Dollars (Kajüter, Klassman, and Nienhaus 2016).[16]

RESEARCH DESIGN

Measurement of Bank Outcome Variables

The primary outcome variable of interest is the quality of loan portfolios. To test the effect of reporting frequency on the quality of loan portfolios, we focus on nonperforming loans, which are loans that have either been restructured, are past due, or are no longer yielding accrued interest revenue. Nonperforming loans represent economic losses and forgone interest revenue related to the poor credit quality of the borrower. We employ nonperforming loans, the key performance metric for credit institutions (Wahlen 1994; Liu, Ryan, and Wahlen 1997; Cantrell, McInnis, and Yust 2014). As a check of robustness, we examine two alternative but complementary measures: loan loss reserves and the ratio of unreserved nonperforming loans to shareholders' equity. The former is more of an ex ante measure of credit risk, whereas the latter reflects the amount of nonperforming loans in excess of loan loss reserves as a fraction of shareholders' equity (i.e., owners' exposure to credit losses).[17]

We next investigate whether greater financial reporting frequency improves the (perceived) stability of the bank and boosts depositor confidence. Specifically, we examine the interest rate demanded by depositors, measured as the annual deposit expense as a percentage of total deposits. To understand the reaction of debtholders to increased reporting frequency, we

---

[16] The banks in our Singaporean sample are above this threshold.

[17] One relative advantage of nonperforming loans is that they are free from managerial discretion and estimation errors.

examine CDS spreads, a direct measure of lenders' perception of the bank's credit risk.

Empirical Estimation Model

Cross-sectional Model

We conduct our primary cross-sectional association analysis on a European sample of 417 public banks from 32 countries. We compare the behavior of banks with quarterly reporting frequency to that of banks with annual or semi-annual reporting frequency.[18] Specifically, we estimate the following regression specification:

$$Y_{i,t+1} = a + b_1 \ Quarterly \ reporting_{i,t} + \Theta \ CONTROLS + w_t + v_i + e_{i,t}. \tag{1}$$

In this model, *Y* is the outcome of interest (loan portfolio quality or credit costs) for bank *i*, measured at year *t*+1. *Quarterly reporting* is an indicator variable that equals one for banks that have published four quarterly reports in the year, and zero for other banks. *CONTROLS* is a vector of time-varying firm characteristics that could be linked to measures of lending quality and reporting frequency. This vector includes bank size, measured as the natural logarithm of total assets (*Size*). Larger banks might have better loan quality and higher loan growth if they are more diversified or better managed. We add a measure of balance sheet liquidity of the banks (*Liquidity*), calculated as the ratio of cash to the sum of short-term borrowing and deposits. We also employ a measure of leverage (*Leverage*), calculated as total liabilities divided by total assets. Conditional on size, banks with different levels of exposure to loans will experience different effects on the outcome variables. Accordingly, we use the fraction of gross loans to total assets (*Loan intensity*) and the annual percentage change in total loans (*Loan growth*) as controls. Further, we include the level of loan loss reserves (*Reserves*) and the income from loans (*Interest*

---

[18] We put all nonquarterly reporters in the same bin. Our findings are not sensitive to separating between annual and semi-annual reporters.

income). The cushion allocated for potential loan losses (i.e., loan loss reserves) is a forward-looking measure, capturing the bank's assessment of future problem loans. Loan interest income accounts for portfolio risk/income.

A key identification challenge in this study is that selection bias could drive any effect we attribute to financial reporting frequency. In particular, unobserved bank characteristics could determine reporting frequency, as well as loan portfolio quality. To allay this issue, we include bank fixed effects, which account for unobserved (time-invariant) bank characteristics. Econometrically, with bank fixed effects, we evaluate the companies that change their reporting frequency within our sample period.[19] The bank fixed effects also control for the cross-country variation in institutional features that may affect our inferences.[20] Also, we include year fixed effects to remove the potentially confounding effects of time trends.

The coefficient of interest in equation (1) is b_1, which measures the effect of quarterly reporting frequency on banking outcomes. When the outcome variable is *nonperforming loans*, a negative (positive) coefficient implies that an increase in reporting frequency is associated with higher (lower) levels of loan portfolio quality. When the outcome variable of interest is *deposit expense*, a positive (negative) coefficient implies that an increase in reporting frequency translates into higher (lower) levels of interest paid on deposits. When the outcome variable of interest is *CDS spreads*, a positive (negative) coefficient implies that greater reporting frequency is linked to higher (lower) CDS spreads.

Differences-in-Differences Design

Even though our cross-sectional tests include the above controls, we recognize that

---

[19] Standard errors are clustered at the bank level. Our findings are robust to clustering at the country-year, country, or year levels.

[20] For example, the definition of nonperforming loans varied across countries until recently (Beck, Jakubik, and Piloiu 2015; Bholat et al. 2016).

endogenous selection remains an issue if there are time-varying confounding factors at the bank level. That is, banks that opt for quarterly financial reporting might be different from those that do not, in ways other than financial reporting frequency just around the adoption of more frequent reporting. To address this challenge, we examine plausibly exogenous regulatory shocks to banks' disclosure frequency. Primarily, we look at the staggered introduction of the TD, which required listed firms in the EU to make public IMS reports of their financial position and performance. To examine the effect of these reports on loan quality, we estimate the following differences-in-differences specification:

$$Y_{i,t+1} = a + b_1\ Post_{i,t} \times TD\ Switcher_i + b_2\ Post_{i,t} + b_3\ TD\ Switcher_i + \Theta\ CONTROLS$$
$$+ w_t + v_i + e_{i,t}. \tag{2}$$

In equation (2), *TD Switcher* takes the value one for firms that switched to quarterly quantitative IMS reports in the year or the year after the country-level adoption of the TD. By design, the control group includes non-switchers.[21] Note that *TD Switcher* focuses only on banks that increase the number of IMS reports that provide earnings information in a year. This definition is critical because the TD does not mandate quantitative statements and gives banks the choice to provide qualitative statements as well. Thus, our definition of *TD Switcher* helps us focus on the effects of quantitative IMSs. The control banks in these tests are those that did not change the number of the IMS reports they provide around the transition period. *Post* indicates whether an observation is related to a year after the country's adoption of the TD (Ernstberger et al. 2017).[22] Thus, *Post*

---

[21] In additional analyses, we limit our attention to constant samples, as well as to samples that only include countries that increased financial reporting frequency (which provides a within-country-time design).

[22] The following countries move to interim reporting (the year of adoption is in parentheses) and, thus, include treatment banks: Austria, Denmark, France, Germany, Ireland, and U.K. (2007); Belgium and Luxembourg (2008); Netherlands (2009). Therefore, Finland, Italy, Portugal, and Spain, which had required quarterly reporting prior to the TD, do not include any treatment banks.

× *TD Switcher* compares changes in the behavior of firms that have experienced an increase in the frequency of quantitative statements pre- and post-regulation change (first difference) with the changes in the behavior of banks that have not experienced a regulation-induced switch (second difference).

We also examine financial reporting in Japan and Singapore, which mandated quarterly financial reports in 2004 and 2003, respectively. As discussed above, unlike the EU setting that gave companies the choice to provide qualitative or quantitative interim statements, regulations in Japan and Singapore mandated the release of full-fledged financial reports on a quarterly basis. In these tests, we use equation (2) to examine the nonperforming loans of banks in Japan and Singapore after their switch to quarterly reporting.[23] The banks in Japan that already reported on a quarterly basis are assigned to the control group. The sample size is significantly smaller in the Singaporean setting, and there are only a handful banks that had been quarterly reporting pre-treatment. Hence, we use banks in Hong Kong as a control group for Singapore.[24]

To sharpen our inferences, we saturate the estimation models with year and bank fixed effects (shown in the models as w_t and v_i, respectively). In addition to this structure, we believe that two features of our setting help us allay concerns with causality. First, we focus on cases in which the timing of the reporting frequency increase is plausibly exogenous to our variables of interest (such as nonperforming loans), hence it is unlikely that the timing systematically coincides with changes in bank-level growth opportunities or other bank characteristics. Second, the shocks to reporting frequency regimes are staggered over time. For any unobserved event or trend to confound our inferences, it would need to coincide systematically with the different

---

[23] Here, instead of *TD Switcher*, we define a similar indicator variable (*Treatment*), which equals one for banks that switched to quarterly reporting in the year after the TD adoption.

[24] Incidentally and reassuringly, Hong Kong did consider switching to mandatory quarterly reporting during the same period as Singapore but decided not to do so (Stoumbos 2017).

shocks to reporting frequency during our sample period.

DATA AND SUMMARY STATISTICS

We conduct our primary analysis on European public banks over the period of 2000–2014. We draw our data set from Bankscope. We require the Bankscope variable *Listed* to be coded as "delisted" or "listed" and the Bankscope International Securities Identification Number (ISIN) to be non-missing.[25] We obtain regression variables from Bankscope and define them in the Appendix. Since Bankscope files do not offer readily available reporting frequency figures, we collect the earnings reporting frequency variable from Worldscope (item 5200) and, if missing, from Factset (variable *ff_freq_code*).[26] One benefit of using these readily available variables is that they are, at least for the European banks in our sample, based on quantitative interim reports, rather than qualitative disclosures.[27]

Panel A of Table 1 shows a steady increase in the relative proportion of quarterly reporting banks, reflecting the overall move to frequent reporting. More clearly, Panel B of Table 1 confirms this observation around the TD for both the sample of banks used for our primary analyses, as well as for our control banks. The results in this panel echo the trend in an event portfolio sense. The relative proportions suggest an overall increase in quarterly reporters, with a sharper rise around the adoption of the TD.[28] Finally, Panel C displays the sample breakdown by country, as well as

---

[25] Bankscope also has a market capitalization variable, which is sometimes missing for public banks. Our results hold for banks with non-missing market capitalization. We also exclude Islamic and central banks from our analysis.

[26] Factset changed its definition of reporting frequency for observations after 2014. While researchers should be mindful of this methodology change, our paper is unaffected by it, as our sample period ends in 2014. (The main dependent variable, year-ahead nonperforming loans, is last available in 2015.)

[27] If there are still missing values, we use the distinct number of original filings recorded in a fiscal year by Capital IQ and Bankscope. These supplements constitute less than 15 percent of the sample and do not alter our conclusions.

[28] Proportionally fewer banks report on a quarterly basis in the TD countries, as per the difference between the percentage of quarterly reporters in Panels A and B. This is because the countries analyzed in the tests whose results shown in Panel B did not require quarterly reporting prior to the TD. This ratio does go up but does not become 100% because not all banks report full-fledged financial reports or quantitative financials.

reporting frequency within countries. There is representation from all countries with no one country dominating the sample. The largest fraction of the sample contributed by a single country is 15 percent (Italy). There is cross-country variation in the fraction of banks that report financial numbers at a quarterly frequency.

Table 2 presents descriptive statistics. Slightly more than half of the sample banks release quarterly reports. On the asset quality side, the average bank (median bank) classifies 6.44 percent (3.75 percent) of its loans as nonperforming and has set aside a reserve of 3.96 percent (2.74 percent). Depositors require 2 to 3 percent annual return, while the average CDS spread is 192 basis points. As for the control variables, the average bank (median bank) assets are over $140 billion ($15 billion), in raw levels. Short-term liquid assets constitute 31.28 percent of short-term funding and deposit liabilities, while shareholders' equity is about one-tenth of liabilities for the average bank. The mean return on equity of 6.85 percent and high interdecile range (~24 percent) are consistent with the heterogeneous landscape of the European banking sector. The average bank in our sample holds 64 percent of its assets in loans, obtains an annual interest income of 6.37 percent, and experiences an annual loan growth of 11.8 percent.

RESULTS

Reporting Frequency and Loan Portfolio Quality

Cross-sectional Association Tests

We first examine the effect of banks' financial reporting frequency on their loan portfolios (Hypothesis 1). We employ the year-ahead nonperforming loans as a fraction of total loans as the observable proxy for loan portfolio quality. Table 3 presents our main findings and shows ordinary least squares (OLS) estimates of equation (1). Our coefficient of interest is the coefficient b_1 on *Quarterly reporter*. In Panel A, in both specifications with and without controls, we find that the

coefficient on *Quarterly reporter* is negative and significant, which suggests a positive conditional association between quarterly reporting and loan portfolio quality. Economically, the magnitude of the coefficient in the model saturated with controls (column (2)) is –0.87 percent. Namely, relative to the sample standard deviation of nonperforming loans (7.83), a bank that becomes a quarterly reporter experiences an average marginal reduction in nonperforming loans of about 11 percent. We also note that the control variables behave consistently with prior evidence. For example, *Loan loss reserves* and *Interest income* are positively associated with the fraction of portfolio loans that do not perform.

In Panels B and C of Table 3, we verify that the positive link between quarterly reporting and loan portfolio quality holds for alternative subsamples and for alternative constructs of loan quality, respectively. Columns (1) and (2) in Panel B show that the effects of the frequency of reporting are not an artifact of, or subsumed by, the quality of financial reports. Specifically, we continue to find the main effect (in similar magnitude) within banks that report under IFRS and within banks that work with a Big Four auditing company. In Panel B, we also show that the conditional association between quarterly reporting and nonperforming loans holds in samples excluding the financial crisis (column (3)) and the countries that launched large-scale bailouts for domestic banks (column (4)). To rule out concerns with changes in sample composition and bank survivorships, we examine a constant sample of banks that appear in our data during the 2005–2013 period and find that our results continue to hold (column (5)).

Turning to alternative metrics of loan portfolio quality in Panel C of Table 3, we find that quarterly reporting is also associated with smaller future figures of *Unreserved NPLs to equity* (approximately 15 percent of the sample standard deviation) and of *Loan loss reserves* (representing over 5 percent of the sample standard deviation). These results support the idea that

the benefits of quarterly reporting are also observed on banks' ex ante assessment of repayment risk (*Loan loss reserves*), as well as their equity exposure to nonperforming loans (*Unreserved NPLs to equity*). In sum, the evidence in Table 3 suggests that higher frequency of reporting is associated with an improvement in the quality of banks' loan portfolios.

In Panel D of Table 3, we present evidence on the timing of the effects of quarterly reporting. On a sample restricted to having non-missing values for one-year, two-year, and three-year-ahead values for nonperforming loans, we show that the effects of quarterly reporting on loan portfolio quality are persistent. The strength of the effect sets in with a lag. Economically, we observe a 0.41 percent, 0.59 percent, and 0.65 percent decline in nonperforming loans one, two, and three years following the switch to quarterly reporting.[29]

Having documented a link between quarterly reporting and loan portfolio quality, we next explore the cross-sectional variation in this relation. First, we examine banks in countries with well-funded deposit insurance funds. We obtain this time-varying country-level information from the survey by Barth, Caprio, and Levine (2013). *Weak deposit insurance* equals one if the deposit insurance company's power is indexed to be less than one.[30] To examine the effect of supervisory monitoring, we define *Weak private monitoring* based on Barth et al.'s (2013) private monitoring index—an aggregation of several Yes/No questions in the survey they conduct, such as the extent of external auditing, credit rating agencies, or regulator's duty to make investigations public.[31] The findings in columns (1) and (2) of Table 4 suggest that the negative association between quarterly

---

[29] Interestingly, we find a flat/slightly declining structure when it comes to CDS spreads (a market-based measure), consistent with markets incorporating the benefits of quarterly reporting quickly (not tabulated).

[30] Barth et al. survey index number VIII.I. This question explores whether the deposit insurance authority has the authority to make the decision to intervene in a bank, take legal action against bank directors or officials, and has ever taken any legal action against bank directors or officers.

[31] Barth et al. survey index number VII.VI. This question measures whether the incentives/ability for the private monitoring of firms, with higher values indicating stronger private monitoring.

reporting and nonperforming loans is stronger when depositors are unsafe and private monitoring is feeble.[32] These results are consistent with the role for capital market discipline (depositors) and a less significant role for the supervisory channel.

We next examine the mediating role of capital market discipline in the main relation we document. If investors monitor bank behavior and act as a disciplinary force, we expect banks operating in regimes with greater stock market participation to exhibit even greater improvements in nonperforming loans when they switch to quarterly reporting. Our findings in column (3) provide support for this view. We find that the effect of quarterly reporting on nonperforming loans is more than doubled in countries with an above-median value for the ratio of the number of listed companies to the country's population—an objective rating of stock market participation developed by the World Bank.

Regulatory Shocks

The findings thus far suggest that greater financial reporting frequency is associated with higher quality loan portfolios. However, one concern is the potentially endogenous selection of banks' reporting frequency due to the omitted/unobserved time-varying characteristics of banks. In particular, banks that more frequently release financial reports might be different from other banks around the time when they choose to change the frequency in ways the econometrician does not observe or include in the estimation model. To overcome this challenge, we examine the effect of regulatory shocks related to reporting frequency. This differences-in-differences approach better isolates the effect of disclosure frequency on measures of bank behavior.

We first present the results from our investigation of the TD setting. As discussed above, in this test, the indicator variable *TD Switcher* equals one for banks that start to provide quarterly

---

[32] These samples have different sizes because the survey results are not available for each of the sample countries.

23

quantitative IMS reports around the adoption or the effective date of the TD. Note that *TD Switcher* focuses only on banks that increase the number of quantitative financial IMS reports. This definition is important because the TD does not mandate quantitative reports and gives banks the choice to provide qualitative reports as well.

Table 5 presents the results for equation (2). The coefficient of interest is *Post × TD Switcher.* Across both columns, this coefficient is negative and significant, suggesting that banks that moved to quarterly quantitative IMS reporting experienced a decline in nonperforming loans relative to the control banks. The 2.2 percent decline in the saturated model in column (2) represents about 28 percent of the sample standard deviation of nonperforming loans. This result corroborates our findings from the full sample tests above. The increase in economic magnitudes on this sample (relative to the primary cross-sectional analysis) is possibly driven by more precise identification.

In additional analyses, we test the robustness of the effect of the TD on bank performance. Specifically, in Table 6 we find similar results for *Unreserved NPLs to equity* and *Loan loss reserves* (Panel A). Similar to Panel C of Table 3, we confirm the findings from the TD on a sample of banks that report under IFRS and those that work with a Big Four accounting firm (columns (1) and (2) in Panel B of Table 6). Further, we show that the main effect holds on a sample that includes only the countries that moved from voluntary reporting to requiring interim management statements (column (3) in Panel B of Table 6) as well as in a constant sample (column (4) in Panel B of Table 6).[33] While the former sharpens the analysis from a within-country perspective, the latter alleviates the concerns with changing sample composition confounding the differences-in-differences analysis.

---

[33] Consistent with Ernstberger et al. (2017), the countries include Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Netherlands, and the U.K.

As discussed above, despite the identification benefits of the TD, the fact that the regulation gives banks the choice to provide financial reports or qualitative statements still leaves room for selection issues. To deal with this issue, we focus on changes in mandated reporting frequency in Japan and Singapore to verify our findings and determine the importance of full-fledged financial reports. In Singapore (2003) and Japan (2004), listed companies were required to release financial reports on a quarterly basis (e.g., Stoumbos 2017). We test the effects of these regulations on subsamples spanning 2000–2014, consistent with the period used in our European sample. (See Panel A of Table 7 for summary statistics of the Asian samples.)

We find that Japanese banks that switched to quarterly reporting also experience declining nonperforming loans relative to Japanese banks that had already been reporting on a quarterly basis (Panel B of Table 7). Likewise, the results in Panel C of Table 7 suggest that banks in Singapore that switched to quarterly reporting realize a decline in nonperforming loans relative to a control group, which consists of banks from Hong Kong where quarterly reporting was not mandated.[34]

A critical assumption in our regulation-based differences-in-differences tests is that the control and treatment groups behave similarly in the pre-treatment period (i.e., the parallel trends assumption). We verify whether this assumption holds in our sample by examining the period immediately before when the firms were induced to switch to quarterly reporting (i.e., a *Prior1,2* dummy variable that equals one within two years preceding the treatment and zero otherwise). The evidence in Table 8 indicates an insignificant coefficient for *Prior1,2 × Treatment* for each of the three regulation settings: Europe (TD), Japan, and Singapore.[35] Note that the coefficients on *Prior1,2 × Treatment* are insignificantly different from zero. These findings suggest that the

---

[34] Only a handful of Singaporean banks had reported on a quarterly basis prior to the regulation, a fact that renders a within-country analysis (like we do in Japan) infeasible. Therefore, the control group consists of Hong Kong banks.

[35] *Treatment* is not identified in the presence of bank fixed effects. *Post* and *Prior1,2* are not identified in the presence of a single treatment and year fixed effects in the Japanese and Singaporean settings.

treatment and control groups have similar levels of nonperforming loans in the pre-period, further mitigating the concern that confounding pre-treatment factors drive our results.

It is important to highlight that, even though we believe that the regulatory settings mitigate concerns with our cross-sectional analyses, regulation decisions are not made in a vacuum and may not be completely exogenous to firm performance.

Response by Capital Providers

In this subsection, we examine depositor and lender reaction to greater reporting frequency. If banks reduce their excessive risk-taking, this should result in a boost in depositor/creditor confidence, which would lower deposit rates and CDS spreads (Hypothesis 2). However, if banks have either increased the loan supply to poor quality borrowers without adequately charging them or have taken on excessive risk following an increase in reporting frequency, then we expect these stakeholders to react negatively.

We first examine the depositor response. Columns (1) and (2) of Table 9 report the results of implementing equation (1) with annual deposit expense as a percentage of outstanding deposits as the outcome variable (*Deposit expense*). Consistent with the idea that banks with higher reporting frequency are perceived to be safer, quarterly reporting banks' deposit interest rate decreases by about 9 percent (=0.243/2.704) relative to comparable banks with lower reporting frequency, as well as relative to themselves when they report at a lower frequency.

The second set of results pertains to the variation in the perceived riskiness of the banks. Specifically, we estimate equation (1) with CDS spread as the outcome variable (*CDS spread*). We measure CDS spreads at monthly and annual frequencies. Thus, our analyses are at the bank-month and bank-year levels. As before, we estimate specifications with both year and bank fixed effects. In Table 10, we find that banks that increase reporting frequency experience a decline in

CDS spreads. The coefficient on *Quarterly reporter* is negative and statistically significant across specifications at the monthly as well as yearly levels. In nominal terms, this effect varies between 40 and 60 basis points. Regarding the economic significance of the coefficients from the saturated models (columns (2) and (4)), the relative drop in the CDS spread translates to one-sixth of the sample standard deviation of CDS spreads (276 basis points). These findings suggest that increasing bank reporting frequency enhances depositor and creditor confidence.

Additional Analyses

We conduct several robustness checks that we do not tabulate for brevity. First, we examine the sensitivity of our results to the exclusion of bank fixed effects. As discussed above, bank fixed effects mitigate concerns that unobserved bank-level heterogeneity drives our results. However, the inclusion implies that the identification comes from banks that change their reporting frequency from semi-annual or annual to quarterly. We do not use the power of cross-sectional variation in banks' reporting frequency in this specification if it remains unaltered during the sample period. We observe that our results continue to hold without bank fixed effects.

Second, we revisit the selection issue in our cross-sectional tests analyses. They could be affected by the bank's choice to provide more frequent reports. Our analyses using regulatory shocks address this issue. An alternative approach would be to account for selection statistically. To this end, we perform the cross-sectional analyses in a propensity score-based matching (PSM) framework (Rosenbaum and Rubin 1983), which can mitigate the bias only to the extent that the selection is based on observables. We find that the PSM analysis yields similar inferences.

Third, we explore equityholders' reaction to increased reporting frequency. While we observe favorable responses from creditors and depositors, it is not clear whether the outcome is desirable from an equityholder perspective. In other words, the regulations may have increased

the soundness of banks but to the detriment of their profit-maximizing objective and their alignment with equity capital markets. Although bank equity is much smaller than the claims bank liabilities, including customer deposits and bank debt, we examine the stock returns (conditional on bank characteristics) around the promulgation of the TD. We determine March, April, and May 2004 as the months most associated with the TD.[36] Finally, since the TD affected the countries that had not imposed interim reports, we benefit from the variation provided within the group of EU countries. We find that non-quarterly reporters enjoy an increase in market value by over 1.5 percent relative to other banks, likely in anticipation of investors' positive expectations about quarterly reporting.[37]

Fourth, we examine the effect of reporting frequency on transparency. The enhanced monitoring and market discipline mechanisms put forth above assume that an increase in reporting frequency leads to an increase in the firm-level information available to the market. However, this is not obvious. For example, Gigler and Hemmer (1998) and Einhorn (2005) examine the interaction between firms' mandatory and voluntary disclosures. The authors argue that it is an open question as to whether an increase in mandatory disclosures will be offset by a decrease in voluntary disclosures, which in many cases could be a more precise indicator of firm value. To examine this issue, we employ the bid-ask spread, a market-based measure of transparency. Although this measure is not widely available in Europe, we compile a sample that includes bid-ask spreads from Capital IQ and find that bid-ask spreads decline for frequent reporters, consistent with increased transparency.

---

[36] The European Parliament approved the TD on March 30, 2004, and the unofficial version of the TD was published on May 11, 2004.

[37] We do not observe a significant cross-sectional variation with bank size in the positive response to the adoption of the TD. We also investigate the amendment of the TD. Consistent with the fact that many IMS providers continue to provide interim reports following the amendment of the TD, we do not find a significantly negative market reaction to the entities that provide quarterly disclosures.

CONCLUSION

We report evidence that greater reporting frequency is associated with improvements in loan portfolios consistent with monitoring via enhanced capital market discipline. Economically, the average bank in our European sample experiences an 11 percent relative decrease in its nonperforming loan portfolio after switching to quarterly reporting. Our results also indicate that banks with more frequently disseminated financial reports experience lower deposit interest rates and smaller credit default swap spreads, consistent with a positive reaction to increased disclosure by depositors and creditors. Collectively, we provide evidence on the effects of accounting reporting frequency on bank behavior.

Several unanswered questions could benefit from future research. First, even though our results suggest that more frequent financial reporting frequency improves banks' lending practices and other studies (e.g., Ertan, Loumioti, and Wittenberg-Moerman 2017) find that increased disclosures enhance the quality of lending, the precise implications of bank regulation for loan supply remain unexplored. Second, we do not examine the externality effects of increased financial disclosure. Third, by design, our evidence on the interplay between supervision and financial reporting and the net effect on bank behavior is rather preliminary. Future work could also investigate the costs of increased reporting frequency in the financial sector.

References

Acharya, V. V., and S. G. Ryan. 2016. Banks' financial reporting and financial system stability. *Journal of Accounting Research* 54 (2): 277–340.

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

Beatty, A. L., and S. Liao. 2011. Do delays in expected loss recognition affect banks' willingness to lend? *Journal of Accounting and Economics* 52 (1): 1–20.

Beatty, A. L., and S. Liao. 2014. Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics* 58 (2): 339–383.

Beck, R., P. Jakubik, and A. Piloiu. 2015. Key determinants of non-performing loans: New evidence from a global sample. *Open Economies Review* 26 (3): 525–550.

Bhat, G., S. Ryan, and D. Vyas. 2017. The Implications of Credit Risk Modeling for Banks. Working paper. Southern Methodist University, New York University, and the University of Toronto.

Bholat, D., R. Lastra, S. Markose, A. Miglionico, and K. Sen. 2016. Non-performing loans: Regulatory and accounting treatments of assets. Working paper. Bank of England, Queen Mary University, University of Essex, and the University of Reading.

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

Bushman, R. M. 2014. Thoughts on financial accounting and the banking industry. *Journal of Accounting and Economics* 58 (2): 384–395.

Butler, M., A. Kraft, and I. S. Weiss. 2007. The effect of reporting frequency on the timeliness of earnings: The cases of voluntary and mandatory interim reports. *Journal of Accounting and Economics* 43 (2): 181–217.

Cantrell, B. W., J. M. McInnis, and C. G. Yust. 2014. Predicting credit losses: Loan fair values versus historical costs. *The Accounting Review* 89 (1): 147–176.

Christensen, H. B., L. Hail, and C. Leuz. 2016. Capital-market effects of securities regulation: Prior conditions, implementation, and enforcement. *Review of Financial Studies* 29: 2885–2924.

Copelovitch, M., C. Gandrud, and M. Hallerberg. 2015. Financial regulatory transparency: New data and implications for EU policy. Working paper. University of Wisconsin–Madison and Hertie School of Governance.

Cuijpers, R., and E. Peek. 2010. Reporting frequency, information precision and private information acquisition. *Journal of Business Finance and Accounting* 37 (1–2): 27–59.

Dang, T.V., Gorton, G., Holmström, B., and Ordonez, G., 2017. Banks as secret keepers. *The American Economic Review*, 107 (4): 1005–1029.

Diamond, D. W., and P. H. Dybvig. 1983. Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*: 401–419.

Edmans, A., M. S. Heinle, and C. Huang. 2016. The real costs of financial efficiency when some information is soft. *Review of Finance* 20 (6): 2151–2182.

Einhorn, E. 2005. The nature of the interaction between mandatory and voluntary disclosures. *Journal of Accounting Research*, 43 (4): 593–621.

Ernstberger, J., B. Link, M. Stich, and O. Vogler. 2017. The real effects of mandatory quarterly reporting. *The Accounting Review* forthcoming.

Ertan, A. 2017. Real earnings management through syndicated lending. Working paper. London Business School.

Ertan, A., M. Loumioti, and R. Wittenberg Moerman. 2017. Enhancing loan quality through transparency: Evidence from the European Central Bank loan-level reporting initiative. *Journal of Accounting Research*, 55 (4): 877–918.

Falato, A., and D. S. Scharfstein. 2016. The stock market and bank risk-taking. Working paper. Federal Reserve Board, Harvard Business School, and NBER.

Flannery, M., and A. V. Thakor. 2006. Accounting, transparency and bank stability. *Journal of Financial Intermediation* 15 (3): 281–284.

Fu, R., A. Kraft, and H. Zhang. 2012. Financial reporting frequency, information asymmetry, and the cost of equity. *Journal of Accounting and Economics* 54 (2): 132–149.

Gigler, F., and T. Hemmer. 1998. On the frequency, quality, and informational role of mandatory financial reports. *Journal of Accounting Research* 36: 117–147.

Gigler, F., C. Kanodia, H. Sapra, and R. Venugopalan. 2014. How frequent financial reporting can cause managerial short-termism: An analysis of the costs and benefits of increasing reporting frequency. *Journal of Accounting Research* 52 (2): 357–387.

Goldstein, I., and H. Sapra. 2014. Should banks' stress test results be disclosed? An analysis of the costs and benefits. *Foundations and Trends in Finance*, 8 (1): 1–54.

Golin, J., and P. Delhaise. 2013. The bank credit analysis handbook: a guide for analysts, bankers, and investors. Singapore: John Wiley & Sons.

Gorton, G., and L. Huang. 2006. Bank panics and the endogeneity of central banking. *Journal of Monetary Economics* 53 (7): 1613–1629.

Gorton, G. 2015. Stress for success: A review of Timothy Geithner's financial crisis memoir. *Journal of Economic Literature* 53 (4): 975–995.

Granja, J. 2016. Disclosure regulation in the commercial banking industry: Lessons from the national banking era. Working paper. The University of Chicago.

Holmström, B. 2015. Understanding the role of debt in the financial system. Working paper. Massachusetts Institute of Technology and NBER.

Hovakimian, A., and E.J. Kane. 2000. Effectiveness of capital regulation at US commercial banks, 1985 to 1994. *Journal of Finance* 55 (1): 451–468.

Kajüter, P., F. Klassmann, and M. Nienhaus. 2016. Causal effects of quarterly reporting—an analysis of benefits and costs. Working paper. University of Münster.

Kane, E. J. 2004. Financial regulation and bank safety nets: An international comparison. Working paper. Boston College.

Kanodia, C., and D. Lee. 1998. Investment and disclosure: The disciplinary role of periodic performance reports. *Journal of Accounting Research* 36 (1): 33–55.

Kanodia, C., and A. Mukherji. 1996. Real effects of separating investment and operating cash flows. *Review of Accounting Studies* 1 (1): 51–71.

Kanodia, C., H. Sapra, and R. Venugopalan. 2004. Should intangibles be measured: What are the economic trade-offs? *Journal of Accounting Research* 42 (1): 89–120.

Kraft, A. G., R. Vashishtha, and M. Venkatachalam. 2017. Frequent financial reporting and managerial myopia. *The Accounting Review* forthcoming.

Kubota, K., and H. Takehara. 2016. Information asymmetry and quarterly disclosure decisions by firms: Evidence from the Tokyo Stock Exchange. *International Review of Finance*, 16(1):127–159.

La Porta, R., F. Lopez de Silanes, A. Shleifer, and R. Vishny. 1998. Law and finance. *Journal of Political Economy* 106: 1113–1155.

Liu, C., S. Ryan, and J. Wahlen. 1997. Differential valuation implications of loan loss provisions across banks and fiscal quarters. *The Accounting Review* 72, 133–146.

Morris, S., and H.S. Shin. 2002. Social value of public information. *The American Economic Review* 92 (5): 1521–1534.

Nallareddy, S., R. Pozen, S., and Rajgopal. 2016. Consequences of mandatory quarterly reporting: The UK experience. Working paper. Duke University, MIT, and Columbia University.

Nier, E., and U. Baumann. 2006. Market discipline, disclosure and moral hazard in banking. *Journal of Financial Intermediation* 15 (3): 332–361.

Ratnovski, L. 2013. Liquidity and transparency in bank risk management. *Journal of Financial Intermediation* 22 (3): 422–439.

Rochet, J. C. 2005. A framework for macro-prudential banking regulation. *Revista de economía* 12 (1): 5–16.

Rosenbaum, P., and D. Rubin. 1983. The central role of the propensity score in observational studies for causal effects. *Biometrika* 70: 41–55.

Shroff, N. 2017. Corporate investment and changes in GAAP. *Review of Accounting Studies* 22 (1): 1–63.

Stein, J. C. 1989. Efficient capital markets, inefficient firms: A model of myopic corporate behavior. *The Quarterly Journal of Economics* 104 (4): 655–669.

Stephanou, C. 2010. Rethinking market discipline in banking: Lessons from the financial crisis. Working paper. The World Bank.

Stoumbos, R. 2017. How does quarterly reporting reduce information asymmetry? Working paper. Yale University.

Wahlen, J. M. 1994. The nature of information in commercial bank loan loss disclosures. *The Accounting Review* 69 (3): 455–478.

Appendix: Variable Definitions

Variable Name	Definition
TD Switcher	Indicator equals one for banks starts reporting on a quarterly basis on the year after the Transparency Directive if the country did not require interim reporting prior to the Transparency Directive but did so after it.
Post	Indicator equals one following the country's adoption of the Transparency Directive.
Quarterly reporter[a]	Indicator equals one for quarterly reporting (Worldscope item 5200). If missing, Bankscope and Capital IQ files are used.
Nonperforming loans[b]	Nonperforming loans divided by gross loans (Bankscope item 18200).
Unreserved NPLs to equity[b]	Nonperforming that are not reserved for, divided by equity (Bankscope item 4038).
Deposit expense[b]	Deposit interest expense divided by total deposits (Bankscope item 18035).
CDS spread[c]	Annual average spread of the five-year CDS contract.
Size[b]	Total liabilities divided by total assets (based on Bankscope item 2025).
Liquidity[b]	The ratio of cash to the sum of short-term borrowing and deposits (Bankscope item 4035).
Profitability[b]	Return on equity (Bankscope item 4025).
Leverage[b]	Equity divided by total liabilities (Bankscope item 4012).
Loan loss reserves[b]	Allowance for loan losses divided by gross loans (Bankscope item 18205).
Loan intensity[b]	Gross loans divided by total assets (Bankscope item 2001 / item 2025).
Loan growth[b]	Annual percentage change in gross loans (Bankscope item 18195).
Interest income[b]	Loan interest income divided by gross loans (Bankscope item 18030).

Test-specific variables are defined in table notes and the text.

Sources:
[a] Worldscope and Factset
[b] Bankscope
[c] Markit

Table 1. Distribution of Bank Reporting Frequency

This table provides details of banks' financial reporting frequency in Europe. Panel A depicts the percentage distribution of quarterly reporting banks over time, and Panel B presents the distribution relative to the country-level adoption of the Transparency Directive. In Panel B, each row adds up to 100 and inferences are based on a constant sample; consistent with Christensen et al. (2016) and Ernstberger et al. (2017), the countries in question are Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Netherlands, and the United Kingdom, which did not require interim reporting prior to the Transparency Directive but did after. Panel C reports the distribution of quarterly reporting across countries.

Panel A. Reporting frequency over time

Time	Quarterly	Nonquarterly
pre-2005	47.06	52.94
2006	51.48	48.52
2007	53.74	46.26
2008	56.72	43.28
2009	59.92	40.08
2010	59.19	40.81
2011	59.79	40.21
2012	60.77	39.23
2013	58.39	41.61
2014	58.67	41.33

Panel B. Reporting frequency around the Transparency Directive (constant sample)

Relative Year	Quarterly	Nonquarterly
-3	25.84	74.16
-2	24.40	75.60
-1	26.79	73.21
0	33.01	66.99
1	37.32	62.68
2	40.19	59.81
3	43.54	56.46

Panel C. Distribution of reporting frequency across countries		
Country	Representation (%)	Within-country quarterly reporting (%)
Austria	2.16	76.5
Belgium	0.83	64.0
Bosnia & Herzegovina	2.09	4.3
Czech Republic	0.96	41.5
Denmark	4.29	90.9
Finland	1.06	86.6
France	8.14	16.8
Germany	4.78	66.6
Greece	2.66	84.0
Ireland	1.20	7.6
Italy	15.45	68.5
Luxembourg	1.16	14.3
Malta	1.36	0.0
Netherlands	1.40	29.2
Norway	10.33	79.7
Poland	6.41	75.7
Romania	1.20	13.9
Portugal	3.55	40.4
Slovenia	1.66	12.8
Slovakia	1.79	11.8
Spain	4.72	77.4
Sweden	2.23	93.4
Switzerland	4.65	15.9
Turkey	6.05	53.3
United Kingdom	3.95	14.4
Other	5.92	40.9
Total	100.00	

Table 2. Descriptive Statistics

This table presents summary sample statistics. The unit of observation is a bank-year. Variable definitions are in the Appendix. All continuous variables are in percentage points, except for *Size*, which is presented in the log form. A bank-year is coded as a *Quarterly reporter* if Worldscope earnings reporting frequency is coded as such. All other variables are defined in the Appendix.

	Mean	stdev	p10	p50	p90	*N*
Quarterly reporter	0.556					3,008
Nonperforming loans (%)	6.441	7.832	0.760	3.750	15.550	3,008
Deposit expense (%)	2.958	2.704	0.685	2.250	5.805	3,270
CDS spread (%)	1.916	2.760	0.153	1.089	4.248	491
Unreserved NPLs to equity (%)	28.064	40.470	1.640	14.480	69.610	2,275
Loan loss reserves[+] (%)	3.960	4.159	0.600	2.740	8.860	2,972
Controls:						
Size (natural logarithm)	9.615	2.282	6.613	9.588	12.687	3,008
Liquidity (%)	31.283	40.875	6.290	22.795	60.310	3,008
Profitability (%)	6.851	16.839	-3.930	8.690	19.690	3,008
Leverage (%)	10.927	13.576	3.970	8.210	17.540	3,008
Loan loss reserves (%)	3.803	4.020	0.600	2.620	8.300	3,008
Loan intensity (%)	63.990	19.981	35.113	67.109	86.459	3,008
Loan growth (%)	11.836	27.855	-6.960	6.890	33.220	3,008
Interest income (%)	6.371	4.471	2.930	5.415	10.600	3,008

[+] Year-ahead values slightly differ from the contemporaneous values used as a control variable.

Table 3. Bank Reporting Frequency and Loan Portfolio Quality

The unit of observation is a bank-year. The dependent variable is year-ahead nonperforming loans (as a percentage of gross loans, Bankscope item 18200). *Quarterly reporter* is an indicator that switches on for banks that produce quarterly financial statements. Panel B presents results estimated on four subsamples. Column (1) includes banks reporting under IFRS (Bankscope item *accstand*), and column (2) Big Four auditors (Bankscope item *auditor*). Column (3) excludes bank-years from the recent financial crisis. Column (4) drops the GIIPS countries (Greece, Ireland, Italy, Portugal, and Spain), which were unable to refinance their government debt or to bail out over-indebted banks during crisis. Column (5) includes estimation results over the period of 2006–2013 with 138 banks with non-missing observations (i.e., a constant sample). Panel C presents robustness results. The dependent variables are the ratio of unreserved nonperforming loans to equity (Bankscope data 4038) and loan loss reserves (Bankscope data 18205), both year-ahead values in percentage points. Panel D describes the link between quarterly reporting and nonperforming loans from zero to three years. Previous controls include the variables used in the regression for the results for Panel A. All variables are defined in the Appendix. *T*-statistics (in parentheses) are robust to within-bank correlation and heteroscedasticity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Quarterly Reporting and Nonperforming Loans

	(1)	(2)
	Nonperforming loans	*Nonperforming loans*
Quarterly reporter	-0.726**	-0.869**
	(-2.15)	(-2.26)
Size		0.811
		(1.65)
Liquidity		-0.014**
		(-2.28)
Profitability		-0.051***
		(-4.68)
Leverage		-0.061*
		(-1.95)
Loan loss reserves		1.180***
		(12.03)
Loan intensity		0.042**
		(2.14)
Loan growth		-0.007*
		(-1.67)
Interest income		0.282***
		(4.43)
Observations	3,008	3,008
Adjusted R-squared	0.603	0.775
Year FE	YES	YES
Bank FE	YES	YES

Panel B. Quarterly Reporting and Nonperforming Loans in Alternative Subsamples

	(1)	(2)	(3)	(4)	(5)
	IFRS only	Big Four auditors only	Excluding 2008-2009	Excluding GIIPS	Constant sample
	Nonperforming loans	*Nonperforming loans*	*Nonperforming loans*	*Nonperforming loans*	*Nonperforming loans*
Quarterly reporter	-1.080*	-0.905**	-0.971**	-0.995**	-1.151*
	(-1.80)	(-2.09)	(-2.38)	(-1.98)	(-1.75)
Observations	2,113	2,703	2,512	2,178	1,072
Adjusted R-squared	0.805	0.772	0.796	0.794	0.805
Previous controls	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES

manuscript

Panel C. Alternative Measures of Loan Portfolio Quality

	(1)	(2)
	Unreserved NPLs to equity	*Loan loss reserves*
Quarterly reporter	-6.048**	-0.220*
	(-2.37)	(-1.66)
Size	7.466**	0.343
	(2.33)	(1.63)
Liquidity	-0.025	-0.004*
	(-0.77)	(-1.76)
Profitability	-0.437***	-0.015***
	(-6.01)	(-3.42)
Leverage	-0.054	-0.002
	(-0.36)	(-0.04)
Loan loss reserves	2.665***	0.755***
	(5.28)	(12.37)
Loan intensity	0.422***	0.015**
	(3.40)	(2.42)
Loan growth	-0.006	-0.004*
	(-0.23)	(-1.85)
Interest income	0.655	0.062*
	(1.02)	(1.90)
Observations	2,561	2,972
Adjusted R-squared	0.662	0.843
Year FE	YES	YES
Bank FE	YES	YES

Panel D. Nonperforming loans

	(1)	(2)	(3)	(4)
	Nonperforming loans t	*Nonperforming loans* t+1	*Nonperforming loans* t+2	*Nonperforming loans* t+3
Quarterly reporter	-0.355	-0.411*	-0.589**	-0.651**
	(-1.59)	(-1.78)	(-2.12)	(-2.00)
Observations	2,191	2,191	2,191	2,191
Adjusted R-squared	0.789	0.714	0.653	0.656
Previous controls	YES	YES	YES	YES
Bank and Year FE	YES	YES	YES	YES

Table 4. Cross-sectional Variation in the Relation between Quarterly Reporting and Nonperforming Loans

The unit of observation is a bank-year. This table presents results from cross-sectional tests in which the dependent variable is year-ahead nonperforming loans (as a percentage of gross loans, Bankscope item 18200). *CS variable* is an indicator in each of the four columns. *Weak deposit insurance* and *weak private monitoring* are sample median values of the distribution obtained from the survey provided by Barth et al. (2013). The former is based on question VIII.I, the deposit insurance power, and the latter is question VII.VI, private monitoring. *Strong market discipline* equals one for banks, whose countries have above-median value for the number of listed companies per 1,000,000 people in the IMF Global Financial Development Database (item GFDDOM01). Previous controls include the variables used in Panel A of Table 3. All other variables are defined in the Appendix. *T*-statistics (in parentheses) are robust to within-firm correlation and heteroscedasticity. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)
	CS Variable: Weak deposit insurance	CS Variable: Weak private monitoring	CS Variable: Strong market discipline
	Nonperforming loans	*Nonperforming loans*	*Nonperforming loans*
Quarterly reporter × *CS Variable*	-1.637**	-1.425**	-1.002*
	(-2.08)	(-2.00)	(-1.73)
Quarterly reporter	-0.088	0.098	-0.659*
	(-0.15)	(0.16)	(-1.66)
CS Variable	4.260***	0.033	-2.872***
	(4.21)	(0.05)	(-3.30)
Observations	2,719	2,719	2,922
Adjusted R-squared	0.788	0.782	0.766
Previous controls	YES	YES	YES
Year FE	YES	YES	YES
Bank FE	YES	YES	YES

Table 5. Bank Reporting Frequency and Asset Quality: Transparency Directive

The unit of observation is a bank-year. The dependent variables are year-ahead nonperforming loans in Panel A. *Post* is an indicator that switches on for years that the Transparency Directive has been in effect in the country of the bank, the information on which is obtained from Christensen et al. (2016). *TD Switcher* is a dummy variable that equals one if the bank increased its reporting frequency in the year when its country adopted the Transparency Directive and started requiring interim financial statements (i.e., Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Netherlands, and the United Kingdom). All other variables are defined in the Appendix. *T*-statistics (in parentheses) are robust to within-firm correlation and heteroscedasticity. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
	Nonperforming loans	*Nonperforming loans*
Post × *TD Switcher*	-3.361***	-2.237**
	(-2.99)	(-2.34)
Post	0.285	0.713
	(0.43)	(1.57)
Size		0.683
		(1.37)
Liquidity		-0.014**
		(-2.31)
Profitability		-0.051***
		(-4.70)
Leverage		-0.063**
		(-2.03)
Loan loss reserves		1.177***
		(12.04)
Loan intensity		0.041**
		(2.11)
Loan growth		-0.007
		(-1.53)
Interest income		0.277***
		(4.28)
Observations	3,008	3,008
Adjusted R-squared	0.603	0.774
Year FE	YES	YES
Bank FE	YES	YES

Table 6. Transparency Directive and Asset Quality: Additional Tests

The unit of observation is a bank-year. This table presents additional tests from the Transparency Directive. *Post* is an indicator that switches on for years that the Transparency Directive has been in effect in the country of the bank, the information on which is obtained from Christensen et al. (2016). *TD Switcher* is a dummy variable that equals one if the bank increased its reporting frequency in the year when its country adopted the Transparency Directive and started requiring interim financial statements (i.e., Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Netherlands, and the United Kingdom). In Panel A, the dependent variables are the ratio of unreserved nonperforming loans to equity (Bankscope data 4038) and loan loss reserves (Bankscope data 18205), both year-ahead values in percentage points. Panel B presents results estimated on four subsamples. Column (1) includes banks reporting under IFRS (Bankscope item *accstand*), and column (2) big four auditors (Bankscope item *auditor*). Column (3) includes only the countries of *TD Switchers*, listed above. The sample presented in column (4) is limited to banks from these countries with non-missing regression variables three years before and after the Transparency Directive. All other variables are defined in the Appendix. *T*-statistics (in parentheses) are robust to within-firm correlation and heteroscedasticity. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Other Measures of Lending Quality around the Transparency Directive

	(1)	(2)
	Unreserved NPLs to equity	*Loan loss reserves*
Post × TD Switcher	-21.333**	-0.494*
	(-2.10)	(-1.83)
Post	12.817***	0.660***
	(3.21)	(3.04)
Size	6.374**	0.337*
	(2.44)	(1.94)
Liquidity	-0.032	-0.004*
	(-0.74)	(-1.77)
Profitability	-0.445***	-0.015***
	(-5.07)	(-3.26)
Leverage	-0.075	-0.002
	(-0.45)	(-0.05)
Loan loss reserves	2.647***	0.755***
	(3.86)	(13.87)
Loan intensity	0.435***	0.017***
	(2.79)	(2.61)
Loan growth	0.000	-0.004*
	(0.01)	(-1.87)
Interest income	0.641	0.061
	(0.76)	(1.19)
Observations	2,561	2,972
Adjusted R-squared	0.665	0.844
Bank and Year FE	YES	YES

Panel B. The Transparency Directive in Alternative Subsamples

	(1)	(2)	(3)	(4)
	IFRS only	Big Four auditors only	Treatment countries only	Constant sample
	Nonperforming loans	*Nonperforming loans*	*Nonperforming loans*	*Nonperforming loans*
Post × TD Switcher	-2.246***	-2.385**	-1.371*	-2.095***
	(-3.23)	(-2.48)	(-1.74)	(-2.81)
Post	1.531***	0.881*	0.209	1.040***
	(3.13)	(1.93)	(0.33)	(2.68)
Observations	2,113	2,703	838	1,492
Adjusted R-squared	0.806	0.772	0.859	0.802
Previous controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES

Table 7. Bank Reporting Frequency and Asset Quality: Alternative Regimes

The unit of observation is a bank-year. The dependent variable is year-ahead nonperforming loans (as a percentage of gross loans, Bankscope item 18200). Panel A presents descriptive statistics for the Japanese and Singaporean analyses. In Panel B, *Treatment* switches on for Japanese banks that moved to quarterly following 2004, after the Tokyo Stock Exchange requirement. The control group consists of other public banks in Japan. In Panel C, *Treatment* switches on for banks in Singapore, which moved to quarterly reporting in 2003. The control group includes a group of Singaporean banks that did not switch to quarterly reporting in 2003 as well as banks from Hong Kong, which do not release financial reports on a quarterly basis. *Post* in Panel A (Panel B) equals one for years after 2004 (2003). All other variables are defined in the Appendix. *T*-statistics (in parentheses) are robust to within-firm correlation and heteroscedasticity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Descriptive Statistics

Japan

	Mean	stdev	p10	p50	p90	N
Nonperforming loans (%)	5.111	3.481	2.060	4.110	9.220	1,689
Size (natural logarithm)	10.168	1.199	8.749	10.079	11.442	1,689
Liquidity (%)	9.742	10.609	3.470	6.770	17.220	1,689
Profitability (%)	0.426	15.477	-9.550	3.890	8.980	1,689
Leverage (%)	7.642	9.997	3.520	5.400	8.270	1,689
Loan loss reserves (%)	2.514	3.040	0.880	1.760	4.200	1,689
Loan intensity (%)	67.009	11.252	55.771	67.518	77.796	1,689
Loan growth (%)	1.730	13.504	-4.450	1.190	6.680	1,689
Interest income (%)	3.122	4.117	1.550	2.130	3.030	1,689

Singapore and Hong Kong

	Mean	stdev	p10	p50	p90	N
Nonperforming loans (%)	1.768	2.592	0.220	0.790	5.190	198
Size (natural logarithm)	10.006	1.734	7.121	10.071	12.092	198
Liquidity (%)	30.769	25.192	13.470	25.805	42.620	198
Profitability (%)	11.230	6.018	4.450	10.565	17.750	198
Leverage (%)	20.539	32.242	8.450	11.590	27.230	198
Loan loss reserves (%)	1.628	1.827	0.280	1.045	4.450	198
Loan intensity (%)	55.590	14.115	41.679	53.094	76.641	198
Loan growth (%)	108.298	1340.063	-1.140	9.955	27.260	198
Interest income (%)	5.797	5.899	2.260	3.835	9.310	198

	(1)	(2)
Panel B. Differences-in-Differences: Japan		
	Nonperforming loans	*Nonperforming loans*
Post × Treatment	-2.094*	-0.761**
	(-1.88)	(-2.58)
Size		-1.098
		(-1.47)
Liquidity		0.075***
		(4.08)
Profitability		-0.019***
		(-3.35)
Leverage		0.023
		(1.06)
Loan loss reserves		0.345***
		(5.21)
Loan intensity		0.026
		(1.42)
Loan growth		-0.013*
		(-1.77)
Interest income		-0.084
		(-0.84)
Observations	1,689	1,689
Adjusted R-squared	0.696	0.793
Year FE	YES	YES
Bank FE	YES	YES

Panel C. Differences-in-Differences: Singapore & Hong Kong

	(1)	(2)
	Nonperforming loans	*Nonperforming loans*
Post × Treatment	-2.634***	-1.742**
	(-2.96)	(-2.40)
Size		-0.562
		(-0.93)
Liquidity		0.029**
		(2.30)
Profitability		-0.002
		(-0.10)
Leverage		-0.163***
		(-9.65)
Loan loss reserves		0.623***
		(5.71)
Loan intensity		0.051*
		(1.89)
Loan growth		-0.001***
		(-6.90)
Interest income		-0.071
		(-0.93)
Observations	198	198
Adjusted R-squared	0.744	0.924
Year FE	YES	YES
Bank FE	YES	YES

Table 8. Plausibly Exogenous Shocks to Bank Reporting Frequency:
Testing the Parallel Trends Assumption

The unit of observation is a bank-year. The dependent variable is year-ahead nonperforming loans (as a percentage of gross loans, Bankscope item 18200). *Prior1,2* is an indicator variable that equals one for banks one or two years before their countries adopt the respective quarterly reporting requirements, and zero otherwise. In columns (2) and (3), *Post* and *Prior1,2* are not identified in the presence of year fixed effects and of a single treatment (i.e., one for Japan and another for Singapore). These variables are identified in column (1) because of the staggered adoption of the Transparency Directive across Europe. *Treatment* is not identified in any of the models because of bank fixed effects. All variables are as defined in Tables 6 and 7. Previous controls include the variables used in Panel A of Table 3. *T*-statistics (in parentheses) are robust to within-firm correlation and heteroscedasticity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Europe (Transparency Directive)	Japan	Singapore
	Nonperforming loans	*Nonperforming loans*	*Nonperforming loans*
Post × Treatment	-2.683**	-0.898**	-1.801***
	(-2.29)	(-2.49)	(-2.85)
Prior1,2 × Treatment	-0.621	-0.372	-0.108
	(-0.63)	(-0.84)	(-0.18)
Post	0.845**		
	(1.98)		
Prior1,2	0.686		
	(1.49)		
Treatment			
Observations	3,009	1,689	198
Adjusted R-squared	0.774	0.793	0.923
Year FE	YES	YES	YES
Bank FE	YES	YES	YES

Table 9. Bank Reporting Frequency and Deposit Funding Costs

The unit of observation is a bank-year. The dependent variable is the one-year-ahead deposit expense as a percentage of total deposits (Bankscope item 18035). All other variables are defined in the Appendix. *T*-statistics (in parentheses) are robust to within-firm correlation and heteroscedasticity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
	Deposit expense	*Deposit expense*
Quarterly reporter	-0.212**	-0.243*
	(-2.02)	(-1.91)
Size		0.387**
		(2.27)
Liquidity		-0.004*
		(-1.94)
Profitability		-0.003
		(-0.90)
Leverage		-0.000
		(-0.07)
Loan loss reserves		-0.011
		(-0.73)
Loan intensity		0.008
		(1.35)
Loan growth		0.002
		(0.95)
Interest income		0.181***
		(4.99)
Observations	3,270	3,270
Adjusted R-squared	0.627	0.642
Year FE	YES	YES
Country FE	YES	YES
Bank FE	NO	NO

Table 10. Bank Reporting Frequency and Bank Credit Quality

The unit of observation is a bank-month in columns (1) and (2) and bank-year in columns (3) and (4). The dependent variable is the annual average of the five-year credit default swap (CDS) spread, in percentage points. All other variables are defined in the Appendix. *T*-statistics (in parentheses) are robust to within-firm correlation and heteroscedasticity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	CDS Spread (monthly)	*CDS Spread* (monthly)	*CDS Spread* (yearly)	*CDS Spread* (yearly)
Quarterly reporter	-0.406**	-0.455**	-0.608**	-0.462*
	(-2.16)	(-2.04)	(-2.25)	(-1.95)
Size		0.254		0.383
		(0.70)		(0.89)
Liquidity		0.007		0.007
		(1.27)		(1.11)
Profitability		-0.024***		-0.046***
		(-3.17)		(-5.18)
Leverage		-0.185**		-0.152
		(-2.18)		(-1.61)
Loan loss reserves		0.165**		0.187**
		(2.31)		(2.46)
Loan intensity		0.039**		0.056***
		(2.02)		(3.45)
Loan growth		-0.004		-0.005
		(-0.95)		(-1.53)
Interest income		-0.099		-0.054
		(-1.49)		(-0.65)
Observations	5,191	5,191	491	491
Adjusted R-squared	0.575	0.642	0.543	0.674
Year FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES