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Brunella Bruno* **and Immacolata Marino†**

Abstract

We examine how banks adjust credit allocation when hidden credit risk is revealed. Using supervisory risk disclosure data from the European Central Bank's 2014 Asset Quality Review, we find that banks experiencing larger increases in non-performing loans and provisions significantly reduce risk-weighted exposures while keeping total credit volumes largely unchanged. This suggests that de-risking primarily occurs through portfolio reallocation-particularly within portfolios-rather than through credit contraction. We document heterogeneous responses depending on the rating approach used to measure credit risk and we show that capital constraints amplify, but are not the sole drivers of, de-risking. Finally, we provide evidence that supervisory risk disclosure plays a key role in shaping banks' risk-taking behavior, even in the absence of observable adjustments in their financial statements.

JEL Classification: G21, G28, M48

Keywords: Transparency, Bank Supervision, Credit risk, Non-performing loans

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1. Introduction

How do banks allocate credit following the revelation of hidden risk? Theory predicts that banks are inherently opaque institutions because they hold a large volume of assets - primarily loans - that are difficult to assess. Opaque balance sheets, when combined with high leverage, increase information asymmetry and raise moral hazard concerns (Campbell and Kracaw, 1980; Bernanke and Gertler, 1995). This opacity can impair the supply of credit to the real economy, leading to inefficient resource allocation and "zombie lending" (Caballero et al., 2008; Blattner et al., 2023; Bonfim et al., 2023). By the same token, reducing opacity by unveiling risk to external observers should induce more prudent lending. Banks may seek to reduce risk to avoid heightened supervisory scrutiny and adverse stress test outcomes, or in response to market discipline and potentially higher funding premia. In practice, banks may adopt different strategies in response to risk disclosure. They could contract credit supply across the board or reallocate credit across borrower categories. They could also expand overall lending while reducing portfolio risk by shifting their asset mix away from riskier counterparties. Therefore, whether and how the revelation of credit risk embedded in banks' balance sheets affects credit allocation remains an empirical question.

In this paper, we show that revealing risk induces banks to lend more prudently by reallocating risk across and within portfolios, without overall effects on total credit volumes. To establish a causal link between the unveiling of hidden credit risk and credit supply, we exploit the unique features of the first European Central Bank (ECB) Asset Quality Review (AQR) in 2014. The AQR was an unprecedented initiative implemented as a preliminary measure before the introduction of the Single Supervisory Mechanism (SSM). It was applied to a subset of European banks to "dispel the fog over their balance sheets" [1] by improving the quality of information available on the condition of the banks under review. This goal was achieved through a comprehensive reassessment of balance sheets which resulted in adjustments to loan loss provisions and non-performing exposures (NPEs) that were communicated first to the reviewed banks and subsequently to market participants.

Several features make the AQR particularly well suited to identify the effects of an exogenous shock to balance-sheet transparency on credit allocation. The supervisory exercise introduced, for the first time across reviewed banks, a stricter and harmonized definition of NPEs - namely, exposures that are more than 90 days past due or deemed unlikely to be repaid. This reclassification led to an increase in non-performing loans (NPLs) [2] of nearly €140 billion (+18.4%) (ECB, 2014). The review

[1] From a speech by Mario Draghi to the European Parliament, as reported by the Financial Times on 26 September 2013, "EU regulators will focus on banks' lending exposures in their review".

[2] In this paper, in line with the practice of European regulators and supervisors, we use the terms *NPLs* and *NPEs* interchangeably, although *NPE* is a broader category that includes not only loans but also, for example, advances and exposures to governments (such as debt securities).

also resulted in additional loan loss provisions of nearly €45 billion, due either to exposures reclassified from performing to non-performing or to the application of stricter provisioning criteria to exposures already classified as non-performing.

Notably, these adjustments were prudential in nature rather than accounting-driven. This means that they occurred not only in cases of accounting rule breaches but also where prior practices, although formally compliant, lacked uniformity.[3] As a result, banks were not necessarily required to reflect these adjustments in their financial statements.[4] This makes the AQR similar to a supply-side shock to balance-sheet transparency, implemented by an independent external observer (the supervisor) and orthogonal to changes in borrower fundamentals and credit demand.

Moreover, the AQR adjustments were first disclosed privately to the banks under review and subsequently made public by the ECB. Combined with the fact that these adjustments were not automatically reflected in banks' balance sheets, this feature is important for understanding the mechanisms underlying banks' responses to risk disclosure, as it implies that banks may have incentives to de-risk not (only) because of binding balance-sheet constraints, but (also) due to heightened supervisory and market scrutiny.

Another important feature of this setting is the substantial heterogeneity in supervisory adjustments across reviewed banks. For example, the share of debtors reclassified as non-performing ranged from –4.5% to over 30% of those initially classified as performing. We exploit this cross-sectional variation by focusing exclusively on AQR banks. Restricting the sample to reviewed banks provides two advantages. First, our identification strategy relies on the official adjustments reported by the ECB – a consistent and unbiased measure of previously underreported credit risk - to distinguish between banks for which the supervisory exercise revealed substantial hidden risk and banks with limited or no additional risk uncovered. Second, this approach avoids potential biases arising from comparisons with non-AQR banks, which may differ systematically for reasons unrelated to the review.

We construct a novel micro-level dataset for euro area banks that combines supervisory and regulatory information to study banks' responses to the disclosure of hidden credit risk. We exploit supervisory adjustments to NPEs and provisions from the ECB's 2014 Comprehensive Assessment and link them to granular quarterly data on banks' credit exposures and regulatory approaches (Internal Ratings-Based versus Standardized) from the EBA Transparency Exercises. We examine

[3] Actually, only 8 percent of the AQR adjustments stemmed from formal violations of accounting rules (Bischof et al. 2026).

[4] As stated by the ECB (2014, p. 11), "the ECB's methodology involved additional prudential prescriptions to accounting concepts in order to achieve consistency and adequate conservatism. The results are of a prudential nature. AQR adjustments were made, often in cases where banks were not breaching accounting rules."

three outcomes: total credit exposures, portfolio composition, and portfolio-level RWA densities (average risk weights), allowing us to assess credit reallocation across and within portfolios and its implications for capital absorption.

To identify the impact of risk disclosure on banks' credit allocation, we employ a difference-in-differences strategy within the AQR sample. We define *Treated* banks as those experiencing above-median supervisory adjustments, while the control group consists of banks with no or limited hidden risk uncovered during the supervisory exercise. We address two potential sources of endogeneity - non-random supervisory adjustment intensity and differential pre-treatment trends - by exploiting the institutional design of the AQR and documenting parallel trends prior to disclosure.

We preview our main results. First, treated banks behave differently from banks with limited or no hidden risk. On average, treated banks reduce risk-weighted exposures significantly more than control banks while leaving overall credit exposures generally unchanged. As a result, the average risk weight of their credit portfolios declines markedly. Quantitatively, the estimated reduction in average risk weights amounts to about 7.4 percentage points, corresponding to roughly 18% of the pre-AQR mean. For a representative treated bank with €231.9 billion in total credit exposures, this implies a reduction in risk-weighted assets (RWAs) of approximately €17 billion purely through lower risk intensity, holding credit volumes constant. Overall, this evidence indicates that de-risking following the ECB's risk disclosure operates primarily through credit portfolio recomposition rather than through a contraction in credit supply.

Second, risk disclosure induces banks to adjust credit composition mainly within portfolios rather than by altering portfolio shares. With the exception of sovereign exposures and mortgages, portfolio shares remain largely unchanged, while average risk weights decline after the review, pointing to within-portfolio reallocation: banks respond to risk disclosure by shifting from riskier to safer borrowers within the same portfolio, an effect that is particularly strong in the corporate segment. This finding highlights a novel contribution of the paper: examining risk-weighted asset densities provides additional insights into banks' lending responses to supervisory initiatives that go beyond changes in aggregate credit volumes or portfolio composition.

Third, banks' responses depend on how credit risk is measured. Following supervisory risk disclosure, IRB banks primarily reduce risk through reallocation within the corporate portfolio. In contrast, treated SA banks cut overall credit and shift their portfolio mix toward safer assets, consistent with a flight-to-quality strategy. These differences reflect the tighter constraints and lower granularity of the standardized approach.

Fourth, we investigate the mechanisms underlying banks' responses to the unveiling of risk. Consistent with prior work on banks' reactions to capital shocks (see Gropp et al., 2019; Plosser and

Santos, 2018), capital constraints are important and act as an amplifier - rather than the sole driver - of portfolio reallocation. The capital channel is active for both IRB and SA banks, amplifying credit reallocation within the riskiest portfolios.

Along with capital, we further investigate the underlying mechanisms by distinguishing the disciplining role of supervisory risk disclosure from mechanical balance-sheet effects operating through accounting recognition. Building on Bonfim et al. (2023),[5] we distinguish between a disciplining mechanism arising from risk disclosure and a balance-sheet channel operating when AQR adjustments are formally recognized in banks' accounts. Our results suggest that supervisory risk disclosure and associated expectations are important drivers of banks' responses, beyond the mechanical effects of financial reporting. This finding has important policy implications: it suggests that supervisory expectations can effectively steer banks' behavior even before adjustments are formally recognized in banks' accounts and therefore before binding balance-sheet constraints mechanically restrict their behavior.

Our paper contributes to several strands of the literature. We extend work on supervisory stringency and banks' behavior (e.g., Granja and Leuz, 2024; Ivanov et al., 2023) by providing evidence from Europe across a broad range of credit exposures, rather than focusing on small business lending (Granja and Leuz, 2024) or syndicated loans to large corporates (Ivanov et al., 2023). We also complement Cortés et al. (2020), who show that banks reallocate credit away from riskier segments following supervisory shocks, by documenting heterogeneous responses across banks depending on their risk measurement approach and by introducing changes in portfolio risk weights as a novel measure of risk reallocation. We are closely related to Bonfim et al. (2023), who examine the impact of on-site inspections on Portuguese banks' lending. While their analysis focuses on high-risk borrowers in a single-country setting, we identify broader mechanisms in a multi-country framework that extend beyond the zombie versus non-zombie firm distinction. In particular, we explicitly identify a capital channel and show that supervisory risk disclosure disciplines bank lending even without observable adjustments in financial statements. Our findings also speak to and complement Blattner et al. (2023), who show that regulatory capital tightening may incentivize banks to hide losses and foster evergreening. We document that supervisory risk disclosure can act as a countervailing mechanism, thereby potentially mitigating zombie lending problems.

We further contribute to research exploiting institutional features of the SSM in Europe. Unlike Fiordelisi et al. (2017) and Abbassi et al. (2025), who study changes in bank behavior following the AQR announcement, we exploit specifically adjustment to asset quality as a shock to

[5] Bonfirm et al. (2023) identify two channels through which supervisory inspections may affect bank lending - the cost channel associated with holding risky loans and a broader disciplining channel linked to supervisory scrutiny.

balance-sheet transparency, which underpins our identification strategy. To our knowledge, we are the first to analyze credit dynamics through changes in portfolio risk weights, a dimension central to credit allocation based on capital absorption.

More broadly, our analysis builds on the literature on the transmission of shocks to bank balance sheets (e.g., Peek and Rosengren, 1995; Bord et al., 2021). Unlike much of this literature, where shocks are demand-driven and intertwined with macroeconomic conditions, the supervisory shock we study is independent of changes in borrowers' risk profiles and credit demand. For this reason, we contribute to the literature on NPLs, which is largely descriptive or based on correlations (e.g., Balgova et al., 2016), by establishing a credible causal link between shocks to asset quality and credit supply. Finally, we add to the literature on financial reporting and supervision (e.g., Costello et al., 2019) by examining a form of risk disclosure that does not necessarily translate into immediate accounting recognition.

The paper is organized as follows. Section 2 describes the institutional framework and develops the testable predictions. Section 3 sets out the empirical strategy. Section 4 illustrates the empirical methodology. Section 5 presents the results and investigates the underlying mechanisms. Section 6 concludes.

2. Institutional background and testable predictions

2.1 The 2014 AQR: a transparency shock to bank balance sheet

The AQR, conducted as part of the ECB's Comprehensive Assessment, was a key preparatory step for the introduction of the single supervisor in the euro area, aimed at enhancing transparency and comparability across banks and harmonizing supervisory practices. Conceived as an exercise "to dispel the fog over bank balance sheets," the primary objective of the AQR was to standardize the methodologies used to assess asset values and risks on banks' balance sheets and to harmonize their application across the euro area. A first key component of this effort was the EBA's introduction of a simplified and consistent definition of NPEs (Baudino et al., 2018) to address longstanding disparities in how impaired assets were classified. A second important component was the review of the adequacy of loan loss coverage and the associated provisioning practices.

In scope and scale, the 2014 AQR was unparalleled, encompassing 130 institutions that collectively accounted for approximately 85% of the euro area's banking assets.[6] Banks were selected according to the significance criteria published in December 2012, when the SSM was approved;

[6] The scope of subsequent reviews was much more limited, involving 9 banks in 2015 (including 5 Greek institutions), 4 banks in 2016 and 6 banks in 2019 (including 6 Bulgarian institutions).

these criteria were primarily based on asset size, including a threshold of €30 billion. On 23 October 2013, the ECB announced the details of the AQR and published the list of banks subject to review. [7]

The 2014 AQR unfolded between November 2013 and November 2014, culminating in the ECB's assumption of direct supervisory responsibilities (Figure 1). It applied a uniform methodology to assess asset quality across more than 800 portfolios, covering 57% of banks' RWAs and over 119,000 borrowers, and included portfolio reviews, data validation, and independent quality assurance by central ECB teams. Overall, the AQR led to €47.5 billion in aggregate adjustments to banks' asset carrying values as of 31 December 2013, over 90% of which reflected higher credit risk provisions. In addition, the harmonized NPE definition alone increased the reported stock of non-performing exposures by €136 billion (over 18%). This revealed substantial misclassifications under prior frameworks and significant heterogeneity across banks and countries, with the share of reclassified debtors ranging from 6% to 32% across countries and from 0% to 43% at the bank level.

The AQR concluded in July 2014, when the results were communicated to the individual banks. The AQR was then followed by stress tests to evaluate banks' shock-absorption capacities under adverse scenarios. The stress test along with the AQR results were released to market participants in October 2014 and formed the basis for banks' capital plans and risk mitigation strategies.

2.2 Testable predictions

Risk disclosure can have heterogeneous effects on banks' lending behavior, depending on the credibility of the information and the channels through which disclosure operates (Bischof et al., 2021). In many environments, disclosures are self-reported by banks and may therefore be biased or strategically distorted. In contrast, our setting exploits supervisory AQR adjustments, which provide an unbiased and reliable unveiling of credit risk. The information originates from the supervisor rather than the banks, is disclosed first to reviewed banks, and is subsequently made publicly available to market participants through the ECB website. Importantly, the AQR was a prudential, not an accounting, exercise: supervisory adjustments were not necessarily binding for reported balance sheets and did not always translate into immediate accounting changes. This institutional setting allows us to study how banks respond to credible risk disclosure through distinct channels.

[7]The asset-related criteria included: (i) ranking among the three largest credit institutions in the home country (rank condition); and (ii) a ratio of bank assets to national GDP above 20%, provided that total assets also exceeded €5 billion. Total assets were measured at year-end 2012, at the highest level of consolidation and at or above the significance thresholds. Because total assets can fluctuate between reporting periods, a 10% margin of deviation was applied to the thresholds. This led to the inclusion of institutions with total assets between €27 billion and €30 billion, or with asset-to-GDP ratios between 18% and 20%, as of year-end 2012 (ECB, 2013).

We first consider how risk disclosure affects banks' overall lending activity. The credible unveiling of previously underreported risk may lead banks to reassess their aggregate risk exposure and adjust total credit supply. We expect banks to contract lending following disclosure. Such a contraction may occur even without mechanical changes in balance sheet items (e.g., provisions or impaired loans), reflecting supervisory and market discipline (Bischof et al., 2021; Bonfim et al., 2023). Risk disclosure may also affect how banks allocate credit across and within portfolios. Even if total lending remains stable, banks may reduce exposure to riskier portfolios or borrowers and reallocate credit toward safer segments. This reallocation is consistent with banks attempting to lower portfolio risk while maintaining lending volumes, for example by substituting away from high-risk counterparties within existing lending relationships.

To better understand these adjustments, we distinguish between three main mechanisms through which supervisory risk disclosure may affect banks' lending behavior.

One channel operates through disciplinary effects from supervisors and market participants. The disclosure of credit risk may trigger heightened supervisory scrutiny and increase the perceived likelihood of future intervention, thereby incentivizing banks to align more closely with supervisory expectations. At the same time, public disclosure through the ECB website may generate reputational concerns vis-à-vis investors, depositors, and rating agencies, potentially increasing funding pressures and disciplining risk-taking (Bischof et al., 2021). Together, these forces may affect lending behavior even when supervisory adjustments do not result in changes to reported financial statements.

Another channel operates through a balance-sheet effect. In some cases, supervisory adjustments are reflected in accounting figures, making disclosure more direct through banks' annual reports. Changes in financial reporting may affect bank lending mechanically. Higher provisions reduce earnings and capital, while increases in non-performing loans raise risk-weighted assets. These mechanical effects can tighten regulatory capital constraints and thereby limit lending capacity.

Finally, the strength of banks' responses to risk disclosure may depend on their capital positions. Capital constraints may amplify banks' reactions regardless of whether the dominant mechanism operates through disciplinary effects or balance-sheet adjustments. Banks with weaker capital buffers face stronger supervisory and market scrutiny and are more sensitive to the capital implications of risk recognition. As a result, capital-constrained banks may adjust credit supply and reallocate lending more aggressively following disclosure (Gropp et al., 2019; Granja and Leuz, 2024). Overall, these channels may operate simultaneously and mutually reinforce each other, thereby shaping banks' risk-taking behavior following risk disclosure.

3. Data and descriptive statistics

We combine three data sources to construct a comprehensive dataset capturing detailed financial and risk metrics for a broad sample of European banks: the EBA Transparency Exercise, the ECB's Comprehensive Assessment, and ORBIS Bank Focus.

The EBA Transparency Exercise dataset provides detailed, standardized information on European banks that participated in the transparency exercises between 2013 and 2016. Based on these data we construct a quarterly, unbalanced panel spanning from December 2012 to December 2016. The dataset includes a broad range of variables, such as credit exposures (not risk-weighted), risk-weighted exposures, asset quality metrics, capital adequacy measures, and other key balance sheet and performance indicators. It also provides a breakdown by borrower category, which is particularly valuable for analyzing how banks allocate credit across portfolios characterized by different risk profiles. The dataset further distinguishes between banks using the standardized approach and those using IRB approach for risk weighting. SA banks apply fixed regulatory risk weights, whereas IRB banks rely on more granular and risk-sensitive weights. This distinction allows us to examine whether the method used to measure credit risk affects portfolio composition and risk allocation in response to a shock to bank asset quality.

In addition to the EBA Transparency Exercise, we incorporate data from the ECB's Comprehensive Assessment, which provides detailed information into the 2014 AQR outcomes - particularly the NPE adjustments (*DeltaNPE*) and adjustments to provisions (*DeltaProv*).

Finally, we supplement our analysis with bank-level balance-sheet data for the period 2012-2016 from ORBIS Bank Focus, an extensive commercial database of financial statements provided by Bureau van Dijk (BvD) Electronic Publishing.

Table 1 summarizes the descriptive statistics for key balance sheet items from Orbis Bank Focus, and for key measures from the Comprehensive Assessment dataset, with particular attention to the *DeltaNPE* and *DeltaProv* variables. *DeltaNPE* is measured as the difference between the AQR-adjusted NPE ratio and the unadjusted NPE ratio at the end of 2013.[8] *DeltaProv* is measured as the AQR adjustment to loan loss provisions.[9] Both adjustments to NPEs and LLPs are widely dispersed.

The average bank in the sample holds €129 billion in total assets, with significant variation across institutions. Of this total, 59% is allocated to gross loans, while customer deposits represent 48%. The data on AQR adjustments reveal substantial cross-bank heterogeneity. *DeltaNPE* for total

[8] *DeltaNPE* is computed as AQR adjustment of nonperforming exposures (NPE) / total credit exposures: Change in nonperforming exposures ratio due to the outcome of the AQR (ECB communication variable E.D1 – E.A1).
[9] *DeltaProv* is computed as AQR adjustment of provisions for credit exposures / risk weighted total credit exposures: Increase in provisioning for credit exposures due to the outcome of the AQR (ECB communication variable D.F1). It also includes changes in provisioning on existing nonperforming exposures.

credit exposures shows a mean increase of 1.911%, with a standard deviation of 2.369%. The distribution ranges from below zero to 5.771% at the 90th percentile, with a median value of 1.228%. *DeltaProv* has a mean of 0.979% and a standard deviation of 1.232%. The 10th percentile is close to zero (0.0147%), the median is 0.476%, whereas the 90th percentile exceeds 3%.

Table 2 reports the joint distribution of banks according to whether AQR adjustments to NPEs and loan loss provisions exceed the sample median. The results show a strong alignment between the two dimensions of the supervisory shock. In terms of observations, 288 out of 369 (about 78%) lie on the main diagonal, indicating that banks with above-median NPE adjustments typically also experience above-median provisioning adjustments, and vice versa. At the same time, the off-diagonal cells remain economically meaningful. A non-negligible number of banks - 16 out of 76 - display a mismatch between the two indicators. In particular, 9 banks experience above-median provisioning adjustments despite below-median NPE reclassifications, while 7 banks display the opposite pattern. This heterogeneity reflects the fact that the AQR combined a reassessment of exposure classification with an independent evaluation of loss expectations. From an empirical perspective, the joint distribution indicates that NPE and provisioning adjustments are strongly correlated but not collinear, motivating both the use of a composite treatment indicator capturing the overall intensity of the supervisory shock (main specification) and a separate analysis of the two dimensions (robustness tests).

Table 3 presents descriptive statistics for credit risk measures derived from the EBA Transparency Exercise. Total credit exposures represent the aggregated value of all bank exposures to different borrower types, with considerable variation in the size of credit portfolio. Its mean value is €232 billion, with a standard deviation of €311 billion. The range spans from €26 billion at the 10th percentile to €736 billion at the 90th percentile. The table also breaks down credit exposures by rating approach. On average, 49% (51%) of exposures fall under the SA (IRB), with a wide range from 0% to 100%, indicating that some banks rely exclusively on a single approach.

Government exposures represent a significant portion of banks' portfolios (approximately 24%), with a mean value of €55 billion. Notably, 81% of these exposures are risk-weighted under the SA. Institution exposures-which include interbank lending and placements with financial institutions-have a mean value of €29 billion, accounting for 12% of total exposures. The SA is also the predominant methodology for this category, covering more than 65% of exposures. Corporate portfolios are the largest component, with an average size of €75 billion (32% of total exposures), 51% of which are assessed under the IRB approach. This indicates that internal models play a more significant role in evaluating credit risk for corporates compared to lower-risk categories such as government and financial institutions.

Corporate SME exposures average €15 billion, with a nearly even distribution between SA and IRB. Retail portfolios - both secured and unsecured - exhibit remarkable variability. For retail portfolios, the SA approach is the preferred method, with the exception of secured retail exposures, which represent 16% of total exposures and are mostly assessed using IRB models (59%). The residual category, labeled "Other exposures," accounts for 7% of total exposures and includes a diverse set of portfolios, the majority of which are weighted under the SA (78%).

The bottom panel of the table reports average risk weights by exposure type, which vary widely across categories. For example, average risk weights range from nearly 8% for government exposures to about 72% for corporate SMEs. Within retail portfolios, average risk weights span from 43% for secured exposures (e.g., mortgages) to 61% for unsecured categories (e.g., consumer loans). Within the retail secured portfolio, the risk-weight distribution ranges from approximately 16% at the 10th percentile to nearly 100% at the 90th percentile. This implies that, subject to a minimum capital requirement of 8%, the capital required per €100 lent can range from as little as €1.20 to €8. Hence, reallocating exposures within the same credit portfolio can generate substantial capital relief, owing to differences in capital absorption across borrowers.

To sum up, the statistics in Table 3 reflect differences in banks' size, business models, credit allocation strategies, and risk management practices. The prominence of the SA in certain categories (such as government exposures) suggests a reliance on fixed regulatory risk weights for lower-risk assets. In contrast, the IRB approach is more common in complex or higher-risk categories, such as corporate and secured retail exposures, where the benefits of more granular risk-weighting can be better exploited. Figure 2 complements this evidence by presenting risk weights by borrower category under the SA and IRB approaches. The figure shows that SA banks report higher and more volatile risk weights than IRB banks, particularly for government, corporate, and retail exposures.

4. Empirical methodology

4.1 Identification strategy

We estimate a difference-in-differences specification on the sample of AQR banks only, interacting a post-AQR indicator with a treatment dummy capturing exposure to the supervisory review. This approach exploits within-bank variation over time while leveraging cross-sectional heterogeneity in exposure to the supervisory shock. The dependent variables include metrics related to credit exposure amount, average risk weights, and portfolio composition.

The econometric model can be represented as:

$$y_{ij,t} = \alpha + \beta_1 Post_t + \beta_2 Post_t * Treated_{ij} + \theta X_{ij,t-1} + \vartheta_{ij} + \mu_{jt} + \varepsilon_{ij,t} \qquad (1)$$

where $y_{ij,t}$ denotes the bank-level outcome of interest for bank i in country j at time t. $Post_t$ is equal to 1 for post-AQR years (2014, 2015, 2016). $Treated_{ij}$ identifies banks classified as exposed to the AQR shock and is defined as an indicator equal to one for banks experiencing an above-median adjustment in either NPE exposures, loan loss provisions, or both. We rely on the sample median to distinguish banks with negligible or no risk unveiling from those with substantial underreporting, given the pronounced right skewness of the distributions (Table 1). As shown in Table 2, the group of treated banks includes banks with above-median adjustments in both NPE and provisioning (27 banks), as well as banks with above-median adjustments in only one dimensions (7 banks with large NPE reclassifications only and 9 banks with large provisioning adjustments only). The coefficient β_2 captures the differential post-AQR response of treated banks relative to other reviewed banks with negligible or no risk underreporting.

$X_{ij,t-1}$ is a vector of lagged bank-specific control variables. ϑ_{ij} represents bank fixed effects, capturing time-invariant unobserved heterogeneity. μ_{jt} represents country*quarter fixed effects, controlling for macroeconomic and institutional factors that vary over time at the country level. As a robustness exercise (Appendix) we replace the treatment indicator with separate dummies for above-median NPE and provisioning adjustments.

The dependent variables in our analysis provide a comprehensive view of bank credit allocation. We first focus on total credit exposure, expressed in logarithmic form to address the broad variability across banks and ensure comparability. Building on this, we investigate how banks allocate credit exposures across main borrower categories, including governments, financial institutions, corporates, SMEs, and retail customers, following supervisory risk disclosure. Next, we study portfolio composition by measuring the share of total credit allocated to each borrower category. Changes in portfolio composition reflect adjustments in lending strategies. For example, altering the portfolio mix - such as reducing the share of corporate exposures and increasing the share of government exposures, or shifting from unsecured to secured retail borrowers - may indicate a "flight-to-quality" strategy across borrower categories. To capture within-portfolio reallocation, we compute RWA densities, defined as the ratio of risk-weighted exposures to total credit exposures at the portfolio level. These densities measure the average risk weight assigned to each borrower category. A decline (increase) in a portfolio's average risk weight reflects a reallocation of resources within the portfolio toward less (more) risky borrowers, either through a reduction in the amount of riskier exposures (holding risk weights constant), a shift toward borrowers assigned lower risk weights (holding amounts constant), or both.

Finally, we examine heterogeneity by regulatory approach to credit risk measurement (SA versus IRB).

To account for time-varying characteristics that influence banks' credit allocation and risk management decisions, we include a comprehensive set of lagged control variables. Capitalization, measured by the Tier 1 capital ratio, is a risk-adjusted indicator of a bank's ability to absorb shocks and sustain lending. Better-capitalized banks are generally more resilient and better positioned to supply credit while remaining in compliance with regulatory requirements, whereas declines in capital ratios may induce a reallocation toward safer exposures to restore adequate capital levels.

Funding structure, proxied by the ratio of customer deposits to total assets, captures a bank's reliance on stable funding sources. Profitability, measured by return on equity (ROE), reflects a bank's ability to generate earnings relative to its equity base and may influence risk-taking and lending behavior. Liquidity, measured as the ratio of liquid assets (cash and due from banks) to total assets, reflects the availability of immediately accessible resources to meet sudden liquidity demands. Liquidity constraints have historically been an important determinant of banks' credit supply, particularly during financial crises (Ivashina and Scharfstein, 2010).

Asset quality is captured by lagged NPL ratios, which may shape banks' risk management and lending decisions in response to the AQR, given the substantial heterogeneity across banks and countries (Table 1 and Figure 4).

4.2 Exogeneity and Parallel Trends

Our difference-in-differences design compares AQR-reviewed banks that received large ex post supervisory adjustments to those with limited or no adjustments. Because all banks in our sample were subject to the review, the relevant source of variation is not participation in the AQR *per se*, but the unexpected supervisory information revealed by the exercise. Identification therefore hinges on interpreting cross-sectional variation in *DeltaNPE* and *DeltaProv* as supervisory "surprise" rather than as a proxy for banks' pre-existing fundamentals or for country-level conditions. This interpretation is supported by the institutional design of the Comprehensive Assessment and the AQR. While the SSM was broadly announced in December 2012, banks were not informed ex ante about their inclusion in the AQR or the portfolios and valuation practices that would be scrutinized in detail until late October 2013. Moreover, the methodological standards, the intensity of the review, and the bank-specific supervisory adjustments were determined during the exercise and became known only upon its completion (Abbassi et al., 2025). In this setting, our *Treated* indicator captures an average effect of an informational shock, rather than a deterministic treatment assignment in the classical sense.

We further assess whether adjustment intensity proxies for observable differences across banks or countries. Figure 3 implements a covariate-validation exercise that relates the probability of

being *Treated* (being above-median of *DeltaNPE* or *DeltaProv*) to a rich set of pre-AQR covariates. The regressors include 2012–2013 changes in profitability (*DROE*), net interest margins (*DNIM*), cost efficiency (*DCTIR*), capitalization (*DTier1*), an IRB-bank indicator, and country indicators for high public debt and high NPL incidence (and their interaction with *DTier1*). The specifications also control for lagged (2013) levels of key bank characteristics (Tier 1 ratio, deposits-to-assets, ROE, liquid assets-to-assets, loan loss reserve coverage, and the NPL ratio). Across panels, coefficients are small and not systematically different from zero, suggesting that treatment intensity is not explained by observables.

Beyond the exogeneity of supervisory adjustment intensity, our difference-in-differences estimator requires that banks with larger versus smaller ex post adjustments would have followed parallel trends in the absence of treatment. We assess this assumption using event-study specifications that interact treatment with year indicators around the AQR.

Figure A.1 reports dynamic estimates for total credit exposures, risk-weighted exposures, and average risk weights. Pre-AQR coefficients are close to zero and do not reveal a strong, systematic, or monotonic divergence between banks that later experience large versus small supervisory adjustments. Given the short pre-treatment window and the limited number of banks, the absence of clear and persistent pre-treatment divergence is the most informative diagnostic for the parallel trends assumption. Differential dynamics emerge only after the completion and disclosure of the AQR and persist thereafter, aligning naturally with a supervisory information channel. Consistently, Figures A.2 and A.3 show limited differential movements in portfolio shares, whereas average risk weights decline sharply within the riskiest portfolios - particularly corporate and SME exposures - pointing to within-portfolio de-risking rather than slow-moving structural change. Finally, limited anticipatory responses by banks that expected tougher findings cannot be ruled out, but they would tend to compress pre-disclosure differences and therefore attenuate estimated post-AQR effects; if anything, our estimates should be interpreted as conservative.

5 Results

5.1 Baseline specification

Table 4 reports the baseline difference-in-differences estimates for total credit exposures (columns 1 and 2), risk-weighted exposures (columns 3 and 4), and average risk weights (columns 5 and 6). The key coefficient is the interaction $Post * Treated$, which captures the differential adjustment of banks experiencing an above-median AQR shock to asset quality relative to banks with limited or no adjustments, controlling for bank fixed effects, country-by-time fixed effects, and lagged bank controls.

A first important message is that the AQR does not translate into an aggregate contraction of credit exposures (columns 1 and 3) and only moderately affects risk weights (column 5). When we distinguish between reviewed banks for which the AQR revealed risk and those for which limited or no risk was revealed, we observe only in the former a clear and strongly statistically significant pattern of de-risking that is not accompanied by a significant change in overall exposure levels. In column (2), the *Post* coefficient is positive but statistically insignificant, and the differential effect for treated banks is essentially zero, providing no evidence of a broad deleveraging response. The adjustment instead occurs along the risk dimension. Column (4) shows a large and precisely estimated reduction in risk-weighted exposures for treated banks. In log terms, the estimates imply a decline of approximately 14.3% in risk-weighted exposures relative to banks for which the AQR revealed limited or no risk. To gauge the economic magnitude, note that the sample mean of total credit exposures is €231.9bn and the mean risk weight is 40.69%, implying average risk-weighted exposures of about €94.4bn. A 14% decline therefore corresponds to a reduction of roughly €13-14 billion in risk-weighted exposures for the average bank in the sample, which is economically sizeable.

The evidence in column (6) suggests that this decline primarily reflects a reduction in portfolio risk intensity rather than a contraction in credit volumes. Consistent with the results in columns (2) and (4), treated banks reduce the average risk weight of their credit portfolios. Interpreting risk weights as densities (defined as risk-weighted exposures divided by total credit exposures) and using the sample mean of 40.69%, the estimate implies a decline of approximately 7.4 percentage points, corresponding to about 18% of the pre-AQR mean average risk weight (7.4/40.69). Economically, for a bank with €231.9bn in total credit exposures, a 7.4 percentage point reduction in average risk weights implies a reduction in risk-weighted exposures of about €17 billion mechanically through lower risk intensity, holding credit volumes constant. This magnitude is consistent with—though not mechanically identical to—the large reduction in log risk-weighted exposures estimated in column (4), supporting the interpretation that banks primarily respond by de-risking rather than by contracting overall credit supply.

To understand how this aggregate reduction in portfolio risk is achieved, we next move from total exposures to portfolio-level allocation. Table 5 decomposes banks' responses along two dimensions: changes in portfolio composition (Panel A) and changes in average portfolio risk weights (Panel B). This distinction allows us to assess whether the decline in overall risk documented in Table 4 reflects reallocation *across* borrower categories, reshuffling *within* portfolios, or both.

Panel A shows that, on average, banks adjust their portfolio composition in the post-AQR period by shifting credit away from sovereign exposures and toward retail secured lending, as reflected in the negative and significant coefficient on Post for sovereign shares (column 1) and the

positive coefficient for retail secured portfolios (column 7). The interaction term $Post * Treated$ is generally small and statistically insignificant across borrower categories, indicating no differential portfolio reallocation across borrower types between treated banks and banks with limited or no risk disclosure.

By contrast, Panel B documents economically and statistically significant reductions in average risk weights within riskier portfolios (corporate and retail unsecured exposures, in particular). Treated banks experience a relatively more pronounced decline in corporate risk weights following the AQR, as indicated by the negative and significant $Post * Treated$ coefficient in column (3). This pattern suggests that banks facing stronger supervisory adjustments rebalance credit within the corporate portfolio toward safer borrowers. For corporate SMEs and retail portfolios, average risk weights decline for all banks, with no differential response between treated and control banks (columns 4 to 7).

Overall, Table 5 shows that within-portfolio reallocation is not accompanied by comparable changes in portfolio shares, reinforcing the interpretation that the primary response of treated banks operates through risk reallocation within portfolios rather than through broad shifts in credit portfolio composition. These findings complement the aggregate results in Table 4. Banks respond to the unveiling of hidden risk by reducing the riskiness of their credit portfolios - particularly in segments with high and dispersed risk - while keeping overall credit supply and portfolio composition largely unchanged.

5.2 Investigating the mechanism: the role of bank capital

An alternative (but not mutually exclusive) mechanism, orthogonal to the disciplining role of risk disclosure, is capital management. While risk disclosure may induce more prudent lending through supervisory moral suasion or market discipline from external observers, banks may also adjust their portfolios to alleviate capital constraints. We therefore investigate whether our results are driven by capital-constrained banks.

Regulatory capital is a key determinant of bank behavior, affecting lending policies and, more broadly, risk-taking (Gambacorta and Mistrulli, 2004). A large banking literature documents that capital-constrained banks tend to deleverage and reduce credit supply, as shrinking the balance sheet and cutting back on risky assets is often less costly than issuing new equity or retaining a higher share of earnings, particularly for weakly capitalized banks (Berger and Udell, 1994). Asymmetric information and the lemons problem (Myers and Majluf, 1984; Peek and Rosengren, 1995) further explain why banks may prefer deleveraging to equity issuance. With debt in place, shareholders may also favor de-risking over pure recapitalization (Admati et al., 2018). More generally, binding capital

requirements induce banks to reduce exposures subject to higher capital charges rather than raise new equity (De Jonghe et al., 2020; Gropp et al., 2019; Cortés et al., 2020).

To test the role of capital constraints, we define capital-constrained banks as those with a CET1 ratio in 2013 (prior to the start of the review) below 8%, corresponding to the threshold applied by the ECB in assessing banks under the baseline scenario of the 2014 Comprehensive Assessment. If de-risking primarily reflects capital management, the response should be concentrated among capital-constrained banks. Table A.1 shows that capital-constrained banks de-risk more in response to risk disclosure than treated but unconstrained banks. However, the effect remains present for treated banks more broadly, indicating that capital constraints amplify - but do not drive - the de-risking response.

Capital constraints may also interact with how banks measure credit risk. In particular, the effects of capital constraints may depend on whether banks rely on standardized, rating-agency-based risk weights or on an IRB model. The Basel II framework introduced a major innovation by linking regulatory capital requirements to credit risk assessments, either provided by external rating agencies under the standardized approach or generated internally by banks under the IRB approach. The choice between these approaches - left to banks' discretion subject to supervisory approval - has important implications for credit allocation and capital management (Bruno et al., 2023). In general, IRB-based capital requirements are more sensitive to the underlying drivers of credit risk. As a result, capital charges for exposures to high-risk (low-risk) borrowers tend to be higher (lower) for IRB banks than for SA banks. As discussed in Section 2, Figure 2 shows that average risk weights differ substantially across the two approaches: IRB banks exhibit lower and more concentrated risk weights both across and within borrower categories relative to banks using the standardized approach.

To examine whether the effects of capital constraints vary with the approach used to measure credit risk, Table 6 analyzes how banks' responses to risk disclosure depend on the intensity of risk unveiling, the credit risk measurement approach, and capital constraints. The table first reports the effects on credit exposures and portfolio shares (Panel A), and then on average risk weights (Panel B). We split the sample into SA banks (Panels A.1 and B.1) and IRB banks (Panels A.2 and B.2). SA banks are defined as those whose credit exposures are entirely subject to standardized risk weights, while IRB banks have a positive share of credit exposures measured using internal ratings. In our sample, 29 banks use the standardized approach and 48 use IRB, with approximately 75% of IRB banks having more than half of their credit exposures measured under internal models.

The coefficient on *Post* captures the average post-AQR adjustment among reviewed banks with limited or no risk unveiling, while $Post * Treated$ identifies the additional response of banks experiencing stronger supervisory adjustments. The triple interaction, $Post * Treated * LowCap$,

captures whether this differential response to risk unveiling is driven or amplified by capital-constrained banks. If capital constraints play an important role, the de-risking response should be stronger among low-capitalized banks, particularly in segments where regulatory capital requirements are more risk-sensitive.

Panel A examines adjustments in portfolio composition. Among SA banks, reviewed banks with limited risk unveiling reduce total exposures after the AQR (column (1)) and rebalance their portfolios away from interbank, corporate, and retail secured exposures toward sovereign and retail secured SME exposures. Treated SA banks adopt a more pronounced flight-to-quality strategy and adjust their portfolio composition more strongly than control banks, further reducing in particular the shares of interbank, corporate, and retail secured exposures (columns (3), (4), and (8)) while increasing sovereign holdings (column (2)). Capital constraints, however, appear to attenuate these adjustments. By contrast, IRB banks show no significant effect on the total amount of credit exposures and only modest changes in portfolio composition, with no substantial differences between treated banks and those with no or limited risk disclosure. The response is stronger among capital-constrained treated IRB banks, which increase the share of retail unsecured SME exposures (column (7)) while reducing sovereign and interbank exposures (columns (2) and (3)). This reallocation, however, does not materially alter the average risk weights of these portfolios, as shown by the results in Panel B.

The main findings from Panel B (average risk weights) can be summarized as follows. First, column (1) shows that both treated SA and treated IRB banks report statistically significant reductions in average risk weights following the AQR, while no change is observed for banks with limited or no risk unveiling. For IRB banks - where risk weights are more sensitive to underlying credit risk - the estimated decline in average risk weights is economically meaningful and implies a sizeable reduction in RWAs achieved through lower risk intensity rather than through changes in aggregate credit volumes. This pattern is consistent with de-risking operating primarily through within-portfolio reallocation rather than balance-sheet contraction. Second, among SA banks, within-portfolio adjustments reduce risk weights in sovereign and retail unsecured exposures (columns 2 and 6), while increasing them in corporate and corporate SME portfolios and, to a lesser extent, in retail unsecured SME exposures (columns 4, 5, and 7). For capital-constrained SA banks, this pattern partially reverses, with lower average risk weights observed in corporate and corporate SME portfolios, consistent with targeted de-risking in the riskiest credit segments. Third, IRB banks experiencing stronger risk unveiling show significant within-portfolio reallocation in corporate exposures (column 4), with lower average risk weights in this category -particularly among capital-constrained banks - indicating a shift toward safer borrowers within the riskiest segment. Finally, capital constraints tend

to amplify prudent responses in the riskiest credit portfolios -particularly corporate exposures - under both regulatory approaches.

All in all, Table 6 highlights that banks' responses to risk unveiling depend on the regulatory approach used to measure credit risk. SA banks adjust portfolio composition more actively than IRB banks. Beyond portfolio composition - and independently of the rating approach - banks experiencing stronger risk unveiling also reallocate within portfolios, resulting in reductions in average risk weights consistent with shifts toward lower-risk exposures. These reductions in risk weights are more pronounced among capital-constrained banks in the riskiest portfolios. As such, capital constraints act as an amplifier, rather than a driver, of prudent behavior under both approaches, confirming the results for the full sample reported in Table A.1.

5.3 Investigating the mechanism: disciplining vs. balance-sheet channels

A distinctive feature of the 2014 AQR is that supervisory adjustments to NPEs and provisions did not mechanically translate into accounting changes in banks' financial statements. While the ECB required banks to acknowledge the supervisory assessment, the actual recognition of these adjustments in balance sheets and income statements was, in many cases, left to banks' discretion, as only a limited number of adjustments reflected clear breaches of accounting rules (Bischof et al., 2026). This institutional feature allows us to disentangle two conceptually distinct channels through which the AQR may have affected banks' behavior: a disciplining channel, operating through the disclosure of previously hidden risks to supervisors and market participants; and a balance-sheet channel, operating when supervisory adjustments are explicitly reflected in banks' accounts. One may expect financial reporting of risk to be a more powerful mechanism than the moral suasion associated with supervisory risk disclosure for two main reasons. First, the reporting of additional provisions and the recognition of new NPLs mechanically depress retained earnings and capital and increase risk-weighted assets, tightening regulatory capital constraints and thereby altering lending strategies. Second, such adjustments are directly observable to investors and analysts and constitute the bank's official audited communication to the market.

To isolate these mechanisms, we manually collected information from banks' annual reports for 2014 and constructed two indicator variables. Dummy *ReportingNPE* equals one if the bank explicitly reports the AQR adjustment to NPEs in its balance sheet, and zero otherwise. Similarly, $ReportingProv$ equals one if the bank reports the additional provisions required by the AQR in its accounts. These variables allow us to distinguish banks for which risk disclosure operated primarily through supervisory communication - first from the supervisor to the bank and subsequently to the market through the publication of the AQR results - from banks for which risk disclosure was

accompanied by explicit accounting recognition in the 2014 financial statements through the reporting of additional provisions, NPLs, or both.

Table 7 documents substantial heterogeneity in the accounting recognition of AQR adjustments across banks. Out of 354 bank–year observations (73 banks), only a minority formally recognize supervisory adjustments to NPEs in their balance sheets. In particular, only 82 observations (15 banks) report NPE adjustments, whereas provisioning adjustments are considerably more common, with 210 observations (42 banks) reporting additional provisions.

The joint distribution highlights that accounting recognition of NPEs and provisions often does not coincide. A sizable group of banks reports additional provisions without reclassifying exposures as non-performing (135 observations, 28 banks), while very few banks recognize NPE adjustments without also reporting additional provisions (7 observations, 1 bank). This pattern suggests that, following the AQR, banks were considerably more likely to adjust provisioning policies than to reclassify loans as non-performing. Overall, Table 7 underscores that supervisory risk disclosure did not automatically translate into uniform accounting recognition across banks, thereby providing useful cross-bank variation to disentangle the disciplining effects of supervisory disclosure from the mechanical balance-sheet effects associated with accounting recognition.

Table 8 exploits this variation to assess whether post-AQR changes in banks' credit risk are primarily associated with supervisory disclosure or with accounting recognition. The baseline difference-in-differences estimates indicate that treated banks reduce risk-weighted exposures and average risk weights after the AQR, while total credit exposures remain broadly unchanged. This pattern is consistent with de-risking through portfolio reallocation rather than through credit contraction. When accounting recognition is taken into account, the interaction terms provide little evidence that formal recognition materially strengthens these effects. In particular, the coefficients capturing provisioning recognition are generally small and statistically insignificant. Similarly, the interaction terms associated with NPE recognition do not indicate systematically stronger de-risking among banks that formally recognize supervisory adjustments in their accounts.

Taken together, these results suggest that supervisory risk disclosure plays an important role in shaping banks' post-AQR risk-taking behavior, beyond the mechanical balance-sheet effects associated with accounting recognition. This evidence complements previous research (e.g., Bonfim et al., 2023) by providing new insights into the mechanisms through which stricter supervision influences bank behavior and by supporting the disciplining role of supervisory expectations.

5.4 Further tests with alternative sample of banks

This section reports a series of robustness checks assessing the sensitivity of our findings to alternative definitions of the supervisory shock and to sample composition. Overall, the additional results, reported in the Appendix, confirm the main conclusions: supervisory risk disclosure induces banks to de-risk primarily through portfolio reallocation rather than through credit contraction.

We first disentangle the two components of the supervisory shock by separately exploiting AQR adjustments to NPEs and loan loss provisions. Tables A.2 and A.3 replicate the baseline specification using alternative treatment indicators based solely on above-median NPE adjustments and provisioning adjustments, respectively. The results closely mirror those of the baseline analysis. In both cases, treated banks do not significantly reduce total credit exposures, while risk-weighted exposures and average risk weights decline sharply following the AQR. The magnitude and statistical significance of the effects are also very similar to those obtained using the composite treatment indicator, confirming that our findings are not driven by the specific aggregation of NPE and provisioning adjustments.

Tables A.4 and A.5 extend this analysis by examining portfolio composition and within-portfolio risk reallocation when treatment is defined separately using NPE and provisioning adjustments. Consistent with the baseline results in Table 5, changes in portfolio shares remain limited and largely common across banks. By contrast, treated institutions experience significant reductions in average risk weights within the riskiest portfolios, most notably corporate exposures. These findings reinforce the interpretation that banks respond to risk disclosure primarily by reallocating credit toward lower-risk exposures within portfolios rather than by altering the overall allocation of lending across borrower categories.

Finally, Table A.6 addresses concerns that the baseline results may be driven by specific subsets of banks or by country-level characteristics. Columns (1)–(3) exclude banks headquartered in high-NPL countries (average NPL ratio above 10% in 2013; see Figure 4), while columns (4)–(6) exclude banks that experienced capital shortfalls in the 2014 Comprehensive Assessment stress tests. High NPL levels were one of the key motivations for establishing the SSM, and banks operating in such environments may respond differently to supervisory risk disclosure due to heightened supervisory scrutiny and market skepticism. Excluding these banks therefore rules out this potential channel. Similarly, excluding shortfall banks ensures that the results are not driven by one of the core outcomes of the Comprehensive Assessment itself, consistent with Sahin and de Haan (2016). Across both alternative samples, treated banks continue to exhibit significant reductions in risk-weighted exposures and average risk weights, with no evidence of a systematic contraction in total credit.

Taken together, the robustness checks confirm that the AQR primarily affected the risk composition of banks' credit portfolios rather than the overall level of credit supply. Across alternative definitions of the supervisory shock and different sample compositions, banks consistently respond to risk disclosure by reducing the risk intensity of their lending while keeping aggregate credit exposures broadly unchanged.

6 Conclusions

This paper exploits supervisory risk disclosure stemming from the ECB's 2014 AQR to study how the unveiling of credit risk embedded in banks' portfolios affects credit allocation. Leveraging the institutional design of the AQR, we identify the causal effects of shocks to balance-sheet transparency on subsequent portfolio adjustments and average risk weights. Banks experiencing larger AQR shocks to NPEs and provisions reallocate credit both across and within borrower categories, leading to lower average risk weights.

Responses vary systematically across regulatory approaches, and capital constraints further shape these responses. While both IRB and SA banks adjust credit allocation following supervisory risk disclosure, IRB banks reallocate more intensively within their riskiest portfolios, particularly corporate exposures. These differences are consistent with the constraints imposed by the risk measurement frameworks: SA banks face limited flexibility to manage capital through model-based risk adjustments and therefore rely more on reallocations across borrower categories to obtain capital relief. Capital-constrained banks react more strongly to supervisory risk disclosure, but capital constraints act primarily as an amplifier rather than as an independent driver of portfolio adjustment.

Finally, exploiting heterogeneity in the accounting recognition of AQR adjustments, we distinguish supervisory disclosure from mechanical balance-sheet effects. If portfolio adjustments were driven mainly by the accounting recognition of additional NPLs and provisions, responses should be stronger among banks that formally reflect supervisory adjustments in their financial statements. We find no evidence of such differences. Instead, the results suggest that the ECB's risk disclosure and associated supervisory expectations play a central role in shaping banks' post-AQR risk-taking responses, beyond the mechanical effects of financial reporting.

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Figures

Figure 1. Timeline of the Asset Quality Review (AQR)

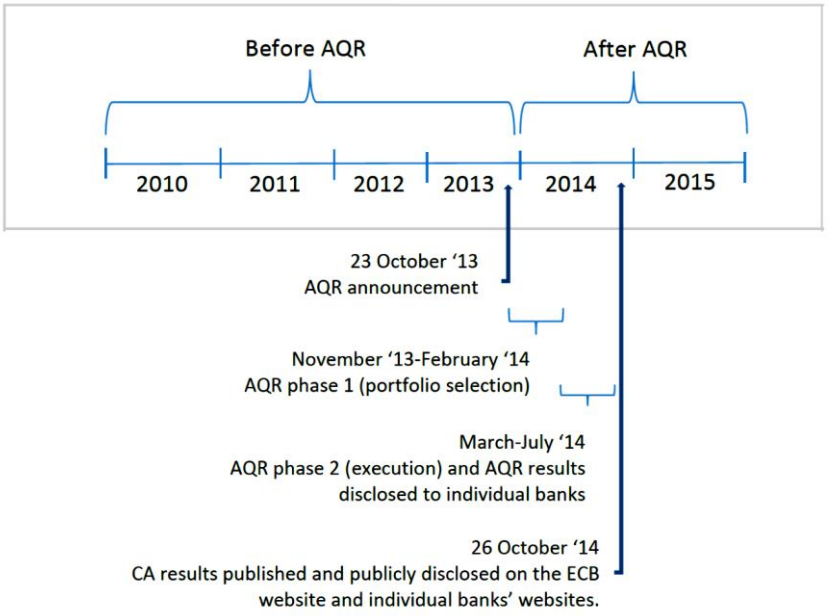
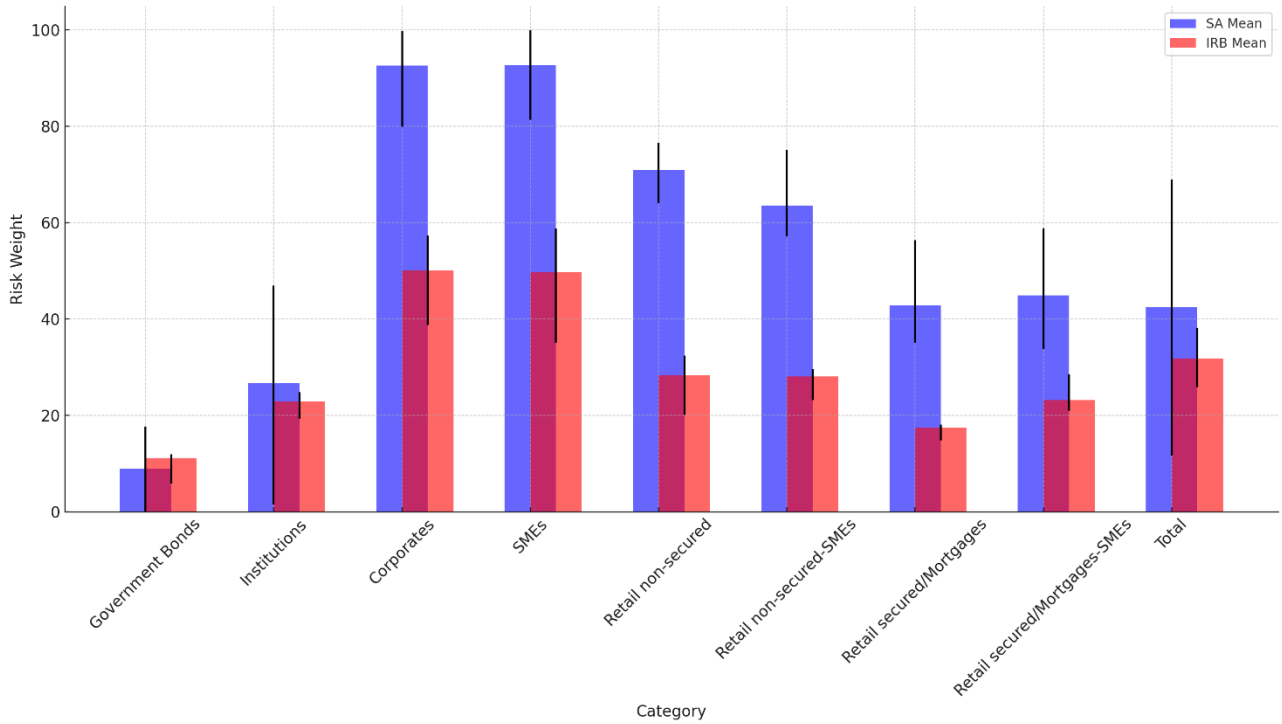
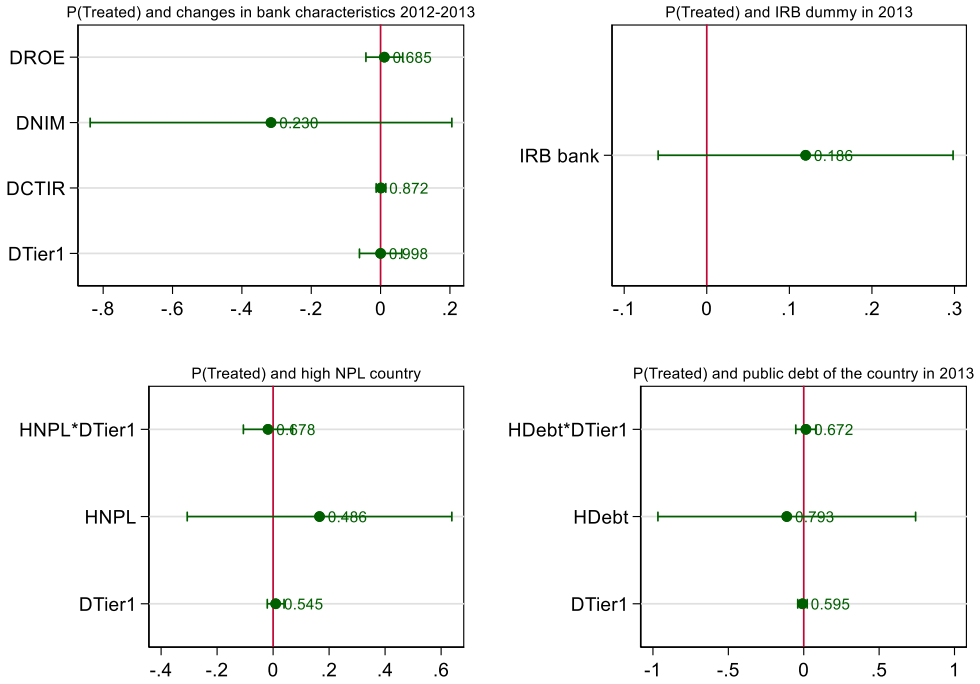


Figure 2. Risk weights in SA and IRB portfolios



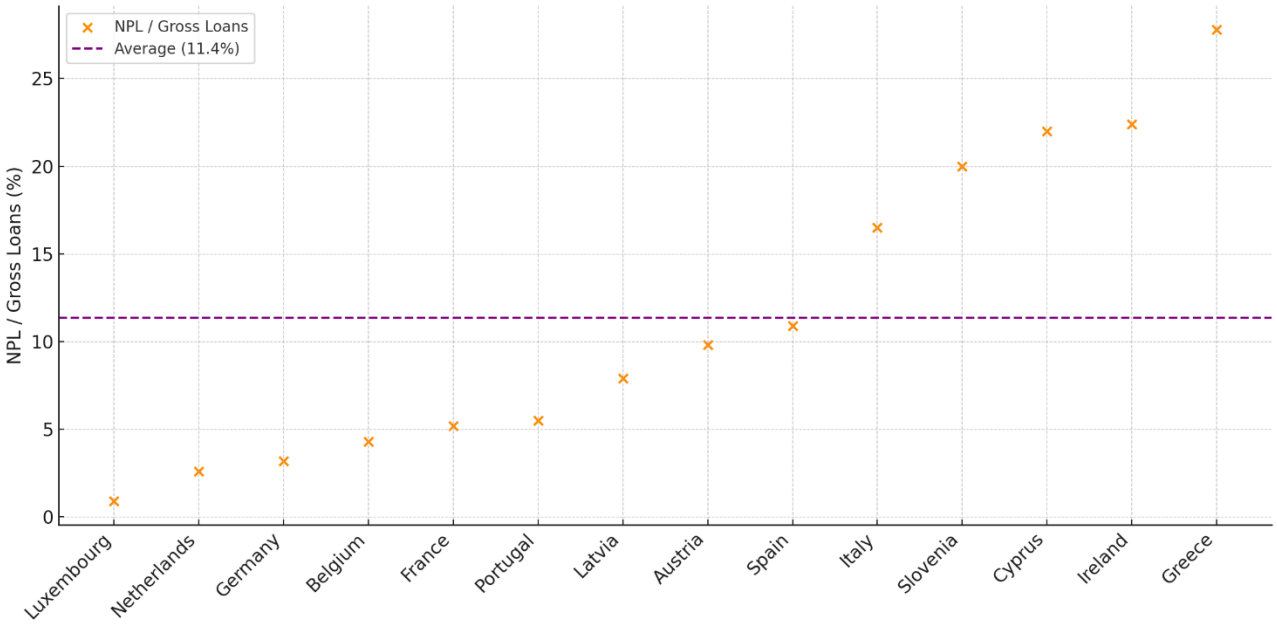
Note. Figure 2 displays the mean risk weights for portfolios under the standardized approach (SA) and the internal rating based approach (IRB), with whiskers representing the range from the 10th percentile to the 90th percentile The blue bars represent risk weights of credit portfolios under the SA approach, while the red bars represent risk weights in credit portfolios estimated through internal ratings.

Figure 3. Validation of the treatment



Note. The figure presents coefficient estimates from regressions of the *Treated* indicator as dependent variable (banks above the sample median in either *DeltaNPE* or *DeltaProv*) on pre-AQR bank fundamentals and country indicators. Each panel reports estimates for: (i) changes in bank fundamentals from 2012 to 2013 (*DROE*, *DNIM*, *DCTIR*, and *DTier1*), (ii) an IRB-bank indicator, and (iii) country-level dummies for high public debt (*HDebt*) and high NPL incidence (*HNPL*) interacted with *DTier1*. All regressions additionally control for lagged (2013) Tier 1 ratio, deposits-to-assets ratio, ROE, liquid assets-to-assets ratio, loan loss reserve coverage, and the NPL ratio. Whiskers denote 95% confidence intervals based on robust standard errors clustered at the bank level.

Figure 4. Average NPL ratios at the country level (as of 2013)



Note. Figure 4 illustrates the average Non-Performing Loans (NPL) to Gross Loans (GL) ratios across European countries in our sample as of 2013.

Tables

Table 1: Descriptive statistics – Balance sheet items (2012-2016)

	(1) Mean	(2) St.Dev	(3) p10	(4) p50	(5) p90	(6) N
Orbis Bank Focus						
Total assets (Euro MM)	128,884	256,487	25,469	81,934	174,732	369
Gross loans/TA	59.38	16.81	32.44	61.49	78.73	369
Total securities/TA	26.28	11.69	13.32	24.19	46.68	369
Cash and due from banks/TA	2.533	1.326	0.695	2.533	4.496	369
Total customer deposits/TA	47.76	18.80	22.84	47.60	73.43	368
Tier1 regulatory capital ratio	14.26	4.232	10.60	13.70	18.10	369
CET1 ratio	13.39	4.781	9.677	12.48	17.36	369
ROE	2.587	10.37	-2.700	4.300	10.72	369
ROA	0.173	0.708	-0.190	0.240	0.800	369
NPL/TA	7.324	8.553	0.629	3.809	13.90	369
NPL/Gross loans	11.14	10.91	1.780	6.840	21.50	369
ECB data						
DeltaNPE – Total credit exposures (pp)	1.911	2.369	0.00270	1.228	5.771	369
DeltaProv – Total credit exposures (pp)	0.979	1.232	0.0147	0.476	3.108	369

Note. Table 1 summarizes key balance sheet items from ORBIS Bank Focus (2012–2016) and changes in non-performing exposures (NPE) and loan loss provisions (Prov) from the ECB's Comprehensive Assessment.

Table 2. Joint distribution of above-median AQR adjustments

	DeltaProv≤Median	**DeltaProv>Median**	**Total**
DeltaNPE≤ Median	146 (33)	40 (9)	186 (42)
DeltaNPE> Median	41 (7)	142 (27)	183 (34)
Total	187 (40)	182 (36)	369

Note. Table 2 reports the joint distribution of banks classified according to whether AQR-induced adjustments to non-performing exposures (NPE) and loan loss provisions (Prov) exceed the sample median.

Table 3: Descriptive statistics – Credit risk measures by rating approach (2012-2016)

EBA data (Transparency exercise)	(1) Mean	(2) St.Dev.	(3) p10	(4) p50	(5) p90	(6) N
Total credit exposures (Euro MM)	231,943	310,943	26,098	107,729	736,176	369
SA (%)	49.0	36.8	0	45.7	100	369
IRB (%)	51.0	36.6	0	54.3	100	369
Government Bonds (Euro MM)	55,242	71,230	4,311	23,723	169,120	369
SA (%)	80.93	30.41	14.21	99.18	100	369
IRB (%)	19.07	30.41	0	0.820	85.79	369
Institutions (Euro MM)	28,843	38,761	1,097	8,036	94,677	369
SA (%)	65.42	34.97	4.927	65.42	100	369
IRB (%)	34.58	34.97	0	34.58	95.07	369
Corporates (Euro MM)	75,177	109,678	1,841	24,700	252,641	369
SA (%)	48.62	37.94	4.345	48.62	100	369
IRB (%)	51.38	37.94	0	51.38	95.65	369
Corporates SMEs (Euro MM)	15,078	21,923	158.0	5,614	39,013	369
SA (%)	50.27	37.58	2.907	50.27	100	369
IRB (%)	49.73	37.58	0	49.73	97.09	369
Retail non-secured (Euro MM)	18,752	33,924	280	6,036	49,768	369
SA (%)	62.79	33.58	8.797	62.79	100	369
IRB (%)	37.21	39.30	0	45.65	100	369
Retail non-secured SMEs (Euro MM)	6,824	11,107	0.245	1,756	22,836	369
SA (%)	59.87	36.27	5.688	59.87	100	369
IRB (%)	40.13	36.27	0	40.13	94.31	369
Retail secured (Euro MM)	36,956	67,178	50.96	11,436	107,210	369
SA (%)	49.29	37.96	2.218	49.29	100	369
IRB (%)	58.50	41.59	0	70.25	100	369
Retail secured SMEs (Euro MM)	3,260	5,326	0	1,023	9,149	369
SA (%)	60.42	34.98	4.323	60.42	100	369
IRB (%)	39.58	34.98	0	39.58	95.68	369
Other exposures (Euro MM)	16,973	24,273	786.7	7,942	51,025	369
SA (%)	76.57	28.12	24.87	81.19	100	369
IRB (%)	23.43	28.12	0	18.81	75.13	369
Risk weights						
Avg. Risk weight (%)	40.69	15.74	21.58	40.01	59.56	369
Risk weight: Government Bonds	7.814	9.799	0.353	4.612	19.10	369
Risk weight: Institutions	26.03	12.48	10.56	24.66	43.58	369
Risk weight: Corporate	70.53	21.93	40.11	69.38	98.58	369
Risk weight: Corporate SMEs	72.49	23.93	35.58	76.19	100	369
Risk weight: Retail non secured	60.59	23.94	24.22	64.86	100	369
Risk weight: Retail non secured SMEs	51.94	21.71	22.46	57.14	76.36	369
Risk weight: Retail secured	42.61	29.05	15.52	35.99	100	369
Risk weight: Retail secured SMEs	47.57	27.99	18.53	39.24	100	369
Risk weight: Other	82.01	22.87	45.04	90.89	100	369

Note. Table 3 presents descriptive statistics on credit exposures by borrower category and rating approach from the EBA Transparency Exercise dataset.

Table 4. AQR risk disclosure and credit allocation (2012–2016)

	Credit Exposures (log)		Risk Weighted Exposures (log)		Risk Weights (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
Post	0.137	0.132	-0.102	0.003	-0.153*	-0.103
	(0.209)	(0.209)	(0.168)	(0.143)	(0.079)	(0.081)
Post*$Treated$		0.008		-0.155***		-0.074**
		(0.092)		(0.050)		(0.032)
Bank controls (t-1)						
NPL/GL	-0.002	-0.002	-0.005	-0.002	-0.001	0.000
	(0.004)	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)
GL/TA	-0.001	-0.001	0.000	-0.000	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)
Log(TA)	0.036*	0.036*	0.033*	0.024	0.003	-0.001
	(0.021)	(0.020)	(0.018)	(0.017)	(0.008)	(0.008)
ROE	0.003	0.003	0.003	0.003*	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Tier1 Ratio	0.003	0.003	0.000	0.001	-0.000	-0.000
	(0.006)	(0.006)	(0.003)	(0.004)	(0.002)	(0.002)
Customer Deposits/TA	-0.002	-0.002	0.002	0.003	0.001	0.002**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)
Observations	369	369	369	369	369	369
Number of banks	76	76	76	76	76	76
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Note. Table 4 reports difference-in-differences estimates of the effect of AQR-induced supervisory adjustments on banks' credit allocation and risk. The dependent variables are total credit exposures (log), risk-weighted exposures (log), and average risk weights (percent). *Post* is an indicator equal to one for the post-AQR period (2014–2016). *Treated* identifies banks exposed to a stronger supervisory shock, defined as banks experiencing an above-median adjustment in non-performing exposures, loan loss provisions, or both, as documented in Table 2. All specifications include bank fixed effects and country-by-quarter fixed effects, as well as lagged bank-level controls. Standard errors, reported in parentheses, are robust and clustered at the bank level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5. AQR risk disclosure and reallocation across credit portfolios (2012–2016)

(A) Share of:	(1) Sovereign	(2) Institution	(3) Corporate	(4) Corporate SME	(5) Retail non-secured	(6) Retail non-secured SME	(7) Retail secured	(8) Retail secured SME
Post	-0.152***	-0.004	-0.014	0.048	0.032	0.011	0.189***	0.018
	(0.055)	(0.031)	(0.064)	(0.050)	(0.021)	(0.013)	(0.061)	(0.013)
Post*$Treated$	0.013	0.012	-0.014	-0.019	0.009	-0.001	0.002	0.003
	(0.017)	(0.021)	(0.029)	(0.019)	(0.013)	(0.006)	(0.037)	(0.004)

(B) Risk weights:	(1) Sovereign	(2) Institution	(3) Corporate	(4) Corporate SME	(5) Retail non-secured	(6) Retail non-secured SME	(7) Retail secured	(8) Retail secured SME
Post	0.105	0.054	-0.274***	-0.327*	-0.371**	-0.218*	-0.459*	-0.163
	(0.064)	(0.064)	(0.102)	(0.165)	(0.159)	(0.128)	(0.241)	(0.154)
Post*$Treated$	-0.020	-0.011	-0.085**	-0.060	0.022	-0.066	0.113	-0.026
	(0.022)	(0.034)	(0.036)	(0.060)	(0.123)	(0.065)	(0.133)	(0.106)
N. observations	369	369	369	369	369	369	369	369
N. banks	76	76	76	76	76	76	76	76
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. Table 5 reports difference-in-differences estimates of the effect of AQR-induced supervisory adjustments on banks' credit portfolio composition and portfolio-level risk weights. In the upper panel, the dependent variables are the shares of total credit exposures allocated to each borrower category. In the lower panel, the dependent variables are the corresponding average risk weights (percent), defined as the ratio of risk-weighted to total exposures within each portfolio. Post is an indicator equal to one for the post-AQR period (2014–2016). Treated identifies banks exposed to a stronger supervisory shock, defined as banks experiencing an above-median adjustment in non-performing exposures, loan loss provisions, or both, as documented in Table 2. All specifications include bank fixed effects, country-by-quarter fixed effects, and lagged bank-level controls. Standard errors, reported in parentheses, are robust and clustered at the bank level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6 – AQR risk disclosure, credit allocation, and capital constraints: SA vs. IRB banks (2012–2016)

(A) Total exposure and share	(1) TotExp(log)	(2) Sovereign	(3) Institution	(4) Corporate	(5) Corporate SME	(6) Retail non-secured	(7) Retail non-secured SME	(8) Retail secured	(9) Retail secured SME
(A.1) SA banks (N=29)									
Post	-1.942**	0.960*	-0.352**	-0.930**	-1.228**	0.150	-0.063	0.205	0.299*
	(0.875)	(0.564)	(0.142)	(0.375)	(0.593)	(0.307)	(0.112)	(0.328)	(0.160)
Post*_Treated_	0.094***	0.067***	-0.021***	-0.042***	-0.011	-0.009*	-0.001	-0.016***	0.003
	(0.020)	(0.015)	(0.005)	(0.010)	(0.014)	(0.005)	(0.003)	(0.006)	(0.004)
Post*_Treated*LowCap_	0.217***	-0.092	0.093***	0.069	0.051	0.012	-0.015	-0.006	-0.036**
	(0.063)	(0.087)	(0.020)	(0.060)	(0.074)	(0.022)	(0.015)	(0.027)	(0.014)
(A.2) IRB banks (N=48)									
Post	-0.070	-0.147**	0.052	-0.010	-0.006	-0.029	0.002	0.169**	0.036**
	(0.405)	(0.062)	(0.045)	(0.097)	(0.061)	(0.022)	(0.013)	(0.080)	(0.014)
Post*_Treated_	-0.052	0.021	0.025	-0.010	-0.022	0.004	-0.004	-0.027	0.005
	(0.089)	(0.018)	(0.025)	(0.031)	(0.021)	(0.014)	(0.006)	(0.034)	(0.005)
Post*_Treated *LowCap_	0.040	-0.073***	-0.051***	0.052*	0.014	0.030	0.039***	0.032	-0.001
	(0.132)	(0.027)	(0.018)	(0.026)	(0.016)	(0.021)	(0.011)	(0.042)	(0.006)
(B) Risk weights	**Avg RW**	**RW Sovereign**	**RW Institution**	**RW Corporate**	**RW Corporate SME**	**RW Retail non-secured**	**RW Retail non-secured SME**	**RW Retail secured**	**RW Retail secured SME**
(B.1) SA banks (N=29)									
Post	-1.176	-0.687	-0.015	0.452	1.298	-0.520*	-0.146	0.818*	-2.106
	(1.003)	(0.832)	(1.756)	(0.437)	(0.918)	(0.297)	(0.183)	(0.407)	(3.901)
Post* _Treated_	-0.107***	-0.218***	-0.016	0.066***	0.091***	-0.024***	0.011**	0.020*	0.024
	(0.024)	(0.024)	(0.037)	(0.010)	(0.020)	(0.004)	(0.005)	(0.010)	(0.105)
Post*_Treated*LowCap_	0.160	0.216**	0.176	-0.214***	-0.525***	0.079***	-0.040	-0.032	0.265
	-1.176	-0.687	-0.015	0.452	1.298	-0.520*	-0.146	0.818*	-2.106
(B.2) IRB banks (N=48)									
Post	-0.057	0.020	0.061	-0.110	-0.107	-0.119	0.108	-0.087	-0.203
	(0.059)	(0.077)	(0.077)	(0.076)	(0.133)	(0.197)	(0.178)	(0.312)	(0.255)
Post*_Treated_	-0.042**	0.005	-0.044	-0.066**	-0.031	0.099	-0.054	0.215	-0.034
	(0.021)	(0.014)	(0.034)	(0.032)	(0.067)	(0.135)	(0.076)	(0.135)	(0.132)
Post*_Treated*LowCap_	-0.028	0.004	0.086**	-0.136**	-0.007	-0.129	-0.071	-0.145*	0.023
	(0.034)	(0.011)	(0.035)	(0.057)	(0.055)	(0.155)	(0.045)	(0.080)	(0.092)

Note. Table 6 reports difference-in-differences estimates for banks using the standardized approach (SA) and internal ratings-based models (IRB). *Post* equals one for 2014–2016. *Treated* identifies banks with above-median AQR-induced adjustments to non-performing exposures, loan loss provisions, or both (see Table 2). *LowCap* denotes banks with a CET1 ratio below 8% in 2013. All specifications include bank fixed effects and country-by-quarter fixed effects. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels.

Table 7. Accounting recognition of AQR adjustments to NPE and provisions

	ReportingProv=0	**ReportingProv=1**	**Total**
ReportingNPE =0	137 (30)	135 (28)	272 (58)
ReportingNPE =1	7 (1)	75 (14)	82 (15)
Total	144 (31)	210 (42)	354 (73)

Notes: Table 7 reports the joint distribution of banks according to whether AQR-induced adjustments to non-performing exposures (NPEs) and loan loss provisions are formally recognized in banks' financial statements. Numbers outside parentheses refer to bank–year observations, while numbers in parentheses report the number of banks.

Table 8 – Supervisory risk disclosure vs. accounting recognition: effects on credit allocation

	(1) Cred.exp (log)	(2) Risk exp. (log)	(3) RWs (%)
Post	0.134	0.002	-0.106
	(0.212)	(0.142)	(0.082)
$Post * Treated$	0.035	-0.173***	-0.100**
	(0.111)	(0.059)	(0.044)
$Post * Treated * Reporting$	-0.061	0.039	0.060
	(0.100)	(0.070)	(0.053)
Post	0.118	-0.011	-0.105
	(0.211)	(0.142)	(0.080)
$Post * TreatedNPE$	-0.037	-0.201***	-0.079**
	(0.102)	(0.055)	(0.037)
$Post * Treated * ReportingNPE$	0.173	0.179***	0.018
	(0.109)	(0.066)	(0.056)
N. Observations	369	369	369
N. banks	76	76	76
Bank FE	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes

Note. Table 8 reports difference-in-differences estimates distinguishing between supervisory disclosure and accounting recognition of AQR-induced adjustments. *Post* equals one for 2014–2016. *Treated* identifies banks with above-median AQR-induced adjustments (see Table 2). *Reporting* (*ReportingNPE*) equals one if the bank recognizes AQR-induced provisioning (NPE) adjustments in its financial statements. All specifications include bank fixed effects and country-by-quarter fixed effects. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level.

Appendix

Table A1. AQR risk disclosure and credit allocation: the role of bank capital

	Credit Exp. (log) (1)	RW Exp. (log) (2)	RW (%) (3)
Post	0.139	-0.001	-0.110
	(0.207)	(0.142)	(0.076)
$Post * Treated$	-0.020	-0.138**	-0.049**
	(0.088)	(0.053)	(0.022)
$Post * Treated * LowCap$	0.173	-0.111**	-0.155**
	(0.109)	(0.055)	(0.062)
NPL/GL	-0.002	-0.002	0.000
	(0.005)	(0.005)	(0.002)
GL/TA	-0.001	-0.001	0.001
	(0.004)	(0.003)	(0.001)
Log(TA)	0.036*	0.024	-0.001
	(0.020)	(0.016)	(0.007)
ROE	0.003	0.003*	0.000
	(0.002)	(0.002)	(0.001)
Tier1 Ratio	0.003	0.001	-0.000
	(0.006)	(0.003)	(0.001)
Customer Deposits/TA	-0.002	0.003	0.001**
	(0.003)	(0.003)	(0.001)
N. observations	369	369	369
N. banks	76	76	76
Bank FE	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes

Note. Table A.1 reports difference-in-differences estimates of the effect of AQR-induced risk disclosure on banks' credit portfolio composition and portfolio-level risk measures. The dependent variables are total credit exposures, risk-weighted credit exposures, and average risk weights. The table report results for the full sample of banks, accounting for capital-constrained banks. All specifications include bank fixed effects and country-by-quarter fixed effects. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A2. AQR risk disclosure and credit allocation: adjustments to NPEs (2012–2016)

	Credit Exposures (log)		Risk Weighted Exposures (log)		Risk Weights (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
Post	0.002	-0.004	-0.169	-0.064	-0.126	-0.072
	(0.183)	(0.186)	(0.180)	(0.163)	(0.091)	(0.093)
Post*$Treated_{NPE}$		0.008		-0.146***		-0.076**
		(0.098)		(0.049)		(0.037)
Bank controls (t-1)						
NPL/GL	-0.005	-0.005	-0.008	-0.005	-0.001	0.000
	(0.004)	(0.005)	(0.006)	(0.006)	(0.002)	(0.002)
GL/TA	0.000	0.000	0.002	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)
Log(TA)	0.048**	0.049**	0.040**	0.030*	0.001	-0.004
	(0.019)	(0.019)	(0.020)	(0.018)	(0.009)	(0.009)
ROE	0.002	0.002	0.002	0.003	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Tier1 Ratio	0.003	0.003	0.001	0.001	-0.000	-0.000
	(0.006)	(0.006)	(0.004)	(0.004)	(0.002)	(0.002)
Customer Deposits/TA	-0.002	-0.002	0.002	0.003	0.001	0.002***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)
Observations	329	329	329	329	329	329
Number of banks	67	67	67	67	67	67
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Note. Table A2 reports difference-in-differences estimates of the effect of AQR-induced adjustments to non-performing exposures (NPEs) on banks' credit exposures, risk-weighted exposures, and average risk weights. *Post* equals one for the post-AQR period (2014–2016). $Treated_{NPE}$ identifies banks with above-median AQR-induced NPE adjustments. All specifications include bank fixed effects, country-by-quarter fixed effects, and lagged bank-level controls. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels.

Table A3. AQR risk disclosure and credit allocation: adjustments to provisions (2012–2016)

	Credit Exposures (log)		Risk Weighted Exposures (log)		Risk Weights (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
Post	0.143	0.128	-0.190	-0.086	-0.199**	-0.145
	(0.219)	(0.220)	(0.182)	(0.153)	(0.085)	(0.088)
Post*$Treated_{Prov}$		0.024		-0.167***		-0.087**
		(0.090)		(0.053)		(0.034)
Bank controls (t-1)						
NPL/GL	-0.002	-0.003	-0.005	-0.001	-0.001	0.001
	(0.004)	(0.004)	(0.005)	(0.005)	(0.002)	(0.002)
GL/TA	-0.001	-0.001	0.000	-0.000	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.003)	(0.001)	(0.001)
Log(TA)	0.036*	0.038*	0.033*	0.027	0.003	-0.001
	(0.021)	(0.021)	(0.018)	(0.016)	(0.008)	(0.008)
ROE	0.003	0.002	0.003	0.003*	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Tier1 Ratio	0.003	0.003	0.000	0.001	-0.000	-0.000
	(0.006)	(0.006)	(0.003)	(0.003)	(0.002)	(0.002)
Customer Deposits/TA	-0.002	-0.003	0.002	0.003	0.001	0.002**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)
Observations	328	328	328	328	328	328
Number of banks	69	69	69	69	69	69
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Note. Table A3 reports difference-in-differences estimates of the effect of AQR-induced adjustments to loan loss provisions on banks' credit exposures, risk-weighted exposures, and average risk weights. *Post* equals one for the post-AQR period (2014–2016). $Treated_{Prov}$ identifies banks with above-median AQR-induced adjustments to provisions. All specifications include bank fixed effects, country-by-quarter fixed effects, and lagged bank-level controls. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels.

Table A4. NPE-related AQR adjustments and reallocation across credit portfolios (2012–2016)

(A) Share of:	(1) Sovereign	(2) Institution	(3) Corporate	(4) Corporate SME	(5) Retail non-secured	(6) Retail non-secured SME	(7) Retail secured	(8) Retail secured SME
Post	-0.167**	-0.001	0.031	0.060	0.040*	0.014	0.151**	0.007
	(0.063)	(0.036)	(0.071)	(0.052)	(0.021)	(0.013)	(0.064)	(0.011)
Post*$Treated_{NPE}$	0.007	0.007	-0.013	-0.030*	0.005	0.003	0.016	0.003
	(0.019)	(0.024)	(0.031)	(0.017)	(0.014)	(0.005)	(0.043)	(0.004)

(B) Risk weights:	(1) Sovereign	(2) Institution	(3) Corporate	(4) Corporate SME	(5) Retail non-secured	(6) Retail non-secured SME	(7) Retail secured	(8) Retail secured SME
Post	0.140**	0.009	-0.285**	-0.389**	-0.391**	-0.224	-0.439	-0.150
	(0.056)	(0.066)	(0.121)	(0.189)	(0.186)	(0.149)	(0.274)	(0.175)
Post* $Treated_{NPE}$	-0.017	0.006	-0.092**	-0.045	0.061	-0.077	0.127	-0.062
	(0.019)	(0.040)	(0.043)	(0.066)	(0.138)	(0.071)	(0.156)	(0.117)
N. observations	329	329	329	329	329	329	329	329
N. banks	67	67	67	67	67	67	67	67
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. Table A4 reports difference-in-differences estimates of the effect of AQR-induced adjustments to NPEs on banks' credit portfolio composition and portfolio-level risk weights. In Panel A, the dependent variables are the shares of total credit exposures allocated to each borrower category. In Panel B, the dependent variables are the corresponding average risk weights (percent), defined as the ratio of risk-weighted to total exposures within each portfolio. *Post* equals one for the post-AQR period (2014–2016). $Treated_{NPE}$ identifies banks with above-median AQR-induced NPE adjustments. All specifications include bank fixed effects and country-by-quarter fixed effects. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels.

Table A5. Provision-related AQR adjustments and reallocation across credit portfolios (2012–2016)

(A) Share of:	(1) Sovereign	(2) Institution	(3) Corporate	(4) Corporate SME	(5) Retail non-secured	(6) Retail non-secured SME	(7) Retail secured	(8) Retail secured SME
Post	-0.134**	-0.003	-0.011	0.055	0.022	0.002	0.204***	0.020
	(0.060)	(0.032)	(0.070)	(0.061)	(0.021)	(0.014)	(0.061)	(0.014)
Post*$Treated_{Prov}$	0.007	0.005	-0.022	-0.012	0.013	-0.001	0.020	0.004
	(0.019)	(0.022)	(0.028)	(0.020)	(0.014)	(0.006)	(0.038)	(0.004)

(B) Risk weights:	(1) Sovereign	(2) Institution	(3) Corporate	(4) Corporate SME	(5) Retail non-secured	(6) Retail non-secured SME	(7) Retail secured	(8) Retail secured SME
Post	0.110	0.034	-0.315**	-0.384*	-0.409***	-0.214	-0.624***	-0.219
	(0.070)	(0.069)	(0.120)	(0.195)	(0.151)	(0.146)	(0.193)	(0.154)
Post* $Treated_{Prov}$	-0.022	-0.009	-0.085**	-0.097	-0.080	-0.062	0.001	-0.030
	(0.024)	(0.038)	(0.039)	(0.063)	(0.106)	(0.064)	(0.114)	(0.107)
N. observations	328	328	328	328	328	328	328	328
N. banks	69	69	69	69	69	69	69	69
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

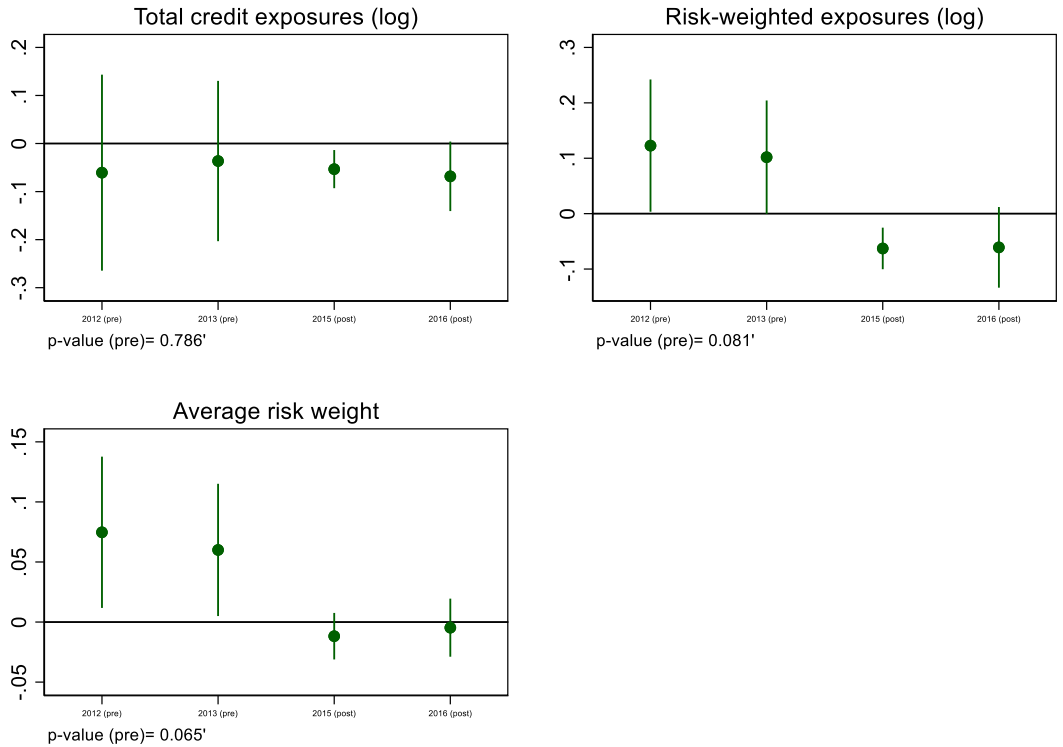
Note. Table A.5 reports difference-in-differences estimates of the effect of AQR-induced adjustments to loan loss provisions on banks' credit portfolio composition and portfolio-level risk weights. In Panel A, the dependent variables are the shares of total credit exposures allocated to each borrower category. In Panel B, the dependent variables are the corresponding average risk weights (percent), defined as the ratio of risk-weighted to total exposures within each portfolio. *Post* equals one for the post-AQR period (2014–2016). $Treated_{Prov}$ identifies banks with above-median AQR-induced adjustments to provisions. All specifications include bank fixed effects and country-by-quarter fixed effects. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels.

Table A6. Alternative Bank Samples

	Subsample (w/o high-NPL countries banks)			Subsample (w/o capital shortfall banks)		
	Credit Exp. (log) (1)	RW Exp. (log) (2)	RW (%) (3)	Credit Exp. (log) (4)	RW Exp. (log) (5)	RW (%) (6)
Post	-0.008	0.076	0.006	0.209	0.145	-0.100
	(0.285)	(0.150)	(0.069)	(0.251)	(0.149)	(0.063)
$Post * Treated$	-0.010	-0.160**	-0.065	-0.058	-0.138**	-0.032**
	(0.113)	(0.063)	(0.039)	(0.081)	(0.057)	(0.014)
NPL/GL	-0.022**	-0.012	0.003	-0.016**	-0.010*	0.001
	(0.009)	(0.007)	(0.003)	(0.007)	(0.006)	(0.002)
GL/TA	-0.007	-0.006*	0.000	-0.005	-0.004	-0.000
	(0.004)	(0.004)	(0.001)	(0.005)	(0.004)	(0.001)
Log(TA)	0.053*	0.016	-0.014**	0.031	0.008	-0.004
	(0.028)	(0.016)	(0.006)	(0.025)	(0.016)	(0.006)
ROE	0.001	-0.003	-0.002*	0.000	-0.001	-0.001
	(0.004)	(0.003)	(0.001)	(0.004)	(0.003)	(0.001)
Tier1 Ratio	0.007	0.005*	-0.001	0.006	0.004	-0.000
	(0.008)	(0.003)	(0.001)	(0.008)	(0.003)	(0.001)
Customer Deposits/TA	-0.001	0.004*	0.001***	0.000	0.001	0.000
	(0.003)	(0.002)	(0.001)	(0.005)	(0.003)	(0.001)
N. observations	239	239	239	277	277	277
N. banks	50	50	50	57	57	57
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country*Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

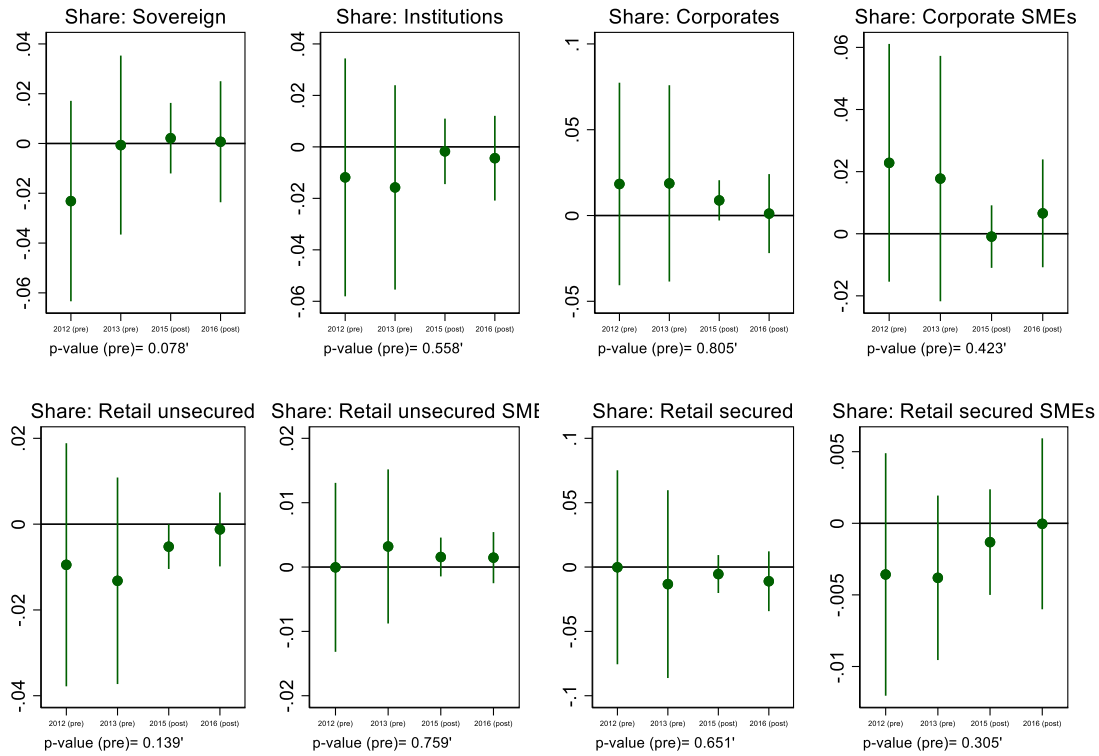
Note. Table A.6 reports difference-in-differences estimates of the effect of AQR-induced risk disclosure on banks' credit portfolio composition and portfolio-level risk measures. The dependent variables are total credit exposures, risk-weighted credit exposures, and average risk weights. Columns (1)–(3) exclude banks headquartered in high-NPL countries, while columns (4)–(6) exclude banks that experienced capital shortfalls following the 2014 ECB Comprehensive Assessment stress tests. Post equals one for the post-AQR period (2014–2016). Treated identifies banks subject to AQR-induced risk disclosure. All specifications include bank fixed effects and country-by-quarter fixed effects. Robust standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure A1. Event-study evidence on credit exposures and risk before and after the AQR



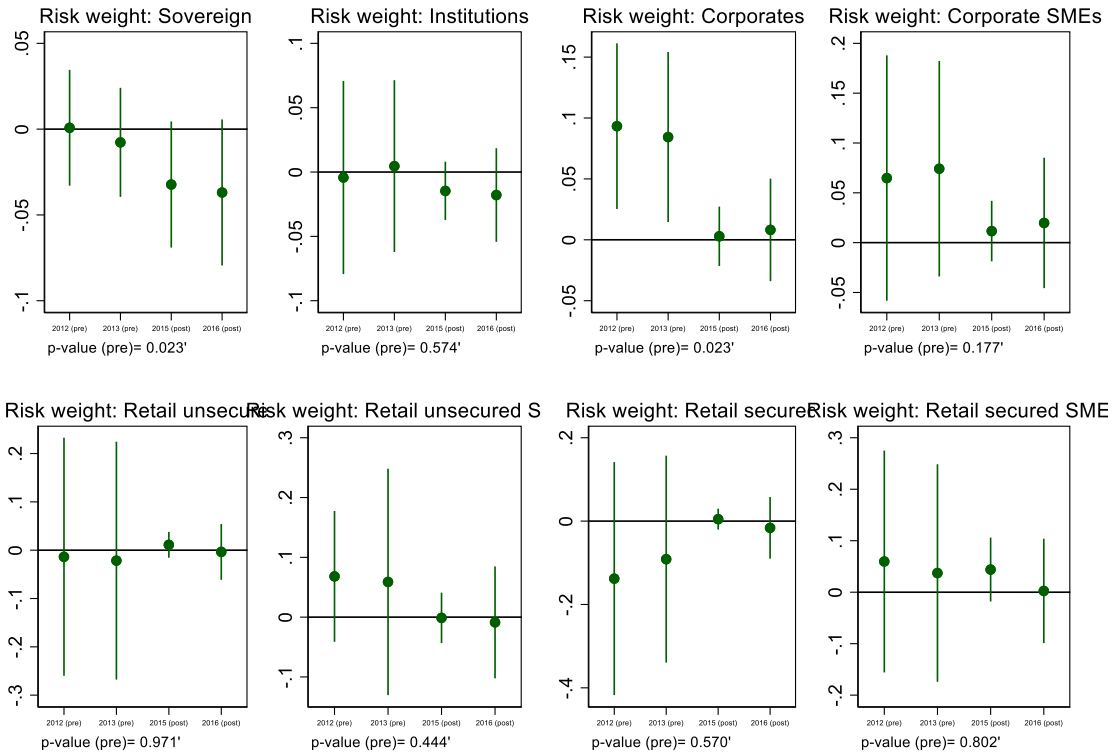
Note. Figure A1 reports event-study estimates of the differential evolution of total credit exposures (log), risk-weighted exposures (log), and average risk weights for banks exposed to a stronger AQR-induced supervisory shock relative to less-exposed banks. Coefficients correspond to interactions between the treatment indicator and year dummies, with 2014 omitted as the reference year. Vertical bars denote 95% confidence intervals. Reported p-values refer to joint tests of the null hypothesis that pre-AQR coefficients (2012–2013) are jointly equal to zero. All specifications include bank fixed effects and country-by-quarter fixed effects.

Figure A2. Event-study evidence on portfolio shares across borrower categories



Note. Figure A2 reports event-study estimates of the differential evolution of portfolio shares across borrower categories for banks exposed to a stronger AQR-induced supervisory shock relative to less-exposed banks. Coefficients correspond to interactions between the treatment indicator and year dummies, with 2014 omitted as the reference year. Vertical bars denote 95% confidence intervals. Reported p-values refer to joint tests of the null hypothesis that pre-AQR coefficients (2012–2013) are jointly equal to zero. All specifications include bank fixed effects and country-by-quarter fixed effects.

Figure A3. Event-study evidence on portfolio-level risk weights across borrower categories



Note. The figure reports event-study estimates of the differential evolution of average portfolio risk weights across borrower categories for banks exposed to a stronger AQR-induced supervisory shock relative to less-exposed banks. Coefficients correspond to interactions between the treatment indicator and year dummies, with 2014 omitted as the reference year. Vertical bars denote 95% confidence intervals. Reported p-values refer to joint tests of the null hypothesis that pre-AQR coefficients (2012–2013) are jointly equal to zero. All specifications include bank fixed effects and country-by-quarter fixed effects.