Can supervisors enforce transparent accounting when the rules leave room for management discretion? *

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Abstract

Supervisors frequently use formal enforcement tools to intervene in banks' financial reporting. However, when managers exercise their discretion within the boundaries of accounting rules, supervisors have to turn to soft and informal actions to nudge, rather than force banks to change their reporting. While informal interventions are generally unobservable, the Asset Quality Review (AQR) revealed the new supervisor's preferred valuation of assets when the European Central Bank (ECB) took over the supervision of Eurozone banks. We find that banks adjusted their loan valuation to the ECB's reporting preferences even if their prior choices were fully compliant. This effect is weaker if a strong local supervisor interferes with central supervision, pointing to the relevance of supervisory consistency in soft enforcement. The reporting changes are associated with greater informativeness of bank earnings, indicating that supervisors' influence on bank reporting goes beyond the assurance of formal compliance and explains bank-level transparency.

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"One of the outcomes we expect from these tests is to dispel this fog that lies over bank balance sheets in the Euro area and in Europe." Mario Draghi, 23/10/2013, in a speech to the European Parliament

1. Introduction

Bank supervisors play an important role in shaping banks' financial reporting behavior. They can intervene in the reporting process on different levels. For one, where banks do not comply with accounting rules, they can issue formal enforcement actions, such as requiring restatements or imposing sanctions. There is robust and well identified evidence that formal enforcement has positive implications for bank transparency and financial system stability (Costello, Granja, and Weber, 2019). However, formal enforcement is not an option when bank managers' discretionary accounting choices formally comply with accounting rules, but do not match the reporting preferences of the supervisor, or when it is overly costly for supervisors to distinguish between compliant and non-compliant use of reporting discretion (e.g., Hanley, Jagolinzer, and Nikolova, 2018). Those situations frequently arise in asset measurement when future cashflows are uncertain and accounting valuation requires managerial estimates. In these cases, supervisors aim to limit managerial discretion inherent to accounting estimates by pushing accounting policies that are more consistent with their preferences (Kaplow, 1992). As these preferences do not warrant formal interventions, supervisors need to resort to alternative 'soft' policy tools that will nudge, rather than force, regulated institutions to take the intended action.¹

¹ Official supervisory terminology typically distinguishes between 'informal' and 'formal' enforcement actions (e.g., FDIC, 2022). In this regard, 'soft' influence through, e.g., the bilateral discussion of supervisory preferences would precede and extend 'informal' enforcement actions such as written memoranda of understanding. In Europe, soft

This paper examines whether banks change their accounting measurement when a supervisor reveals its preferred reporting of asset values and, if so, whether the reporting changes increase transparency. These questions are unresolved because the efficacy of soft supervisory influence in enforcing a preferred accounting practice is conceptually ambiguous. First, banks' own reporting choices deviate from the supervisors' preferences for a reason, often because they optimize their earnings and capital management (e.g., Beatty and Liao, 2014; Beatty, Chamberlain, and Magliolo, 1995; Liu and Ryan, 2006). When there is no formal enforceability of how banks exercise their discretion and supervisors lack a procedure for formal sanctioning of banks, it is nontrivial whether and how banks react to the soft actions of a supervisor. Arguably, managers might perceive non-abidance with the supervisor's preferences as costly, especially if they need to rely on supervisory forbearance to avoid scrutiny regarding other aspects of prudential supervision (Bischof, Daske, Elfers, and Hail, 2022). Also, public disclosure of a supervisor's preferences may create indirect pressure by other market participants (similar to, e.g., the publication of SEC comment letters; Duro, Heese, and Ormazabal, 2019). Moreover, even if supervisors succeed in changing a bank's discretionary reporting within the scope of extant accounting standards, it remains unclear whether their influence benefits bank transparency. In particular, any limitation to reporting discretion also reduces bank managers' flexibility to incorporate meaningful forwardlooking information (Ahmed, Takeda and Thomas, 1999; Kanagaretnam, Lobo and Yang, 2004; Bushman, 2016).

supervisory influence appears to be the prevalent enforcement mechanism for bank disclosures. For instance, the European Central Bank has no record of any formal sanctions related to banks' public financial accounting (ECB, 2022).

Soft supervisory influence on the exercise of reporting discretion is generally unobservable, and there is a dearth of empirical evidence on its consequences. In this paper, we use the European Central Bank's (ECB) 2014 Asset Quality Review (AQR) to explore how, beyond the formal enforcement channel, bank regulators' financial reporting preferences affect banks' reporting practices and overall transparency. In the run-up to the European Single Supervisory Mechanism (SSM), which shifted the responsibility for the prudential supervision of the most significant Eurozone banks from national regulators to the ECB, the ECB reassessed the audited financial statements of each affected bank and published its findings. For example, the ECB revealed that it viewed banks' loan loss allowances to be understated by, on average, 20.5% (median: 10.2%). However, as emphasized by the ECB, most of the AQR adjustments were not due to formal violations of accounting rules. Rather, they represent an observable shift in supervisory reporting preferences within the discretion of a common accounting framework, with the ECB often preferring higher provisioning levels than the national supervisors previously in charge of bank supervision.

We use this setting to address our research question in three steps. Employing a panel of yearly bank-level accounting data over the period from 2011 to 2017 (i.e., three years before and three years after the introduction of the SSM in the Eurozone), we first explore changes in banks' reporting behavior by focusing on the level of loan loss provisions and loan loss allowance. Our research design benefits from national regulators remaining responsible for the supervision of non-SSM banks. We include all other European banks that overlap in size with the SSM treatment sample as a benchmark group to enable a difference-in-differences estimation that controls for general time trends and macro-level shocks. Controlling for changes in the underlying risk of the loan portfolio, we find a negative standalone effect of SSM supervision on the level of loan loss

provisions and loan loss allowance. This contrasts with the common notion that the ECB is generally a stricter supervisor than previous national regulators (Fiordelisi, Ricci, and Lopes, 2017), and is consistent with our understanding that the impact of the SSM is not uniform across all affected banks but depends on the firm- and country-specific differences in supervisory policy. Consequently, when we take the magnitude of the AQR adjustments into account, we find that against the negative base effect, loan loss provisions increase significantly with larger adjustments. We interpret this as evidence that banks' reporting choices are influenced by supervisory preferences beyond simple compliance with accounting standards.

Second, we examine cross-sectional variation in the changes in reporting behavior around the AQR more closely. Specifically, our findings suggest that the ECB is less successful in implementing its reporting preferences in countries where the local supervisor is of a high quality and actively engaged in accounting supervision. In such settings, the prior accounting discretion is more likely to reflect the local supervisor's preferences, leading to a conflict of interest between the ECB and the NCA, on whose resources the ECB heavily relies. That is, banks supervised by a strong national supervisor are less likely to align their reporting with ECB preferences, indicating the importance of supervisory consistency in shaping accounting outcomes.

Third, we explore whether alignment with the ECB's reporting preferences helps improve reporting quality, and, ultimately, bank transparency. We document that loan loss provisions and the allowances of banks with higher AQR adjustments become more responsive to changes in aggregate credit risk. In addition, we find that banks with high AQR adjustments appear to have more predictable loan charge-offs, and manage earnings and capital less under ECB supervision. We further estimate panel regressions of monthly bid-ask-spreads as a proxy for market liquidity and information asymmetry among investors for the subsample of listed treatment and control firms. We find that the SSM adoption is associated with a decrease in the bid-ask spreads of participating banks by about 16%. However, when we interact SSM participation with the magnitude of a bank's AQR adjustment, we observe that this effect is limited to those banks with greater AQR adjustments. This finding supports the view that informal enforcement by a competent supervisory authority can reduce information asymmetry and contributes to a higher level of perceived transparency in a similar way as traditional legal enforcement.

Our study primarily contributes to research on the role of supervisory authorities in shaping reporting outcomes and firm transparency, particularly in the banking industry (Balakrishnan, De George, Ertan, and Scobie, 2021; Bischof et al. 2022; Costello et al., 2019; Granja, 2018; Granja and Leuz, 2022; Nicoletti, 2018). Prior evidence indicates that the strictness of supervisory enforcement is an important determinant of banks' reporting choices. We add to this literature by documenting the relevance of soft supervisory influence as an additional policy tool beyond formal enforcement actions. While soft influence is rarely observable, we take advantage of the fact that the ECB's publication of the AQR results reveals its supervisory reporting preferences on the firm level. Given such preferences may vary considerably across supervisory regimes, our findings suggest that when explaining variation in bank reporting, the heterogeneous interpretation of identical accounting rules by different supervisors engenders supervisory influence that is not necessarily captured by typical measures of enforcement strictness.

Our paper also adds to the topical literature on the economic implications of adopting the SSM in Europe. Some prior studies analyze the determinants (Acharya and Steffen, 2014; Homar, Kick, and Salleo, 2015) and the immediate market reaction to the publication of the AQR results

and the contemporaneous stress test (Carboni, Fiordelisi, Ricci, and Lopes, 2017; Sahin and de Haan, 2016). Fiordelisi et al. (2017) point to the real effects of SSM supervision and document that affected banks reduced their credit supply in the run-up to the launch of the SSM in order to improve their equity capital ratios. Against this backdrop, our study is the first to examine the disclosure of the supervisory accounting adjustments introduced by the SSM. In particular, we document how the new transnational bank supervisor exerts a soft influence to change accounting behavior and increase the long-term transparency of supervised institutions.

2. Institutional setting and empirical predictions

2.1. Bank supervision and accounting enforcement under the SSM

Following the European sovereign debt crisis, policymakers and regulators called for a coordinated approach regarding the governance of financial system stability. A major aspect of these initiatives was the integrated supervision of cross-border banking activities, as banking supervision was predominantly performed by national supervisors even for large, internationally active banking groups. To facilitate the harmonization of the European system of banking supervision, the European countries formally agreed to form a Banking Union in December 2012.

This Banking Union consists of three building blocks: the SSM, the Single Resolution Mechanism, and a common deposit insurance scheme. Under the SSM, the ECB formally assumed responsibility as the prudential supervisor of all banks in the Eurozone as of November 2014 (Regulation EU/1024/2013). At the same time, the ECB automatically redelegated the supervision of all "non-significant" institutions back to the originally responsible national supervisors. The ECB determines the significance of a bank on a country-by-country basis depending on predetermined size cutoffs (either total assets above EUR 30 billion or the bank being among the

three largest financial institutions of a country) and the extent of its cross-border activities. As such, with the adoption of the SSM regulation, the ECB became the direct supervisor of 120 major financial institutions in 18 Eurozone countries (plus Lithuania, which adopted the Euro in 2015). Prudential supervision for these significant institutions is carried out by joint supervisory teams composed of staff directly employed by the ECB and assigned by the national supervisors. To impede regulatory capture, team members rotate on a regular basis (ECB, 2018). Although the ECB sets the supervisory agenda and the joint supervisory teams are always headed by ECB staff, their operations rely extensively on the national supervisor's existing supervisory infrastructure and local staff (European Court of Auditors, 2016; IMF, 2018).

On October 26, 2014, shortly before the introduction of the SSM, the ECB and the European Banking Authority (EBA) released the results of a Comprehensive Assessment (CA) that consisted of the AQR and a stress test of major Eurozone banks. While the stress test gauged the banks' resilience against macroeconomic shocks, the AQR involved a detailed review of bank balance sheets with the objective of increasing and harmonizing the transparency of banks' risk exposures. In particular, the AQR assessed the adequacy of loan loss provisions, collateral valuations, and the classification of loan exposures as non-performing. The AQR was a supervisory exercise of unprecedented scale (ECB, 2014), lasting 12 months, involving more than 6,000 staff, and costing nearly EUR 500 million for external auditors and consultants. In 2015 and 2016, the EBA carried out two more AQRs to prepare the inclusion of additional banks into the SSM supervisory system (2015: 13 banks, 2016: 3 banks). Importantly, the ECB's published adjustments did not require immediate accounting restatements, and only 8% of the total adjustments of loan loss reserves resulted from actual violations of binding accounting rules (ECB, 2014). As such, the AQR adjustments revealed differences between the ECB's preferences on the use of managerial discretion in loan loss provisioning and management's actual reporting practice under the previous regime of national bank supervision.

2.2. Supervisory reporting preferences, banks' reporting behavior, and bank transparency

Formal supervisory enforcement is an important determinant of firms' reporting behavior (Christensen, Hail, and Leuz, 2013; Gipper, Leuz, and Maffett, 2020; Holthausen, 2009). In the banking sector, bank supervisors tend to dominate the public enforcement of reporting regulations, as they have economic resources and legal powers that usually outmatch those of general accounting supervisors (such as the securities market regulator) by a wide margin (Bischofet al., 2022). However, bank supervisors' reporting preferences are not always legally enforceable. Accounting standards frequently provide considerable reporting discretion, especially with regard to asset measurement and impairments. To limit this discretion, supervisors can, to a certain extent, issue formalized reporting guidance (Beck and Narayanamoorthy, 2013). Beyond such guidance, they have to resort to 'soft' influence, mainly through the informal discussion of their reporting preferences. However, given the lack of legal enforceability through penalties and sanctions, it is a priori unclear why banks would comply with these preferences. A potential explanation is that banks perceive non-abidance as costly, particularly if they rely on leniency regarding other aspects of supervision.

Against this backdrop, we investigate whether the transnational unification of supervisory institutions under the SSM affects bank reporting, beyond formal compliance with accounting standards, through a harmonization of these supervisory reporting preferences. Importantly, this effect is likely not uniform at the individual firm level but depends on the relative divergence in

supervisory reporting preferences between the national regulator and the ECB, which becomes observable in the bank-specific reporting adjustments disclosed in the AQR. We therefore expect that individual SSM banks will modify their accounting policies corresponding to the magnitude of their respective AQR adjustments.

The extent to which the ECB succeeds in implementing its reporting preferences likely depends on individual countries' institutional setup, such as the sources of the national supervisor's prior leniency, and the national supervisor's relative resources and bargaining power. This crosssectional variation helps to establish the link between changes in the supervisory reporting preferences and banks' accounting behavior.² For well-endowed national supervisors that have a history of active involvement in accounting supervision, prior leniency is likely intentional, pointing to a conflict of interest between the ECB and the national supervisor. At the same time, a national supervisor's endowment and ability also determine its bargaining power in setting supervisory policies relative to the ECB, which initially had to rely on local resources and the existing infrastructure for its own enforcement activities (European Court of Auditors, 2016; IMF 2018). As the ECB's soft enforcement of reporting preferences beyond formal compliance thus depends on the support of the national supervisor, a lack of compatibility between the central and the local agency plausibly impedes any effect of the SSM on banks' reporting behavior. Consequently, we predict that banks will adjust their reporting less in the presence of a dominant national supervisor.

² Specifically, supervisory leniency can be driven by regulatory capture and political influence (Agarwal, Amromin, Ben-David, and Dinc, 2018; Lambert, 2018), or by a lack of supervisory resources, which reduces the ability to detect shortcomings and enforce corrective actions (Fremeth and Holburn, 2012; Jackson and Roe, 2009; Macher et al., 2011).

Bank supervisors' preferences regarding bank transparency are not necessarily aligned with investors' demand for information. For instance, some supervisors may prefer bank opacity as it facilitates the orderly resolution of troubled institutions and can protect the supervisor's reputation (Gallemore, 2022). In our setting, the AQR disclosures reveal that the ECB preferred an increase in certain banks' loan loss provisions. On the one hand, this potentially reflects a preference for unconditional conservatism that obscures banks' performance and risk position. On the other hand, if the AQR adjustments accurately capture under-provisioning, and the ECB's soft enforcement of its reporting preferences is successful, we expect affected SSM banks' loan loss provisioning to become more informative, i.e., more responsive to aggregate credit risk, less earnings and capital management, and more predictive of future loan charge-offs (Altamuro and Beatty, 2010; López-Espinosa, Ormazabal, and Sakasai, 2021). Accordingly, such changes in reporting behavior would increase banks' perceived transparency and, through the reduction in adverse selection, lead to an increase in stock liquidity (Diamond and Verrecchia, 1991; Verrecchia, 2001).³

3. Research design and data

3.1. Research design

We evaluate the changes in reporting practice and transparency around the adoption of the SSM in three steps. First, we examine whether banks individually adjust their loan loss provisioning. Second, we analyze the relation between the institutional characteristics of national supervisors and the ECB's reporting preferences after the introduction of the SSM. Third, we test

³ Even if the AQR adjustments are not fully aligned with investors' informational needs, they can suggest a higher level of supervisory strictness under the SSM that might affect the perception of bank reporting quality. Similarly, supervisory disclosures that reveal substantial AQR adjustments likely trigger investor attention that extends to all aspects of financial reporting, which in turn can generate market pressure to increase the overall level of public information.

whether the observed adjustments in reporting behavior are accompanied by changes in the informativeness of banks' loan loss reporting, and whether they are associated with an increase in bank transparency and lower levels of information asymmetry among market participants.

We use a difference-in-differences design over the sample period from 2011 to 2017 that exploits the size overlap between SSM participants and European non-SSM banks arising from the different size thresholds for SSM participation in the Eurozone countries to construct a control group (Gropp, Mosk, Ongena, and Wix, 2019). We only include non-SSM banks that are at least as large as the smallest SSM bank in the benchmark sample to reduce the influence of differences in business models or funding strategies potentially correlated with bank size. Our research design also benefits from the staggered introduction of the SSM from 2014 to 2016 (with the majority of banks being included in 2014). Together, these features allow us to control for general time trends and market-wide shocks in reporting behavior and stock liquidity.

SSM supervision and banks' reporting choices

We examine changes in banks' reporting behavior by estimating different specifications of the following difference-in-differences regression model:

(1) Loss Recognition_{it} = $\beta_0 + \beta_1 SSM Treated_{it} + \beta_2 SSM Treated_{it} * AQR_i + \sum \beta_j Controls_{it} + \sum \beta_k Fixed Effects_{it} + \varepsilon$

As dependent variables, we use (a) the ratio of loan loss provisions to total gross loans (*LLP Ratio*), and (b) the ratio of the loan loss allowance to gross loans (*LLA Ratio*). The difference-indifferences estimator *SSM Treated* is a binary indicator variable that takes on the value of '1' beginning in the first year that an SSM bank becomes subject to ECB supervision. *SSM Treated* * AQR yields the coefficient of interest and captures the potentially heterogeneous treatment effect. We compute AQR as the magnitude of the ECB's disclosed adjustment of a bank's loan loss provisions, scaled by the concurrent loan loss allowance. We include the following firm-level and macroeconomic control variables (lagged by one year): *Size* is the natural logarithm of banks' total assets, *RoA* is the ratio of pre-provisioning income to total assets to measure banks' profitability, *Tier 1* is the ratio of banks' tier 1 capital to risk-weighted assets, *Cost-to-Income* is the operating expense divided by operating income measuring banks' operational efficiency, *GDP* is the annual gross domestic product growth rate in a country (source: World Bank), and *RWA* is the ratio of risk-weighted assets to total assets as a measure of the underlying portfolio risk. We add changes in non-performing loans from year *t*–*1* to year *t* in regressions of loan loss provisions to control for non-discretionary changes in delinquency rates. We include year- and firm-fixed effects and cluster standard errors by bank to adjust for time-series correlation.

Institutional determinants of the SSM effect

Next, we analyze how changes in accounting behavior after the introduction of the SSM are shaped by countries' institutional characteristics. Specifically, we expand Equation (1) and add three fully interacted binary partitioning variables that proxy for the extent and quality of national bank supervisors' involvement in accounting supervision before the SSM: *Auditor Exchange* indicates whether auditors are subject to mandatory reporting requirements to national bank supervisors based on the Basel core principles (source: IMF Financial Sector Assessment Program). *Regulatory Quality* and *Government Effectiveness* are two established proxies for the overall quality and strength of national supervisory institutions from the World Bank's Worldwide Governance Indicators (WGI) database (Kaufmann, Kraay, and Mastruzzi, 2010). Strong local

supervisors are more likely to impede the implementation of the ECB's preferences; thus, we expect a negative coefficient for the triple interaction.

Reporting quality and bank transparency under the SSM

To examine whether changes in banks' reporting behavior represent an improvement in accounting quality and bank transparency, we estimate discretionary loan loss provisions based on three alternative regression models (López-Espinosa, Ormazabal, and Sakasai, 2021):

(2a) LLP Ratio_{it} =
$$\beta_0 + \beta_1 NPL_{it} + \beta_2 \Delta NPL_{it} + \beta_4 Loan Growth_{it} + \sum \beta_k Fixed Effects_{it} + \varepsilon$$
,

- (2b) $LLP \ Ratio_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 \Delta NPL_{it} + \beta_3 \ Loan \ Growth_{it} + \beta_4 \ Loan \ Ratio_{it} + \sum \beta_j \ Fixed$ Effects_{it} + ε ,
- (2c) LLP Ratio_{it} = $\beta_0 + \beta_1 \Delta NPL_{it} + \beta_2 \Delta NPL_{it+1} + \beta_3 \Delta NPL_{it-1} + \beta_4$ Loan Growth_{it} + $\sum \beta_i Control_{sit} + \sum \beta_j Fixed Effect_{sit} + \varepsilon$,

where *LLP Ratio* is the ratio of loan loss provisions to total loans, *Loan Growth* is the annual change in total loans, *Loan Ratio* is the ratio of gross loans to total assets, *NPL* is the ratio of nonperforming loans to total loans, ΔNPL_t is the change in nonperforming loans divided by total loans from year *t*–1 to year *t*, ΔNPL_{t-1} is the change in nonperforming loans divided by total loans from year *t*–2 to year *t*-1, and ΔNPL_{t+1} is the change in nonperforming loans divided by total loans from year *t*–2 to year *t*-1. *Size* is the natural logarithm of total assets, *Cost-to-Income* is operating expenses divided by operating income, *GDP* is the annual growth rate of a country's gross domestic product, and *RWA* is the ratio of risk-weighted assets to total assets. We also include year and firm-fixed effects.

We use the residuals from estimating Equations (2a), (2b), and (2c) as our proxies for discretionary loan loss provisions (*DLLP*), and test whether SSM adoption is associated with the use of discretionary loan loss provisions for purposes of earnings and capital management (e.g., López-Espinosa et al.,2021; Beatty and Liao, 2011; Bushman and Williams, 2012):

(3) $DLLP_{it} = \beta_0 + \beta_1 SSM Treated_{it} + \beta_2 SSM Treated_{it} * AQR_i + \beta_3 SSM Treated_{it} * AQR_i * Earnings_{it} + \beta_4 SSM Treated_{it} * AQR_i * Tier 1_{it} + \beta_5 AQR_i * Tier 1_{it} + \beta_6 AQR_i * Earnings_{it} + \beta_7 SSM Treated_{it} * Earnings_{it} + \beta_8 SSM Treated_{it} * Tier 1_{it} + \beta_9 Earnings_{it} + \beta_{10} Tier 1_{it} + \sum \beta_j Controls_{it} + \sum \beta_k Fixed Effects_{it} + \varepsilon.$

We define *SSM Treated* and *AQR* as in Equation (1). *Earnings* is earnings before taxes and loan loss provisions divided by total assets, *Tier 1* is the ratio of banks' tier 1 capital to risk-weighted assets, and *Controls* capture *Size*, *Cost-to-Income*, *GDP*, and *RWA*. We include year and firm-fixed effects.

We also explore whether changes in banks' loan loss reporting around the SSM adoption represent an increas in informativeness. Following Altamuro and Beatty (2010) and Beck and Narayanamoorthy (2013), we use the association of the loan loss allowance and future loan chargeoffs to measure the informativeness of loan loss provisions, and estimate the following model:

(4) Charge-Offs_i = $\beta_0 + \beta_1 SSM Treated_{it} + \beta_2 SSM Treated_{it} * AQR_i + \beta_3 SSM Treated_{it} * AQR_i * Loss Allowance_{it} + \sum \beta_j Controls_{it} + \sum \beta_k Fixed Effects_{it} + \varepsilon$,

where *Charge-Offs* are loan charge-offs in t, t+1, or t+2, alternatively, scaled by total loans of the prior year. *LLA Ratio* is the loan loss allowance in t-1, scaled by total loans. We include the same controls as in Equation (1) and add year and firm-fixed effects.

To consider the extent to which banks' loan loss provisions reflect changes in aggregate economic conditions, we follow López-Espinoa et al., (2021) and estimate an expanded version of Equation (1) that includes $\triangle CDS$, the fractional change in the five-year sovereign CDS spread, to capture the overall credit conditions in a country:

(5) Loss Recognition_{it} = $\beta_0 + \beta_1$ SSM Treated_{it} + β_2 SSM Treated_{it} * $\Delta CDS_{ct} + \beta_3$ SSM Treated_{it} * $AQR_i + \beta_4$ SSM Treated_{it} * $AQR_i * \Delta CDS_{ct} + \beta_5 \Delta CDS_{ct} + \sum \beta_j$ Controls_{it} + $\sum \beta_k$ Fixed Effects_{it} + ε

The dependent variable is *LLP Ratio*, the ratio of loan loss provisions to total loans. *SSM Treated, AQR*, and the control variables are defined as in Equation (1). We add ΔNPL , the change in nonperforming loans divided by total loans from year *t*–1 to year *t*, to control for non-discretionary changes in delinquency rates, and include year and firm-fixed effects.

Finally, we conclude our analysis of the SSM introduction's effect on bank transparency by analyzing whether the changes in banks' reporting behavior are associated with changes in stock liquidity as an indicator of overall bank transparency. For this analysis, we use a panel of monthly observations for the subsample of listed sample banks from 2011 to 2017 and estimate the following regression:

(6) $Log(Bid-Ask-Spread)_{it} = \beta_0 + \beta_1 SSM Treated_{it} + \beta_2 SSM Treated_{it} * AQR_i + \sum \beta_j Controls_{it} + \sum \beta_k Fixed Effects_{it} + \varepsilon,$

where the dependent variable *Bid-Ask Spread* is the monthly median quoted spread between the bid and the ask price. *Controls* capture firm-specific determinants of stock liquidity: the absolute value of the monthly *Abnormal Stock Return* (based on a simple market model), *Market Value*, the

monthly median of daily *Share Turnover*, and *Return Variability* measured by the standard deviation of daily stock returns. We estimate the liquidity regressions in a log-linear form with the natural logarithm of the dependent and control variables and lag the control variables by 12 months. We include country-month and firm-fixed effects to control for country-specific time trends as well as for time-invariant bank and country characteristics.

3.2. Sample and data

Our sample period begins in 2011, three years before the launch of the SSM, and runs until 2017, three years after.⁴ We collect annual bank accounting information from S&P Global Market Intelligence (formerly SNL Financial), AQR Data from the ECB's repository, and capital market data from Thomson Reuters Datastream. Table 1 summarizes the sample selection process. For the accounting analysis, the initial treatment sample includes all 136 SSM banks, of which we keep 129 banks that were also subject to an AQR in 2014, 2015, or 2016. We exclude 12 banks that were nationalized during the sample period, and drop six more banks due to missing data. Furthermore, we keep only banks reporting under IFRS to ensure the comparability of the applicable accounting framework, resulting in a final treatment sample of 103 SSM/AQR banks with 617 annual observations.

For the control group, we initially select all 3,845 EU banks from the S&P universe that were not included in the SSM and that were not directly owned by a treatment bank or shared their direct or ultimate parent with a treatment bank.⁵ We further exclude banks with missing data to

⁴ From 2018, Eurozone banks that apply IFRS started to report loan loss provisions under IFRS 9's new expected credit loss model, which impairs the comparability of post-2018 accounting numbers to earlier periods (when banks applied the incurred loss model under IAS 39). This supports our choice of the sample period.

⁵ Ownership information in S&P Global Market Intelligence is static and only available for the latest update. Therefore, we supplement the data with ownership information from the 2012 Bureau van Dijk Bankscope tape.

estimate Equation (1), banks that are in the bottom five percent of the distribution of the ratio of total loans to total assets (Fiordelisi, 2017), banks that do not overlap with the size range of the SSM banks⁶, and non-IFRS banks. This leads to a final control sample of 612 banks and 3,029 bank-year observations.

We use the subsample of banks with publicly listed equity and trading data available on Datastream for the liquidity analysis. Using the same selection criteria as for the accounting analysis yields a final sample of 6,141 bank-month observations for AQR/SSM banks and the control group.

To establish the validity of the parallel trend assumption for our treatment and control group, we report coefficient estimates in Figure 1. We interact the *SSM Treated* indicator in Eq. (1) with dummy variables for each year, using t-1 (the year before a bank becomes subject to SSM supervision) as the benchmark period. These coefficients are never significantly different from zero (at a 5% significance level) in the pre-SSM period, mitigating concerns about systematically different time-trends or anticipation effects that might bias our difference-in-differences results. We also document the coefficient estimates for the *SSM Treated***AQR* interaction over the different time periods. These results suggest that banks with higher AQR adjustments did not anticipate the ECB's findings by adjusting their loan loss provisions ahead of regulatory intervention.

Table 2, Panel A presents summary statistics for the firm-level variables used in the accounting and liquidity analyses. With an interquartile range of 1.4% for the ratio of annual loan

⁶ We validate our results using entropy balancing as a quasi-matching technique that alleviates concerns about potential differences between our treatment and control sample (Hainmueller, 2012) and that is widely used in recent research (Chapman, Miller and White, 2019; Ferri, Zheng and Zhou, 2018; Shroff, Verdi and Yost, 2017). We reweight the observations in our sample so that the distribution of the control variables in the control group is as similar as possible to the treatment group along the first three moments (mean, variance, skewness). The findings from this robustness test support our inferences from the main tests (Appendix B).

loss provisions to total gross loans, and of 7% for the ratio of the loan loss allowance to total gross loans, there is considerable variation in the two dependent variables of interest in the baseline accounting analysis. The table also indicates that the adjustments to loan loss provisions in the AQR disclosures were economically meaningful, with a mean (median) of 20.5% (10.2%) of the treatment banks' loan loss allowance.

In panel B of Table 2, we document the determinants of the AQR adjustments disclosed by the ECB. This analysis is supposed to address whether banks' pre-SSM accounting discretion rather reflects informative signaling or opportunistic earnings management. While the evidence on common determinants derived from publicly available data is mixed and weak, the results tend to support the latter view. In univariate tests, the AQR adjustments are lower for banks in countries with a more independent supervisor and a higher level of market monitoring, and they are larger for banks with lower Tier 1 capital ratios. When we simultaneously include all variables in one specification, only the proxy for the market monitoring incentives (*High Private Monitoring*) remains significantly negatively associated with the AQR adjustments. Overall, we interpret these results as being indicative of some national regulators lacking sufficient market control and allowing supervised banks to underreport their loan losses.

4. Empirical results

4.1. SSM supervision and banks' reporting choices

We begin by estimating how switching to the ECB as the responsible bank supervisor under the SSM affected credit risk-related reporting outcomes. We report our baseline results in Table 3.⁷

The results are quantitively and qualitatively similar if we exclude 2014 as the initial treatment year, indicating that our results capture a longer-term shift in reporting behavior.

The results in columns (1) and (2) suggest that for participating banks, SSM implementation is negatively associated with the level of loan loss provisioning. On average, loan loss provisions (scaled by total gross loans) decrease by 0.2 percentage points relative to non-SSM banks. However, in line with our predictions, the change in supervisory responsibility does not affect all SSM treatment banks uniformly. The significantly positive interaction of *SSM Treated* and *AQR* in column (2) indicates that a bank with an average AQR adjustment of 20.5% decreases its loss provisions by 0.35 percentage points (0.017 x 0.205) less than a bank with a zero adjustment. In columns (3) and (4), we report results for the level of banks' loan loss allowances. Again, while the average effect of the SSM adoption is negative (-0.9 percentage points), we observe that relative to SSM banks with a zero AQR adjustment, treatment banks with an average AQR adjustment reduce their loan loss allowances by 0.9 percentage points.

Taken together, our findings indicate a meaningful change in reporting behavior following the implementation of the SSM and consistent with the reporting preferences of the new supervisor revealed through the AQR results. Relative to other treatment banks, banks with a larger AQR adjustment increase their level of periodic loan loss provisions and aggregate loan loss allowances in the post-SSM period. We interpret this evidence as consistent with the notion that even within the bounds of formal compliance with accounting standards, a change in the supervisor's reporting preferences alters banks' financial reporting practices.

4.2. Institutional determinants of the SSM effect

In Table 4, we present the results from estimating Eq. (1) including three fully interacted country-level split variables that are supposed to capture the quality and involvement of the prior

national supervisor. We only tabulate the variables of interest, but include the full set of controls plus year and firm-fixed effects in the regressions.

Columns (1) and (2) of Table 4 report the results regarding *Auditor Exchange*.⁸ With the baseline results persisting, we observe a significantly negative coefficient on the triple interaction with *SSM Treated* and *AQR* for loan loss provisions, which counterbalances the simple interaction of *SSM Treated* and *AQR*. We confirm this result in columns (3) to (6) with our two alternative proxies for supervisors' quality and power – *Regulatory Quality* and *Government Effectiveness*.

Overall, this evidence suggests that where national supervisors have a history of involvement in accounting enforcement—and where prior leniency is thus more likely to reflect supervisors' preferred reporting policy—banks react less to the ECB's preferences. We interpret this finding as consistent with the notion that a 'soft' supervisory influence on banks' reporting choices relies on a streamlined enforcement approach and homogeneous preferences at all levels of supervision.

4.3. Reporting quality and bank transparency under the SSM

Opportunistic usage of discretionary loan loss provisions

To conclude our analysis, we examine whether the introduction of the SSM affected banks' opportunistic usage of reporting discretion in their loan loss provisioning. Table 5, Panel A, shows the first-stage results for the three alternative models we use to estimate discretionary loan loss provisions. In Panel B of Table 5, the negative triple interaction of *SSM Treated*, *AQR*, and *Earnings* suggests that after the introduction of the SSM, banks with higher AQR adjustments have

⁸ Our results for auditor exchange are robust on the 10% significance level to the alternative measure of auditor reporting towards bank supervisors proposed by Balakrishnan, De George, Ertan, and Scobie (2021).

lower tendency to increase (decrease) their loan loss provisions to counterbalance high (low) preprovisioning income, indicating a decline in potentially opportunistic earnings smoothing. However, we do not observe similar changes in capital management through discretionary loan loss provisions.⁹ Overall, these findings are in line with the notion that the ECB had a limiting influence on banks' opportunistic use of discretionary accounting choices.

Informativeness about future loan losses

Next, we analyze whether banks' loan loss allowances become more informative about future realizations of loan losses after the introduction of the SSM. We present the results from estimating Equation (4) in Table 6. They support this conjecture, as we find that the primary coefficient of interest for the triple interaction of *SSM Treated*, *LLA*, and *AQR* is significantly positive in all specifications, using loan charge-offs up to three years ahead as the dependent variable. This result indicates that for banks with a larger AQR adjustment, there is an increase in the association of current loan loss allowances and future charge-offs under SSM supervision, consistent with an increase in the informativeness of their loan loss provisioning (Altamuro and Beatty, 2010; Beck and Narayanamoorthy, 2013).

Responsiveness to aggregate credit risk and provisioning informativeness

We follow López-Espinosa, Ormazabal, and Sakasai (2021) and analyze the association between aggregate credit risk (indicated by the spread of five-year sovereign credit default swaps in the bank's home country) and loan loss provisioning. We present the results from estimating Equation (5) in Table 7. Notably, for both *LLP* and *LLA* as the dependent variable, we observe a

Incentives for capital management are likely limited for many of our treatment banks, as under Basel II's Internal Ratings Based approach, any shortfall of accounting provisions relative to expected losses must be deducted from regulatory capital.

significantly negative baseline coefficient for the interaction of *AQR* and *ACDS*, suggesting that firms with higher AQR adjustments were less responsive to changes in aggregate credit risk in the pre-SSM period. However, as indicated by the significantly positive triple interaction of *AQR*, *ACDS*, and *SSM Treated*, this difference is muted after the implementation of the SSM. The evidence suggests that the AQR adjustments document insufficient loan loss provisioning prior to SSM adoption, and that these banks become more responsive to changes in overall credit conditions under SSM supervision.

Changes in market liquidity

In the final step of our analysis, we examine whether for the subsample of publicly listed banks, SSM supervision and the disclosure of the AQR results are associated with a higher level of perceived transparency as reflected in higher stock market liquidity. In column (1) of Table 8, we document a significant increase in liquidity for banks that fall under SSM supervision. Column (2) reveals that the liquidity benefits are entirely attributable to the magnitude of the AQR adjustments. The base coefficient estimate for the SSM introduction becomes statistically insignificant once we include an interaction term that captures variation in the impact of the new supervisory regime and, correspondingly, the supervisory AQR disclosures. For the average treatment bank in our sample (in terms of the magnitude of the AQR adjustment), bid-ask-spreads decrease by about 15% relative to the control group after the SSM implementation, which is economically meaningful, but not too large to be implausible.

Taken together, our findings suggest that those SSM banks that, relative to their prior national supervisors, experienced a substantial switch in supervisory reporting preferences adjusted their loan loss provisions such that they became more informative about the underlying portfolio risk, with market participants perceiving these banks as more transparent.

5. Conclusion

When the ECB became the responsible supervisor for major Eurozone banks under the European Single Supervisory Mechanism in 2014, it performed an extensive review of these banks' financial statements and publicly disclosed the results of this Asset Quality Review. The published accounting adjustments were nonbinding, as they address within-GAAP discretion rather than formal noncompliance with applicable accounting standards. As such, they reflect the reporting preferences of the new supervisor. We use this setting to examine whether such 'soft' supervisory influence entails changes in banks' reporting behavior and can affect accounting quality and transparency.

The supervisory AQR disclosures reveal that the ECB favored a higher level of reporting conservatism for many banks. We observe that in the post-SSM period, banks with greater AQR adjustments increased their loan loss provisions and allowances more than other treatment banks. Moreover, we find that this effect is less pronounced in countries with a high-quality national supervisor that is actively involved in banks' accounting procedures. We attribute this finding to frictions in the soft enforcement of financial reporting when the reporting preferences diverge at different levels of the supervisory process.

Our findings further suggest that the treatment banks' adaptation to the ECB's reporting preferences is associated with a decrease in earnings and capital management and an increase in the risk sensitivity and informativeness of their loan loss provisions. Further, banks with larger adjustments in the AQR also display a significant increase in stock liquidity after SSM introduction, indicating a higher level of aggregate firm transparency. Taken together, our analysis complements the literature on supervisory influence on bank transparency. Beyond enforcing formal compliance with accounting standards, our results point to the important role of supervisory reporting preferences and soft institutional influence in shaping financial reporting outcomes.

The European AQR setting offers unique features, but is also subject to limitations. Particularly, the ECB only performed the AQRs on a group of systemically relevant banks. As such, our setting does not allow any statements about the generalizability of our results for smaller banks that receive less supervisory attention. Further, given the public disclosure of the AQR results, it is unclear whether reporting outcomes would have been the same without the public scrutiny arising from these disclosures. Finally, our analysis does not provide insights into the exact channels of soft supervisory influence as we cannot observe private communications between banks and the respective supervisor. We leave these questions for future research.

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Figure 1: Trends in key accounting figures around the introduction of the SSM

Notes: The figure shows the reporting patterns around the SSM adoption and the AQR disclosures. We estimate the model in Eq. (1) but replace the *SSM Treated* and the *SSM Treated* **AQR* coefficient with seven separate indicator variables, each marking the year relative to the first treatment year over the 2011 to 2017 period. We omit the indicator for year t-1, which serves as benchmark for all other years. The figure plots the coefficient estimates for the seven years (except t-1) together with their confidence intervals. We include all control variables and fixed effects from Eq. (1) in the estimation. Standard errors are clustered by bank.

Table 1: Sample selection

	(1)	(2)	(3)	(4)	(5)
Year	AQR	New SSM Banks	SSM Dropouts	SSM Banks	Overlap (1) & (2)
2014	130	120	-	120	119*
2015	9	15	6	129	9**
2016	3	1	4	126	1
2017	0	0	1	125	0
Potential treatment sample					129

Panel A: Overview of AQR/SSM banks

* Out of these 119 banks, five participated in the AQR in 2015 but joined the SSM in 2014.

** Out of these nine banks, five participated in the AQR in 2014 but joined the SSM in 2015, and one bank participated in the AQR in 2016 but joined the SSM in 2015.

Panel B: Sample selection procedure

	Treated Banks	Treated Obs.	Control Banks	Control Obs.
All SSM banks	136			
Less: banks not in AQR	-7			
AQR & SSM banks	129	903		
Less: AQR Banks nationalized during sample period	-12	-84		
AQR & SSM Banks	117	819		
All other banks in Europe with data from S&P			3,845	26,915
Less: Missing data on dependent or control variables	-7	-152	-748	-11,448
Less: Bottom 5% TL/TA			-233	-1,086
Less: TA < smallest treatment bank			-1,297	-6,627
Less: Non-IFRS banks	-8	-50	-955	-4725
Total Sample	102	617	612	3029

Notes: Panel A shows the number of banks that participated in an AQR or became subject to SSM supervision during the sample period. Column (1) indicates the number of participants in the point-in-time AQR in a given year, column (2) shows how many new banks became subject to ECB supervision under the SSM, column (3) indicates how many banks previously in the SSM dropped out of the SSM again, column (4) presents the total number of banks in the SSM in a given year, and column (5) shows how many banks became subject to ECB supervision under the SSM and also participated in an AQR during the sample period. Panel B illustrates the sample selection procedure for the treatment and the control group. The sample period includes all years over the 2011-2017 period using all European banks as control that are at least as large as the smallest SSM/AQR bank. We exclude banks that are owned by a treatment bank or that are in the bottom 5th percentile of the total loans to total assets ratio, and bank observations that have missing data on any control variable or dependent variable for our baseline Test in Table 3.

Table 2: Descriptive statistics and determinants of AQR adjustments

Panel A: Descriptive statistics

	Bank-years	Mean	Std. Dev.	P1	P25	Median	P75	P99
Accounting Analysis:								
Tier 1	3577	0.155	0.077	0.065	0.113	0.138	0.170	0.552
Size	3577	15.445	1.835	13.107	13.909	14.991	16.591	19.754
Cost-to-Income	3577	0.637	0.185	0.232	0.529	0.634	0.734	1.304
RoA	3577	0.010	0.008	-0.013	0.005	0.009	0.013	0.037
Risk-weighted Assets	3577	0.550	0.196	0.074	0.429	0.565	0.681	1.011
GDP	3577	0.011	0.023	-0.031	0.001	0.011	0.022	0.069
ΔNPL	2028	0.011	0.029	-0.057	-0.004	0.006	0.023	0.097
CDS	3453	0.005	0.715	-0.183	-0.023	-0.006	0.016	0.525
Loan loss provision (LLP) Ratio	3577	0.011	0.013	-0.007	0.002	0.008	0.016	0.058
Loan loss allowance (LLA) Ratio	3577	0.054	0.049	0.000	0.017	0.041	0.076	0.228
Non-performing loans (NPL) Ratio	2193	0.129	0.092	0.000	0.053	0.116	0.189	0.367
Coverage Ratio (LLA/NPL)	2172	0.535	0.436	0.099	0.335	0.454	0.577	3.293
Charge-offs	786	0.009	0.015	0.000	0.002	0.004	0.011	0.071
Gross Loan Growth	3548	0.013	0.158	0.006	0.010	0.010	0.011	0.017
AQR	617	0.205	0.460	0.000	0.026	0.102	0.232	0.946
Country-Level Partitioning								
Auditor Euchanos	2590	0.266	0.442	0.000	0.000	0.000	1 000	1 000
Audior Exchange	3389	0.200	0.442	0.000	0.000	0.000	1.000	1.000
High Government Efficiency	3646	0.389	0.488	0.000	0.000	0.000	1.000	1.000
Liquidity Analysis:	Bank-months							
Did Ash Coursed	<i>C</i> 141	0.010	0.015	0.000	0.001	0.004	0.012	0.090
Diu-Ask Spreud	0141	0.010	0.015	0.000	0.001	0.004	0.015	0.009
AUS(AUNORMAI STOCK KETURN)	0141	0.005	0.071	0.001	0.019	0.045	0.084	0.431
Market value (EUK million)	0141	/034.528	13862.092	23.200	330.339	1038.144	/264.929	/0025.555
Share Turnover	6141	0.250	1.660	0.000	0.000	0.001	0.004	15.1/5
Keturn Variability	6141	0.023	0.015	0.002	0.014	0.019	0.028	0.089

Notes: The table shows descriptive statistics for all firm-level variables used in our accounting and liquidity tests. All continuous variables are winsorized at the 1% and at the 99% level. All variables are defined in Appendix A.

Table 2 (continued)

Panel B: Determinants of AQR adjustments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable:	AQR	AQR	AQR	AQR	AQR	AQR	AQR	AQR	AQR	AQR	AQR	AQR	AQR
High private monitoring	-0.106**												-0.070**
	(0.033)												(0.032)
Central bank supervisor		-0.122***											-0.073
		(0.007)											(0.192)
Change in Sovereign													
CDS			0.267**										0.023
			(0.022)										(0.915)
GIPS				-0.031									-0.029
				(0.532)	0.40.4								(0.792)
GDP					-0.496								-1.800
House Dries Indon					(0.737)	0.001							(0.541)
House Frice Index						(0.687)							(0.814)
Size						(0.087)	-0.014						0.000
Size							(0.518)						(0.000
Low Tier 1 Capital							(0.510)	0.063*					0.099
2011 1101 1 041014								(0.077)					(0.211)
Cost-to-Income								(,	-4.517				8.559
									(0.850)				(0.802)
RoA										2.823			4.758
										(0.212)			(0.329)
RWA											0.677		-13.874
											(0.963)		(0.605)
Listed Bank												-0.059	-0.061**
												(0.102)	(0.017)
N	80	80	80	80	80	80	80	80	80	80	80	80	80
KZ	0.053	3 0.066	0.069	0.006	0.002	0.002	0.0	0.01	1 0.00	2 0.01	5 0.000	0.02	0.152
Adj. K2	0.040	0.054	0.057	-0.007	-0.011	-0.011	-0.00	-0.00	-0.01	1 0.00	2 -0.013	0.007	0.000

Notes: The table shows regression results for the analysis of the determinants of the AQR adjustments. The sample comprises only AQR treatment banks with available data on all explanatory variables. All independent variables are measured in the year before the AQR assessment. *AQR* is the magnitude of the AQR adjustment on loan loss provisions (i.e., additionally required loan loss provisions) scaled by the amount of the loan loss allowance in the year preceding the AQR. *High private monitoring* is a binary indicator that takes the value of '1' for countries with values of private monitoring above the sample median in 2014. *Central bank supervisor* is a binary indicator that takes the value of '1' if the central bank is simultaneously in charge of the banking supervision in the respective country in 2014. *GDP* and *House Price Index* are country-averages for the three years preceding the SSM. *GIPS* is a binary indicator that takes the value of '1' for banks headquartered in Greece, Italy, Portugal, or Spain. *Change in Sovereign CDS* is the change in the sovereign 5-year CDS spread from 2013 to 2014. All other variables are defined in Appendix A. We include the constant but do not report it. The table reports OLS coefficient estimates and (in parentheses) *p*-values based on robust standard errors clustered by country. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

	(1)	(2)	(3)	(4)
Dependent Variable:	LLP	LLP	LLA	LLA
Test Variables				
SSM Treated	-0.002* (0.054)	-0.005*** (0.002)	-0.009** (0.012)	-0.017*** (0.000)
SSM Treated*AQR		0.017*** (0.002)		0.044*** (0.004)
Control variables				
Tier 1	-0.002	-0.002	-0.095*** (0.000)	-0.096*** (0.000)
Size	0.006***	0.005***	-0.013***	-0.013***
Cost-to-Income	-0.006**	-0.006**	0.009	0.004)
RoA	0.039)	0.107	(0.191) 1.001***	(0.264) 0.986***
GDP	(0.127) -0.101***	(0.149) -0.097***	(0.000) 0.113**	(0.000) 0.124**
RWA	(0.000) 0.000	(0.000) 0.000	(0.038) -0.051***	(0.021) -0.052***
	(0.919)	(0.998)	(0.000)	(0.000)
Fixed Effects	Year, Firm	Year, Firm	Year, Firm	Year, Firm
N Adj. R ²	3,577 0.510	3,577 0.513	3,577 0.797	3,577 0.798

Table 3: Loan loss reporting following the introduction of the SSM

	(1)	(2)	(3)
Dependent Variable:	LLP	LLP	LLP
SSM Treated	-0.009***	-0.009***	-0.009***
	(0.003)	(0.006)	(0.006)
SSM Treated *AQR	0.031***	0.045***	0.038***
	(0.004)	(0.006)	(0.004)
SSM Treated *Auditor Involvement	0.007**		
	(0.023)		
SSM Treated * AQR *Auditor Involvement	-0.028***		
	(0.010)		
SSM Treated * High Regulatory Quality		0.006	
		(0.187)	
SSM Treated * AQR *High Regulatory Quality		-0.036**	
		(0.035)	
SSM Treated * High Government Efficiency			0.005
			(0.178)
SSM Treated * AQR *High Government Efficiency			-0.029**
			(0.043)
Controls	Yes	Yes	Yes
Fixed Effects	Year, Firm	Year, Firm	Year, Firm
Ν	3,527	3,577	3,577
Adj. \mathbb{R}^2	0.508	0.515	0.515

Table 4: Institutional characteristics and reporting behavior around the SSM

Notes: The table shows regression results for the differential effect of SSM supervision, depending on the magnitude of the AQR impact, on banks' loan loss provisions and loan loss allowances ratio conditional on a set of country-specific binary indicator variables as defined in Appendix A. *Regulatory Quality* and *Government Effectiveness* are binary indicators that take the value of '1' for countries with values of Regulatory Quality and Government Effectiveness above the sample median in 2014. *Auditor Exchange* is a binary indicator that takes the value of '1' for countries in which auditors are subject to mandatory reporting requirements to national bank supervisors according to the basel core principles assessed in the Financial Sector Assessment Program (FSAP) by the IMF. We include the same control variables as in Table 4, Panel A, as well as year and firm fixed effects, but do not report the coefficients. The table reports OLS coefficient estimates and (in parentheses) *p*-values based on robust standard errors clustered by bank. ***, ***, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

	(1)	(2)	(3)
Dependent Variable:	LLP	LLP	LLP
ANDI	0 08/***	0.040***	0.060***
	(0.000)	(0.049)	(0.009)
ANDI + 1	(0.000)	(0.001)	(0.000)
			-0.017
ANDI + 1			(0.233)
			(0.048)
NDI	0.001***	0 100***	(0.008)
	(0,000)	(0.000)	
Loan Growth	0.016***	(0.000)	0.006
Loun Growin	-0.010°	-0.007	(0.232)
Loans Patio	(0.000)	(0.114)	(0.232)
Louns Kallo		-0.007	
Size		(0.114)	0.000
SILE			(0.974)
Cost to Income			0.006**
Cost-to-income			-0.000^{+1}
CDP			(0.019)
001			(0.056)
DWA			0.000
RWA			(0.704)
			(0.704)
Fixed Effects	Year, Firm	Year, Firm	Year, Firm
Ν	2,055	2,055	1,274
Adj. R ²	0.327	0.295	0.188

Table 5: Opportunistic usage of discretionary loan loss provisions

Panel A: First-stage estimation of discretionary loan loss provisions

Table 5 (continued)

Panel B: Regulatory capital and earnings management

	(1)	(2)	(3)
Dependent Variable:	Discretionary LLP Model a	Discretionary LLP Model b	Discretionary LLP Model c
SSM Treated	-1 082***	-0 913***	-1 271**
Som neurou	(0.001)	(0.010)	(0.038)
SSM Treated * AOR	4 278***	2 532**	2 391
	(0.001)	(0.032)	(0.385)
SSM Treated * AOR * Earnings	-2.343**	-2.376***	-3.805**
Sour Fronton Fight Lannings	(0.029)	(0.004)	(0.047)
SSM Treated * AOR * Tier 1	-0.054	0.016	0.340
	(0.262)	(0.749)	(0.139)
AOR * Tier 1	0.026	-0.033	0.103
	(0.740)	(0.782)	(0.319)
SSM Treated * Tier 1	0.008	0.030*	-0.009
	(0.501)	(0.053)	(0.527)
AQR * Earnings	-0.306	0.024	3.794***
~ 0	(0.579)	(0.955)	(0.000)
SSM Treated * Earnings	0.374*	0.470**	-0.272
0	(0.069)	(0.030)	(0.370)
Tier 1	-0.008	-0.019*	-0.085***
	(0.449)	(0.092)	(0.000)
Size	-0.424*	-0.085	0.041
	(0.059)	(0.654)	(0.882)
Cost-to-Income	-0.708**	-0.893***	-0.005
	(0.036)	(0.002)	(0.988)
GDP	-0.246	-0.540	6.471
	(0.933)	(0.858)	(0.159)
RWA	-0.535	-0.693	-0.011
	(0.228)	(0.116)	(0.984)
Earnings	-0.424*	-0.085	0.041
	(0.059)	(0.654)	(0.882)
Fixed Effects	Year, Firm	Year, Firm	Year, Firm
Ν	1,995	1,995	1,214
Adj. R ²	0.271	0.274	0.301

Notes: The table shows regression results for the differential effect of SSM supervision, depending on the magnitude of the AQR impact, on banks' use of discretionary loan loss provisions. Panel A shows results for the three different models to estimate discretionary loan loss provisions. The dependent variable in Panel A is *LLP* Ratio the loan loss provision ratio. In Panel B, the dependent variable, *Discretionary LLP Model a/b/c*, are computed as the logarithm of the absolute residual from the regressions in Panel B. *Earnings* is the percentage of earnings before taxes plus loan loss provisions divided total assets. *Tier 1* is the percentage of Tier 1 capital divided by total risk-weighted assets. All other variables are defined in Appendix A. We include year and firm fixed effects, but do not report the coefficients. The table reports OLS coefficient estimates and (in parentheses) *p*-values based on robust standard errors clustered by bank. ****, ***, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

	(1)	(2)	(2)
Dependent Variable:	СО	CO_{t+1}	CO_{t+2}
SSM Treated	0.002	-0.001	0.005*
	(0.530)	(0.691)	(0.056)
SSM Treated * LLA	-0.097	-0.022	-0.098
	(0.326)	(0.766)	(0.228)
SSM Treated * AQR	-0.021*	-0.012	-0.023*
	(0.055)	(0.257)	(0.075)
SSM Treated * LLA * AQR	0.852**	0.839*	1.570***
	(0.045)	(0.074)	(0.001)
LLA *AQR	-1.035**	-1.000**	-0.610*
	(0.029)	(0.031)	(0.079)
Controls	Yes	Yes	Yes
Fixed Effects	Year. Firm	Year, Firm	Year. Firm
Ν	768	621	487
Adj. R ²	0.522	0.499	0.492

1 able 6: Informativeness of loan loss provisions about future loan charge-off	Table 6:	Informative	eness of loan	loss provisions	s about future	loan charge-off
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Notes: The table shows regression results for the differential effect of SSM supervision, depending on the magnitude of the AQR impact, on the predictive value of banks' loan loss allowances (lagged by one year) for realized loan charge-offs (scaled by total loans) in the current period (*CO*), one year ahead (CO_{t+1}), or two years ahead (CO_{t+2}). We include the same control variables as in Table 4, Panel A, as well as year and firm fixed effects, but do not report the coefficients. The table reports OLS coefficient estimates and (in parentheses) *p*-values based on robust standard errors clustered by bank. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 7: Responsiveness to aggregate credit risk

	(1)	(2)
Dependent Variable:	LLP	LLA
SSM Treated	-0.008**	-0.027***
	(0.011)	(0.000)
SSM Treated * AQR	0.017***	0.040***
	(0.002)	(0.000)
SSM Treated * $\triangle CDS$	0.001	-0.005**
	(0.266)	(0.018)
$AQR * \Delta CDS$	-0.042***	-0.182***
	(0.004)	(0.000)
SSM Treated * AQR * ACDS	0.040***	0.181***
	(0.007)	(0.000)
ΔCDS	-0.000	0.002
	(0.773)	(0.277)
ΔNPL	0.068***	0.061
	(0.000)	(0.110)
Controls	Yes	Yes
Fixed Effects	Year, Firm	Year, Firm
Ν	1,979	1,979
Adj. R ²	0.531	0.824

Notes: The table shows regressions results for the differential effect of SSM supervision, depending on the magnitude of the AQR impact, on the responsiveness of banks' loan loss provisions and loan loss allowances to aggregate credit risk. $\triangle CDS$ is the fractional change in the spread of a bank's home country's five-year sovereign CDS. $\triangle NPL$ is the change in nonperforming loans divided by total loans from year t–1 to year t. We include the same control variables as in Table 4, Panel A, as well as year and firm fixed effects, but do not report the coefficients. The table reports OLS coefficient estimates and (in parentheses) *p*-values based on robust standard errors clustered by bank. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

	(1)	(2)
Dependent Variable:	Log(Bid-Ask Spread)	Log(Bid-Ask Spread)
Test Variables:		
SSM Treated	-0.185*	-0.037
	(0.054)	(0.741)
SSM Treated * AQR	-	-0.865**
		(0.037)
Control Variables:		
Log(<i>Market Value</i> ₁₋₁₂)	-0.117**	-0.111*
	(0.038)	(0.052)
Log(<i>Share Turnover</i> _{t-12})	-0.057**	-0.062***
	(0.015)	(0.009)
Log(<i>Return Variability</i> _{t-12})	0.025	0.032
	(0.568)	(0.459)
Abs(Abnormal Stock Return _t)	0.250	0.253
	(0.115)	(0.113)
Fixed Effects	Firm. Country*Month	Firm. Country*Month
N	5.565	5.565
Adj. R ²	0.922	0.922

Table 8: Changes in market liquidity following the introduction of the SSM

Notes: The table shows regression results for the differential effect of SSM supervision, depending on the magnitude of the AQR impact, on banks' stock liquidity. The sample comprises 5,565 monthly observations from 104 treatment and control banks with publicly listed equity. We use the natural logarithm of a firm's monthly median quoted daily *Bid-Ask-Spread* as the dependent variable. *SSM Treated* is a binary indicator variable that takes on the value of '1' beginning in the first month that a treatment bank is under SSM supervision. *AQR* is the impact of the AQR adjustment on loan loss provisions (i.e., additionally required loan loss provisions) scaled by the amount of the loan loss allowance in the year preceding the AQR. We include the natural logarithm of *Market Value, Share Turnover*, and *Return Variability* (lagged by 12 months) as well as the concurrent absolute abnormal monthly stock return as control variables. We additionally include country-month and firm fixed effects in the regressions. The table reports OLS coefficient estimates and (in parentheses) *p*-values based on robust standard errors clustered by bank. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Appendix A: Variable definitions

Variable	Definition	Data Source
Firm-level Variables		
Tier 1	Tier 1 capital / total risk-weighted assets	S&P Global MI
Low Tier 1 Capital		
Size	Ln(total assets)	S&P Global MI
Cost-to-Income Ratio	Operating expenses / operating income	S&P Global MI
RoA	Net income before loan loss provisions / total assets	S&P Global MI
Risk-weighted Assets	Risk-weighted assets / total assets	S&P Global MI
ANPL	Non-performing loans _t / non-performing loans _{t-1}	S&P Global MI
$\Delta NPL t+1$	Non-performing loans _{t+1} / non-performing loans _t	S&P Global MI
$\Delta NPL t-1$	Non-performing loans _{t-1} / non-performing loans _{t-2}	S&P Global MI
NPL	Non-performing loans / total gross loans	S&P Global MI
Loan Growth	Total gross loanst / total gross loanst-1	S&P Global MI
Loan loss provisions (LLP) Ratio	Loan loss provision / total gross loans	S&P Global MI
Loan loss allowance (LLA) Ratio	Loan loss allowance / total gross loans	S&P Global MI
Non-performing loans (NPL) Ratio	Non-performing loans / total gross loans	S&P Global MI
Earnings	(Earnings before taxes + loan loss provisions)/total assets	S&P Global MI
AQR Adjustment	AQR adjustment on the loan loss provision (additionally	
	required loan loss provisions) / loan loss allowance in	ECB &
	2013	S&P Global MI
Liquidity Variables		
Bid-Ask Spread	Monthly median of the quoted spread between the bid and ask price	Datastream
Abs(Abnormal Stock Return)	Absolute abnormal monthly stock return	Datastream
Market Value	Monthly median of daily market value	Datastream
Share Turnover	Monthly median of daily share turnover	Datastream
Return Variability	Monthly standard deviation of daily returns	Datastream
Country Variables		
Change in Sovereign CDS 2013-2014	5 year CDS spread _t / 5 year CDS spread _{t-1}	Datastream
GIPS	Indicator if bank headquarter is in Greece, Italy, Portugal	Manually
	or Spain	Computed
Inflation (mean 3 years)	Mean inflation over the last 3 years before treatment	Worldbank
Economic Growth (mean 3 years)	Mean GDP growth over the last 3 years before treatment	Worldbank
	Mean unemployment over the last 3 years before	Worldbank
Unemployment (mean 3 years)	treatment	
House Price Index (mean 3 years)	Mean HPI over the last 3 years before treatment	Worldbank
	Binary variable that takes the value of '1' for countries	Kaufmann et al.
High Government Effectiveness	with above median government effectiveness over the	(2011)
	sample period from 2011-2017	TZ C
	Binary variable that takes the value of '1' for countries	Kautmann et al.
High Regulatory Quality	with above median regulatory quality over the sample	(2011)
CDD	period from 2011-2017	XX. 11D. 1
GDP	Y early Growth in Gross Domestic Product	world Bank

	(1)	(2)
Dependent Variable:	LLP Ratio	LLA Ratio
Test Variables:		
SSM Treated	-0.002	0.001
	(0.250)	(0.875)
SSM Treated*AQR	0.018***	0.044**
-	(0.005)	(0.014)
Control Variables:		
Tier 1	-0.034*	-0.045
	(0.080)	(0.300)
Size	0.009***	-0.005
	(0.004)	(0.465)
Cost-to-Income	-0.012***	0.002
	(0.001)	(0.841)
RoA	-0.043	0.618**
	(0.651)	(0.041)
GDP	-0.104***	0.188**
	(0.004)	(0.021)
RWA	0.019**	0.068***
	(0.050)	(0.010)
Fixed Effects	Year, Firm	Year, Firm
Ν	3,017	3,017
Adj. R ²	0.589	0.826

Appendix B: Loan loss reporting following the introduction of the SSM (entropy balanced sample)

Notes: The table presents regression results for a replication of Table 4, Panel A, using an entropy balanced sample. We use entropy balancing to reweight the observations in our sample in a way such that the distribution of values of the control variables in the treatment group is as similar as possible to the distribution in the control group along the first three moments (mean, variance and skewness). We include year and firm fixed effects in the regressions, but do not report the coefficients. The table reports OLS coefficient estimates and (in parentheses) *p*-values based on robust standard errors clustered by bank. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.