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[Ertan, A](#), Loumioti, M and Wittenberg-Moerman, R

(2017)

Enhancing loan quality through transparency: evidence from the European Central Bank loan level reporting initiative.

Journal Of Accounting Research, 55 (4). pp. 877-918. ISSN 0021-8456

DOI: <https://doi.org/10.1111/1475-679X.12162>

Wiley

<https://onlinelibrary.wiley.com/doi/abs/10.1111/14...>

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**Enhancing Loan Quality through Transparency:
Evidence from the European Central Bank Loan Level Reporting Initiative**

Aytekin Ertan

London Business School
London NW1 4SA, United Kingdom
aertan@london.edu

Maria Loumioti

MIT Sloan School of Management
Cambridge, Massachusetts 02142
loumioti@mit.edu

Regina Wittenberg-Moerman*

Marshall School of Business, The University of Southern California
Los Angeles, California 90089
reginaw@marshall.usc.edu

December 2016

* Accepted by Philip Berger. This paper greatly benefited from discussions with European Data Warehouse (ED) personnel, securitized credit specialists from two large European banks and credit analysts in Moody's local offices in Italy, Spain and Germany regarding the first loan level ABS reporting initiative. We are also thankful to ED staff for their guidance and support in understanding the data structure. We are grateful to Jan Bouwens, Jean-Edouard Colliard (discussant), Mark DeFond, Cem Demiroglu, Douglas Diamond, David Erkens, Michelle Hanlon, Chris Higson, Anya Kleymenova, Christian Leuz, Robin Litjens, Mike Minnis, Maria Ogneva, Tjomme Rusticus, Hareesh Sapra, Andrew Sutherland, Ahmed Tahoun, Irem Tuna, Florin Vasvari, Chris Williams (discussant) and the conference participants at the Banque de France - Toulouse School of Economics conference, the Tilburg University Spring Camp, the HKUST Accounting Research Symposium, the FARS Annual Meeting, 10th Annual Tel-Aviv University Conference, the UCLA-USC-UCI Symposium and workshop participants at the London Business School, Massachusetts Institute of Technology, the Ohio State University, the University of Chicago Booth School of Business, the University of Southern California, and the University of Texas at Dallas for helpful comments. We thank Blake Sainz and Yina Yang for their excellent research assistance. Aytekin Ertan, Maria Loumioti and Regina Wittenberg-Moerman acknowledge research support from London Business School, MIT Sloan School of Management and the University of Southern California, respectively. An Online Appendix to this paper can be downloaded at <http://research.chicagobooth.edu/arc/journal-of-accounting-research/online-supplements>.

**Enhancing Loan Quality through Transparency:
Evidence from the European Central Bank Loan Level Reporting Initiative**

Abstract

We explore whether transparency in banks' securitization activities enhances loan quality. We take advantage of a novel disclosure initiative introduced by the European Central Bank, which requires, as of January 2013, banks that use their asset-backed securities as collateral for repo financing to report securitized loan characteristics and performance in a standardized format. We find that securitized loans originated under the transparency regime are of better quality with a lower default probability, a lower delinquent amount, fewer days in delinquency and lower losses upon default. Additionally, banks with more intensive loan level information collection and those operating under stronger market discipline experience greater improvement in their loan quality under the new reporting standards. Overall, we demonstrate that greater transparency has real effects by incentivizing banks to improve their credit practices.

Keywords: Securitization; Asset-backed securities; Transparency; Credit risk; Credit standards; Loan quality

JEL classifications: G14; G21; G23; M41

1. Introduction

Loan securitization is an important credit market practice that allows banks to diversify credit risk and gain liquidity and offers borrowers easier access to credit (e.g., Shin [2009]). However, securitization was blamed for playing a detrimental role in the 2008 global financial crisis by giving rise to severe agency problems in loan underwriting, screening and monitoring (e.g., Keys et al. [2010], Garmaise [2015]). These agency problems were primarily attributed to structural inefficiencies inherent in securitization, such as the complexity and opacity of securitized loan portfolios. In the aftermath of the crisis, regulators and investors called for greater transparency in banks' securitization activities, which would facilitate better assessment and pricing of banks' risk-taking by credit market participants. However, whether transparency can have *real effects* on a bank's credit practices and risk-taking behavior by improving the quality of securitized loans has yet to be empirically explored.

We attempt to address this question by taking advantage of the novel securitized loan level reporting requirements introduced by the European Central Bank (ECB) for banks that borrow from the ECB's repurchase (repo) financing operations by pledging as collateral their asset-backed securities (ABS). From January 2013 onwards, banks that use their ABS for repo borrowing are required to quarterly report loan level data on the structure and performance of their securitized loan portfolios in a detailed and standardized format set by the ECB. A bank that fails to adhere to these new reporting requirements cannot borrow from the ECB's repo operations, which can be costly given the very low interest rates the ECB offers (ECB Euro Money Survey [2012]). A third party agency, the European DataWarehouse (ED), administers the data collection, monitoring and control process under the new reporting regime. Access to ED data is open to banks, non-bank institutional investors, regulators and credit rating agencies.

This reporting initiative represents the first loan level disclosure for the portfolios of asset-backed securities globally. The ECB's primary objective for mandating this reporting system is to facilitate better risk assessment in securitized transactions and to restore investor confidence in the securitized loan market.

We expect that greater transparency in banks' securitization activities will incentivize them to issue and securitize better quality loans. Under the new reporting regime, banks are required to quarterly report very detailed loan- and borrower-specific information. We presume that the comprehensive and recurring information collection and reporting required by the new standards will result in a greater information set being available to banks for making credit decisions. In turn, this will enhance banks' screening efforts and underwriting standards, leading to higher quality loans relative to those issued under the pre-transparency regime. Further, we expect the new reporting requirements to result in stronger market discipline. Detailed loan level disclosure should assist investors and regulators in more accurately assessing the riskiness of securitized loan portfolios. Moreover, these disclosures are standardized and will therefore allow these institutions to compare credit standards and securitized loan performance across banks. This greater oversight should further incentivize banks to issue better quality loans.

However, greater transparency may not result in higher loan quality. Over the past few years, the ECB has relaxed its lending standards for banks participating in repo financing. Thus, these banks may not feel pressured to improve their underwriting standards and decrease risk-taking. Relatedly, since the participating banks are highly leveraged, they may not have sufficient resources to be able to invest in training personnel and improving their monitoring and control systems to utilize the large amount of information collected. Further, the inherent complexity of a securitized credit structure may prevent investors from accurately assessing loan portfolio

riskiness even when loan performance measures are reported, which may discourage banks from improving their securitized loan quality.

To test our research question, we employ data on the SME (small and medium-sized enterprise) loan-backed securities reported to the ED from the first quarter of 2013 to the second quarter of 2014.¹ The sample covers 974,717 unique SME loans issued to 606,396 borrowers by 37 banks located in Italy, Spain, Portugal, France, The Netherlands, Germany and Belgium. These loans were originated over the period from 2009 through 2014 and securitized in 73 unique SME loan-backed ABS deals. We focus on four primary loan performance metrics reported by participating banks —whether a loan is in default, the amount of late loan principal and interest payments (delinquent amount), the number of days that loan payments are delayed for (days in delinquency) and the expected loss if the borrower defaults on the loan (loss given default).

Supporting our hypothesis that transparency enhances loan quality, we find that securitized loans originated under the transparency regime (transparency loans hereafter) are of higher quality compared to previously issued loans, controlling for bank, loan and firm characteristics as well as ABS deal fixed effects. More specifically, transparency loans experience a 2.01 percent lower default probability than non-transparency loans do, which represents 28.71 percent of the mean default probability of our sample loans. Transparency loans also experience 0.20 percent lower delinquent amounts and 4.20 percent fewer days in delinquency, representing 21.73 percent and 23.52 percent of the respective mean values for the sample loans. Relative to non-transparency loans, transparency loans are also expected to experience a 2.40 percent

¹ SMEs are considered one of the most important drivers of GDP growth in Europe (the European Commission's 2013/2014 SME Performance Review). In particular, SMEs constitute over 99 percent of European companies and contribute 58 cents of every euro value added in the EU business sector, employing about 70 percent of the European workforce.

smaller loss given default, which translates into 8.30 percent of the mean loss given default, further suggesting that the reporting banks strengthen their loan screening standards under the transparency regime.

Note that employing ABS deal fixed effects helps us to alleviate, at least partially, the concern that our results are driven by securitized loan market dynamics, such as changes in banks' loan issuance and securitization activities over time. We further address this concern by taking advantage of the staggered adoption of the loan level reporting requirements. We focus on loans issued by banks that adopted the reporting standards in the first two quarters of 2013 and compare them to loans originated over this period by non-reporting banks (i.e., banks that started borrowing from the ECB's repo operations and adopted the standards in later quarters). We continue to find that transparency loans are of higher quality relative to loans originated in the same period by non-reporting banks.

We also recognize the possibility that our results can be driven by the ECB's closer monitoring of its repo borrowers, not by its reporting requirements. To mitigate this concern, we limit our sample to banks that used ECB repo borrowing prior to January 2013, since these banks were already subject to ECB monitoring prior to the transparency regime. We continue to show a significant quality improvement for loans originated under the transparency regime. These analyses also alleviate the concern that banks strategically chose when to adopt the new standards, as banks that borrowed from the ECB prior to the transparency regime were required to adopt the new standards in the first quarter of 2013.

Next, we attempt to identify the channels through which transparency affects securitized loan quality. Consistent with our expectations that the comprehensive information collection required by the ECB enhances banks' screening efforts and underwriting standards, we find that banks

with more intensive loan level information collection experience a greater improvement in the quality of loans originated under the transparency regime. We also find that both the mandatory and voluntary information disclosure components contribute to the improvement in loan quality. In addition, we present evidence supporting our prediction that the effect of transparent reporting on loan quality is greater when market discipline is stronger. We find that banks that operate under more intensive investor and regulatory oversight (i.e., when credit and securitization practices can be easily compared across banks) experience a greater improvement in loan quality.

We further examine whether our results are affected by banks' strategically selecting which loans to securitize under the transparency regime. Banks may securitize better quality loans, while retaining worse quality loans as non-securitized on the balance sheet. Also, banks may opt to pledge their better performing ABS as repo collateral (i.e., ABS secured by better quality SME loans). In such cases, bank's credit riskiness should increase in the post-adoption period. However, we find that banks experience a significant decrease in their credit riskiness, as reflected by their lower credit default swap (CDS) spreads and bonds' yield to maturity, suggesting that the new standards incentivized banks to improve their underwriting standards and loan quality. We further document that bond bid-ask spreads decrease in the transparency period, consistent with new bank disclosures reducing investor information asymmetry regarding banks' credit riskiness. Moreover, we find that the effect of transparent reporting on bank credit riskiness and information asymmetry varies with the channels through which transparency affects loan quality. We show a greater effect of transparent reporting on CDS spreads, bond yields to maturity and bond bid-ask spreads when banks' information collection is more extensive and market discipline is stronger.

Our paper contributes to the literature in several important ways. First, we expand the

research on agency costs in loan securitization, such as banks' lower screening and monitoring efforts (e.g., Keys et al. [2010], Keys et al. [2012], Wang and Xia [2014], Kara et al. [2015],) and the misreporting of borrowers' information (Demyanyk and Van Hemert [2011], Garmaise [2015]). We complement these studies by showing that greater transparency in banks' securitized loan portfolios can alleviate agency costs in structured credit.

Second, we contribute to the growing literature on the role of transparency in the banking industry (e.g., Jordan et al. [2000], Beatty and Liao [2014], Bushman [2014], Kleyменова [2015], Acharya and Ryan [2016]). In particular, we extend the studies that examine the role of transparency in alleviating banks' risk-taking behavior (e.g., Cordella and Yeyati [1998], Blum [2002], Bushman and Smith [2003], Nier and Baumann [2006], Goldstein and Sapra [2013], Bushman and Williams [2015]). We also add to recent studies that investigate how regulators can discipline bank managers by introducing more transparent reporting standards (e.g., Freixas and Laux [2011], Costello, Granja and Weber [2015]). Further, Granja [2016] shows that financial statement disclosures promoted the stability and development of the 19th century state banking system. Our contribution lies in showing a direct link between reporting transparency via loan level disclosures and the quality of banks' lending decisions.

Third, our paper is relevant to the research on the role of banks' reporting in credit crises (e.g., Ryan [2008], Laux and Leuz [2010], Barth and Landsman [2010], Kothari and Lester [2012], Laux [2012], Badertscher, Burks and Easton [2012], Bischof and Daske [2013], Bischof et al. [2015]). We find that the transparent reporting of the characteristics and performance of asset-backed securitizations can improve loan underwriting standards and discipline bank managers. We thus provide important evidence on the real effects of disclosure, i.e., how transparency can alter managerial decision making (e.g., Gigler et al. [2014], Kanodia and Sapra [2016]).

Lastly, we contribute to the emerging literature on the role of transparency in improving operational decisions and organizational performance (e.g., Buell, Kim and Tsay [2015], Mohan, Buell and John [2015], Christensen et al. [2016]). Taking advantage of the fact that we can directly observe securitized loan performance, we are able to delineate two important channels through which transparency leads to better credit practices. We show that both the information collection and the market discipline channels are instrumental in ensuring higher loan quality.

2. Securitization, the ECB loan level reporting initiative and hypotheses development

2.1 SME LOAN SECURITIZATIONS

SME loan securitization is a structured finance practice that allows banks to diversify and transfer their SME credit risk exposures.² Securitization is administered through special purpose entities (SPE) that are originated by banks. These entities pool a large portfolio of SME loans from banks' balance sheets (typically called securitized loans or assets) and use the cash flows from these loans (i.e., the principal and interest payments) as collateral to issue new debt (typically called asset-backed securities or ABS). Loans that are securitized are usually highly leveraged and are therefore costly for banks to hold on their balance sheets due to regulatory capital requirements. However, certain ABS characteristics – most importantly diversification and credit enhancements – hedge ABS deals from borrowers' idiosyncratic credit risks. Consequently, the majority of ABS tranches are highly rated (i.e., usually AAA or AA rated). Appendix A provides additional institutional details about the SME loan securitization process.

SME loan-backed ABS deals constitute the second largest securitization market in Europe (after residential mortgage-backed securities) in terms of both the amounts outstanding and new

² Based on European Commission guidelines, SMEs are firms with (i) fewer than 250 employees, and (ii) either annual sales below EUR 50 million or total assets below EUR 43 million (the European Commission, "The New SME Definition", January 2005). Market participants in Europe usually refer to these guidelines to define the SME loan market (Moody's Investor Service, "European SME Asset-Backed Securities: A Guide", October 14 2014).

issuances (AFME Reports [2014]). Prior to the financial crisis, a great portion of SME loan-backed ABS tranches were sold to institutional investors, since the European securitization market was relatively liquid. Usually, the senior highly rated tranches were sold to investors, while banks retained the most junior tranches. However, following the collapse of the securitization markets in Europe in 2009, European banks have retained about 90% of their newly issued SME loan ABS, reducing their credit risk by selling off low quality loans and retaining higher rated ABS (AFME Data Reports [2014]). The annual SME loan issuance in the Eurozone remained stable in the post-crisis period, representing about 35 percent of total corporate loan issuance and 5 percent of banks' total assets over the 2010-2014 period (ECB Statistical Data Warehouse).

In the post-crisis era, the ECB has served as the primary investor in the majority of ABS deals in the Eurozone and provided banks with a very important source of liquidity. Specifically, banks used their retained ABS as collateral for the ECB's repurchase agreement ("repo") financing, i.e., short-term borrowing collateralized by ABS. Importantly, the ECB lends very high amounts at below market level interest rates for repo backed by ABS, making this facility a preferable source of liquidity for Eurozone banks (European Money Market Survey [2012]; Moody's Report on European SME ABS Market Landscape [2015]).³

2.2 AGENCY COSTS IN SECURITIZATION

Prior studies find that securitization gives rise to agency problems in loan underwriting and monitoring. In the years preceding the crisis, loan securitizations led to banks' lowering their credit standards as well as their screening and monitoring efforts (e.g., Keys et al. [2010], Keys

³ In particular, the ECB allowed for a larger collateral base by (i) reducing the rating threshold for ABS from AAA in 2010 to A- in 2011 and to BBB- in 2012, and (ii) reducing the ABS haircut in repo agreements (i.e., the difference between market price and the ECB purchase price) from 15 percent on a AAA- to A-rated ABS in 2010 to 11 percent in 2013. Moreover, the ECB implemented a number of interest rate cuts of 25 basis points (in November and December 2011 and May and December 2013) and extended financing with longer maturities.

et al. [2012], Wang and Xia [2014]). There is also evidence that securitization caused the mispricing of credit risk (e.g., Nadauld and Weisbach [2011], Ivashina and Sun [2011], Kara et al. [2015]). Moreover, rating agencies underestimated the credit risk in asset-backed securities, which further fueled the agency problems associated with securitization (e.g., Benmelech and Dlugosz [2009]).

The credit crisis that escalated in the US in 2008 and expanded to Europe in early 2009 revealed structural inefficiencies in loan securitizations, causing investors to panic over hidden information with respect to securitized loan quality and bank managers' loan screening and monitoring activities (Gorton [2008]). In particular, a lack of transparency in the ABS deals' underlying loan portfolio structure and quality caused lending counterparties to demand higher spreads and more collateral, essentially freezing liquidity in the credit market and leaving the majority of the global banking system effectively insolvent (e.g., Gorton and Metrick [2012]).

In the aftermath of the credit crisis, several institutions actively involved in the loan securitization market created the Global Joint Initiative to promote market recovery and liquidity (e.g., the Securities Industry and Financial Markets Association, the American Securitization Forum, the European Securitization Forum). The Initiative's steering committee identified the demand for greater transparency as a catalyst for restoring market discipline and investors' confidence. Detailed disclosure of securitization activities and loan underwriting decisions might have deterred banks from excessive risk-taking behavior, since a transparent environment would allow regulators to monitor banks more effectively and institutional investors to price credit risk more accurately (Goldstein and Sapra [2013]).

2.3 THE EUROPEAN CENTRAL BANK LOAN LEVEL REPORTING INITIATIVE

In line with the global call for greater transparency in loan securitizations, in 2013 the ECB introduced the first ABS loan level reporting standards in Europe, requiring that banks disclose, every quarter, granular data on ABS portfolio structure and performance. The ECB argues that in the past “assessments of asset-backed securities have been hampered by the lack of standardized, timely and accurate information on single loan exposure.” The ECB thus posits that the loan level reporting initiative will help investors (and other third parties) with their due diligence and the risk assessment of the ABS deals, and, ultimately, “greater transparency will help to restore confidence in the securitization market”.

The ECB launched in December 2009 a technical group of banks, ECB representatives, non-bank institutional investors and credit rating agencies to determine the requirements of the new reporting standards and the design of the ABS loan level standardized data templates. Standardization aimed to render securitized loan portfolio performance comparable across different banks. Figure 1 provides a detailed illustration of the ECBs’ loan level reporting initiative timeline. In April 2011, the technical group first announced the reporting standards for SME loan- -backed ABS, to which banks participating in repo borrowing had to adhere from January 2013.⁴

Under the new standards, banks are required to report information on securitized loan characteristics and performance (e.g., loss given default, expected default probability, actual defaults and late payments). These data are categorized in mandatory fields that banks are required to disclose (e.g., loss given default, loan defaults and days in default) and optional fields (e.g., the borrower’s accounting performance, the bank’s internal borrower rating and foreclosure costs). The classification of mandatory and optional fields was determined by the ECB technical

⁴ Starting January 2013, new reporting requirements are imposed also on residential mortgage-backed ABS. The loan level reporting requirements were expanded to other ABS classes – auto-, consumer loan-, credit-card- and commercial mortgage-backed ABS.

group based on the relative importance (for investors) and the collection costs (for banks) of specific loan level information.⁵

Loan level reporting is facilitated by the European Datawarehouse (ED). Launched in June 2012, the ED is the central repository of ABS information that administers data collection and compliance with ECB reporting standards. In addition, the ED performs data consistency and accuracy checks for the reported data, such as testing for the inappropriate or excessive use of missing variables and examining significant deviations in key information variables compared to previous submissions. As of June 2014, the ED covered loan level data on 719 ABS deals across Eurozone countries (491 mortgage-backed, 122 SME loan-backed and 76 auto loan-backed deals). ABS loan level data has more than 160 institutional subscribers across Europe and the US.

2.4 HYPOTHESIS DEVELOPMENT

Greater transparency in banks' securitization activities under the ECB's reporting initiative is likely to enhance their lending decisions. We hypothesize that securitized loans originated under the transparency regime will be of better quality than previously issued and securitized loans, primarily for two reasons. First, according to the new reporting standards, participating banks are required to collect and quarterly report very detailed loan- and borrower-specific information. We expect that the comprehensive information collection and recurring reporting imposed by the ECB under the transparency regime will provide banks with a greater amount of loan and borrower information on which they can rely in making lending decisions. This will likely allow banks to enhance their screening efforts and underwriting standards. We therefore expect the greater information collection required by the new reporting standards to result in banks' issuing

⁵ The ECB allowed banks a nine-month transition period to improve their information collection and fully comply with the mandatory information reporting requirements.

and securitizing better quality loans.

Second, we expect the reporting initiative to increase market discipline, with greater investor and regulatory oversight incentivizing banks to issue higher quality securitized loans. Detailed disclosures at the loan level should allow these institutions to better assess the underlying risk of the loan portfolio backing an ABS deal. Moreover, the standardization of loan level disclosures will facilitate the comparison of underwriting standards and securitization activities across banks, further helping investors and regulators to better evaluate banks' credit practices.

Even though the majority of institutional investors do not currently actively purchase newly issued SME loan-backed ABS, they are likely to intensively analyze and monitor them to better understand the securitization practices of participating banks in anticipation of entering back into the market when the ECB decreases or ceases its heavily discounted repo financing. In addition, a significant number of SME loan-backed ABS issued pre-crisis and purchased by institutional investors are still outstanding over our sample period. Loan level information on SME loan-backed ABS should provide investors with a useful benchmark in evaluating the riskiness of these deals. Furthermore, investors are likely to monitor and analyze loan level reporting data to assess the overall riskiness of participating banks. SME loans represent an economically significant asset that banks hold (ECB European Statistical Warehouse Data Reports [2015]). The detailed data on the characteristics and performance of SME loans should also provide investors with important insight into the reporting banks' overall underwriting and monitoring practices, thus helping them to evaluate other loan types issued by these banks.

Although we expect that greater transparency will induce banks to issue better quality loans, we recognize several factors that may confound our hypothesis. First, over the past few years, the ECB has lowered credit standards in an effort to support highly leveraged banks (ECB Euro

Money Survey [2012]). Due to the ECB's comparatively laxer standards, reporting banks may not be incentivized to enhance loan quality. Second, the inherent complexity in securitized portfolio structures may deter investors from effectively processing loan level information, which could discourage banks from improving securitized loan quality.⁶ Third, greater information collection on loan and borrower performance might not immediately translate to better decisions by loan officers. To enhance credit decision quality, banks may also need to invest in training personnel, improving their monitoring and control systems and potentially restructuring loan divisions. Banks using ECB repo borrowing are highly leveraged or under severe liquidity constraints and thus may not be able to make such investments upon adopting the new reporting standards. Moreover, even if banks do invest in credit quality enhancing activities, we may fail to find an improvement in loan quality as a longer time period may be needed to implement the changes in a bank's infrastructure. As a result, whether transparency in securitized loan portfolio structure improves loan quality remains an open question.

3. Data sources and sample selection

We obtain our dataset on securitized SME loans from the ED. These loans were reported by banks to the ED over the 2013Q1–2014Q2 period. The SME loan level reporting requirements include 48 mandatory and 65 optional variables grouped in six categories: loan, ABS pool and bank identifiers, borrower information (e.g., postcode, industry, segment) and financials (e.g., sales, net income, long-term debt), loan characteristics (e.g., size, maturity, purpose), loan interest rate details (e.g., base rate, loan interest payment frequency) and loan performance information (e.g., defaults, loan delinquent amount). While reporting data on borrowers'

⁶ Indeed, Principia's [2012] recent survey of structured finance investors reveals investors' concerns with respect to integrating and utilizing loan level data to achieve an efficient and consistent analysis of ABS deals. See Principia's Q4 2012 survey, "Trends in ABS, MBS & CDOs Loan Level & Collateral Performance Data," (http://www.ppllc.com/OurNews/Articles/Principia_ABS_Loan_Level_Performance_Data_Report.pdf).

accounting performance is optional, the remaining categories include both mandatory and voluntary variables.

The ED securitized loan population covers 1,769,342 unique SME loans issued over the period 2000-2014 to 967,913 borrowers and securitized in 122 ABS deals by banks in Portugal, Spain, France, Belgium, Italy, Germany and The Netherlands, i.e., all Eurozone countries active in SME loan securitizations. The population of securitized SME loans includes 6,159,883 observations at the loan-quarter level. We exclude 497,636 loans originated before 2009 to eliminate loans originated over the credit bubble (we thus eliminate 43 ABS deals originated prior to 2009).⁷ Moreover, we exclude 109,516 loans whose originating bank name cannot be uniquely identified, 104,034 loans with a missing interest rate, amount and/or maturity⁸ and 83,439 loans where the data recording date is after the loan maturity date or before the loan start date. Our final sample includes 974,717 loans to 606,396 SMEs issued by 37 banks and pooled in 73 ABS deals from 2009 to 2014 (i.e., 2,961,217 observations at the loan-quarter level). Panel A of Table 1 describes the sample selection process.

Panel B of Table 1 reports the distribution of borrowers and loans by country of origination and reporting quarter. The majority of loans and borrowers come from banks in Spain, Italy and Belgium, consistent with the banks in these countries significantly engaging in SME loan securitizations. In Panel C, the distribution of ABS deals (SPEs) and banks by country of origination and reporting quarter also yields interesting insights. The overall number of ABS deals and banks tends to increase over time, consistent with the ECB's looser credit standards allowing banks easier access to repo financing over our sample period (ECB Euro Money Survey

⁷ The period from 2000 to 2009 is the period of credit expansion and lax credit standards in Europe (SIFMA [2015]). Including loans originated before 2009 in our final sample, i.e. loans originated throughout the credit boom, yields statistically stronger results (untabulated).

⁸ This information is missing primarily for loan entries over the grace period (the first three quarters of 2013), when participating banks were not required to report all mandatory variables.

[2012]).⁹

4. Variable definitions and summary statistics

To examine the effect of reporting transparency on securitized loan quality, we use four loan performance measures: (i) loan loss given default (*Loss given default*), (ii) the ratio of a borrower's late principal and interest payments to the loan balance outstanding (*Delinquent amount*), (iii) the natural logarithm of the number of days a borrower delays interest and principal payments (*Number of days in delinquency*), and (iv) an indicator variable reflecting whether a borrower defaulted on the loan (*Default*). All variables are described in detail in Appendix B. Table 2 reports the summary statistics for these measures. The mean probability of default (*Default*) is 7.00 percent. The mean delinquent amount to the current loan balance (*Delinquent amount*) is 0.92 percent and the mean natural logarithm of the number of days a borrower delays interest and principal payments (*Number of days in delinquency*) is 0.17, i.e., 5 days. The low mean values for the delinquent amount and the days in delinquency are driven by the low default rates for the sample loans. Excluding well performing loans (i.e., loans with zero delinquencies or defaults), the mean delinquent amount is 10.82 percent and the mean number of days in delinquency is 62 days (untabulated). The mean loss given default (*Loss given default*) is 29.00 percent.

We define transparency loans (*Transparency loan*) using an indicator variable reflecting whether a loan's origination date is after the quarter when the originating bank adopted the new reporting standards. The mean value of *Transparency loan* is equal to 0.13, indicating that thirteen percent of the sample loans were originated under the transparency regime. Next, we

⁹ As some banks had not completed their reporting by our data collection date, we observe a smaller number of ABS deals and banks for the second quarter of 2014.

proxy for banks' reporting practices and investor and regulatory oversight. First, we look at a bank's information collection efforts. Under the new reporting standards, banks must explain why a variable (mandatory and optional) is not reported using the following classification: data are not collected because they are not required by the underwriting standards (ND1), data are collected but not loaded in the reporting system (ND2), data are collected but loaded in a separate system from the reporting one (ND3), data are collected but will only be available in future quarters (ND4), data are not relevant at the present time (ND5) or data for continuous variables are missing (ND Other). Our proxy for the extent of a bank's information collection with respect to a specific loan is the natural logarithm of the number of non-missing variables by loan entry each quarter, i.e., the number of variables that do not fall into the above six categories (*Information collection*). Similar proxies for information collection associated with banks' lending activities have been used in prior studies (e.g., Lisowsky et al. [2016], Minnis and Sutherland [2016]). The mean value of the *Information collection* variable is 4.48, suggesting that banks quarterly report, on average, 88 of the 113 variables per loan over our sample period.

Second, we proxy for investor and regulatory oversight on banks' credit practices that likely disciplines banks' lending decisions. We presume that market discipline will be stronger when these institutions have more information available to assess and compare similar lending decisions across different banks. We posit that they will compare performance primarily across loans issued over the same time period and to borrowers in the same industry and geographical location. Thus, for each sample loan we identify its origination year and the two-digit zip code and industry of the borrowing firm. We then estimate the total number of loans issued to other borrowers in the same year, industry and two-digit zip code (comparable loans), as reported by peer banks each quarter. *Market discipline* is the natural logarithm of the total number of

comparable loans reported by peer banks. The mean value of *Market discipline* is 4.96, reflecting that, on average, peer banks report 142 comparable loans per quarter.

We also employ a battery of loan characteristics that prior studies have shown to affect loan performance. Specifically, we proxy for loan riskiness by the interest rate (*Interest rate*) and an indicator variable reflecting whether the loan is collateralized (*Secured*). We further control for the time to maturity (*Years to maturity*), which is associated with the time-varying probability of a borrower's default (e.g., Rodriguez [1988]).¹⁰ We show that the mean interest rate for the loans in our sample is 4.21 percent, while 60 percent of the sample loans are collateralized. The mean natural logarithm of outstanding loan maturity is 1.18, which reflects 3.50 years to loan maturity.

In addition, we proxy for a bank's screening effort upon origination and presume that screening incentives are weaker for loans securitized upon origination, relative to loans that a bank securitizes following origination, i.e., after retaining loan ownership at least for some time (Bozanic, Loumioti and Vasvari [2016]). We proxy for the time to securitization using the ratio of the loan balance outstanding upon securitization to the original loan amount (*Securitized loan amount*), with lower values indicating a longer time period up to a loan's securitization. The mean value of the *Securitized loan amount* is 77.00 percent, suggesting that the majority of our sample loans were securitized soon after their origination. Lastly, we control for relationship loans (*Lending relationship*) that may exhibit better performance (e.g., Agarwal and Hauswald [2010], Chang et al. [2014]). We define *Lending relationship* as an indicator variable that equals one if the borrower has taken a loan from the same bank over the five-year period prior to the current loan origination date. Thirty-six percent of the sample loans are issued to borrowers that have prior lending relationships with their banks.

¹⁰ In robustness tests (untabulated), we replace the time to maturity with the number of years since loan origination scaled by the loan maturity in years or the number of years since loan origination; our results remain unchanged.

5. Research design and empirical results

5.1 TRANSPARENT REPORTING AND SECURITIZED LOAN QUALITY

To examine the effect of reporting transparency on securitized loan quality, we employ an ordinary least square (OLS) model where the dependent variable is one of the following performance measures: *Delinquent amount*, *Number of days in delinquency* or *Loss given default*. We also use a probabilistic model where the dependent variable is an indicator variable reflecting whether a borrower defaulted on the loan (*Default*).

$$\begin{aligned} \text{Loan performance} = & \alpha + \beta_1 \text{Transparency loan} + \beta_2 \text{Interest rate} \\ & + \beta_3 \text{Secured} + \beta_4 \text{Years to maturity} \\ & + \beta_5 \text{Securitized loan amount} + \beta_6 \text{Lending relationship} \\ & + \text{Loan purpose FE} + \text{Loan type FE} + \text{Borrower type FE} \\ & + \text{Borrower industry FE} + \text{Reporting quarter FE} + \text{ABS deal FE} \end{aligned} \quad (\text{Model 1})$$

Our main independent variable of interest – *Transparency loan* – is equal to one if the loan was originated after the bank initiated transparent loan level reporting, and zero otherwise. In line with our prediction that transparency increases loan quality, we expect the coefficient on this variable (β_1) to be negative. We control for *Interest rate*, *Secured*, *Years to maturity*, *Securitized loan amount* and *Lending relationship*. We also include in the analyses loan purpose (operating, investing, financing, other), loan type (term loan, revolving facility, other), borrower type (public company, limited company, partnership, individual, other) and borrower industry (1-digit NACE [Nomenclature of Economic Activities] classification) fixed effects. Moreover, we control for reporting calendar quarter fixed effects to capture the variation in the reporting behavior of participating banks over time.

Importantly, we also include ABS deal fixed effects in our analyses, thus estimating the variation in loan quality within the ABS deal (i.e., we estimate the performance of transparency loans relative to other loans in the same ABS deal). This approach allows us to account for the

ABS deal's structural features as well as the characteristics of the lending bank that are potentially associated with loan quality (in SME loan securitizations, all loans in the deal are typically originated by the same bank). In addition, since sample loans are usually securitized soon after their origination and due to the fact that we measure the variation in loan quality within an ABS deal, ABS deal fixed effects also allow us to control for variations in loan characteristics and quality over time. In all analyses, standard errors are clustered at the ABS deal level.

Panel A of Table 3 reports the results of this test. Across all specifications, we find a negative and significant coefficient on the *Transparency loan* variable, suggesting that transparency loans, i.e., loans originated after the bank joined the transparent reporting initiative, are of better quality. Specifically, transparency loans have a 2.01 percent lower default probability (*Default*) than non-transparency loans do, which represents 28.71 percent of the mean default probability of our sample loans. Transparency loans also experience 0.20 percent lower delinquent amounts (*Delinquent amount*) and 4.20 percent fewer days in delinquency (*Number of days in delinquency*), representing 21.73 percent and 23.52 percent of the respective mean values for the sample loans. Relative to non-transparency loans, transparency loans are also expected to experience a 2.40 percent smaller loss given default (*Loss given default*), which translates into 8.30 percent of the sample's mean loss given default, further suggesting that participating banks strengthen their underwriting standards under the new reporting regime.¹¹

The coefficients on the control variables are consistent with our expectations. Loans to risky borrowers, as measured by *Interest rate* and *Secured*, experience a worse performance following issuance. In specification (IV), the negative coefficient on *Secured* is in line with collateralized

¹¹ We also analyze the effect of transparency on *Delinquent amount* and *Number of days in delinquency* when we restrict our sample to non-performing loans. We continue to find a significant effect of transparency on these variables (untabulated).

loans having a smaller loss given default. Loans with a longer time to maturity experience a better performance (e.g., Rodriguez [1988]). The positive coefficient on *Securitized loan amount* suggests that loans originated to be securitized are of low quality, as they experience a higher amount of late loan payments and more days in delinquency. Consistent with relationship lenders' stronger due diligence, loans issued by these lenders have a significantly stronger performance.

The results presented in Panel A of Table 3 are consistent with our hypothesis that reporting transparency improves securitized loan quality. However, an important potential concern is the possibility that our findings may be driven by changes in banks' loan issuance and securitization activities over time, which we may not sufficiently control for by using ABS deal fixed effects. Thus, the negative coefficient on *Transparency loan* may be capturing an evolution in securitized loan market dynamics that is unrelated to reporting transparency. To address this concern, we take advantage of banks' staggered adoption of ECB reporting standards. Thus, we limit our sample to loans originated in the first two quarters of 2013 and compare the performance of loans issued by transparent banks and banks that have yet to adopt the new reporting standards (i.e., banks that accessed repo financing in later quarters).

Panel B of Table 3 reports the results of these tests. Despite a significant reduction in the sample size, we find that *Transparency loan* has a significant effect on three loan performance measures. Loans originated in the first two quarters of 2013 by reporting banks experience a 0.90 percent lower default probability, which represents 16.67 percent of the mean default probability for loans originated in the first two quarters of 2013. The loans of reporting banks also have 0.10 percent lower delinquency amounts and 3.00 percent fewer days in delinquency compared to loans issued by non-reporting banks over the same period, which represents 20.00 percent and

19.00 percent of the respective mean values for loans originated in the first two quarters of 2013. The lower economic significance of *Transparency loan* in these analyses relative to that reported in our primary specification can be explained, at least partially, by better controlling for the evolution in the securitized loan market dynamics. However, the lower economic significance of the results can also be attributed to banks' information collection and processing being less developed in the first two quarters of 2013 relative to subsequent periods.¹²

Another concern that we address is whether our findings can be driven by the ECB's closer monitoring, not by its reporting requirements. Based on banks' annual reports and business press articles, we identify 24 sample banks that used ECB repo financing prior to January 2013 and thus have already been subject to ECB supervision prior to the initiation of the reporting requirements. We re-estimate Model 1 for these banks and present the results in Panel C of Table 3. We find that the coefficients on *Transparency loan* are significant in all specifications and have an economically similar effect on loan performance relative to our primary tests. Also, note that these analyses help to alleviate the concern that banks strategically choose when to adopt the new standards, because banks that borrowed from the ECB prior to the transparency regime were required to adopt the new standards in the first quarter of 2013.

We further perform several additional robustness tests and report them in an Online Appendix. First, we show that the results are robust when we base *Transparency loan* on the release date of the new requirements in April 2011. Moreover, we show that the improvement in loan quality that we document in our main analyses is driven primarily by the banks' adoption of

¹² Note that our results cannot be explained by early adopters being better performing banks. Obtaining banks' financials from CapitalIQ, we find that relative to banks that initiated loan level reporting in later quarters, banks adopting the new reporting standards in the first two quarters of 2013 had a significantly higher ratio of non-performing loans to total loans and a lower return on assets, with no significant difference in loan loss provisions (untabulated). This evidence is consistent with Fecht et al. [2015], who show that worse performing banks start utilizing repo financing from central banks relatively earlier than their better performing peers.

the new requirements rather than by their release. Second, we verify that the effect of transparency on loan quality cannot be explained by changes in banks' risk exposures or banks' strategically choosing when to securitize loans during the quarter, as well as by the economic contraction in Eurozone countries, EU-wide or national regulatory changes and differences in supervisory pressures and scrutiny by international authorities across the sample countries. Third, we show that the positive effect of transparency on SME loan quality likely generalizes to other securitization classes.

5.2 INFORMATION COLLECTION AND MARKET DISCIPLINE CHANNELS

5.2.1 The effect of information collection on loan quality

We next examine the channels through which transparency can lead to an improvement in credit standards and loan quality. First, we focus on whether the comprehensive and recurring data collection mandated by the ECB improves banks' credit standards and screening efforts. The ideal test would be to compare the loan- and borrower-specific information a bank collects prior to and following the new reporting requirements. Then, controlling for other determinants of loan performance, if a bank with a higher increase in data collection under the ECB's reporting standards is found to have a stronger improvement in loan performance, we would infer that enhanced data collection improves loan quality. Unfortunately, banks' data collection efforts prior to the transparency initiative are not observable.¹³

We thus examine whether the quality of transparency loans is stronger when the information collection under the reporting regime is more extensive. We augment Model 1 with *Information collection* and the interaction term between *Transparency loan* and *Information collection*:

¹³ However, as credit securitization specialists in two major Eurozone banks and ED representatives conveyed in our discussions, prior to the adoption of the reporting requirements, some information items had never been collected, while others had been kept in decentralized local branch reporting systems or in hardcopy format, and thus had not been actively used by banks in their underwriting and monitoring practices. New reporting requirements incentivized banks to significantly enhance their information collection and processing practices.

$$\begin{aligned}
\text{Loan performance} = & \alpha + \beta_1 \text{Transparency loan} + \beta_2 \text{Information collection} \\
& + \beta_3 \text{Transparency loan} \times \text{Information collection} \\
& + \beta_4 \text{Interest rate} + \beta_5 \text{Secured} + \beta_6 \text{Years to maturity} \\
& + \beta_7 \text{Securitized loan amount} + \beta_8 \text{Lending relationship} \\
& + \text{Loan purpose FE} + \text{Loan type FE} + \text{Borrower type FE} \\
& + \text{Borrower industry FE} + \text{Reporting quarter FE} + \text{ABS deal FE}
\end{aligned}$$

(Model 2)

The variable of interest is the interaction term between *Transparency loan* and *Information collection*. We predict a negative coefficient on this variable (β_3), suggesting that the effect of transparency on loan quality is stronger when a bank's information collection efforts are more extensive. The loan performance measures, control variables and model specifications are similar to Model 1. Panel A of Table 4 reports the results of these tests. We find a negative and significant coefficient on *Transparency loan* \times *Information collection* in three of the four specifications. Thus, consistent with our expectations, banks with high loan level information collection on their borrowers experience greater improvements in their securitized loan quality under the new reporting regime. Economically, an interquartile increase in information collection further decreases the default probability of transparency loans by 1.00 percent, the percentage of late loan payments by 0.09 percent and the late loan payment duration by 2.40 percent.¹⁴ These effects represent 14.29 percent, 9.78 percent and 14.12 percent of the respective mean values for loan default probability, loan delinquencies and late loan payment duration.¹⁵

To alleviate the concern that our results are driven by banks' strategic reporting, we re-estimate the *Information collection* variable by eliminating non-reported variables related to loan performance in all ND categories (e.g., loan renegotiations, loan renegotiation date, foreclosure

¹⁴ To interpret the coefficient in the interaction term of our probit model where the dependent variable is an indicator variable reflecting whether the borrower defaulted on the loan, we compute the marginal effects using Buis' (2010) methodology, which is a variation of the Norton et al. [2004] methodology. The same applies to a probit model that include an interaction term in column 1 of Table 5.

¹⁵ These findings are in line with McNichols and Stubben (2008) and Shroff (2016) who suggest that accounting information set available to managers alters their investment decision.

costs, cumulative loan recoveries). We expect that banks are more likely to exhibit reporting bias for loan performance information. Our results are robust to this definition of the *Information collection* variable (Panel B of Table 4). In addition, we examine the missing variables classified as not collected because information is not required by a bank's underwriting standards (i.e., ND1). We presume that reporting bias is likely to be lower when loan data are not reported due to banks' loan underwriting standards relative to when the data is collected but not reported (ND2 and ND3) or when the data are not relevant at the present time (ND5). We augment Model 1 with *Unreported – underwriting standards*, defined as the natural logarithm of the number of missing variables attributed to the bank's underwriting standards (i.e., ND1 classification), as well as its interaction term with *Transparency loan*. As we report in Panel C of Table 4, we find a positive and significant coefficient on the interaction term in most specifications, consistent with transparency having a weaker effect on loan quality when the number of unreported variables is higher.¹⁶

Lastly, we explore the effect of mandatory and voluntary information components on securitized loan quality.¹⁷ We define *Mandatory info collection* (*Voluntary info collection*) as the natural logarithm of the number of mandatory (voluntary) items reported for a loan in a respective quarter. We augment Model 1 with *Mandatory info collection*, *Voluntary info collection* and their interaction terms with *Transparency loan*. In Panel D of Table 4, we find negative and significant coefficients on *Transparency loan* × *Mandatory info collection* (*Transparency loan* × *Voluntary info collection*) in two (three) of the four specifications,

¹⁶ Analyses reported in the Online Appendix further show that banks do not strategically use missing variable classifications to hide poor performance.

¹⁷ Untabulated summary statistics show that banks report on average about 42 of the 48 mandatory variables over the grace period, and by 2013Q3 they fully comply with the reporting standards (i.e., report all 48 mandatory variables). Banks report, on average, about 42 of the 65 voluntary variables over our sample period.

consistent with both disclosure components contributing to the improvement in loan quality.¹⁸ An interquartile increase in mandatory (voluntary) collection further decreases the percentage of late payments by 0.06 percent (0.05 percent) and the late loan payment duration by 1.30 percent (1.00 percent). These effects of mandatory (voluntary) information collection represent 6.52 (5.43) percent and 7.65 (5.88) percent of the respective mean values for loan delinquencies and late loan payment duration. Moreover, an interquartile increase in voluntary information collection further decreases the default probability by 0.40 percent, which represents 5.71 percent of the sample mean default probability.

5.2.3 The effect of market discipline on loan quality

An additional channel through which the transparency can enhance loan quality is market discipline. To examine whether an improvement in loan quality is greater when market discipline is stronger, we estimate Model 2, where we substitute the *Information collection* variable with the *Market discipline* variable. We focus on the interaction term between *Transparency loan* and *Market discipline*. We predict a negative coefficient on this variable (β_3), suggesting that the effect of transparency on loan quality is amplified when investor and regulatory oversight is stronger.

We present the results of these tests in Table 5. The negative and significant coefficients on *Transparency loan* \times *Market discipline* in all specifications suggest that banks operating under tighter oversight – when loan and securitization practices can be easily compared across banks – experience a greater enhancement in loan quality under the transparency regime. More specifically, an interquartile increase in market discipline further decreases the default probability of transparency loans by approximately 0.40 percent, the percentage of late loan

¹⁸ Note that the more significant effect of voluntary, relative to mandatory, information collection on loan quality is likely due to the low variation in the number of mandatory data items reported across sample banks, as each of them reports all mandatory data items by the end of the grace period.

payments by 0.04 percent and the late loan payment duration in days by 2.00 percent. These effects represent 5.70 percent, 4.44 percent and 11.50 percent of the respective mean values for the loan default probability, loan delinquencies and days in delinquency.¹⁹

5.3 TRANSPARENT REPORTING AND THE PERFORMANCE OF BANKS' CREDIT SECURITIES

Our primary tests rely on the loan performance in ABS pledged as collateral to the ECB by reporting banks. Therefore, we recognize that our results may be affected by banks' selectively choosing which loans to securitize and include in these ABS deals. Specifically, banks may not improve their loan quality, instead choosing to include their better quality loans in ABS deals, thus leaving worse quality loans as non-securitized on the balance sheet. Also, banks may opt to use their better performing ABS as repo collateral (i.e., ABS secured by better quality SME loans), while not pledging their worse performing ABS to the ECB. Note that such strategic behavior is unlikely: banks are incentivized to securitize their worse performing loans for ABS pledged as collateral, because ECB lending standards for banks participating in repo financing are relatively lax (e.g., Fecht et al. [2015]). However, to further mitigate this concern, we perform a number of additional analyses that focus on the valuation of bank credit securities.

We first explore the effect of transparent reporting on investors' assessment of banks' credit riskiness, as measured by credit default swap (CDS) spreads and bonds' yield to maturity. On the one hand, if banks choose to retain bad quality loans as non-securitized and to securitize better quality ones, we should observe an increase in bank's credit riskiness in the post-adoption

¹⁹ Although these findings are consistent with our market discipline proposition, we acknowledge that they can also be driven, at least partially, by banks' learning (e.g., Sutherland [2015]). Banks may benefit from acquiring knowledge about the loan practices and loan performance of other banks operating in their credit markets and reporting to the ECB, thus improving their own screening and monitoring processes. Moreover, increased transparency in banks' securitization activities can also discipline credit rating agencies – an effect this paper does not explore. In a more transparent reporting environment, credit rating agencies cannot cater to SPEs and their banks; thus, banks may be pressured to securitize higher quality loans to obtain a certain credit rating. Unfortunately, we could not obtain ABS rating data from the ED or public databases to test for this additional mechanism.

period.²⁰ On the other hand, if the new reporting standards indeed incentivized banks to improve their underwriting standards and loan quality, participating banks' credit riskiness would decrease under the transparency regime. Similarly, if banks strategically select which ABS to pledge as repo collateral without enhancing their credit practices and underwriting standards, we should find no evidence of a decrease in their credit riskiness under the transparency regime.

Obtaining data from the Markit database, we identify 11 banks in our sample with traded CDS contracts in 2009-2014. We eliminate banks with low liquidity (i.e., less than four daily quotes on average) due to potentially stale CDS prices. We estimate the following OLS model:

$$CDS\ spread = \alpha + \beta_1 Post\ transparency + \beta_2 Controls + Quarter\ FE + Bank\ FE \quad (Model\ 3)$$

The dependent variable (*CDS spread*) is the one- or five-year spread on a bank's traded CDS contracts, averaged at the bank-quarter level. The main variable of interest is *Post transparency*, which takes the value of one for every quarter following a bank's first report to the ECB, and zero otherwise. Controls include the natural logarithm of banks' total assets (*Size*), the ratio of total liabilities to total assets (*Leverage*), cash to short-term borrowings and deposits (*Liquidity*), the ratio of net income to total assets (*ROA*), the ratio of loan loss provisions to gross loans (*Loan loss provisions*), quarter and bank fixed effects. We cluster standard errors at the bank level.²¹

We present the results of the Model 3 estimation in columns 1 and 2 of Panel A, Table 6. We find negative coefficients on *Post transparency* for both the one- and five-year CDS spread

²⁰ Banks typically securitize their worse quality loans and retain their better quality loans as non-securitized, so that the bad quality loans would not be recognized as standalone loans on banks' balance sheets but will be bundled under a highly rated ABS. Thus, the securitization decreases the bank's credit risk. However, if following the introduction of the new reporting requirements, banks change their securitization practices and choose to securitize their better quality loans, while retaining worse quality loans as non-securitized, we should observe an increase in their credit riskiness relative to the pre-transparency period.

²¹ To alleviate the concern that our results are driven by small cluster bias (Angrist and Pischke [2009]), we also estimate Model 3 with no clusters. The more conservative estimates for t-statistics are obtained when we cluster standard errors; these are reported. The same applies to the Model 4 estimation.

estimations, albeit at 10% significance level for the latter specification. Economically, after banks adopt the reporting standards, the one- and five-year CDS spreads are lower by 0.47 percent and 0.55 percent, respectively, which, in turn, represent 21.00 percent and 20.00 percent of the average one- and five-year CDS spreads for reporting banks.

To better control for the effect of bank fundamentals on CDS spreads, we match reporting banks with a sample of non-reporting banks with available CDS data (one-to-one matching) based on bank size (total assets), return on assets (net income to total assets), leverage (total liabilities to total assets), loan loss provisions (loan loss provisions to gross loans), liquidity (cash to short-term borrowings and deposits) and country of incorporation.²² We augment Model 3 with the *Reporting bank* indicator variable, which takes the value of one for reporting banks and zero for the matched banks. We then interact *Reporting bank* with *Post transparency* (for each control bank we assign the first “artificial” reporting quarter as the first reporting quarter of its matched transparent bank). We present the results of this estimation in columns 3 and 4 of Panel A, Table 6. The coefficient on *Reporting bank* \times *Post transparency* is negative and significant for the five-year CDS spread specification (for the one-year CDS specification, the coefficient on the interaction term is negative but insignificant). Relative to the control banks, the reporting banks experience five-year CDS spreads that are lower by about 1.00 percent under the transparency regime. We acknowledge that the documented improvement in CDS spreads may be driven by banks’ gaining access to ECB repo financing, which decreases their riskiness. However, restricting our sample to banks that were already receiving repo financing from the ECB prior to the initiation of their reporting (similar to the sample employed in Panel C of Table 3) leaves our results unchanged (untabulated).

²² We use the values of the matching variables reported for fiscal year 2012, i.e., the year before the implementation of the new reporting standards. We obtain banks’ financials from Bankscope.

Next, we examine the effect of transparency on participating banks' bond yield to maturity. We obtain bond data for the 2009-2014 period from the Bloomberg database. We employ Model 3 above with the bond yield to maturity as the dependent variable, averaged at the bond-quarter level. We add additional controls for the following bond characteristics: the natural logarithm of bond par value in \$million (*Bond offering balance*), the natural logarithm of bond maturity in years (*Bond maturity*), an indicator variable equal to one if the bond is secured (*Secured bond*), and the natural logarithm of the number of bond trades in a given quarter (*Bond liquidity*).

We present the results of these tests in Panel B of Table 6 (column 1). We find a negative coefficient on *Post transparency*. Economically, the bond yield to maturity is lower by about 0.36 percent after banks adopt the reporting standards, which represents 13.00 percent of the mean bond yield to maturity. We also perform the analyses for the matched sample of bonds by non-reporting banks, further matched on the bond offering amount, maturity, liquidity and whether a bond is secured. In line with our CDS tests, we also augment our model with the *Reporting bank* and *Reporting bank* \times *Post transparency* variables and estimate it for the sample of both reporting and control banks. Supporting the participating bank sample results, the coefficient on *Reporting bank* \times *Post transparency* is negative and significant (column 2). Relative to the bonds issued by the control banks, the bonds issued by the reporting banks have a lower bond yield to maturity by about 2.90 percent under the transparency regime.

The lower CDS spreads and bond yield to maturity under the transparency regime are consistent with transparent reporting enhancing banks' credit practices. To further corroborate these results, we examine whether the effect of transparency varies with the extent of participating banks' information collection and market discipline. We expect transparent reporting to have a greater effect on the credit riskiness of banks with more extensive

information collection and stronger market discipline, as we document that information collection and market discipline amplify transparency's positive effect on bank credit practices.

With respect to information collection, we employ in Model 3 two primary variables of interest – *Post transparency_High Information collection* and *Post transparency_Low Information collection* – that reflect the extent of a bank's information collection. *Post transparency_High Information collection* (*Post transparency_Low Information collection*) is an indicator variable that takes the value of one if the bank's information collection in a given quarter in the post-transparency regime is above (below) the sample median, zero otherwise. We employ a similar research design to test for the effect of market discipline on credit securities valuations. *Post transparency_High Market discipline* (*Post transparency_Low Market discipline*) takes the value of one if a bank's market discipline in a given quarter in the post-transparency regime is above (below) the sample median, zero otherwise. We perform these tests for the sample of participating banks and report them in Panel C of Table 6. Consistent with our predictions, in most specifications across CDS and bond securities, the coefficient on *Post transparency_High Information collection* (*Post transparency_High Market discipline*) is significantly higher than that on *Post transparency_Low Information collection* (*Post transparency_Low Market discipline*). Overall, the results presented in Panels A to C of Table 6 indicate that it is unlikely that the effect of transparent reporting on loan quality can be attributed to banks' strategic behavior.

We supplement CDS spread and bond yield analyses by examining bond bid-ask spreads under the transparency regime (we do not have access to CDS bid-ask spread data). We predict that by offering investors access to previously unobservable securitized loan level characteristics and performance data, transparent reporting improves investors' understanding of banks' loan

underwriting and securitization practices. We thus expect to observe a decrease in investors' information uncertainty/asymmetry regarding banks' credit riskiness under the transparency regime. We employ Model 3 with bond bid-ask spreads as the dependent variable and report our findings in Panel D of Table 6. We find a substantial decrease in the bond bid-ask spreads in the transparency period for the sample of participating banks as well as the matched sample (columns 1 and 2, respectively). For the former sample, bid-ask spreads are lower by about 0.17 percent after banks adopt the reporting standards, which represents around 26.00 percent of the sample mean. Relative to the bonds issued by the control banks, the bonds issued by the reporting banks have lower bid-ask spreads by about 0.13 percent under the transparency regime.

We also examine how the effect of transparency on information uncertainty/asymmetry varies with the two channels through which we expect transparency to affect loan quality. We report these analyses for the sample of participating banks in columns 3 and 4. We find that the coefficient on *Post transparency_High Information collection* is significantly higher than that on *Post transparency_Low Information collection*, although we do not find significant results for the market discipline channel. Overall, we view bond bid-ask spread tests as further supporting our inference that transparent reporting incentivizes banks to improve their loan quality and underwriting standards.

In the last set of analyses (untabulated), we complement our tests by exploring the loan portfolio quality of reporting banks under the transparency regime. If, in response to the new regulatory requirements, banks strategically choose to retain bad quality loans as non-securitized and to securitize better quality ones, we should observe a deterioration in their loan portfolio quality. Using quarterly financial data from Capital IQ available for a sample of 13 participating

banks (as well as a matched sample of banks), we do not observe a decrease in loan portfolio quality (proxied by the ratios of loan loss provisions and loan impairments to gross loans).

6. Conclusion

We explore whether greater transparency in securitized loan activities can alleviate banks' risk-taking behavior and improve their credit standards. We take advantage of the securitized loan level reporting requirements introduced by the ECB for banks that access the ECB repurchase (repo) financing operations using their asset-backed securities as collateral. Starting from January 2013, these banks were required to report quarterly information about the structure and performance of the securitized loan portfolios in a detailed and standardized format that has been predetermined by the ECB. We find that loans originated under the transparency regime are of better quality in terms of their default probability, loss given default, delinquencies and number of days in delinquency. Delineating the channels that likely explain the positive association between transparent reporting and loan quality, we find that banks with more comprehensive loan level information collection, as well as those operating under tighter market oversight, experience a greater improvement in loan quality.

We supplement these findings by showing participating banks' lower CDS spreads and bond yields to maturity and lower bond bid-ask spreads under the transparency regime, supporting the positive effect of the new reporting standards on banks' loan underwriting and securitization practices. We also find that the positive effect of transparent reporting on banks' credit securities is stronger for banks that experience greater information collection and stronger market discipline under the new reporting requirements, further reinforcing the importance of these two channels through which transparency leads to better credit standards.

Our findings indicate that the well-documented agency costs inherent in securitization can be

alleviated by increasing transparency. Specifically, we show that transparency can be an effective incentive for banks to reduce their risk-taking behavior in loan securitizations. These results are particularly important in light of forthcoming changes to the disclosure requirements for ABS deals in the European Union, requiring European banks to disclose loan level information for all their asset-backed securitizations starting from 2017. However, the findings in our paper need to be interpreted with caution, as the economic benefits of transparency may not outweigh its costs. By reducing risk-taking behavior under the transparency regime, banks potentially restrict financing to highly leveraged companies, increasing their bankruptcy risk (e.g., Shivdasani and Wang [2011]). In addition, increasing transparency in banks' credit decisions, i.e., requiring them to disclose private information about their borrowers, may reduce banks' returns from lending activities, thereby further decreasing credit availability to borrowers (e.g., Dang et al. [2016]). More research is required to understand the costs of greater transparency in the securitization markets.

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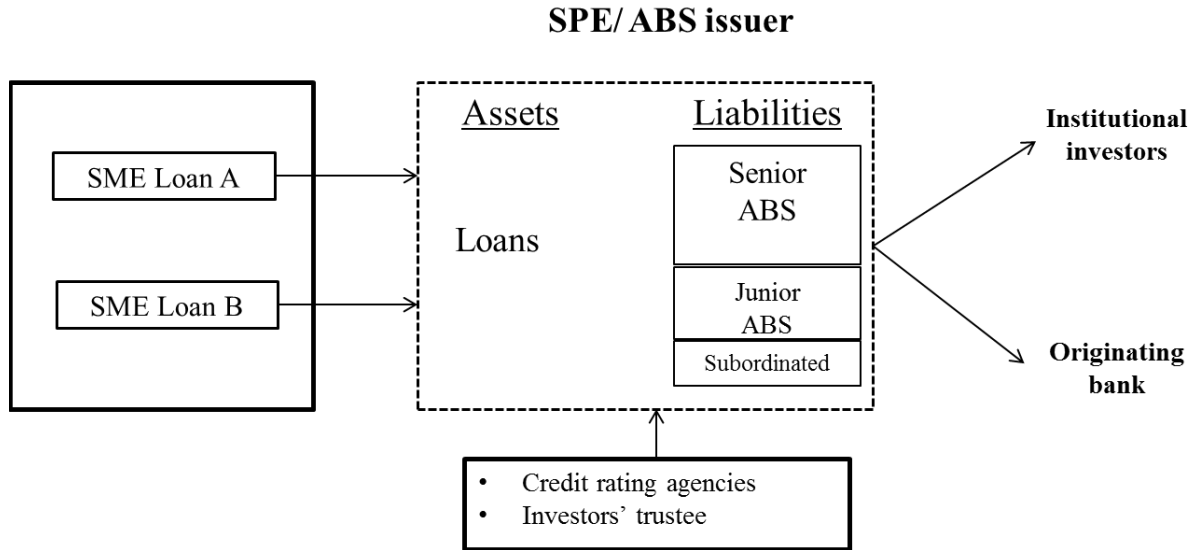
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APPENDIX A

The SME loan securitization process



The key steps in the SME loan securitization process are summarized as follows:

- The bank (“originator”) creates an off-balance-sheet special purpose entity (SPE) and sells its SME loans to the SPE. The SPE uses the principal and interest payments of these loans as collateral to issue new senior, junior and subordinated securities (asset-backed securities or ABS). These ABS are subsequently sold to institutional investors or are purchased by the originator and retained on its balance sheet to be used as repo collateral. The securitized SME loan portfolio is static, suggesting that the bank cannot manage the portfolio over time by discretionarily changing its structure.
- At least one credit rating agency issues ratings for the ABS tranches and assesses the riskiness of the securitized SME loan pool based on certain criteria but without issuing individual SME loan ratings. The assessment of SME loan portfolio quality relies on the type and amount of each loan’s collateral, loan characteristics (e.g., interest rate, seniority and maturity), loan performance and portfolio diversification in terms of borrower industry and geography. Credit rating agencies further rely on internal bank ratings (when available), macroeconomic forecasts for borrowers’ country and industry, and the bank’s credit underwriting policies. Credit rating agencies issue ratings at ABS issuance and continue to evaluate the deal’s creditworthiness and update the rating, if needed, over the life of the SPE.
- ABS credit ratings are higher than the average credit quality of the SME securitized loans, primarily due to several credit enhancements that are designed to protect ABS tranches against defaults in the underlying loan portfolio. These credit enhancements include portfolio diversification across borrower characteristics (e.g., industry, geography, borrower concentration in the SPE loan portfolio) and loan characteristics (e.g., loan maturity, interest rate), overcollateralization (requiring a higher principal value of portfolio loans relative to the principal balance of the ABS), interest coverage buffer (requiring that total interest payments of loans are higher than the interest disbursements), required cash balance (requiring ABS deals to maintain a minimum cash balance as a buffer against delinquencies), etc. These

features hedge the performance of the ABS against credit risk deterioration and potential losses in the underlying securitized loan portfolio, keeping the SPEs solvent and making ABS tranches less risky than the individual loans used as collateral.

- The originating bank is usually responsible for servicing (i.e., collecting loan payments) and tracking the performance of the securitized loan portfolio. Servicing banks are also required every quarter to collect information on the total ABS and portfolio balance outstanding, the number of defaulted loans, cash inflows and payments to noteholders and aggregate portfolio characteristics and performance.
- The servicer reports this information to the investor's trustee (usually a large investment bank), which is responsible for estimating whether the SPE is in compliance with the diversification and the other credit enhancement criteria and preparing quarterly investor reports. Importantly, loan level characteristics and performance information are not disclosed to investors.
- Many European banks retain their ABS deals in order to pledge them as repo collateral, especially after the credit crisis. Retention of ABS deals (i.e., repackaging loans in ABS deals) also positively affects banks' liquidity coverage ratio, thus, enhancing banks' balance sheet outlook, liquidity risk and regulatory capital constraints.

APPENDIX B

Variable definitions

Variable	Definition
<u>Loan performance</u>	
<i>Default</i>	An indicator variable equal to one if the borrower has defaulted on the loan, and zero otherwise.
<i>Delinquent amount</i>	The amount of delayed principal and interest payments to the total loan balance outstanding.
<i>Number of days in delinquency</i>	The natural logarithm of the number of days the borrower delays loan principal or interest payments. If the number of days in delinquency is zero, then the value of the variable is also zero.
<i>Loss given default</i>	Percentage of the loan balance outstanding that the bank will lose during the recovery process if the borrower defaults on the loan.
<u>Transparency characteristics</u>	
<i>Transparency loan</i>	An indicator variable equal to one if the loan was originated after the bank adopted the ECB loan level reporting standards, and zero otherwise.
<i>Information collection</i>	The natural logarithm of the non-missing variable values by loan entry reported to the ED. A variable is deemed missing if the bank codes it as “data not collected because they are not required by the underwriting standards” (ND1), “data are collected but not loaded to the reporting system” (ND2), “data are collected but loaded in a separate system from the reporting one” (ND3), “data are collected but will only be available in future quarters” (ND4), “data are not relevant at the present time” (ND5) or data for continuous variables are missing (ND Other).
<i>Mandatory information collection</i>	The natural logarithm of the non-missing mandatory variables by loan entry reported to the ED. See the definition of <i>Information collection</i> for the detailed description of missing variables.
<i>Voluntary information collection</i>	The natural logarithm of the non-missing optional variables by loan entry reported to the ED. See the definition of <i>Information collection</i> for the detailed description of missing variables.
<i>Unreported – underwriting standards</i>	The natural logarithm of the number of missing variables attributed to the bank’s underwriting standards (ND1). If the number of ND1 classifications used by loan entry is zero, then the value of the variable is also zero.
<i>Market discipline</i>	The natural logarithm of the number of comparable loans that peer banks report in a quarter. Comparable loans are loans issued in the same 2-digit borrower’s post code, NACE borrower’s industry and year.
<u>Loan characteristics</u>	
<i>Years to maturity</i>	The natural logarithm of the number of years remaining until the loan matures.
<i>Interest rate</i>	Percentage points of the loan interest rate.

APPENDIX B (Continued)

<i>Securitized loan amount</i>	Securitized loan amount to the original loan amount.
<i>Secured</i>	An indicator variable equal to one if the loan has collateral, and zero otherwise.
<i>Lending relationship</i>	An indicator variable equal to one if the borrower has borrowed at least once over the past five years from the same bank, and zero otherwise.
<u>Bank performance</u>	
<i>1-yr CDS spread</i>	Spread on a one-year CDS contract, averaged at the bank-quarter level.
<i>5-yr CDS spread</i>	Spread on a five-year CDS contract, averaged at the bank-quarter level.
<i>Bond yield to maturity</i>	Bond yield to maturity, averaged at the bond-quarter level.
<i>Bond bid-ask spread</i>	The difference between the bond bid and ask price, averaged at the bond-quarter level.

FIGURE 1. Timeline of the ECB's ABS Loan Level Initiative

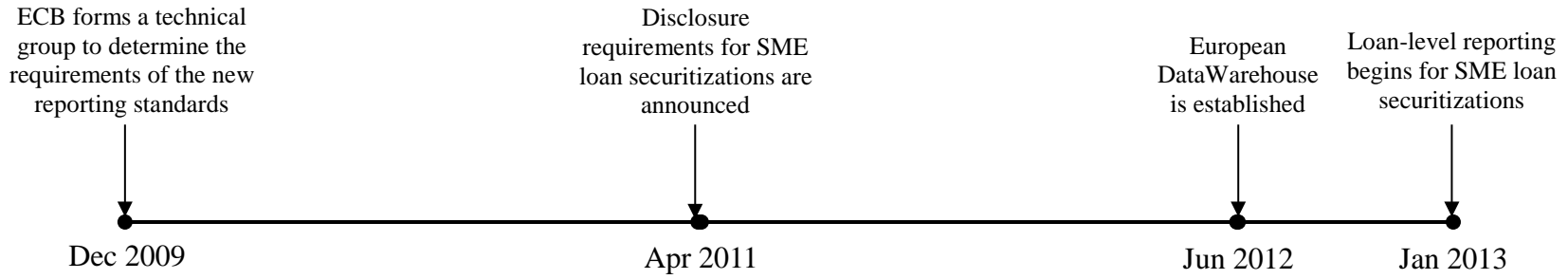


TABLE 1*Sample selection and distribution*

Panel A: Sample selection	Loans	Borrowers	SPEs	Observations at the loan-quarter level
SME loans reported to the ED over 2013Q1-2014Q2	1,769,342	967,913	122	6,159,883
<i>Less:</i>				
SME loans originated prior to 2009	497,636	263,173	43	2,314,113
Ambiguous bank name	109,516	45,706	6	271,203
Missing interest rate, loan amount and/or maturity	104,034	30,303	0	448,527
Recording date is after loan maturity date or before loan start date	83,439	22,335	0	164,823
Total	974,717	606,396	73	2,961,217

Panel B: Number of loans and SME borrowers by country-reporting quarter

Country	Reporting Quarter											
	2013Q1		2013Q2		2013Q3		2013Q4		2014Q1		2014Q2	
	#Loans	#SMEs	#Loans	#SMEs	#Loans	#SMEs	#Loans	#SMEs	#Loans	#SMEs	#Loans	#SMEs
Spain	33,866	30,466	126,645	115,132	121,466	110,750	230,164	195,485	219,567	192,781	100,374	95,748
Italy	105,618	95,154	104,092	95,056	103,342	93,639	86,699	79,280	79,058	71,969	36,763	33,424
Portugal	6,901	6,260	25,354	18,772	28,124	20,826	7,561	6,894	51,868	22,049	-	-
Germany	-	-	-	-	-	-	-	-	16,989	9,869	13,570	8,638
Belgium	147,815	82,140	150,433	82,920	150,349	81,925	158,414	88,088	174,589	104,000	175,865	104,099
France	63,943	51,335	72,786	55,445	70,788	56,565	89,213	47,368	111,714	30,212	58,366	29,037
Netherlands	9,444	7,528	7,801	6,863	7,477	6,569	7,213	6,336	6,986	6,143	-	-
Total	367,587	272,883	487,111	374,188	481,546	370,274	579,264	423,451	660,771	437,023	384,938	270,946

TABLE 1 – Continued

Panel C: Number of banks and ABS deals by country-reporting quarter												
Country	Reporting Quarter											
	<u>2013Q1</u>		<u>2013Q2</u>		<u>2013Q3</u>		<u>2013Q4</u>		<u>2014Q1</u>		<u>2014Q2</u>	
	#SPEs	#Banks	#SPEs	#Banks	#SPEs	#Banks	#SPEs	#Banks	#SPEs	#Banks	#SPEs	#Banks
Spain	9	6	18	7	17	7	31	10	30	10	9	6
Italy	15	12	16	12	18	14	20	16	17	16	4	4
Portugal	2	2	2	2	3	3	6	4	7	4	-	-
Germany	-	-	-	-	-	-	-	-	3	3	1	1
Belgium	3	3	3	3	2	2	3	3	3	3	3	3
France	4	4	4	4	4	4	4	4	4	4	3	3
Netherlands	3	3	1	1	2	2	2	2	2	2	-	-
Total	36	30	44	29	46	32	66	39	66	42	20	17

This table reports the sample selection procedure (Panel A), the distribution of borrowers and loans by country of origination and reporting quarter (Panel B) and the distribution of ABS deals (SPEs) and banks by country of origination and reporting quarter (Panel C).

TABLE 2*Summary statistics*

	Obs.	Mean	SD	Median
<u>Loan performance</u>				
<i>Default</i>	2,961,217	0.07	0.25	0.00
<i>Delinquent amount (%)</i>	2,961,217	0.92	3.70	0.00
<i>Number of days in delinquency</i>	2,961,217	0.17	0.83	0.00
<i>Loss given default</i>	2,961,217	0.29	0.21	0.28
<u>Transparency characteristics</u>				
<i>Transparency loan</i>	2,961,217	0.13	0.33	0.00
<i>Information collection</i>	2,961,217	4.48	0.17	4.72
<i>Market discipline</i>	2,961,217	4.96	1.10	4.66
<u>Loan characteristics</u>				
<i>Interest rate</i>	2,961,217	4.21	1.76	3.84
<i>Secured</i>	2,961,217	0.60	0.49	1.00
<i>Years to maturity</i>	2,961,217	1.18	0.71	1.16
<i>Securitized loan amount</i>	2,961,217	0.77	0.26	0.85
<i>Lending relationship</i>	2,961,217	0.36	0.48	0.00
<u>Credit securities performance</u>				
<i>1-yr CDS spread</i>	152	0.02	0.02	0.03
<i>5-yr CDS spread</i>	152	0.03	0.02	0.04
<i>Bond yield to maturity</i>	1,192	0.03	0.02	0.03
<i>Bond bid-ask spread</i>	1,192	0.65	0.68	0.90

This table presents descriptive statistics for the variables used in our primary tests. The values of continuous variables are winsorized at 1% and 99%. Variables are described in Appendix B.

TABLE 3

Transparency and securitized loan performance

Panel A: The effect of reporting transparency on securitized loan quality				
	(I)	(II)	(III)	(IV)
	<i>Default</i>	<i>Delinquent amount</i>	<i>Number of days in delinquency</i>	<i>Loss given default</i>
<i>Transparency loan</i>	-0.020*** (-2.79)	-0.195* (-1.70)	-0.042** (-1.98)	-0.024** (-2.11)
<i>Interest rate</i>	0.011*** (9.41)	0.305*** (7.86)	0.041*** (7.34)	0.004** (2.29)
<i>Secured</i>	0.017*** (4.30)	0.193 (1.05)	0.051** (2.39)	-0.053* (-1.66)
<i>Years to maturity</i>	-0.002 (-0.68)	-1.405*** (-5.41)	-0.007 (-0.56)	-0.038*** (-4.83)
<i>Securitized loan amount</i>	0.001 (1.14)	0.816*** (2.60)	0.063** (2.10)	0.013 (0.68)
<i>Lending relationship</i>	-0.009*** (-3.20)	-0.154*** (-2.61)	-0.016*** (-2.58)	-0.012* (-1.79)
Fixed effects	YES	YES	YES	YES
Obs.	2,729,323	2,961,217	2,961,217	2,961,217
Pseudo -R ² / Adj.-R ²	14.07%	4.43%	7.37%	44.21%
Panel B: The effect of reporting transparency on the quality of securitized loans originated in the first two quarters of 2013 by reporting and non-reporting banks				
	(I)	(II)	(III)	(IV)
	<i>Default</i>	<i>Delinquent amount</i>	<i>Number of days in delinquency</i>	<i>Loss given default</i>
<i>Transparency loan</i>	-0.009*** (-3.28)	-0.104* (-1.92)	-0.029*** (-3.14)	-0.003 (-0.70)
<i>Interest rate</i>	0.004*** (6.04)	0.086*** (2.59)	0.023*** (3.26)	0.003 (0.40)
<i>Secured</i>	0.003*** (2.49)	0.029 (0.55)	0.003 (0.46)	-0.059 (-1.16)
<i>Years to maturity</i>	-0.005*** (-4.22)	-0.313*** (-3.16)	-0.020*** (-3.11)	-0.046*** (-5.54)
<i>Securitized loan amount</i>	0.013 (0.43)	-0.835 (-1.24)	0.048 (3.33)	0.090*** (3.59)
<i>Lending relationship</i>	-0.004*** (-2.61)	-0.066** (-2.04)	-0.006 (-0.74)	-0.019 (-1.18)
Fixed effects	YES	YES	YES	YES
Obs.	161,216	167,985	167,985	167,985
Pseudo -R ² / Adj.-R ²	44.30%	7.55%	5.09%	24.67%

TABLE 3 (Continued)

Panel C: The effect of reporting transparency on securitized loan quality for the subsample of banks that used ECB repo financing before the initiation of the ECB's loan level reporting standards

	(I) <i>Default</i>	(II) <i>Delinquent amount</i>	(III) <i>Number of days in delinquency</i>	(IV) <i>Loss given default</i>
<i>Transparency loan</i>	-0.021*** (-2.68)	-0.195** (-1.96)	-0.043* (-1.87)	-0.026** (-2.00)
<i>Interest rate</i>	0.011*** (6.15)	0.305*** (7.86)	0.049*** (9.50)	0.037** (2.17)
<i>Secured</i>	0.018*** (3.99)	0.193 (1.05)	0.071** (2.29)	-0.041 (-0.86)
<i>Years to maturity</i>	-0.001 (-0.43)	-1.405*** (-5.41)	-0.016 (-1.09)	-0.045*** (-4.09)
<i>Securitized loan amount</i>	0.012 (1.00)	0.816*** (2.60)	0.093** (2.45)	0.004 (0.22)
<i>Lending relationship</i>	-0.009*** (-2.69)	-0.154*** (-2.61)	-0.021*** (-2.78)	-0.012 (-1.35)
Fixed effects	YES	YES	YES	YES
Obs.	1,968,479	2,200,333	2,200,333	2,200,333
Pseudo -R ² / Adj.-R ²	15.21%	5.24%	7.27%	35.69%

This table reports the analyses of the effect of transparency on securitized loan quality. In Panel A, we use all loans in our sample. In Panel B, we restrict our sample to loans issued in the first two quarters of 2013 and compare the performance of loans issued by reporting and non-reporting banks. In Panel C, we restrict our sample to loans issued by banks that borrowed from the ECB repo facility before the initiation of the ECB's loan level reporting standards. *Transparency loan* is an indicator of whether a loan is originated under the transparency regime. Across all panels, in specification (I), the dependent variable is equal to one if the borrower defaults on a loan, and zero otherwise (*Default*). In specification (II), the dependent variable is the ratio of late loan payments to the loan balance outstanding (*Delinquent amount*). In specification (III), the dependent variable is the natural logarithm of the number of days the borrower has delayed loan principal or interest payments (*Number of days in delinquency*). In specification (IV), the dependent variable is the percentage of loan losses the bank will incur if the borrower defaults (*Loss given default*). All other variables are defined in Appendix B. The values of continuous variables are winsorized at 1% and 99%. In all panels, we estimate specification (I) by a probit model and specifications (II)-(IV) by an OLS model. For the OLS models, coefficients are reported and t-statistics are in parentheses. For the probit model, marginal effects are reported and z-statistics are in parentheses. Loan purpose, loan type, 1-digit NACE borrower industry, borrower type, reporting quarter and ABS deal fixed effects are included but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the ABS deal level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively. Coefficients of interest are in boldface.

TABLE 4

Transparency, information collection and securitized loan performance

Panel A: The effect of information collection on the relation between transparency and securitized loan quality

	(I) <i>Default</i>	(II) <i>Delinquent amount</i>	(III) <i>Number of days in delinquency</i>	(IV) <i>Loss given default</i>
<i>Transparency loan</i>	-0.024*** (-3.38)	-0.154* (-1.71)	-0.061** (-2.29)	-0.026* (-1.77)
<i>Information collection</i>	-0.886** (-2.71)	-9.843*** (-2.81)	-3.884*** (-3.22)	-0.193 (-0.45)
<i>Transparency loan</i> × <i>Information collection</i>	-0.324** (-2.25)	-2.208* (-1.92)	-0.604*** (-2.72)	0.115 (1.31)
<i>Interest rate</i>	0.011*** (8.19)	0.217*** (10.28)	0.047*** (7.25)	0.005** (2.15)
<i>Secured</i>	0.018*** (5.32)	0.081 (0.69)	0.051** (2.34)	-0.056* (-1.65)
<i>Years to maturity</i>	0.000 (0.10)	-0.632*** (-5.12)	-0.004 (-0.31)	-0.044*** (-5.30)
<i>Securitized loan amount</i>	0.004 (0.47)	0.264 (0.92)	0.060 (1.48)	0.028 (1.36)
<i>Lending relationship</i>	-0.009*** (-3.86)	-0.066** (-2.41)	-0.015*** (-2.75)	-0.015* (-1.79)
Fixed effects	YES	YES	YES	YES
Obs.	2,729,323	2,961,217	2,961,217	2,961,217
Pseudo-R ² / Adj.-R ²	15.27%	10.59%	7.80%	41.36%

Panel B: The effect of information collection on the relation between transparency and securitized loan quality, excluding loan performance-related information

	(I) <i>Default</i>	(II) <i>Delinquent amount</i>	(III) <i>Number of days in delinquency</i>	(IV) <i>Loss given default</i>
<i>Transparency loan</i>	-0.021*** (-4.34)	-0.200*** (-2.97)	-0.074*** (-3.56)	-0.033*** (-2.89)
<i>Information collection</i>	-0.812*** (-2.62)	-9.340*** (-2.80)	-3.219*** (-3.15)	-0.174 (-0.49)
<i>Transparency loan</i> × <i>Information collection</i>	-0.401*** (-3.31)	-2.557*** (-3.42)	-0.793*** (-4.11)	-0.106 (-1.22)
Controls	YES	YES	YES	YES
Fixed effects	YES	YES	YES	YES
Obs.	2,729,323	2,961,217	2,961,217	2,961,217
Pseudo-R ² / Adj.-R ²	15.09%	10.22%	7.50%	37.98%

TABLE 4 (Continued)

Panel C: The effect of information unreported due to banks' underwriting standards on the relation between transparency and securitized loan quality

	(I) <i>Default</i>	(II) <i>Delinquent amount</i>	(III) <i>Number of days in delinquency</i>	(IV) <i>Loss given default</i>
<i>Transparency loan</i>	-0.009* (-1.77)	-0.113** (-2.39)	-0.035** (-2.04)	-0.016*** (-2.59)
<i>Unreported –underwriting standards</i>	0.006* (1.80)	0.322* (1.64)	0.006** (2.33)	0.009 (0.65)
<i>Transparency loan</i> × <i>Unreported –underwriting standards</i>	0.096** (2.37)	0.733*** (3.19)	0.115** (2.34)	0.108 (1.55)
Controls	YES	YES	YES	YES
Fixed effects	YES	YES	YES	YES
Obs.	2,729,323	2,961,217	2,961,217	2,961,217
Pseudo-R ² / Adj.-R ²	14.61%	10.00%	6.69%	41.82%

Panel D: The effect of mandatory and voluntary information collection on the relation between transparency and securitized loan quality

	(I) <i>Default</i>	(II) <i>Delinquent amount</i>	(III) <i>Number of days in delinquency</i>	(IV) <i>Loss given default</i>
<i>Transparency loan</i>	-0.023*** (-4.98)	-0.153*** (-3.03)	-0.051*** (-2.49)	-0.027** (-2.34)
<i>Mandatory info collection</i>	-0.516 (-1.31)	-5.151*** (-2.84)	-1.306 (-0.58)	-0.023 (-0.04)
<i>Transparency loan</i> × <i>Mandatory info collection</i>	0.184 (0.48)	-6.233*** (-2.85)	-1.303** (-2.30)	0.100 (0.25)
<i>Voluntary info collection</i>	-0.368*** (-3.68)	-4.202*** (-2.63)	-2.158*** (-3.15)	-0.136 (-0.86)
<i>Transparency loan</i> × <i>Voluntary info collection</i>	-0.127* (-1.83)	-4.005*** (-3.89)	-0.266** (-2.42)	0.044 (1.27)
Controls	YES	YES	YES	YES
Fixed effects	YES	YES	YES	YES
Obs.	2,729,323	2,961,217	2,961,217	2,961,217
Pseudo-R ² / Adj.-R ²	15.29%	10.73%	7.89%	41.99%

This table reports the analyses of whether banks' information collection enhances the relation between transparency and loan quality. We measure information collection using the natural logarithm of variables with non-missing values reported for each loan entry to the ED (*Information collection*). In Panel A, we examine the effect of total information collection on securitized loan quality. In Panel B, we re-estimate the *Information collection* using the natural logarithm of variables with non-missing values reported for each loan entry to the ED, excluding variables related to loan performance (e.g., loan defaults, delinquencies, etc.). In Panel C, we use *Unreported – underwriting standards* to proxy for bank's information collection efforts, defined as the natural logarithm of the number of missing variables attributed to bank's underwriting standards (ND1). In Panel D, we examine the effect of mandatory and voluntary information collection separately on securitized loan quality. *Transparency loan* is an indicator of whether a loan is originated under the transparency regime. Across all panels, in specification (I), the dependent variable is equal to one if the borrower defaults on a loan, zero otherwise (*Default*). In specification (II), the dependent variable is the ratio of late loan payments to the loan balance outstanding (*Delinquent amount*). In specification (III), the dependent variable is the natural logarithm of the number of days the borrower has delayed loan principal or interest payments (*Number of days in delinquency*). In specification (IV), the dependent variable is the percentage of loan losses the bank will incur if the borrower defaults (*Loss given default*). In Panels B through D, the control variables (untabulated) are the same as in Panel A. All other variables are defined in Appendix B. The values of continuous variables are winsorized at 1% and 99%. Across all panels, specification (I) is estimated by a probit model and specifications (II)-(IV) by an OLS model. For the OLS models, coefficients are reported and t-statistics are in parentheses. For the probit model, marginal effects are reported and z-statistics are in parentheses. Loan purpose, loan type, 1-digit NACE borrower industry, borrower type, reporting quarter and ABS deal fixed effects are included but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the ABS deal level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively. Coefficients of interest are in boldface.

TABLE 5

Transparency, market discipline and securitized loan performance

	(I) <i>Default</i>	(II) <i>Delinquent amount</i>	(III) <i>Number of days in delinquency</i>	(IV) <i>Loss given default</i>
<i>Transparency loan</i>	-0.016*** (-3.28)	-0.155** (-2.27)	-0.020** (-1.99)	-0.020** (-2.18)
<i>Market discipline</i>	-0.078 (-1.45)	-0.020 (-0.43)	-0.027 (-0.57)	0.007 (0.19)
<i>Transparency loan</i> × <i>Market discipline</i>	-0.009** (-2.10)	-0.021*** (-2.75)	-0.010** (-2.74)	-0.005 (-0.72)
<i>Interest rate</i>	0.012*** (9.28)	0.179*** (10.89)	0.046*** (7.59)	0.005** (2.21)
<i>Secured</i>	0.021*** (4.86)	0.132*** (2.56)	0.051** (2.37)	-0.057* (-1.67)
<i>Years to maturity</i>	-0.002 (-0.62)	-0.491*** (-6.86)	-0.007 (-0.56)	-0.045*** (-5.22)
<i>Securitized loan amount</i>	0.015 (1.57)	0.328*** (2.34)	0.065** (2.18)	0.029 (1.36)
<i>Lending relationship</i>	-0.001 (-0.59)	-0.077*** (-3.17)	-0.016*** (-2.61)	-0.015* (-1.76)
Fixed effects	YES	YES	YES	YES
Obs.	2,729,363	2,961,217	2,961,217	2,961,217
Pseudo-R ² / Adj.-R ²	13.83%	5.89%	7.47%	41.40%

This table reports the analyses of whether market discipline enhances the relation between transparency and securitized loan quality. We measure market discipline using the natural logarithm of the number of comparable loans that peer banks report in a quarter. Comparable loans are loans issued by other participating banks in the same two-digit borrower's post code, the NACE borrower's industry and year (*Market discipline*). *Transparency loan* is an indicator of whether a loan is originated under the transparency regime. In specification (I), the dependent variable is equal to one if the borrower defaults on a loan, zero otherwise (*Default*). In specification (II), the dependent variable is the ratio of late loan payments to the loan balance outstanding (*Delinquent amount*). In specification (III), the dependent variable is the natural logarithm of the number of days the borrower has delayed principal or interest payments (*Number of days in delinquency*). In specification (IV), the dependent variable is the percentage of loan losses the bank will incur if the borrower defaults (*Loss given default*). All variables are defined in Appendix B. The values of continuous variables are winsorized at 1% and 99%. Specification (I) is estimated by a probit model, while specifications (II)-(IV) by an OLS model. For the OLS (probit) models, coefficients (marginal effects) are reported and t- (z-) statistics are in parentheses. Loan purpose, loan type, 1-digit NACE industry, borrower type, reporting quarter and ABS deal fixed effects are included but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the ABS deal level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively. Coefficients of interest are in boldface.

TABLE 6

Transparency and banks' credit securities performance

Panel A: Reporting transparency and CDS spreads				
	(I)		(II)	
	<u>Participating banks</u>		<u>Matched sample</u>	
	<i>1-yr CDS spread</i>	<i>5-yr CDS spread</i>	<i>1-yr CDS spread</i>	<i>5-yr CDS spread</i>
<i>Post transparency</i>	-0.005** (-2.32)	-0.006* (-1.78)	0.003 (0.40)	0.004 (0.76)
<i>Reporting bank</i> × <i>Post transparency</i>			-0.005 (-1.32)	-0.010** (-2.33)
<i>Size</i>	0.004 (1.24)	0.005 (1.22)	0.005* (1.61)	0.005 (1.46)
<i>Leverage</i>	0.005** (1.99)	0.005 (1.47)	0.006** (2.18)	0.005* (1.93)
<i>Liquidity</i>	-0.013 (-1.14)	-0.014 (-1.47)	-0.029* (-1.62)	-0.026* (-1.77)
<i>ROA</i>	-0.113** (-2.22)	-0.508** (-2.23)	-0.320*** (-3.73)	-0.284*** (-5.38)
<i>Loan loss provisions</i>	-0.114 (-0.20)	-0.081 (-0.18)	-0.249 (-1.38)	-0.298 (-0.74)
Quarter FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Obs.	152	152	311	311
Adj.-R ²	81.23%	88.52%	81.70%	86.87%

This table reports the analyses of the performance of banks' credit securities under transparency regime. Panel A reports the results for the test that examines CDS spreads under the transparency regime. We estimate specification (I) for reporting banks only and specification (II) for the matched sample of reporting and control banks. In both specifications, the dependent variables are the one-year or five-year CDS spreads in percentage points, averaged at the bank-quarter level. *Post transparency* is equal to one for the post-adoption quarters, and zero otherwise (for banks in the control group, the variable is equal to one for the post-adoption quarters of its matched bank). *Reporting bank* is equal to one for banks that adopted the ECB reporting standards (treatment group), and zero for the control banks. *Size* is the natural logarithm of total assets, *Leverage* is total liabilities to total assets, *Liquidity* is cash to short-term borrowings and deposits, *ROA* is net income to total assets, *Loan loss provisions* is loan loss provisions to gross loans. All independent variables are measured at the bank-quarter level. The values of continuous variables are winsorized at 1% and 99%. T-statistics are in parentheses. Bank and quarter fixed effects are included but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively. Coefficients of interest are in boldface.

TABLE 6 (Continued)**Panel B: Reporting transparency and bond yield to maturity**

	(I) <u>Participating</u> <u>banks</u>	(II) <u>Matched</u> <u>sample</u>
	<i>Bond yield to maturity</i>	
<i>Post transparency</i>	-0.004** (-2.26)	-0.003** (-1.96)
<i>Reporting bank</i> × <i>Post transparency</i>		-0.029*** (-3.10)
<i>Bond offering balance</i>	-0.001 (-1.55)	-0.001 (-1.57)
<i>Bond maturity</i>	0.005 (1.49)	0.005 (1.47)
<i>Secured bond</i>	-0.007** (-2.47)	-0.007 (-1.23)
<i>Bond liquidity</i>	-0.010*** (-2.73)	-0.001 (-0.74)
<i>Size</i>	-0.005** (-1.98)	-0.006 (-1.24)
<i>Leverage</i>	0.004*** (3.09)	0.001*** (3.03)
<i>Liquidity</i>	-0.005*** (-2.68)	-0.002* (-1.74)
<i>ROA</i>	-0.030*** (-6.51)	-0.005** (-1.97)
<i>Loan loss provisions</i>	-0.001*** (-3.39)	-0.001 (-1.46)
Quarter FE	YES	YES
Bank FE	YES	YES
Obs.	1,192	2,384
Adj.-R ²	42.54%	43.50%

Panel B reports the results for the test that examines banks' bond yield to maturity under the transparency regime. We estimate specification (I) for bonds issued by reporting banks only and specification (II) for a matched sample of bonds by reporting and control banks. In both specifications the dependent variable is the bond yield to maturity, averaged at the bond-quarter level. *Post transparency* is equal to one for post-adoption quarters, and zero otherwise (for banks in the control group, the variable is equal to one for the post-adoption quarters of its matched bank). *Reporting bank* is equal to one for banks that adopted the ECB reporting standards (treatment group), and zero for the control banks. *Bond offering balance* is the natural logarithm of the bond principal value; *Bond maturity* is the natural logarithm of bond maturity in years; *Secured bond* is an indicator of whether a bond is collateralized; *Bond liquidity* is the natural logarithm of the number of quarterly trades. All other independent variables are the same as those used in Panel A. The values of continuous variables are winsorized at 1% and 99%. T-statistics are in parentheses. Bank and quarter fixed effects are included but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively. Coefficients of interest are in boldface.

TABLE 6 (Continued)

Panel C: The effect of information collection and market discipline under the transparency regime on participating banks' CDS spreads and bond yield to maturity

	(I)		(II)		(III)	
	<i>1-yr CDS spread</i>		<i>5-yr CDS spread</i>		<i>Bond yield to maturity</i>	
<i>Post transparency_</i> <i>High Information collection</i>	-0.004* (-1.61)		-0.008*** (-2.78)		-0.006*** (-3.80)	
<i>Post transparency_</i> <i>Low Information collection</i>	-0.003 (-1.00)		-0.003** (-2.10)		-0.003** (-2.12)	
<i>Post transparency_</i> <i>High Market discipline</i>		-0.009*** (-2.55)		-0.009*** (-4.14)		-0.010*** (-5.04)
<i>Post transparency_</i> <i>Low Market discipline</i>		-0.003* (-1.87)		-0.003*** (-2.08)		-0.002 (-1.11)
Controls	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES	YES
Comparison of coefficients:	F-test= 0.41 Prob.= 0.52	F-test= 7.64 Prob.= 0.02	F-test= 7.80 Prob.= 0.01	F-test= 8.16 Prob.= 0.01	F-test= 4.97 Prob.= 0.05	F-test= 45.12 Prob.= 0.00
Obs.	152	152	152	152	1,192	1,192
Adj.-R ²	90.01%	89.46%	90.44%	89.03%	47.79%	48.46%

Panel C reports the analyses of the effect of reporting transparency on the CDS spreads and bond yields to maturity of participating banks by their information collection and market discipline levels under the transparency regime. *Post transparency_High Information collection* (*Post transparency_Low Information collection*) is an indicator variable that equals one if a participating bank experiences above (below) median loan level information collection under the transparency regime. *Post transparency_High Market discipline* (*Post transparency_Low Market discipline*) is an indicator variable that equals one if a participating bank experiences above (below) median market discipline under the transparency regime. In specifications (I) and (II), the dependent variables are the one- and five-year CDS spreads in percentage points, respectively, averaged at the bank-quarter level. In specification (III), the dependent variable is the bond yield to maturity, averaged at the bond-quarter level. *Controls* include the same variables (untabulated) as those used in the similar specifications in Panels A and B, respectively. The F-tests examines whether the coefficients on *Post transparency_High Information collection* and *Post transparency_Low Information collection* (or *Post transparency_High Market discipline* and *Post transparency_Low Market discipline*) are statistically different from each other. The values of continuous variables are winsorized at 1% and 99%. T-statistics are in parentheses. Bank and quarter fixed effects are included but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively. Coefficients of interest are in boldface.

TABLE 6 (Continued)

Panel D: Reporting transparency and bond bid-ask spread

	<i>Bond bid ask spread</i>			
	(I)	(II)	(III)	(IV)
	<u>Participating</u> <u>banks</u>	<u>Matched</u> <u>Sample</u>	<u>Participating banks</u>	
<i>Post transparency</i>	-0.171*** (-2.88)	-0.283* (-1.75)		
<i>Reporting bank</i> × <i>Post transparency</i>		-0.128* (-1.69)		
<i>Post transparency</i> _ <i>High Information collection</i>			-0.184** (-2.34)	
<i>Post transparency</i> _ <i>Low Information collection</i>			-0.123 (-1.45)	
<i>Post transparency</i> _ <i>High Market discipline</i>				-0.072 (-1.22)
<i>Post transparency</i> _ <i>Low Market discipline</i>				-0.031 (-0.58)
Controls	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Comparison of coefficients:			F-test= 5.80 Prob. = 0.02	F-test= 3.03 Prob.= 0.11
Obs.	1,192	2,384	1,192	1,192
Adj.-R ²	28.11%	28.81%	21.46%	23.68%

Panel D reports the analyses of banks' bond bid-ask spread under the transparency regime. We estimate specification (I) for bonds issued by reporting banks only and specification (II) for a matched sample of bonds by reporting and control banks. Specifications (III) and (IV) report the analyses of the effect of transparency on the bond bid-ask spread of participating banks by their information collection and market discipline levels under the transparency regime. Across all specifications, the dependent variable is bond bid-ask spread, averaged at the bond-quarter level (*Bond bid-ask spread*). *Post transparency* is equal to one for post-adoption bond trade quarters, and zero otherwise (for banks in the control group, the variable is equal to one for the post-adoption quarters of its matched bank). *Reporting bank* is equal to one for banks that adopted the ECB reporting standards (treatment group), and zero for the control banks. *Post transparency_High Information collection* (or *Post transparency_Low Information collection*) is an indicator variable that equals one if a participating bank experiences above (below) median loan level information collection under the transparency regime. *Post transparency_High Market discipline* (or *Post transparency_Low Market discipline*) is an indicator variable that equals one if a participating bank experiences above (below) median market discipline under the transparency regime. *Controls* are the same variables as those in Panel B. The F-tests examines whether the coefficients on *Post transparency_High Information collection* and *Post transparency_Low Information collection* (or *Post transparency_High Market discipline* and *Post transparency_Low Market discipline*) are statistically different from each other. The values of continuous variables are winsorized at 1% and 99%. T-statistics are in parentheses. Bank and quarter fixed effects are included but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively. Coefficients of interest are in boldface.