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Accounting standard-induced regulatory capital management: evidence from the new lease accounting standard ASC 842

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ABSTRACT

The amount of operating leases for U.S. banks, such as rent paid for bank branches and equipment, is not trivial. As such, the new lease accounting standard, ASC 842, exerts a downward pressure on the regulatory capital ratios of U.S. banks due to the requirement to fully risk-weight capitalized operating lease assets. We therefore expect banks to adjust their regulatory capital ratios upward. Using a difference-in-differences design, we find that less well-capitalized banks (treatment group) increase their Tier 1 capital ratio more than better-capitalized banks (control group) after adopting ASC 842, mainly by reducing lending growth rather than increasing shareholders' equity. This effect is stronger in treated banks with higher ex-ante operating lease commitments, indicating a lease-induced regulatory capital management. Further, less well-capitalized banks significantly adjust towards an optimal Tier 1 capital ratio, and those that are riskier, pay higher dividends, and are non-advanced approaches banks, show greater adjustments of Tier 1 capital ratio and more pronounced declines in lending growth. Finally, we show evidence that suggests the contraction of lending in less well-capitalized banks harms local economies. Overall, the evidence in this study suggests that banks reveal a preference for shrinking credit growth over raising equity levels in response to the new lease accounting standard, highlighting a potential unintended consequence of operating lease capitalization.

1. Introduction

Operating leases represent a substantial source of financing for entities. Under codification ASC 840, operating leases are primarily disclosed as footnote items while capital leases are recognized on firms' balance sheets. Critics argue that such differential accounting treatment of leases creates a distortion where firms may exploit operating leases for related reporting benefits (Caskey & Ozel, 2019; Imhoff & Thomas, 1988) which exacerbate the opacity and lack of comparability of firms' underlying economic activities (Cornaggia et al., 2013; Financial Accounting Standards Board, 2016; SEC, 2005). In response, the Financial Accounting Stability Board (FASB) issued codification ASC 842 (under ASU No. 2016–02), which mandates the capitalization of all operating leases (except short term and variable leases) by recognizing a lease liability and a related right-of-use (ROU) asset on firms' balance sheet, in addition to the recognition of rental expense in the income statement (Bank for International Settlements, 2022; Financial Accounting Standards Board, 2016).

Under ASC 842, federal banking regulators (i.e., the OCC, Federal Reserve, and FDIC) decided that U.S banks must risk-weight the ROU operating lease asset at 100 percent for regulatory capital purposes upon adoption (Bank for International Settlements, 2022;

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FFIEC, 2019).[1] That is, the ROU asset must be fully added to banks' total risk-weighted assets (the denominator in regulatory capital ratios). Because banks are active users of operating leases relating to their real estate branches, office space, equipment, and other fixed assets, the risk-weight of ROU assets has a nontrivial effect on regulatory capital ratios. Practitioners have expressed concerns that this decision could potentially hurt banks' lending behavior and, hence, economic activity upon adoption. For instance, an equipment leasing expert, Bill Bosco notes that "*this decision (*i.e.*, fully risk-weighting ROU assets under ASC 842) will further restrict banks' ability to lend and impede their ability to help spur the economy*".[2] In a later commentary, Bill Bosco adds that "*I predict the worldwide availability of bank lending will shrink by $2.6 trillion in 2019 when banks transition to the new lease accounting rules*" simply because "*banks will cut back on lending to address the new capital need*".[3] Similarly, a Hubler blog post notes that "*ASC 842 affects capital requirements by altering the calculation of risk-weighted assets (RWAs) for banks with leases. With the inclusion of lease assets on the balance sheet, RWAs may increase, resulting in a higher capital requirement. This can strain banks' financial positions and limit lending capacities*".[4] Despite these critical apprehensions, given the pivotal role that bank credit plays in real economic activity, there is currently no formal analysis examining banks' capital management behavior following the new lease accounting standard. In this study, we address this gap by investigating whether and how banks adjust their regulatory capital ratios in response to the adoption of ASC 842 and whether such capital management behavior has any real consequences on local economies.

We argue that because most U.S banks rely heavily on operating leases for their real estate branch offices and equipment, operating lease capitalization is expected to (mechanically) lower their regulatory capital ratios (Cornaggia et al., 2013), particularly those with substantial operating lease commitments before adoption. To the extent that falling below (or getting close to) the minimum regulatory capital thresholds could potentially trigger costly regulatory intervention (including activity restrictions, payout restrictions, and bonus caps), coupled with the fact that banks typically maintain an optimal (desired) capital ratio which might have been plausibly depressed due to full risk-weighting of ROU assets, we conjecture that ASC 842 reasonably induces most U.S banks to actively adjust their regulatory capital ratios upon adoption.

To adjust their regulatory capital ratios upwards, banks may, in principle, either increase their regulatory capital levels through retained earnings or new equity issues (Cohen & Scatigna, 2016; De Jonghe & Öztekin, 2015) or downsize their risk-weighted assets via a reduction in lending growth (Bostandzic et al., 2022; Bridges et al., 2015; De Jonghe et al., 2020; Dou & Xu, 2021; Gropp et al., 2019), replacement of riskier (higher risk-weighted) loans with safer ones (Cortés et al., 2020), and selective securities sales (de-Ramon et al., 2022).[5] Alternatively, banks may undertake a combination of these responses (Bakkar et al., 2019; Cohen & Scatigna, 2016; de-Ramon et al., 2022).

While adjusting regulatory capital ratios upwards through new equity issues will align with regulators' expectations (Hanson et al., 2011), shrinking risk-weighted assets, particularly by running down on loans, will reflect an undesirable consequence of the new lease accounting standard, given the potential effect on overall economic activity (Gropp et al., 2019; Juelsrud & Wold, 2020). This may particularly be the case when cutting credit supply becomes the dominant strategy among banks (Hanson et al., 2011). Similarly, banks may resort to accounting discretion over accruals by under-provisioning (over-provisioning) loan losses to increase retained earnings (Tier 2 capital through loan loss reserve add-backs), and hence, regulatory capital levels (Barth et al., 2017; Beatty & Liao, 2014; Ng & Roychowdhury, 2014). This may compromise the essence of regulatory capital as a gatekeeper to the financial stability of banks, given the potential deterioration in the quality thereof (Ng & Roychowdhury, 2014; Orozco & Rubio, 2024). To this end, whether and how banks adjust their regulatory capital ratios following the adoption of the new lease accounting standard has important policy implications. For this reason, our study distinguishes itself from the study that examines the firm-level capital structure adjustment upon the new lease standard adoption (Ferreira et al. 2025).

To examine our research question, we base our inference on the identifying assumption that banks that are less well-capitalized prior to the adoption of ASC 842 will have a stronger incentive to adjust their regulatory capital ratios upwards relative to better-capitalized banks. Such an incentive may arise from a potential increase in regulatory risk (i.e., the probability of breaching or approaching the regulatory minimum) and/or the need to rebalance regulatory capital ratios, which may have been distorted upon adoption, to desired levels. Accordingly, we analyze banks' standard-induced adjustment behavior in a difference-in-differences framework, using ex-ante less well-capitalized banks (those with below-median levels of Tier 1 ratio, based on 2018Q4 values) as the treatment group and better-capitalized banks (those with above-median Tier 1 ratio levels) as the control group.

Our empirical results show that ex-ante less well-capitalized banks increase the growth rate of Tier 1 ratio more, relative to better-capitalized banks, in the post-adoption period, consistent with the former having a greater incentive to manage their balance sheet upon adoption. Examining the various paths of adjustment reveals that the increase in Tier 1 ratio growth is achieved primarily through a reduction in loan growth rather than an increase in the growth rate of shareholders' equity (ordinary share capital and retained earnings) or a selective sale of investment securities. Further analyses suggest that the reduction in credit growth is accounted for by a reduction in the growth rates of real estate loans and loans to individuals, consistent with the contraction in loan growth

[1] FAQs on treatment of ROU Asset (https://www.bis.org/press/p170406a.htm).

[2] See the post, "Basel and EFRAG Decide on New Lease Rules: Two Bad Calls for the Industry".(https://www.monitordaily.com/article-posts/basel-efrag-decide-new-lease-rules-two-bad-calls-industry/).

[3] See the post, "Lease Accounting Rules Add to Bank Capital Woes: Topic 842 May Cause Credit Crunch in 2019" (https://www.monitordaily.com/article-posts/lease-accounting-rules-add-bank-capital-woes-topic-842-may-cause-credit-crunch-2019/).

[4] See the post, "Navigating ASC 842: How Lease Accounting Changes Affect Debt Covenants and Bank Capital Requirements" (https://www.hubler.ai/blog-posts/navigating-asc-842-how-lease-accounting-changes-affect-debt-covenants-and-bank-capital-requirements).

[5] In this study, we use the terms "manage" and "adjust" interchangeably.

reflecting a shrinkage of assets rather than a reduction in risk. To validate this preceding evidence, we further show that (a) ex-ante less well-capitalized banks experience a significant decline in risk-weighted assets growth relative to better-capitalized banks, yet (b) there is no significant difference in risk-taking behavior between treatment and control banks ex-post, corroborating an asset-shrinking argument rather than a risk-reduction behavior.

To be sure that the effect we document is driven by the new lease accounting standard, we perform cross-sectional analyses based on banks' *as-if* capitalized future operating lease commitments. To the extent that fully risk-weighting capitalized operating lease commitments exerts a mechanical downward pressure on banks' regulatory capital ratio upon adoption, we expect the effect of the new lease standard to be stronger among treated banks with substantial amounts of operating lease commitments prior to adoption. Consistent with our conjecture of a standard-induced adjustment behavior, we find that the results (increase in Tier 1 ratio growth and decline in lending growth) are more pronounced for treated banks with ex-ante above-median levels of *as-if* capitalized operating lease commitments.

Next, we perform additional tests to demonstrate the potential mechanisms driving banks' adjustment behavior. In this regard, we find that banks adjust towards an optimal Tier 1 capital ratio following the adoption of ASC 842 and this adjustment is stronger among treated banks relative to control banks, in line with banks actively rebalancing their regulatory capital ratios to desired levels following a potential distortion induced by full risk-weighting of ROU assets under ASC 842 (i.e., a desired capital ratio channel). Moreover, we also find that the main results (increase in Tier 1 ratio growth and decline in lending growth) are stronger among treated banks that are riskier, those that pay higher dividends, and non-advanced approaches banks, consistent with such banks having a stronger incentive to adjust their regulatory capital ratios due to a potential volatility-induced uncertainty, heightened likelihood of payout restrictions, and the absence of an implicit government guarantee, respectively (i.e., a regulatory risk channel). Our baseline results are robust to the parallel trend assumption, a PSM-matched sample of treated and control banks, an entropy-balanced sample, the use of levels rather than growth rates of outcome variables, alternative definitions of the treatment group, and an alternative difference-in-differences specification.

In supplementary analyses, we follow the methodology in Chen et al. (2025) and examine the potential effect of ASC 842 on local economies. Consistent with the standard-induced cut in loan growth potentially harming overall economic activity in the year of adoption, we find that metropolitan statistical areas (MSAs) in which treated banks control a larger market share experience higher unemployment rates in 2019. Overall, our results suggest that banks prefer shrinking their level of risk-weighted assets to increasing shareholders' equity in the event of a standard-induced adjustment. Such an adjustment path runs contrary to regulators' expectations, given its potential implications for real economic activity. In essence, our findings highlight an unintended consequence of the new lease accounting standard.

Our study finds that banks significantly adjust their balance sheets in response to ASC 842, similar to Ferreira et al. (2025), yet we diverge in three key aspects. First, we focus on adjustments on a lender's asset side, which could lead to direct macroeconomic implications, while Ferreira et al. (2025) emphasize the liability side of borrowing firms, resulting in relatively indirect effects. Thus, our study and Ferreira et al. (2025) inherently have different policy implications in terms of the economic impact of operating lease capitalization, highlighting the fundamental difference between banks and non-financial firms. Second, while Ferreira et al. (2025) primarily link balance sheet adjustments to avoiding loan covenant violations, our study examines banks' motivations rooted in either the need to mitigate regulatory risk (i.e., avoid regulatory intervention) and/or rebalance their regulatory capital ratios (which may have been distorted due to full risk-weighting of ROU assets) back to desired levels. Lastly, we analyze banks' adjustment of a prudential ratio by considering multiple balance sheet elements, including both asset and equity sides, while Ferreira et al. (2025) focus solely on existing debt. The former approach offers a broader perspective on balance sheet adjustments compared to the latter, which broadly reflects an absolute framework (at least, in a conceptual sense).

This study contributes to a growing literature on the economic implications of the new lease accounting standard. Existing evidence suggests that ASC 842 is associated with a decrease in operating lease usage (Chatterjee, 2020; Ma and Thomas, 2023), a substitution of operating leases with short-term and variable leases (Yoon, 2021), and a decline in investment (Chen et al., 2023). Similarly, other studies show that capitalization of operating leases is associated with negative stock returns (Milian and Lee, 2024)), a reduction in firms' perceived credit risk (He et al., 2023), an increase in firm-specific lease discounting rates (Binfarè et al., 2025), and an increase in loan spreads (Li et al., 2023). We offer novel evidence from the banking industry that ASC 842 prompts banks to adjust their regulatory capital ratios by reducing lending, with potential unintended consequences for local economies. Our findings thus provide additional insights that should be valuable for the FASB's post-implementation review process of ASC 842.

We also contribute to the existing literature that examines the balance sheet adjustment behavior of banks. Existing studies typically focus on adjustment behaviors induced by system-wide (Gropp et al., 2019; Juelsrud & Wold, 2020) or bank-specific (Cortés et al., 2020; de-Ramon et al., 2022) capital requirements.[6] In this paper, we examine an alternative trigger – *an accounting rule change* – that exerts downward pressure on banks' regulatory capital ratios, inducing their balance sheet adjustments. By so doing, we also add to a limited stream of recent studies that examine the impact of statutory financial reporting standards, particularly SFAS 166/167,

[6] While the credit cut response we observe aligns with banks' response in those studies, the regulatory capital constraints imposed by ASC 842 plausibly vary by the size of banks' operating lease obligations prior to adoption. In contrast, in studies like Gropp et al. (2019), such a constraint varies by bank size (i.e., banks subject to the European Banking Authority's 2011 capital exercise were selected based on total consolidated assets); in Cortés et al. (2020), it varies by banks' performance on supervisory stress tests which are typically modeled on hypothetical changes in macroeconomic indicators; and in de-Ramon et al. (2022) and De Jonghe et al. (2020), it varies according to observed changes in banks' fundamentals, following a supervisory review. In essence, ASC 842 plausibly introduces a constraint fundamentally different from that observed in prior studies.

on financial institutions' regulatory capital management behaviors (Dong et al., 2022; Dou et al., 2018; Dou & Xu, 2021).[7]

The remainder of the paper proceeds as follows. Section 2 presents the institutional background, while Section 3 introduces the related literature and develops the hypotheses; Section 4 discusses the empirical design; Section 5 presents the empirical results; Section 6 presents supplementary evidence, and Section 7 offers the concluding remarks and policy implications.

2. Institutional background

Under the Statement of Financial Accounting Standards No. 13 (SFAS 13), *Accounting for Leases*, codified as ASC 840, *Leases*, a lessee can designate a lease as either a capital lease or an operating lease conditional on meeting a set of four criteria, commonly referred to as the "bright line tests": (a) the lease transfers ownership of the asset to the lessee at the end of the lease term, (b) the lease includes a bargain purchase option that allows the lessee to purchase the asset, (c) the lease term exceeds 75 percent of the asset's useful life, and (d) the present value of the minimum lease payment is over 90 percent of the asset's fair value. In the event of a lease failing to meet none of these criteria, the lessee must designate the lease as an operating lease. For financial reporting purposes, under ASC 840, capital leases were akin to debt-financing purchases, whereas operating leases were akin to rental agreements.

In effect, an asset and a corresponding liability are recognized in the balance sheet for capital leases, whilst operating lease liabilities are only disclosed as footnote items (besides the recognition of an expense in the income statement) over the lease term. Critics of ASC 840 thus argued that such a differential accounting treatment of leases allowed managers to exploit operating leases for related reporting benefits (Caskey & Ozel, 2019; Imhoff & Thomas, 1988). For instance, a lessee can opportunistically structure a lease transaction such that the lease term falls right below the 75 percent threshold (say 74 percent of the asset's useful life) and, by so doing, avoids recognizing a liability in the balance sheet. In this regard, economically similar lease transactions will be treated differently by different firms, thus exacerbating the opacity and incomparability of accounting information (Cornaggia et al., 2013; Financial Accounting Standards Board, 2016; SEC, 2005; Weidner, 2017).

In response, the FASB issued ASC 842 (under ASU No. 2016–02) in February 2016, which overhauled ASC 840. ASC 842 became effective for public business entities (both financial and non-financial) in fiscal years beginning after December 15, 2018, with an option to adopt early. For non-public business entities, the effective date is after December 15, 2021. The main innovation of the new lease accounting standard, ASC 842, is that lessees are now required to recognize a right-of-use operating lease asset and a corresponding lease liability in the balance sheet, in addition to recognizing a rental expense in the income statement for operating leases.[8] Moreover, ASC 842 maintains the four bright line tests under ASC 840 but applies such tests in a more principle-based framework.[9]

For regulatory capital purposes, the Office of the Comptroller of the Currency, Federal Deposit Insurance Corporation, and Federal Reserve Board additionally mandate all U.S. banks to fully risk-weight the capitalized operating lease right-of-use asset (Bank for International Settlements, 2022; FFIEC, 2019). The implication is that U.S. banks will need to add the full value of the right-of-use asset in their calculations of risk-weighted assets (the denominator in banks' regulatory capital ratios). Given that ASC 842 does not affect the income statement (i.e., recognition of operating lease rentals in the income statement remained unchanged under ASC 842), banks' level of regulatory capital (numerator in regulatory capital ratios) remains materially unchanged.[10] In essence, capitalization of operating leases is expected to exert a downward pressure on the regulatory capital ratios of most U.S. banks, thus posing a potential increase in regulatory risk (Argimón et al., 2018).[11]

To mitigate regulatory pressures associated with breaching minimum capital requirements and/or rebalance their capital ratios towards desired levels, banks may seek to manage their regulatory capital ratios upward by either increasing the level of regulatory capital through new equity issues or retaining more earnings or by shrinking risk-weighted assets through a reduction in lending growth, portfolio rebalancing, or selective sale of assets. Given that the potential financial stability and real economic repercussions of

[7] SFAS 166/167 required US banks to consolidate the assets and related loan loss reserves of their variable interest entities (VIEs) effective as of January 2010. Regulators further required consolidating banks to fully risk-weight the consolidated assets for regulatory capital purposes, thus exerting a downward pressure on their regulatory capital ratios. Dou & Xu (2021) find that banks required to risk-weight the consolidated assets under SFAS 166/167 cut back on lending and raise loan spreads, and Dou et al. (2018) find that such banks also reduce mortgage approval rates, relative to unaffected banks, in the post-implementation period. While SFAS 166/167 affects only banks with VIEs (typically the largest US banks), ASC 842 concurrently affects all banks since almost every US bank leases a branch office or equipment for its operations. In essence, ASC 842 reasonably exerts regulatory capital constraints that plausibly have a wider adverse impact on bank lending across the US relative to SFAS 166/167. In addition, Dou & Xu (2021) suggest that banks cut back on lending growth under SFAS 166/167 solely to reverse the potential distortion induced by fully risk-weighting consolidated VIEs (i.e., the *desired capital ratio channel*) rather than to circumvent regulatory intervention (i.e., the *regulatory risk channel*). However, we document both channels under our setting, consistent with ASC 842 having a relatively wider effect on US banks' regulatory capital ratios compared to SFAS 166/167.

[8] Under ASC 842, leases are now classified as either a finance lease or an operating lease. Finance leases are the same as capital leases under ASC 840 and are treated in the same fashion. Also, lessees do not have to capitalize operating leases with a lease term of 12 months or less and variable leases.

[9] In addition to the pre-existing four criteria of recognition under ASC 840, ASC 842 adds a fifth criterion under which a lease is designated as a finance lease if the leased asset is of a specialized nature such that it will have no other use to the lessor at the end of the lease term.

[10] Core regulatory capital typically includes common equity, retained earnings, accumulated other comprehensive income, hybrid instruments, and loan loss reserves.

[11] "For many banks, adding leases could alter balance sheets by $1B or more". (https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/for-many-banks-adding-leases-could-alter-balance-sheets-by-1b-or-more-49081634).

each of the foregoing available adjustment options is different, it is imperative to examine whether and how banks manage their regulatory capital ratios upon adoption.

3. Literature review and hypotheses development

Prior literature has reached a consensus that banks actively adjust their capital ratios. Existing studies examine a partial adjustment framework that assumes an optimal (target) capital ratio towards which banks constantly adjust. Particularly, these studies estimate banks' target capital ratios and examine the speed of adjustment towards this target. In this regard, Berger et al. (2008) find that U.S. publicly listed bank holding companies actively manage their capital by setting target capital ratios and making periodic adjustments towards such targets. This result is also observed in later studies such as De Jonghe & Öztekin (2015); Francis & Osborne (2010); and Memmel & Raupach (2010), who focus on a sample of global banks, UK banks, and German banks, respectively.

Banks' regulatory capital management may be induced by sudden increases in loan losses, which deplete their capital (Anani & Elwasify, 2023; Berger et al., 2008) or changes in bank-specific (de-Ramon et al., 2022) and system-wide regulatory capital requirements (Gropp et al., 2019). In each respective case, the incentive to adjust may derive from the need to achieve banks' own desired (target) capital ratios and/or circumvent regulatory pressures associated with deviating (getting close) from (to) the required regulatory minimum. Another potential source of adjustment, which remains largely underexplored, is an accounting rule change. In this study, we examine how the new lease accounting standard, ASC 842, affects banks' regulatory capital management behavior.

We argue that to the extent U.S. banks rely heavily on operating leases, particularly for their real estate branch office space and equipment,[12] the new lease accounting standard exerts a significant downward pressure on their regulatory capital ratios upon adoption. For example, Comerica Incorporated expects that adding between $450 million and $550 million of leased assets to its balance sheet will lower its common equity Tier 1 ratio by between 8 and 10 basis points.[13] Similarly, Valley National Bancorp notes in its 2018 Form 10-K that recognizing ROU assets of approximately $216 million and operating lease obligations of $241 million is expected to negatively impact its total capital ratio by about 10 to 12 basis points and Tier 1 capital ratio by approximately 7 to 9 basis points. Additionally, First Citizens Bancshares Incorporated indicates that capitalizing roughly $70 million in ROU assets will adversely impact its regulatory capital ratios by 3 to 4 basis points.[14]

Given that falling below (or getting close to) the regulatory minimum ratio could induce federal regulators to institute regulatory actions, including restrictions on payouts, a ban on payment of bonuses to directors, and, in much severe cases, a closure of the bank,[15] coupled with the fact that banks maintain their own desired or optimal capital ratios (Berger et al., 2008; Memmel & Raupach, 2010) which might have been depressed because of fully risk-weighting ROU assets under ASC 842, the new lease accounting standard should reasonably induce most U.S. banks to shore up their regulatory capital ratios to offset any downward pressure due to full risk-weighting.[16] Because ASC 842 was issued in February 2016 but became effective for publicly listed banks in January 2019, it is not remote to assume that banks may have had enough time to adjust their regulatory capital ratios in anticipation (i.e., prior to adoption) of full risk-weighting of their ROU assets upon adoption. If that is the case, we would expect to find no evidence of adjustment during the adoption period. Yet, because various adjustment paths typically entail some costs (discussed below), we expect banks to have less incentive to adjust their behavior prior to their regulatory capital ratios being affected. This leads to our first hypothesis:

H1: *Following the adoption of ASC 842, banks adjust their regulatory capital ratios.*

In terms of the various paths of adjustment, banks typically have two primary options: shrinking their level of risk-weighted assets (i.e., an asset-side adjustment) or shoring up the regulatory capital level (i.e., an equity-side adjustment). The choice between these strategies potentially depends on their relative costs and benefits, as assessed by a bank, which can vary based on several factors, including existing market conditions, risk-return tradeoffs, etc.

Shrinking risk-weighted assets can be achieved through several non-mutually exclusive mechanisms, one of which includes adjusting the size of banks' loan portfolios. This entails running down the entire loan portfolio or slowing down loan growth. In this sense, Gropp et al. (2019) find that banks subject to the 2011 European Banking Authority's capital exercise increase their core Tier 1 capital ratio primarily by reducing lending to corporate and retail borrowers,[17] aligning with Bostandzic et al. (2022); Bridges et al. (2015); De Jonghe et al. (2020); and Dou & Xu (2021), who document a similar effect on bank lending. Intuitively, a size-based loan portfolio adjustment provides a reasonably faster (relative to portfolio rebalancing and securities sales) reduction in the denominator of the regulatory capital ratio upon adoption of ASC 842, since it can be implemented simply by tightening existing lending standards

[12] For example, in its 2019 Form 10-K,1st Bancorp notes that "*The adoption of this standard in January 2019 resulted in the recognition of ROU assets and lease liabilities for operating leases of $59.6 million and $62.1 million, respectively, with the [most significant impact] from recognition of ROU assets and liabilities related to the operating leases for the Bank's branches and ATMs*".

[13] https://www.sec.gov/Archives/edgar/data/28412/000002841218000146/cma-2018q210q.htm.

[14] See 2018 Form 10-K, First Citizens Bancshares Incorporated.

[15] For instance, the Office of the Comptroller of the Currency (OCC) closed down Riverside National Bank of Florida in 2010 because its capital was deficient (Department of the Treasury Office of Inspector General, 2012). In a recent case, regulators closed down Pulaski Savings Bank in January 2025 because it was critically undercapitalized (FDIC Office of Inspector General, 2025).

[16] Even though most US banks typically hold regulatory capital ratios above the required levels (i.e., they have buffers), our intuition is that as long as full risk-weighting the ROU assets "eats into" such buffers, it should draw banks closer to the regulatory minima than before, potentially heightening regulatory risk.

[17] The 2011 EBA capital exercise required a set of EU banks to increase and maintain their core Tier 1 capital ratio from 5% to 9% by the end of June 2012. A total of 61 banks were affected by this capital exercise.

or non-renewal of maturing loans. However, it could come at the cost of banks' long-term profitability by sacrificing future interest income and potentially damaging valuable client relationships.

Banks may also reduce risk-weighted assets by rebalancing the risk profile of their loan portfolio, i.e., replacing riskier loans with safer ones. In this regard, Cortés et al. (2020) find that banks affected by stress test-induced increases in capital requirements tend to re-allocate credit away from riskier markets towards safer ones (i.e., rebalance their loan portfolio), consistent with Juelsrud & Wold (2020), who find that Norwegian banks increase capital ratios, following Norway's implementation of the Basel III accord, by substituting high-risk assets (e.g., corporate loans) for relatively low-risk assets (e.g., household loans). In effect, the benefit of such an adjustment path is that it (mechanically) improves banks' capital ratio by reducing average loan risk weights and hence, the total value of risk-weighted assets for credit risk, while maintaining the overall size of their loan book (Gropp et al., 2019). Yet, to the extent that safer loans typically yield lower returns (D'Acunto & Rossi, 2022), rebalancing the loan portfolio upon adoption of ASC 842 could be costly in the sense that it may lead to a substantial reduction in profitability.

Beyond cutting back on loan growth or rebalancing the loan portfolio, selectively disposing of investment securities remains a plausible option to reduce the level of risk-weighted assets, particularly because investment securities constitute a major portion of banks' risk-weighted assets after loans (Beatty & Liao, 2014). To manage regulatory capital ratios, banks typically exploit the accounting (and regulatory) treatment of such securities by selling non-zero weighted securities (e.g., non-agency sponsored mortgage-backed securities), particularly available-for-sale securities (AFS), with unrealized fair value gains.[18] For banks facing a significant decline in regulatory capital ratios following ASC 842, this strategy could be particularly beneficial given its dual effect of reducing the size of risk-weighted assets (because the securities sold are taken out of the stock of credit risk-weighted assets (i.e., a positive denominator effect)) as well as increasing the level of regulatory capital (because the unrealized gain is effectively moved from accumulated-other-comprehensive-income to net income (i.e., a positive numerator effect)) (Anani & Elwasify, 2023; Barth et al., 2017; Ellul et al., 2015).[19]

Such an adjustment path may, however, be costly if banks have to sell securities in a rising interest rate environment (straddling the post-ASC 842 period) or when security values are depressed, since they would have to book significant unrealized losses in net income, which would reduce the regulatory capital level (Ellul et al., 2015). Similarly, besides a potential loss in future investment income due to an ASC 842-induced securities sales, to the extent that banks typically hold AFS securities to manage liquidity (Beatty & Liao, 2014), selling such securities to manage regulatory capital ratios upon adoption of ASC 842 may disrupt their future liquidity management flexibility (Kim et al., 2019; Meder, 2015). This is particularly true given that HTM securities sales are highly restricted under prevailing accounting guidance (see footnote 18).

Taken together, the preceding discussions, which largely reflect a plethora of options available to banks to adjust the asset side of their balance sheet upon adoption of the new lease accounting standard, suggest that banks are likely to reduce their level of risk-weighted assets following ASC 842, leading to the following hypothesis:

H2a: *Following the adoption of ASC 842, banks adjust their regulatory capital ratios by shrinking risk-weighted assets (*i.e.*, a denominator effect).*

As an alternative option, banks may shore up their level of regulatory capital by either retaining earnings or issuing additional common equity. For instance, Cohen & Scatigna (2016) document that banks from both advanced and emerging economies manage their post-2008 financial crisis regulatory capital ratios primarily through retained earnings rather than via sharp adjustments in risk-weighted assets. They show that lower dividend payouts and higher loan spreads are the main channels banks use to shore up retained earnings. While increasing spreads and cutting back on dividends potentially have the benefit of avoiding the issuing costs and dilution of ownership and earnings commonly associated with additional equity issues (Myers & Majluf, 1984), it is imperative to note that banks may still be unwilling to employ them in adjusting their regulatory capital upon adoption of ASC 842 for the following reasons.

First, a spread strategy can be most effective when all other banks (or the majority of banks) are eager to increase loan spreads to enhance their capital ratios upon the adoption of ASC 842 (Hanson et al., 2011). If only a few banks employ such a strategy, borrowing firms are likely to switch banks, potentially rendering the approach costly (and hence less attractive). Second, dividend cuts may send negative signals to banks' shareholders and uninsured depositors, who may respond by demanding higher premiums (Bushman & Williams, 2012) or withdrawing their funds *en masse* (Diamond & Dybvig, 1983). In this sense, existing evidence suggests that banks are typically reluctant to cut dividends, even in scenarios where doing so is optimal (Acharya et al., 2011; Floyd et al., 2015). Thus, if banks perceive that dividend cuts will be costly, they may be unwilling to use such a path post-ASC 842 to manage their regulatory capital ratios.

[18] Under the Accounting Standard Codification (ASC) 320, US banks are required to classify their securities holdings in three broad categories: trading, held-to-maturity (HTM), and available-for-sale (AFS). For measurement subsequent to initial recognition, trading securities are measured at fair value through net income; HTM securities are measured at historical cost, with changes in fair values only disclosed; AFS securities are measured at fair value through accumulated other comprehensive income (AOCI). This implies that fair value gains or losses on AFS securities can only be recognized in net income when such securities are sold or when their impairment is deemed to be other than temporary. Unlike AFS securities, HTM securities cannot be readily sold since doing so will taint a bank's entire HTM portfolio with a 2-year moratorium typically imposed on classifying future securities as HTM. Only under specific scenarios, known as the safe harbor conditions, can a bank sell HTM securities. This includes when the security is very close to maturing; when the sale occurs under an event that is isolated, non-recurring, unanticipated, and unusual for the reporting entity, etc.

[19] This approach will only yield a positive numerator effect, i.e., increase the level of regulatory capital, only for non-advanced approaches banks since such banks do not include accumulated other comprehensive income in regulatory capital.

In terms of issuing additional common equity, De Jonghe & Öztekin (2015) find that under-capitalized banks from economies with developed capital markets (including the US) achieve recapitalization mainly by issuing additional ordinary equity relative to shrinking risk-weighted assets. For banks that experience a significant downward pressure on their regulatory capital ratios due to ASC 842, issuing additional common shares could provide a direct and substantial increase in their regulatory capital level (Orozco & Rubio, 2024), which could simultaneously signal market confidence if successfully executed. However, just like all other adjustment paths discussed above, issuing equity is not without cost: it is inherently associated with significant underwriting fees and legal expenses, coupled with a dilution in ownership and earnings per share of existing shareholders, which could make it potentially less attractive. Moreover, banks may be unwilling to issue additional equity if they believe that it will signal an overvaluation to investors (Gropp et al., 2019) – i.e., the information asymmetry argument – or when they are highly levered (Admati et al., 2018), in which case any marginal returns from their intermediation activities will accrue to debtholders – i.e., the debt overhang argument.

Besides issuing additional equity, cutting dividends, or increasing loan spreads, banks may equally increase regulatory capital levels by exercising accounting discretion over loan loss provisioning (Barth et al., 2017; Beatty & Liao, 2014; Ng & Roychowdhury, 2014). For instance, under-provisioning loan losses has the direct effect of increasing common equity tier 1 (CET 1) capital through a mechanical increase in retained earnings. This is particularly effective if banks view Tier 1 capital (which includes CET 1 and AT1 capital) as the target ratio to adjust upon adopting ASC 842. If total capital (Tier 1 plus Tier 2 capital) is the target, banks can equally increase loan loss reserves by over-provisioning loan losses. In this case, Tier 1 capital is reduced by the extent of the decrease in net income (due to over-provisioning), but the full effect of the decrease is mitigated by the add-back of loan loss reserves in Tier 2 capital (Ng & Roychowdhury, 2014). The overall effect, all else equal, is a potential increase in banks' total regulatory capital level. Exercising discretion over loan loss provisioning could be a faster way for banks to mechanically shore up their regulatory capital ratios, following ASC 842, as it does not involve any real transactions compared to the other adjustment options discussed above. But it may still attract ex-post scrutiny from regulators and auditors if banks pursue it aggressively (Barth et al., 2017; Beatty & Liao, 2014).

Overall, the preceding discussions suggest that adjusting regulatory capital ratios by increasing shareholders' equity, following the adoption of ASC 842, remains a plausible path. Accordingly, we formulate the corresponding prediction as follows:

H2b: *Following the adoption of ASC 842, banks adjust their regulatory capital ratios by increasing shareholders' equity (*i.e.*, a numerator effect).*

As mentioned earlier, we acknowledge that the path of adjustment depends on the overall assessed relative costs and benefits of each alternative; hence, it is not unreasonable to expect that banks may adopt a mix of options upon the adoption of ASC 842. Indeed, Bakkar et al. (2019) find that in an attempt to achieve their target capital ratios, under-capitalized banks de-lever by an aggressive cut in loans and other assets, but at the same time, raise external capital. According to this supporting evidence, banks may employ a mixed strategy in adjusting their capital ratios upon adoption of the new lease accounting standard.

4. Research design

4.1. Sample and data

In this study, we obtain a sample of U.S. public bank holding companies, spanning 2015Q1 to 2019Q4, using the PERMCO-RSSD link table from the Federal Reserve Bank of New York. We begin our sample period in 2015Q1 to rule out the impact of prior regulations such as the Dodd-Frank Act and the Basel III capital framework. We restrict the period to 2019Q4 to exclude the potential impact of the COVID-19 pandemic and the Current Expected Credit Loss (CECL) model adoption on banks' adjustment behavior (Anani & Elwasify, 2023; Chen et al., 2025). Data for the analyses is primarily retrieved from the Bank Regulatory Database (WRDS) and supplemented with information from banks' FR Y-9C – Consolidated Financial Statements for Bank Holding Companies. One helpful piece of data that we employ in our analyses is banks' future operating lease commitments. Because this data is only found in disclosures prior to the adoption of the new lease standard, and major databases such as Compustat and Bank Regulatory (WRDS) do not contain information on banks' pre-adoption and post-adoption operating lease commitments, we hand-collected this data from banks' Form 10-K and 10-Q.

To be included in the sample, we require sample banks to have at least two quarters of data, both before and after the effective date of ASC 842. Given that our sample period ends in 2019Q4, we exclude three bank holding companies with a November-October and December-November calendar year-end. Such banks will adopt the new standard in a period beginning in 2020 (which straddles the Covid-19 period and may thus be confounded). We also exclude three banks that adopted the standard early and banks with missing disclosed operating lease data.[20] Finally, we exclude banks with missing observations on key regression variables, including total assets, Tier 1 capital ratio, deposits, and common equity capital. The above process yields a final sample of 297 publicly traded bank holding companies, comprising 149 in the treatment group and 148 in the control group.

[20] The three banks we exclude (e.g., Equity Bancshares Inc.) are all Emerging Growth Companies (EGCs) that adopted ASC 842 in the first quarter of 2019, ahead of their *initial* scheduled effective date (i.e., fiscal years beginning after December 15, 2019). Specifically, these banks explicitly "*elected not to use the extended transition period for complying with any new or revised financial accounting standards pursuant to Section 13 (a) of the Exchange Act*" as indicated on the first page of their Form 10-Ks. We exclude such banks simply to maintain some level of ex-ante homogeneity in our sample since the incentive for these banks to adopt the standard early is not particularly clear, and may differ from that of the remaining banks in our sample who could have equally exercised their early adoption option but did not. Notwithstanding, our inferences are not affected if we include these banks in the sample.

4.2. Model specification

Banks' regulatory capital ratio can be simplified as shown in **Eq. (1)**:

$$Regulatory\ capital\ ratio = \frac{C}{RWA} \tag{1}$$

where C denotes banks' regulatory capital level and RWA is banks' risk-weighted assets. By taking the natural logarithm and first difference of **Eq. (1)**, we obtain a direct relationship between changes in banks' regulatory capital ratio, regulatory capital level, and risk-weighted assets as follows:

$$\Delta Ln(Regulatory\ capital\ ratio_t) = \Delta Ln(C_t) - \Delta Ln(RWA)_t \tag{2}$$

The expression in **Eq. (2)** implies that banks can increase the growth in the regulatory capital ratio by either increasing the growth in regulatory capital or reducing the growth in risk-weighted assets (Juelsrud & Wold, 2020). For our analyses, we focus on banks' Tier 1 capital ratio (i.e., the LHS of **Eq. (2)**) given that it constitutes banks' core capital ratio, which is of most significance to banks and regulators (Beatty & Liao, 2014). Tier 1 capital (numerator in Tier 1 capital ratio) consists of Common Equity Tier 1 (CET1) capital plus Additional Tier 1 (AT1) capital. CET1 capital is made up of banks' ordinary share capital, share premiums, retained earnings, and accumulated other comprehensive income (AOCI) (if the bank is an advanced approaches bank), whereas AT1 capital consists of contingent convertibles (CoCos) or hybrid securities, noncumulative, nonredeemable preference shares, and minority interest.

We narrow our analyses to banks' ordinary share capital (CE) and retained earnings (RE) as constituents of C in **Eq. (2).** Our choice is informed by the fact that ordinary share capital and retained earnings constitute banks' core (highest quality) capital and hence are most likely to be the candidates for adjustment. In terms of banks' risk-weighted assets (RWA), we focus our attention on two key components: loans (Loan) and investment securities (IS). These two form a major portion of banks' risk-weighted assets (Beatty & Liao, 2014) and therefore most likely to be altered in the event of banks' balance sheet adjustment. Given these decompositions, we can now rewrite **Eq. (2)** as follows:

$$\Delta Ln(Tier\ 1\ ratio_t) = \Delta LnC_t(CE, RE) - \Delta LnRWA_t(Loan, IS) \tag{3}$$

In the first part of our analysis, we examine whether U.S. banks adjust their Tier 1 ratio upon adoption of ASC 842. To do this, we employ a difference-in-differences estimation technique that examines the differences in the growth rates of Tier 1 ratio between treatment banks and control banks upon adoption of the new lease standard. Our identifying assumption is that banks that are less-capitalized prior to adoption of ASC 842 are most likely to have a stronger incentive to adjust their regulatory capital ratios upon adoption since operating lease capitalization will most likely either (a) draw the capital ratios of such banks closer to the regulatory minimum (by depleting their buffers) or (b) shift them away from their desired levels (which potentially also draws their ratios close to the regulatory minimum) relative to ex-ante better-capitalized banks. Accordingly, we define our treatment group as less-capitalized banks (based on Tier 1 capital ratio) and identify the control group as better-capitalized banks, prior to adoption. Following prior literature (e.g, see Gropp et al., 2019; Juelsrud & Wold, 2020), we specify the following static difference-in-differences model:

$$\Delta Ln(Tier\ 1\ ratio_{it}) = \beta_1 + \beta_2 Treat_i \times ASC\_842_t + \sum_{k=3}^{K} \beta_k X_{ki,t} + \theta_i + \theta_t + \varepsilon_{it} \tag{4}$$

$\Delta Ln(Tier\ 1\ ratio_{it})$ is the growth rate in Tier 1 ratio for bank i in quarter t; $Treat_i$ is the treatment group indicator which equals 1 for banks below the median Tier 1 ratio (in 2018Q4) and 0 otherwise[21]; ASC_842_t is the indicator for the post-adoption period which is coded as 1 from 2019Q1 onward and 0 otherwise; We set the quarter of adoption to 2019Q1, given that ASC is effective for fiscal years commencing after December 15, 2018; Following prior literature (Cortés et al., 2020; De Jonghe & Öztekin, 2015; Gropp et al., 2019; Juelsrud & Wold, 2020; Ng & Roychowdhury, 2014), we include a set of bank-quarter control variables represented as $X_{ki,t}$; θ_i and θ_t are bank and quarter fixed effects, respectively; ε_{it} is the error term; [22] The coefficient of interest is β_2 which captures the differences in Tier 1 ratio growth between treatment and control banks from before to after the adoption of ASC 842; If banks shore up their regulatory capital ratio upon adoption of ASC 842, we expect β_2 to be significantly positive.[23]

Next, we examine in detail how banks adjust the various components of Tier 1 ratio and risk-weighted assets following adoption of the new lease accounting standard (i.e., we now focus on the RHS of **Eq. (3)**). Accordingly, we extend the specification in **Eq. (4)** with

[21] We use the median as our defining threshold because all the banks in our sample have a Tier 1 ratio above the 8% federal threshold for well-capitalized banks. This is because most banks maintain a buffer above the regulatory minimum due to the costly implications of violating/getting close to regulatory capital thresholds (Amel-Zadeh et al., 2017; Barth et al., 2017). Acknowledging the cutoff we use can be arbitrary, we also use alternative cutoffs and report those results in Table 10.

[22] We cluster standard errors at the bank level.

[23] Our use of ΔLn (*Tier* 1 *ratio*), i.e. the growth rate of Tier 1 ratio, rather than Ln (*Tier* 1 *ratio*) is directly motivated by our hypothesis which posits that banks *adjust* their Tier 1 capital ratio following their adoption of the new lease accounting standard. The *rate of change*, models banks' response to ASC 842 in a *dynamic* sense rather than simply a *one-time shift* to a new static level of Tier 1 ratio. Moreover, our design is consistent with relevant studies that also examine banks' response to changes in capital requirements (see de-Ramon et al.(2022), Gropp et al.(2019), and Juelsrud & Wold (2020)).

the dependent variables of interest as the growth in ordinary share capital (CE), retained earnings (RE), loans (Loan), and investment securities (IS). We specify the following equations, with $Y_{it} = f(CE_{it}, RE_{it}, Loan_{it}, IS_{it})$:

$$\Delta Ln(Y_{it}) = \beta_1 + \beta_2 Treat_i \times ASC\_842_t + \sum_{k=3}^{K} \beta_k X_{ki,t} + \theta_i + \theta_t + \varepsilon_{it} \quad (5)$$

If banks adjust Tier 1 capital ratio, upon adoption of ASC 842, by issuing new equity and/or retaining earnings (i.e., increasing shareholders' equity or regulatory capital levels) we expect β_2 to be significantly positive when $Y_{it} = f(CE_{it}, RE_{it})$. However, if banks shore up Tier 1 capital ratio by running down on loan growth and/or selectively selling investment securities (i.e., shrinking risk-weighted assets), we predict β_2 is significantly negative when $Y_{it} = f(Loan_{it}, IS_{it})$.

4.3. Descriptive statistics

Table 1 presents the summary statistics of the variables employed in the regressions. To control for potential outliers in the data, all continuous variables are winsorized at the 1st and 99th percentiles of their distribution. The sample mean (median) Tier 1 ratio is 13.705 % (12.588 %), which suggests that the average bank in our sample holds a buffer above the minimum required Tier 1 ratio of 8 % for well-capitalized banks.[24] The mean (median) growth rate of Tier 1 ratio (ΔLn *(Tier 1 ratio)*) is −0.001(0.001). *Size* is the natural logarithm of total assets with a mean (median) of 15.831 (15.461).

The mean (median) operating lease commitment (*Op_Lease*) for the full sample of 0.027 (0.004) implies that, on average, banks' pre-adoption levels of operating lease commitments represent 2.7 % (0.4 %) of their total assets.[25] In terms of observable average differences between the treatment and control group, ex-ante less-capitalized banks tend to be bigger and less liquid, relative to ex-ante better-capitalized banks. Moreover, less-capitalized banks tend to advance more loans (as a proportion of total assets) and have relatively lower values of pre-adoption level operating lease obligations (as a proportion of total assets).[26]

5. Empirical results

5.1. Baseline analyses

5.1.1. Regulatory capital adjustment

In Table 2, we present empirical results for **Eq. (4)** in which we test whether banks shore up their regulatory capital ratio upon adoption of the new lease accounting standard. Consistent with our expectations, we find that ex-ante less well-capitalized banks adjust their Tier 1 ratio higher than better-capitalized banks upon adoption of ASC 842, as indicated by the significantly positive coefficient on *Treat*ASC_*842 in all columns of Table 2. Specifically, the fully parameterized result in Column (3) (*Coeff* = 0.010, *t*-stat = 2.961) suggests that, on average, treated banks experience an *additional* increase in Tier 1 ratio of approximately 1 percentage point in the post-ASC 842 adoption period, relative to banks in the control group, consistent with our conjecture of the former having a stronger incentive to manage their regulatory capital ratios upon adoption.[27] This figure represents an adjustment of about 81 % of the

[24] To the extent that, on average, our sample banks have capital ratios above the regulatory minimum, we refer to "less well-capitalized banks" when we use the term "less-capitalized banks". We use the two terms interchangeably.

[25] A comparison of banks' average operating lease intensity (2.7%) to that of non-financial firms as documented in Li et al. (2023) (see their Table 2) suggests that our sample US banks tend to have a higher proportion of operating lease to total assets than firms in the following industries: General Building Contractors [0.69%]; Metal, Mining [0.91%]; Tobacco Products [1.21%]; Non-Classifiable Establishments [1.41%]; Pipelines [1.90%]; Primary Metal [2.13%]; Oil and Gas Extraction [2.19%]; Paper and Allied Products [2.38%]; Transportation Equipment [2.41%]; and Electronic Equipment [2.42%]. Banks' operating lease intensity is, however, much lower than firms in industries such as Apparel and Other Textile Products [20.31%]; Leather and Leather Products [20.85%], etc. This is unsurprising given that such industries rely heavily on high-tech machinery that evolves rapidly, making operating leases a practical choice. Notwithstanding, the sample median operating lease/total assets across non-financial firms [2.7%] in Li et al. (2023) is the same as the mean for our sample banks, with a standard deviation (11.4%) slightly higher than that of non-financial firms as reported in Li et al. (2023) – 10.2% and Ferreira et al. (2025) – 10%, consistent with operating leases constituting a meaningful proportion of banks' total assets when compared to non-financial firms.

[26] See **Table A8** (in the Appendix) for additional summaries.

[27] In untabulated analyses, we estimate a nested version of **Eq. (4)** without quarter fixed effects so that the effect of *ASC_842* can be estimated. We find that the coefficient on *ASC_842* in that model, which captures the time series change in the growth rate of Tier 1 ratio for banks in the control group from the pre- to the post-ASC 842 period, is insignificant (*Coeff*= −0.001, *t*-stat= −0.406). This suggests that better-capitalized banks (control banks) did not, on average, actively adjust their Tier 1 ratio from the pre- to the post-ASC 842 period. The coefficient on *Treat*ASC_*842, however, remains positively significant (*Coeff*= 0.008, *t*-stat=2.485). We obtain similar inference when we estimate a nested version of **Eq. (5)** for the respective adjustment paths: (−0.002 [-0.273]; 0.006 [1.308]; −0.004 [-1.364]; and 0.001 [0.168]) for the *CE*, *RE*, *Loan*, and *IS* models, respectively. We thank a reviewer for suggesting these tests.

Table 1
Summary Statistics.

		Full Sample					Less-capitalized Banks			Better-capitalised banks		
Variables	N	Mean	Median	St.D	Min	Max	N	Mean	Median	N	Mean	Median
Panel A: Adjustment Variables												
Tier 1 ratio	5940	13.705	12.588	4.071	8.919	34.508	2980	11.533	11.433	2960	15.892***	14.532***
Δ Ln (Tier 1 ratio)	5643	−0.001	0.001	0.051	−0.480	0.644	2831	−0.003	0.000	2812	0.000**	0.002***
CE	5643	0.010	0.000	0.024	0.000	0.121	2831	0.009	0.000	2812	0.011***	0.001***
RE	5643	0.058	0.058	0.038	−0.039	0.175	2831	0.053	0.051	2812	0.063***	0.064***
Loans	5643	0.696	0.724	0.154	0.153	0.982	2831	0.749	0.749	2812	0.643***	0.679***
IS	5643	0.193	0.171	0.114	0.003	0.656	2831	0.163	0.153	2812	0.224***	0.200***
RE loans	5643	0.478	0.499	0.193	0.002	0.910	2831	0.511	0.525	2812	0.444***	0.456***
IDV loans	5643	0.044	0.013	0.080	0.000	0.535	2831	0.045	0.014	2812	0.042	0.012***
C&I loans	5643	0.121	0.099	0.085	0.000	0.436	2831	0.141	0.123	2812	0.102***	0.077***
Agric loans	5643	0.010	0.001	0.021	0.000	0.120	2831	0.011	0.001	2812	0.009***	0.001
Panel B: Control Variables												
Size	5940	15.831	15.461	1.535	13.404	21.359	2980	15.904	15.599	2960	15.758***	15.360***
ROA	5643	0.007	0.006	0.004	0.000	0.024	2831	0.007	0.006	2812	0.007	0.006
Liquid	5643	0.052	0.036	0.046	0.008	0.266	2831	0.043	0.033	2812	0.060***	0.041***
Loans_Deposits	4755	0.892	0.906	0.210	0.232	1.542	2427	0.935	0.933	2328	0.847***	0.869***
LLR growth	5346	−0.011	−0.003	0.091	−3.139	1.081	2682	−0.012	−0.003	2664	−0.010	−0.004
Panel C: Other Variables												
Op_Lease	5320	0.027	0.004	0.114	0.000	1.344	2679	0.021	0.004	2641	0.033***	0.004***
RWA_TA	5940	0.747	0.763	0.119	0.375	0.984	2980	0.797	0.802	2960	0.696***	0.716***
Z_score	5605	1.565	1.569	1.194	−1.149	4.661	2819	1.528	1.536	2786	1.603**	1.606***
Non-Performing Loans	5508	0.006	0.004	0.008	0.000	0.059	2772	0.005	0.005	2736	0.007***	0.004***
Sd_Income	5346	0.011	0.010	0.004	0.004	0.026	2682	0.011	0.011	2664	0.011	0.010***
Dividends	5433	107.414	0.548	608.714	0.000	5318.182	2829	112.418	0.663	2604	101.978	0.487**

Notes: This table presents descriptive statistics for the full sample and univariate tests for differences in means and medians of estimation variables between treatment and control banks. *, **, and *** denote statistical significance in the means and medians of comparing samples at the 10%, 5%, and 1% levels, respectively. To control for outliers, all continuous variables are winsorized at the 1st and 99th percentiles of their distribution. Variable definitions are presented in Appendix **Table A1.**

Table 2
ASC 842 and Adjustment of Tier 1 ratio.

	(1)	(2)	(3)
Variables	Δ *Ln(Tier 1 ratio)*	Δ *Ln(Tier 1 ratio)*	Δ *Ln(Tier 1 ratio)*
*Treat*ASC_842*	0.008***	0.008***	0.010***
	(3.120)	(2.820)	(2.961)
Size		−0.015*	−0.028***
		(−1.950)	(−3.330)
Liquid		0.036	0.046
		(0.672)	(0.873)
ROA		0.478*	1.954***
		(1.744)	(3.223)
Loans_Deposits		−0.002	−0.009
		(−0.090)	(−0.368)
LLR growth		−0.025	−0.028
		(−1.236)	(−1.420)
Constant	−0.010***	0.230**	0.436***
	(−3.292)	(2.016)	(3.269)
Observations	5,643	4,323	4,323
Adj. R^2	0.011	0.004	0.018
Bank FE	Yes	Yes	Yes
Quarter FE	Yes	No	Yes

Notes: This table reports estimation results for Eq. (4) in which we examine whether banks adjust their Tier 1 ratio upon adoption of the new lease accounting standard. The dependent variable of interest is the growth in banks' Tier 1 ratio. The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter t* − 1 to *quarter t*. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

estimated downward pressure on banks' Tier 1 capital ratio due to full risk-weighting under ASC 842, in line with treated banks actively adjusting their Tier 1 capital ratio in the post-adoption period.[28]

In terms of economic significance, the documented coefficient implies that, relative to better-capitalized banks, less-capitalized banks actively increase Tier 1 ratio growth by approximately 20 % of its sample standard deviation, during the post-adoption period, suggesting a meaningful adjustment of banks' regulatory capital ratio. In comparison, the upward adjustment of the Tier 1 ratio we document is about three times that of Berger et al. (2008)'s estimate that US bank holding companies tend to adjust their Tier 1 capital ratio by approximately 35 basis points, on average. Similarly, our results are close to the estimate of Gropp et al. (2019) who find that EU banks affected by the European Banking Authority's 2011 capital exercise adjusted their Core Tier 1 ratio by 1.86 percentage points higher, relative to unaffected banks. Overall, the results we document are economically meaningful, as banks significantly adjust their Tier 1 capital ratio following the adoption of the new lease accounting standard.

5.1.2. Adjustment paths

Our next set of results presents evidence on the various channels of adjustment of banks' Tier 1 ratio. For these analyses, we focus on banks' ordinary share capital (*CE*) and retained earnings (*RE*) as constituents of banks' regulatory capital level (i.e., the numerator); loans (*Loan*) and investment securities (*IS*) as constituents of banks' risk-weighted assets (i.e., the denominator). Table 3 shows the results of estimates based on **Eq. (5).** Results using the growth in ordinary share capital, Δ*Ln(CE)*, and retained earnings, Δ*Ln(RE)*, as the dependent variables are presented in Columns (1) and (2), respectively. The results indicate that there is no statistically significant difference in the growth of ordinary share capital and retained earnings, respectively, between treatment and control banks in the post-adoption period. Columns (3) and (4) report results using the growth in loans, Δ*Ln(Loan)*, and investment securities, Δ*Ln(IS)*, respectively.

Column (3) shows that less-capitalized banks experience, on average, approximately 1 percentage point lower growth in outstanding loans relative to better-capitalized banks in the post-adoption period. The difference is statistically significant at the 1 percent level.[29] A back-of-the-envelope calculation shows that, with the standard deviation of loan growth at 0.067 (untabulated), the coefficient on *Treat*ASC_*842 for the Δ*Ln(Loan)* model implies that less-capitalized banks reduce loan growth by approximately 15 %

[28] To estimate the adverse impact of ASC 842 on banks' Tier 1 capital ratio, we follow the approach in Dou & Xu (2021) by taking the difference between Tier 1 capital ratio if ASC 842 had not been implemented (i.e., "As if" Tier 1 capital ratio) and the reported Tier 1 capital ratio at the end of 2019Q4: $\textit{Downward pressure} = \frac{\textit{Tier 1 capital}}{\textit{Risk-weighted assets}-\text{"as-if" } \textit{Capitalized operating lease assets}} - \frac{\textit{Tier 1 capital}}{\textit{Risk-weighted assets}}$ Based on the above formular, our estimate of the mean downward pressure on banks' Tier 1 capital ratio due to operating lease capitalization under ASC 842 is approximately 1.24 percentage points (with a standard deviation of 0.29 and a maximum value of 4.62 percentage points).

[29] This result is consistent with Dou & Xu (2021) who find that banks required to risk-weight capitalized off-balance sheet securitized assets (which were previously disclosed) under SFAS 166 and 167, cut back on lending and raise spreads, relative to unaffected banks, in the post-implementation period. However, unlike Dou & Xu (2021), we examine a wide range of banks' adjustment paths beyond loans, thus providing a comprehensive understanding of banks' plethora of options in the event of a standard-induced adjustment.

Table 3
ASC 842 and Channels of Regulatory Capital Management.

	(1)	(2)	(3)	(4)
Variables	Δ *Ln(CE)*	Δ *Ln(RE)*	Δ *Ln(Loan)*	Δ *Ln(IS)*
*Treat*ASC_842*	0.002	−0.013	−0.010***	−0.008
	(0.161)	(−1.577)	(−2.755)	(−1.044)
Size	0.011	−0.002	0.040***	0.035*
	(0.354)	(−0.097)	(4.280)	(1.820)
Liquid	0.316**	0.146*	0.199***	0.170
	(2.535)	(1.897)	(2.950)	(1.447)
ROA	4.819*	10.125***	1.852***	3.148***
	(1.874)	(3.883)	(3.215)	(3.005)
Loans_Deposits	0.068	0.012	0.137***	−0.227***
	(1.095)	(0.317)	(4.580)	(−3.628)
LLR growth	0.620***	0.402***	0.412***	0.466***
	(3.918)	(6.618)	(5.558)	(6.237)
Constant	−0.296	−0.029	−0.766***	−0.392
	(−0.622)	(−0.096)	(−5.138)	(−1.310)
Observations	3,997	4,134	4,323	4,323
Adj. R^2	0.042	0.071	0.244	0.106
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

Notes: This table reports estimation results for Eq. (5) in which we examine the various paths of banks' Tier 1 ratio adjustment upon adoption of ASC 842. The dependent variables in Columns (1) and (2) are the growth rates in ordinary share capital and retained earnings, respectively; the dependent variables in Columns (3) and (4) are the growth rates in outstanding loans and investment securities, respectively. Accordingly, Columns (1) and (2) capture banks' regulatory capital management via shareholders' equity (numerator effect) whilst Columns (3) and (4) reflect regulatory capital management through risk-weighted assets (denominator effect). The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter t* − 1 to *quarter t*. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

((0.010/0.067)*100) of its sample standard deviation, an economically meaningful impact. We, however, find no evidence of a selective sale of investment securities in the post-adoption period (Column 4).

Overall, the results in Table 3 suggest that banks reveal-prefer shrinking their level of risk-weighted assets (through a reduction in credit growth) to increasing the growth in shareholders' equity upon adoption of the new lease accounting standard. Inferring from our discussions in Section 3, banks' choice to shrink loan growth relative to increasing shareholders' equity can be explained by several theoretical and practical considerations. For instance, banks may have stayed clear of cutting dividends to increase retained earnings upon adoption plausibly because they may want to avoid sending negative signals to investors and uninsured depositors who might interpret dividend cuts as an indication of impending troubles at the bank (Acharya et al., 2011; Floyd et al., 2015).

Similarly, because the regulatory capital constraints imposed by operating lease capitalization reasonably vary by the size of banks' pre-adoption level lease intensity and capital ratios (e.g., among less well-capitalized banks, those with a smaller operating lease obligation relative to their assets might not be significantly affected), not all banks will adjust their capital ratios upon adoption. In this sense, a high spread strategy will be impractical, given that borrowers are most likely to get better terms at banks that are not adjusting their capital ratios and hence have no incentive to charge higher spreads. In untabulated analyses (see footnote 27), we find that better-capitalized banks did not significantly adjust their Tier 1 capital ratio upon adoption, implying that borrowers could switch to such banks for better interest rates (assuming they don't increase spreads for other reasons), potentially amplifying the unattractiveness of a high spread strategy.

As mentioned in Section 3, under-provisioning loan losses to mechanically increase retained earnings levels could be an attractive option for most banks since it is the only adjustment path that does not entail making any real transactions. For such a path to be effective, however, it must reasonably be aggressive (to offset the downward pressure introduced by full risk-weighting of the ROU asset). Yet, because regulators and external auditors heavily scrutinize aggressive loan loss provisioning due to its detrimental effect on the quality of banks' loss absorption capacity (Beatty & Liao, 2014; Bushman & Williams, 2012; Gopalan et al., 2024) and information environment (Nicoletti, 2018), it is possible banks may have engaged in some level of provisioning to increase retained earnings a bit but it is less likely they did so aggressively. Finally, banks may have been equally reluctant to issue additional common equity upon adoption of ASC 842 simply to avoid the associated transaction costs, diluting existing ownership and earnings per share, or sending negative signals to investors and uninsured depositors (Gropp et al., 2019).

5.1.3. Asset shrinking and risk reduction

Given the different risk weights assigned to various categories of loans for regulatory capital purposes (i.e., some loan categories are deemed riskier than others), the observed reduction in credit growth may either reflect a reduction in risk (i.e., portfolio rebalancing), recalibration of internal risk-weight models (particularly for advanced approaches banks), or simply highlight pure asset shrinking (Gropp et al., 2019). If the first two channels hold, then we should observe a decrease in the growth of commercial and industrial loans (Δ*Ln(C&I loans)*) and individual loans (Δ*Ln(IDV loans)*), which typically have higher risk-weights, and a corresponding increase in the

growth rate of real-estate loans (Δ*Ln(RE loans)*) and agricultural loans (Δ*Ln(Agric loans)*), which have relatively lower risk weights (Grenadier & Hall, 1996), coupled with a reduction in the growth of average risk weights (total risk-weighted assets/total assets). On the other hand, if less-capitalized banks engage in asset shrinking rather than risk reduction or model recalibration, then we should observe a reduction in the growth of outstanding loans of different categories, while growth in average risk weights (Δ*Ln(Avg. Risk Weight)*) remains unchanged.

We test these possibilities by estimating **Eq. (5)** with the dependent variables as the growth in the indicated loan categories above and banks' average risk weights. The evidence provided in Table 4 suggests that the reduction in outstanding loan growth is attributed to a decline in the growth of both outstanding real estate loans (Column 1) and individual loans (Column 2). Columns (2), (3), and (4) of Table 4 show that there is no statistically significant difference in the growth of outstanding commercial and industrial loans, agricultural loans, and average risk weights, respectively, between treated and control banks. In summary, these results tend to be consistent with an asset-shrinking argument rather than a risk-reduction argument.

We further validate the preceding results by performing two additional tests. If the above conclusion is valid, then we expect to observe an overall reduction in the growth of risk-weighted assets (which is simply average risk-weight multiplied by total assets) with no significant change in banks' risk-taking. We proceed by examining changes in banks' growth in risk-weighted assets (Δ*Ln(Risk-Weighted Assets))* and two measures of risk-taking*:* the Z-score (*Z_score*) and growth in non-performing loans (Δ*Ln(Non-Performing Loans)*). We present the results in Table 5**.** Column (1) shows a statistically significant reduction in the growth of risk-weighted assets for treated banks relative to banks in the control group. Specifically, less-capitalized banks reduce risk-weighted assets growth by approximately 1.5 percentage points compared to better-capitalized banks in the post-adoption period. On the other hand, Columns (2) and (3) of Table 5 show that there is no observed statistically significant difference in risk-taking between less-capitalized and better-capitalized banks. The coefficient on *Treat*ASC_*842 is negative and insignificant in both columns. Overall, the preceding results corroborate our findings in Table 4 above.

Treated banks' preference to shrink real estate loans and individual loans relative to other loan categories, such as commercial and industrial loans, could be explained by several plausible reasons. First, though commercial and industrial loans have higher risk-weights (due to their high perceived credit risk), they tend to generally offer higher yields to banks compared to real estate loans and individual loans (D'Acunto & Rossi, 2022). Hence, treated banks may be reluctant to shrink the former to avoid their profitability from being adversely affected upon adoption, since that could yield a reverse effect on their regulatory capital management (due to a potential significant decline in their retained earnings). Moreover, because banks typically have longstanding relationships with their commercial borrowers (Berger et al., 2025), they may have equally taken this into account by limiting the extent to which they cut commercial credits to avoid harming such relationships.

On the other hand, loans to individuals generally have higher risk-weights (and lower yields) than loans secured by real estate (Chronopoulos et al., 2023; Grenadier & Hall, 1996), but offer a much lower yield compared to commercial loans and even agricultural loans. In this sense, treated banks' choice to shrink both individual and real estate loans could potentially be driven by a strategic stance in which they effectively reduce the size of their total risk-weighted assets while keeping the associated loss in interest income (and hence, a reduction in retained earnings) to a minimum. The results from Columns (1) & (2) of Table 4 shows that while treated banks shrink both real estate and individual loans upon adoption of ASC 842, the cut in the latter (approximately 2.8 percentage points) is almost double that of the former (approximately 1.6 percentage points) even though Table 1 indicates that they extend relatively more real estate loans than individual loans (see Column 9 of Table 1). The preceding results broadly support our reasoning.

5.2. Cross-sectional analyses

5.2.1. Operating lease intensity

Our baseline results test the identifying assumption that the effect of the new lease accounting standard on banks' capital adjustment behavior depends on their prevailing capital ratios prior to adoption. That is, ex-ante less well-capitalized banks are the ones expected to have the strongest incentive to shore up their regulatory capital ratios upon adoption. Moreover, to the extent that fully risk-weighting capitalized operating lease commitments mechanically exerts a downward pressure on banks' regulatory capital ratios, we should expect that less-capitalized banks with substantial levels of ex-ante (future) operating lease commitments will have a greater incentive to manage their existing regulatory capital ratios in the post-adoption period. To test this conjecture, we proceed in two ways.

First, we estimate the *as-if* capitalized amounts of banks' operating lease commitments using hand-collected data on disclosed future minimum operating lease payments as of the 2018 year-end. The implicit assumption here is that banks will eventually capitalize all lease commitments existing as of the 2018 year-end upon adoption of ASC 842 in 2019Q1. Our assumption is premised on the idea that since most banks' operating leases relate to their office buildings and equipment, which form a core infrastructure for their operations, it is not unreasonable to assume that banks may not necessarily shut down branch offices or halt the usage of equipment to comply with the new standard. Doing so would be suboptimal, given the potential adverse effects on operations.

Following Cornaggia et al. (2013), we estimate banks' *as-if* capitalized operating lease commitments using the equation below:

$$Op\_Lease = \sum_{t=1}^{5} \frac{MLP_t}{(1+r)^t} + \sum_{t=6}^{q+6} \frac{BMLP_t}{(1+r)^t} \tag{6}$$

where *r* is the bank-specific implicit interest rate, which we estimate as total interest expense over total liabilities (mainly including deposits and subordinated debt) based on 2018Q4 values. *MLP* is the disclosed minimum operating lease payments over the next five

Table 4
Regulatory Capital Management and Asset Shrinking.

	(1)	(2)	(3)	(4)	(5)
Variables	Δ *Ln(RE loans)*	Δ *Ln(IDV loans)*	Δ *Ln(C&I loans)*	Δ *Ln(Agric loans)*	Δ *Ln(Avg. Risk Weight)*
*Treat*ASC_842*	−0.016***	−0.028**	−0.003	0.006	0.001
	(−3.194)	(−2.300)	(−0.319)	(0.214)	(0.532)
Size	0.055***	0.035	0.034*	−0.023	−0.014**
	(3.648)	(1.290)	(1.683)	(−0.444)	(−2.254)
Liquid	0.436***	0.602**	0.111	0.154	−0.547***
	(3.538)	(2.492)	(0.945)	(0.351)	(−13.533)
ROA	2.490*	0.344	3.322***	6.793*	−0.570*
	(1.752)	(0.234)	(3.509)	(1.808)	(−1.909)
Loans_Deposits	0.139***	−0.009	0.101*	−0.068	−0.001
	(2.915)	(−0.113)	(1.726)	(−0.315)	(−0.044)
LLR growth	0.485***	0.656***	0.530***	0.524***	−0.005
	(6.282)	(6.083)	(4.598)	(5.226)	(−0.385)
Constant	−1.015***	−0.580	−0.652**	0.394	0.251***
	(−3.912)	(−1.327)	(−2.004)	(0.504)	(2.691)
Observations	4,323	4,234	4,275	3,124	4,323
Adj. R^2	0.207	0.067	0.097	0.025	0.176
Bank FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes

Notes: In this table we examine the extent to which the observed reduction in credit growth reflects banks' asset shrinkage or risk reduction. Δ*Ln(RE loans)* is the growth in real estate loans; Δ*Ln(IDV loans)* is the growth in loans to households; Δ*Ln(C&I loans)* is the growth in commercial and industrial loans; Δ*Ln(Agric loans)* is the growth in agricultural loans; and Δ*Ln(Avg. Risk Weight)* is the growth in average risk weights. The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter t* − 1 to *quarter t*. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

Table 5
Validation Test: Regulatory Capital Management and Asset Shrinking.

	(1)	(2)	(3)
Variables	Δ *Ln(Risk Weighted Assets)*	*Z_score*	Δ *Ln(Non-Performing Loans)*
*Treat*ASC_842*	−0.015***	−0.072	−0.037
	(−3.350)	(−1.585)	(−1.650)
Size	0.081***	−0.005	0.146***
	(5.715)	(−0.031)	(3.855)
Liquid	0.248***	0.739	−0.459
	(3.674)	(1.360)	(−1.295)
ROA	0.829*		−0.566
	(1.871)		(−0.155)
Loans_Deposits	0.086***	−0.596	0.086
	(3.296)	(−1.468)	(0.756)
LLR growth	0.067***	0.408**	0.502***
	(3.063)	(2.469)	(2.971)
Constant	−1.348***	2.524	−2.386***
	(−5.999)	(0.984)	(−4.118)
Observations	4,323	4,285	4,188
Adj. R^2	0.055	0.738	0.012
Bank FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes

Notes: In this table we validate the extent to which the observed reduction in credit growth reflects banks' asset shrinkage rather than risk reduction. Δ*Ln(Risk Weighted Assets)* is the growth in risk-weighted assets; *Z_score* is banks' Z-score; and Δ*Ln(Non-Performing Loans)* is the growth in non-performing loans. The Z-score model in Column (2) does not include the control for *ROA* because the latter is included in the computation of the former, which makes the two mechanically correlated. The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter t* − 1 to *quarter t*. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

years as of 2018 year-end; q = disclosed thereafter minimum operating lease payments/MLP_5; and *BMLP* = disclosed thereafter minimum operating lease payments / q.

Next, we split our sample into two groups based on the median value of *Op_Lease*. Banks above the median are assigned to the *High* group; otherwise, they are assigned to the *Low* group. We then re-estimate **Eq. (4)** for each sub-sample and present the results in **Panel A** of Table 6. The coefficient for banks in the high operating lease group (*Coeff* = 0.012) in Column (1) of Table 6 is larger than for

banks in the low group (*Coeff* = 0.010) in Column (2), and the difference in coefficients is significant. This result aligns with our conjecture that less-capitalized banks with substantial ex-ante lease commitments have a greater incentive to shore up their regulatory capital ratios upon adoption, consistent with a standard-induced adjustment behaviour.

For consistency, we present results for loan growth in a similar fashion to the above. We report the results in Columns (3) and (4) of Table 6**,** Panel A. The results show that the reduction in credit growth following the adoption of ASC 842 is driven by treated banks in the high group, corroborating our earlier findings. In **Panel B** of Table 6, we test the sensitivity of the above results to the use of an alternative discounting rate. In this regard, we follow Cornaggia et al. (2013) and set *r* in **Eq. (6)** to 10 %. Overall, our inferences remain unchanged in this regard.

5.2.2. *Mechanism tests*

5.2.2.1. Desired capital ratio channel. We argue that full risk-weighting of the ROU operating lease asset under ASC 842 potentially shifts banks' regulatory capital ratios away from their desired levels, which are typically set above the regulatory minimum, so banks can comfortably absorb any future losses that may arise from their risk-taking behaviour (Berger et al., 2008; Jacques & Nigro, 1997). In response, banks adjust their capital ratios back to their desired level. To directly test this mechanism, we employ a partial adjustment framework to examine whether banks adjust towards an optimal Tier 1 capital ratio following the adoption of ASC 842. Second, we test the extent to which this adjustment behaviour varies between treated and control banks. If our conjecture holds, we expect any adjustment towards the target Tier 1 capital ratio post-ASC 842 to be more pronounced for treated banks (i.e., less well-capitalized banks) relative to control banks (i.e., better-capitalized banks).

Following the methodology in Flannery & Rangan (2006) and Berger et al. (2008), we estimate a partial-adjustment model of Tier 1 capital ratio for the sample period 2015Q1 to 2019Q4. The model begins by assuming that ASC 842 shifts banks away from their desired Tier 1 capital ratio, K^*, and getting back to this desired ratio requires banks to make costly adjustments to their balance sheets.

Table 6
Regulatory Capital Management and Operating Lease Commitments.

Panel A: Lease intensity based on a bank-specific implicit discount rate				
Dependent Variable:	Δ *Ln(Tier 1 ratio)*		Δ *Ln(Loan)*	
	(1)	(2)	(3)	(4)
Op_Lease	High	Low	High	Low
*Treat*ASC_842*	0.012**	0.010**	−0.017**	−0.008
	(2.242)	(1.982)	(−2.555)	(−1.296)
p-value of diff. in coefficients	**0.024**		**0.010**	
Constant	0.760**	0.576***	−1.618***	−1.236***
	(2.490)	(2.653)	(−4.183)	(−4.911)
Observations	1,960	2,094	1,960	2,094
Adj. R^2	0.025	0.011	0.295	0.214
Controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Panel B: Lease intensity based on a flat 10 percent discount rate for all banks				
	(5)	(6)	(7)	(8)
Op_Lease	High	Low	High	Low
*Treat*ASC_842*	0.014***	0.011**	−0.020***	−0.007
	(2.637)	(2.138)	(−2.925)	(−1.260)
p-value of diff. in coefficients	**0.008**		**0.010**	
Constant	0.785***	0.562**	−1.603***	−1.189***
	(2.614)	(2.587)	(−4.198)	(−4.710)
Observations	1,947	2,107	1,947	2,107
Adj. R^2	0.025	0.013	0.295	0.210
Controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

Notes: This table presents cross-sectional results of our baseline based on banks' ex-ante as-if capitalized operating lease commitments (*Op_Lease*). Banks with above median levels of *Op_Lease* are categorized in the *High* group, otherwise they are categorized under the *Low* group. Panel A shows cross-sectional results for Tier 1 growth *(ΔLn(Tier 1 ratio))* and Loan growth (Δ*Ln(Loan)*) in which *Op_Lease* is computed based on a bank-specific implicit discount rate defined as total interest expense over total liabilities. Panel B presents results for *Op_Lease* computed based on a flat rate of 10 percent for all banks. The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter t* − 1 to *quarter t*. Differences in the coefficients of *Treat*ASC_842* are reported. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

To capture the adjustment process, the model assumes that banks close a constant proportion, α, of the gap between the actual/observed capital ratio, K, and desired K^* each quarter as follows:

$$K_{i,t} - K_{i,t-1} = \alpha\left(K^*_{i,t} - K_{i,t-1}\right) + \delta_{i,t} \tag{7}$$

where $K^*_{i,t}$ is the target Tier 1 capital ratio of bank i in quarter t; $K_{i,t}$ is the observed Tier 1 capital ratio of bank i in quarter t; α is the scalar speed of adjustment; and $\delta_{i,t}$ is the random error. A value of $0 < \alpha < 1$ suggests a partial adjustment towards the desired $K^*_{i,t}$. Re-arranging **Eq. (7)** yields the following specification:

$$K_{i,t} = \alpha K^*_{i,t} + (1-\alpha)K_{i,t-1} + \delta_{i,t} \tag{8}$$

Because the target Tier 1 capital ratio is not directly observable, we use the predicted values from the following model as a proxy:

$$K^*_{i,t} = \beta X_{i,t-1} \tag{9}$$

where $X_{i,t-1}$ are lagged values of the bank characteristics we employ in our main regression models. Combining **Eq. (8)** and **Eq. (9)** yields the following specification:

$$K_{i,t} = \alpha\beta X_{i,t-1} + (1-\alpha)K_{i,t-1} + \delta_{i,t} \tag{10}$$

From **Eq. (10)**, we recover $\widehat{\alpha}$ directly from the parameter estimate $\widehat{(1-\alpha)}$, after which $\widehat{\beta}$ is recovered by dividing the parameter estimate $\widehat{\alpha\beta}$ by $\widehat{\alpha}$. With $\widehat{\beta}$, we then use **Eq. (9)** to estimate $K^*_{i,t}$ for each bank i in quarter t. Because **Eq. (10)** has a lagged dependent variable, we follow Flannery & Hankins (2013) and estimate it using Blundell & Bond (1998)'s dynamic generalized method of moments (GMM). Finally, we incorporate the effect of the new lease accounting standard by adding an interaction term to **Eq. (7)** as follows:

$$K_{i,t} - K_{i,t-1} = \alpha\left(K^*_{i,t} - K_{i,t-1}\right) + \beta_G\left(K^*_{i,t} - K_{i,t-1}\right) \times ASC\_842_t + \delta_{i,t} \tag{11}$$

We re-write $K_{i,t} - K_{i,t-1}$ as $\Delta K_{i,t}$ and $K^*_{i,t} - K_{i,t-1}$ as $Gap_{i,t}$ to yield the following:

$$\Delta K_{i,t} = \alpha Gap_{i,t} + \beta_G Gap_{i,t} \times ASC\_842_t + X_{i,t-1} + \lambda_i + \theta_t + \delta_{i,t} \tag{12}$$

where $X_{i,t-1}$ are lagged values of bank characteristics; λ_i and θ_t are bank and quarter fixed effects, respectively. A positive β_G would suggest an (increasing speed of) adjustment towards the desired/optimal Tier 1 capital ratio following the adoption of ASC 842. We

Table 7
Adjustment Towards Target Tier 1 Ratio.

Variables	Full Sample (1) *ΔTier 1 ratio*	Less-capitalized (2) *ΔTier 1 ratio*	Better-capitalized (3) *ΔTier 1 ratio*
*Gap*ASC_842*	0.017**	0.135***	0.019*
	(2.237)	(4.391)	(1.852)
p-value of diff. in coefficients		**0.003**	
Gap	0.166***	0.190***	0.146***
	(15.847)	(12.235)	(10.144)
$Size_{t-1}$	0.501***	0.392***	0.846***
	(4.737)	(3.146)	(4.386)
$Liquid_{t-1}$	−2.712***	−1.783**	−3.597***
	(−4.473)	(−2.170)	(−4.039)
ROA_{t-1}	2.100	17.532**	−5.064
	(0.344)	(1.990)	(−0.591)
$Loans\_Deposits_{t-1}$	−0.016	−0.399	0.240
	(−0.057)	(−1.047)	(0.588)
$LLRgrowth_{t-1}$	−0.215	−0.159	−0.189
	(−1.487)	(−0.936)	(−0.755)
Constant	−7.818***	−6.352***	−13.072***
	(−4.617)	(−3.192)	(−4.226)
Observations	3,691	1,885	1,806
Adj. R^2	0.084	0.091	0.089
Bank FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes

Notes: This table presents the OLS estimation results for Eq. (12). Column (1) presents results for the full sample and Columns (2) & (3) reports results for less-capitalized (treatment group) and better-capitalized (control group) banks, respectively.*t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

estimate **Eq. (12)** using OLS.

The dynamic generalized method of moments (GMM) estimation results for **Eq. (10)** are reported in **Table A2** (in the Appendix) and results for the OLS (full sample) estimation of **Eq. (12)** are shown in Table 7, **Column (1)**; **Columns (2)** and **(3)** present the corresponding results of the latter for our treatment and control group separately.[30] From Table A2 **Panel B,** the estimated average target Tier 1 capital ratio over the sample period is 13.37 %. This is about 5.37 percentage points above the Federal Reserve's well-capitalized level of 8 %, consistent with prior evidence, which suggests that banks generally maintain a target capital ratio that is above the required regulatory minimum (Berger et al., 2008; Deyoung et al., 2018; Memmel & Raupach, 2010). For less-capitalized (better-capitalized) banks, the target Tier 1 ratio is 13.23 % (13.52 %), with a maximum of 16.10 % (15.73 %). Column (1) of Table 7 shows that the estimated coefficient on $Gap_{i,t} \times ASC\_842_t$ is significantly positive, consistent with banks adjusting (faster) towards an optimal Tier 1 capital ratio following the adoption of the new lease accounting standard. Most importantly, Columns (2) and (3) indicate that this adjustment behavior is stronger for treated banks relative to control banks, in line with our conjectures.

5.2.2.2. Regulatory risk channel. We also argue that since falling below or approaching the required minimum could potentially trigger regulatory intervention (including dividend restrictions, bonus caps, and activity restrictions), ASC 842 potentially heightens regulatory risk. To mitigate such risk, banks adjust their regulatory capital ratios upwards upon adoption. In this section, we test this mechanism by examining the extent to which our main results vary within the cross-section of riskier banks, high dividend-paying banks, and banks' regulatory structure (which reflects notions of an implicit government guarantee).

5.2.2.2.1. Risk-taking. A key theoretical prediction is that excessive risk-taking is associated with significant volatility in banks' earnings, thus exposing shareholders' equity to an increased likelihood of losses (Hellmann et al., 2000; Repullo, 2004; Repullo & Suarez, 2004). Coupled with the increase in banks' level of risk-weighted assets (denominator in regulatory capital ratios) upon adoption of ASC 842, regulatory capital ratio could shrink substantially in the likely event where excessive risk-taking yields significant net losses than gains given the potential material reduction in the level of regulatory capital (numerator in regulatory capital ratios) induced by the associated decline in net income. In this sense, riskier banks tend to be exposed to a higher degree of uncertainty in their regulatory capital ratios ex-ante. To mitigate any potential regulatory risk associated with significant declines in regulatory capital ratios upon adoption, we expect that banks with relatively higher risk profiles will have a stronger incentive to adjust their regulatory capital ratios.

We measure banks' ex-ante risk-taking using the standard deviation of interest income (*Sd_Income*). We then partition the sample into *High* and *Low* groups based on the median values of *Sd_Income*. The results are reported in Table 8**, Panel A**. The coefficient for banks in the high-risk group (*Coeff* = 0.012) in Column (1) of **Panel A** is larger than for banks in the low-risk group (*Coeff* = 0.007) in Column (2), and the difference is significant at the 5 % level. The results suggest that banks with the most volatile earnings, potentially due to excessive risk-taking, tend to have a stronger incentive to shore up their regulatory capital ratios ex-post. In Columns (3) and (4), where we present the results for loan growth, we continue to obtain evidence consistent with our conjecture.

5.2.2.2.2. Capital distribution. Due to the strong signaling effect of dividends on depositors and shareholders, banks prefer to maintain stable dividend payments rather than reduce them (Acharya et al., 2011). This fact is highlighted by existing evidence, which suggests that banks often prefer to maintain or even increase dividend payments, even when doing so may be suboptimal (Acharya et al., 2011; Brav et al., 2005). In this sense, regulators tend to constrain bank payouts when they believe a bank's loss-absorbing capacity may be potentially impaired following a payment (Fabrizi et al., 2021). This is typically the case when a bank is less capitalized or draws closer to a regulatory or bank-specific capital threshold. To the extent that the new lease accounting standard shrinks banks' regulatory capital ratios, we expect that ex-ante less-capitalized banks that pay relatively higher dividends (hereafter, dividend-paying banks) will have a stronger incentive to adjust their regulatory capital ratios to mitigate potential regulatory restrictions on future capital distributions due to a likely lease-induced capital shortfall, upon adoption.

We test our prediction in the cross-section by splitting our sample based on banks' ex-ante levels of the median dividends on ordinary shares, defined as ordinary share dividends scaled by the book value of common equity (Chronopoulos et al., 2022; Luu et al., 2023; Onali, 2014) − *Dividends*. We place banks with above median levels of *Dividends* in the *High* group; otherwise, they are assigned to the *Low* group. We report the results in Table 8**, Panel B**. As shown in Columns (1) to (4) of **Panel B**, the effects are more pronounced among dividend-paying banks, consistent with our conjecture.

5.2.2.2.3. Regulatory structure. Anecdotal evidence suggests that the new lease accounting standard had no impact on the regulatory capital ratios of the largest U.S. banks. For example, JPMorgan Chase & Co. and Bank of America Corporation, both of which are

[30] We estimate the GMM model using the entire sample period from 2015Q1 to 2019Q4. In our model, the instruments for the first difference and level equations are the lagged differences and level changes in *Size*, *Liquid*, *ROA*, *Loans_Deposits*, and *LLR_growth*, respectively. We employ all lags of Tier 1 ratio from the first onwards as the GMM-type instruments. For the GMM estimator to provide consistent estimates, the differenced error term must not be subject to second-order autocorrelation (AR 2 test), and all instruments must be valid (Hansen test). **Panel A** of **Table A2** shows that AR 2 = 0.731 and the Hansen *p*-value = 0.206, in support of the null hypothesis of no second-order autocorrelation and that the instruments are valid, respectively (i.e., *p*-values in both tests exceed the 0.10 threshold).

Table 8
ASC 842 and Regulatory Risk.

Panel A: Regulatory Capital Management and Risk-Taking Behaviour

Dependent Variable:	Δ *Ln(Tier 1 ratio)*		Δ *Ln(Loan)*	
	(1)	(2)	(3)	(4)
Sd_Income	High	Low	High	Low
*Treat*ASC_842*	0.012**	0.007*	-0.012**	-0.006
	(2.200)	(1.748)	(-2.369)	(-1.105)
p-value of diff. in coefficients	**0.027**		**0.017**	
Constant	0.485***	0.382*	-0.591***	-0.848***
	(2.854)	(1.888)	(-3.673)	(-3.335)
Observations	2,174	2,149	2,174	2,149
Adj. R^2	0.020	0.026	0.156	0.342
Controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

Panel B: Regulatory Capital Management and Capital Distribution Behavior

Dependent Variable:	Δ *Ln(Tier 1 ratio)*		Δ *Ln(Loan)*	
	(1)	(2)	(3)	(4)
Dividends	High	Low	High	Low
*Treat*ASC_842*	0.015***	0.007	-0.012**	-0.008
	(3.300)	(1.142)	(-2.169)	(-1.251)
p-value of diff. in coefficients	**0.001**		**0.029**	
Constant	0.221	0.570**	-0.869***	-0.711***
	(1.280)	(2.608)	(-3.528)	(-3.311)
Observations	2,010	1,975	2,010	1,975
Adj. R^2	0.012	0.021	0.162	0.327
Controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

Panel C: Regulatory Capital Management, Advanced Approaches and Non-Advanced Approaches Banks

Dependent Variable:	Δ *Ln(Tier 1 ratio)*		Δ *Ln(Loan)*	
	(1)	(2)	(3)	(4)
Regulatory Structure	Non-AA	AA	Non-AA	AA
*Treat*ASC_842*	0.010***	0.003	-0.010**	-0.001
	(2.828)	(0.387)	(-2.534)	(-0.158)
p-value of diff. in coefficients	**0.005**		**0.011**	
Constant	0.497***	-0.919	-0.824***	-0.950
	(3.706)	(-1.135)	(-5.390)	(-0.555)
Observations	4,071	252	4,071	252
Adj. R^2	0.020	0.135	0.247	0.161
Controls	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

Notes: This table presents cross-sectional results of our baseline based on banks' ex-ante risk-taking (**Panel A**), dividend paying behavior (**Panel B**), and whether they are advanced-approaches (AA) or non-advanced approaches (non-AA) banks (**Panel C**). Risk taking is measured as the standard deviation of banks' interest income (*Sd_Income*). Banks with above median levels of *Sd_Income* are categorized in the *High* group, otherwise they are categorized under the *Low* group. Banks with above median levels of *Dividends* (i.e., high dividend paying banks*)* are categorized in the *High* group, otherwise they are categorized under the *Low* group. AA banks (prior to December 31st, 2019) are defined as those with at least $250 billion in assets or $10 billion in on-balance sheet foreign exposures, or those that elect to employ such advanced approaches. Non-AA banks are those that do not meet the above thresholds. We identify AA and non-AA banks based on banks' FR Y-9C data item "BCHAP83" as of 2018Q4. The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter t* − 1 to *quarter t*. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

advanced approaches (hereafter "AA") banks (i.e., banks with at least $250 billion in assets or $10 billion in on-balance sheet foreign exposures, or those that elect to employ such advanced approaches), expect no material effect on their regulatory capital ratios upon adoption.,[3132] On the other hand, non-advanced approaches (hereafter "non-AA") banks, such as Comerica Incorporated, expect a decrease of about 8 to 10 basis points in their regulatory capital ratio upon adoption. Similarly, Fifth Third Bancorp, a non-advanced approaches bank, expects the new lease standard to exert a significant downward pressure on its pre-adoption regulatory capital ratios.

Based on the foregoing, we expect treatment banks that are advanced approaches banks to have a lower incentive to adjust their regulatory capital ratios in the post-adoption period. This expectation may alternatively be explained by the notion that AA banks, being the largest U.S banks, tend to enjoy an implicit government guarantee and hence face a lower regulatory risk. In effect, such banks have a lower incentive to adjust their regulatory capital ratios compared to non-AA banks, who generally do not enjoy such protection (Fiechter et al., 2017). Accordingly, we re-estimate **Eq. (4)** and **Eq. (5)** separately for AA banks and non-AA banks in Table 8**, Panel C**.[33] Consistent with our reasoning, we find that the main result is particularly concentrated among non-AA banks.[34]

5.2.3. Additional cross-sectional tests

To be sure that our preceding (cross-sectional) tests reflect the effect of adopting the new lease accounting standard rather than capturing alternative explanations, we re-perform the tests in Tables 7 **(Columns 2 &3), and** Table 8 by conditioning on banks' ex-ante operating lease commitments. In each of the respective additional (cross-sectional) tests, we partition our sample based on (a) *treated banks* with above-median values of *Op_Lease*, banks with above-median values of both (b) *Sd_Income* and *Op_Lease*, (c) *Dividends* and *Op_Lease*, and (d) those that are *Non-AA banks* with above-median values of *Op_Lease*. Such banks are grouped under the "*High*" subsample; otherwise, they are assigned to a subsample we label narrowly as "*Others*".

As an example, the "*High*" group with respect to banks' risk-taking behavior will include banks with both above-median values of *Sd_Income* and *Op_Lease*, while the "*Others*" group consists of a combination of banks with below-median values of both *Sd_Income* and *Op_Lease*, below-median values of *Sd_Income* but above-median values of *Op_Lease*, or above-median values of *Sd_Income* but below-median values of *Op_Lease*. If our identifying assumption holds and if our reasoning backing the cross-sectional tests reflects the effect of the new lease accounting standard, then we expect the results, in all cases, to be concentrated in the "*High*" group relative to the "*Others*'' group. The results, presented in Appendix Tables A3 to A6, support the empirical validity of the original tests in Tables 7 and 8.

5.3. Robustness

5.3.1. Propensity score matching

One primary concern is that our results may be potentially driven by systematic differences between treatment and control banks rather than capturing the effect of the new lease accounting standard. This is a valid concern, as Table 1 shows that treatment and control banks tend to differ on various bank-specific characteristics, on average. Moreover, even though including bank-specific controls in our regressions may alleviate the above concerns, there is still a chance that our models do not correctly specify the relation between our outcomes and these bank-specific controls **(**i.e., functional form misspecification). In that case, our models may have insufficiently adjusted for such controls, thus biasing our estimates (Shipman et al., 2017).

To ensure that less-capitalized and better-capitalized banks are similar across bank-specific covariates and reduce bias related to functional form misspecification, we employ the propensity score matching (PSM) technique. Specifically, we employ a kernel-based propensity score matching based on observed pre-adoption levels of bank size (*Size*), return on assets (*ROA*), and liquidity (*Liquid*), to identify comparable control groups for treated banks.[35] We set a kernel bandwidth of 0.06 of the estimated propensity score difference between treatment and control banks.

We assess the quality of our matching process by performing a univariate test for differences in means across covariates between treatment and control banks before and after the matching. We present the results in Table 9**, Panel A**. Panel A shows that after matching, the differences between treatment and control banks are statistically insignificant across all observable covariates. The implication is that our matching process significantly achieved a great degree of balance between the two groups. In **Panel B** of

[31] See the post, "For Many Banks, Adding Leases Could Alter Balance Sheets by $1B or More".(https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/for-many-banks-adding-leases-could-alter-balance-sheets-by-1b-or-more-49081634).

[32] Under the prevailing provisions of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA), effective as of December 31st, 2019, advanced approaches banks include the eight global systemically important banks (GSIBs) and non-GSIBs with at least $700 billion in consolidated total assets or $75 billion in foreign exposures, or if the bank elects to use the advanced approaches.

[33] We identify advanced approaches and non-advanced approaches banks based on banks' FR Y-9C data item "BCHAP83" as of 2018Q4.

[34] We only present the loan growth results with respect to **Eq. (5)** given the results related to the other adjustment paths continue to remain insignificant.

[35] Kernel-based propensity score matching assigns weights to observations of the control group using a kernel function. For each treated bank, the kernel function assigns weights to control banks based on the difference in the propensity scores. The bandwidth specified determines the extent to which weights are assigned. In our matching process, we employ a smaller bandwidth of 0.06 to ensure more weight is assigned to control banks who are closer in propensity scores to banks in the treatment group. Such a narrow bandwidth gives us a better covariate balance between our treated and control banks and hence, a more precise estimate of the average treatment effect relative to a wider bandwidth. In untabulated test, we obtain similar estimates when we use an alternative bandwidth of 0.05. Overall, the idea under kernel matching is thus very similar to the other PSM techniques such as nearest-neighbor or interval matching.

Table 9
Robustness: PSM-Matched Sample.

Panel A: Quality of matching

Variables		Treat	Control	Diff	*t*-statistics
Size	Unmatched	16.073	15.859	0.214	1.23
	Matched	16.051	16.014	0.037	0.22
Liquid	Unmatched	0.039	0.057	−0.018	−3.65
	Matched	0.039	0.040	−0.001	−0.17
ROA	Unmatched	0.012	0.012	0.000	−0.51
	Matched	0.012	0.012	0.000	−0.13
Loans_Deposits	Unmatched	0.952	0.874	0.078	3.19
	Matched	0.953	0.904	0.049	1.15
LLR_growth	Unmatched	−0.004	−0.003	−0.001	−0.08
	Matched	−0.004	−0.003	−0.001	−0.07

Panel B: Matched-sample estimation results

Variables	(1)	(2)	(3)	(4)	(5)
	Δ *Ln(Tier 1 ratio)*	Δ *Ln(CE)*	Δ *Ln(RE)*	Δ *Ln(Loan)*	Δ *Ln(IS)*
*Treat*ASC_842*	0.019***	−0.017	−0.003	−0.011**	−0.007
	(4.306)	(−1.446)	(−0.358)	(−2.019)	(−0.766)
Constant	0.433***	−0.246	0.226	−0.757***	−0.106
	(2.785)	(−0.520)	(1.008)	(−4.814)	(−0.375)
Observations	4,134	3,808	3,945	4,134	4,134
Adj. R^2	0.016	0.043	0.072	0.243	0.095
Controls	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes

Notes: This table presents results of estimation of both Eq. (4) and Eq. (5) using a PSM-matched sample of ex-ante less-capitalized (treatment group) and better-capitalized banks (control group). Matching is based on pre-ASC levels of bank size, return on assets, and liquidity. Panel A reports the quality of the matching algorithm by showing the differences in means of bank covariates for the unmatched sample and matched sample in the pre-adoption period (i.e., 2018Q4). Differences in mean values and *t*-statistics are also reported. Panel B presents re-estimates of the baseline results (i.e., Column (3) in Table 2 and all Columns in Table 3) with the PSM-matched sample. The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter* $t-1$ to *quarter t*. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

Table 9, we present estimation results of the PSM-matched sample for **Eq. (4) and (5)**. The results suggest that our inferences remain unchanged when we use propensity score matching.[36]

5.3.2. *Parallel trend assumption and dynamic effects*

Next, we propose a dynamic difference-in-differences design to test for the assumption that treatment and control banks exhibit similar trends in outcomes prior to the adoption of ASC 842. The specification provides preliminary evidence on the treatment effect dynamics across the observation window (i.e., 2015Q1 to 2019Q4). The model is specified as follows, where:

$\Delta Ln(Z_{it}) = f(Tier1ratio_{it}, CE_{it}, RE_{it}, Loans_{it}, IS_{it})$:

$$\Delta Ln(Z_{it}) = \beta_1 + \beta_{-3} Treat_i \times I\{Y_t \leq -3\} + \sum_{y=-2}^{3} \beta_y Treat_i \times I\{Y_t = y\} + \sum_{k=1}^{K} \beta_k X_{ki,t} + \theta_i + \theta_t + \varepsilon_{it} \quad (13)$$

β_{-3} is the single coefficient for far leads. Y_t are the relative quarters from the adoption of the new lease accounting standard, $Y_t = t - 2019Q1$; The observation window runs from 2015Q1 to 2019Q4, whereas the event window is restricted to be within the interval [-3; +3]; Dummies at the left extreme of the event window, i.e., $Y_t \leq -3$, are assigned a value of 1; and 2018Q4 is set as the omitted category, following standard practice in the literature.

The point estimates, based on a 95 % confidence interval, from **Eq. (13)** are presented graphically in Fig. 1. In the pre-ASC 842 period, there is no significant difference in the growth of Tier 1 ratio, common equity, retained earnings, loans, and investment securities between less-capitalized and better-capitalized banks. Point estimates, in this regard, are insignificant and close to zero. We, however, observe an emerging trend in the quarter of adoption of ASC 842. There is a sharp increase in the growth of Tier 1 ratio in the quarter of adoption, which suggests that less-capitalized banks tend to adjust their Tier 1 regulatory capital ratio higher than better-capitalized banks, ex-post. As expected, the effect is only transitory as seen by the positive but marginally significant (insignificant) coefficient in relative quarters 1 and 2, after which the effect strongly re-emerges in relative quarter 3.

[36] In **Table A7** (in the Appendix), we re-perform our matching estimations with an entropy-balanced sample by re-weighting the control group's observations based on the first moment of covariates employed in the baseline regression (Hainmueller, 2012). The results show that our inferences remain unchanged.

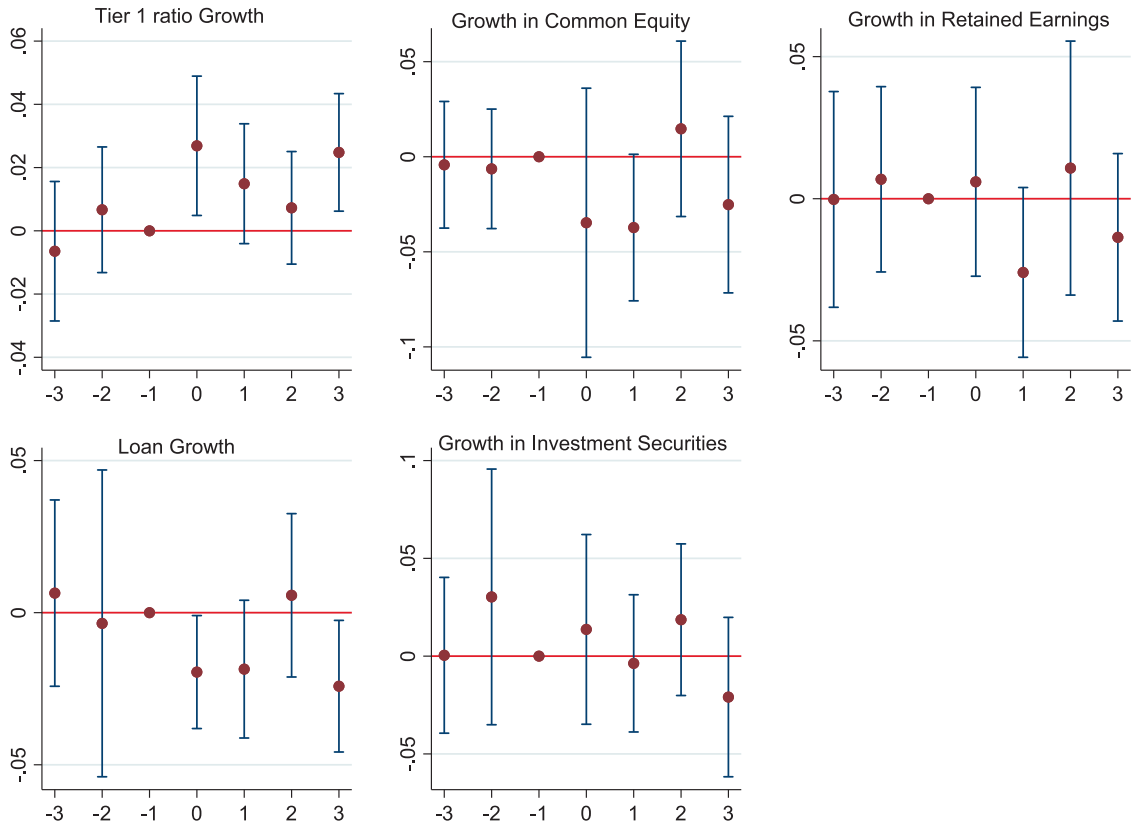

Fig. 1. Dynamic Difference-in-Differences: ASC 842 and Regulatory Capital Management. **Notes:** This figure graphically presents the point estimates of the dynamic DiD specification in Eq. (13); The observation window runs from 2015Q1 to 2019Q4, and the event window is restricted to the interval [-3; +3]; Treatment effects to the left extreme of the event window are accumulated at β_{-3} accordingly; The x-axis denotes the relative quarters from the effective date of ASC 842, with 0 depicting the actual quarter of the shock (2019Q1); The quarter prior to the shock (-1(2018Q4)) is the omitted category, and the y-axis presents the estimated treatment effect within a 95 percent confidence interval.

In terms of banks' adjustment paths, we observe no clear emerging trends (on average) in post-adoption changes (relative to the observed trend in the pre-adoption period) in the growth rates of ordinary share equity, retained earnings, and investment securities between less-capitalized and better-capitalized banks.[37] Instead, we observe a relatively downward trend in the growth of outstanding loans in the post-adoption period, particularly in relative quarters 0 and 3. That is, less-capitalized banks tend to have a significantly lower growth in loans (on average) following the adoption of ASC 842, consistent with our main results. Interestingly, the treatment effect dynamics of loan growth mirror those of the growth in Tier 1 ratio, corroborating our argument that banks reveal a preference for shrinking loan growth in the event of a standard-induced adjustment. Overall, the parallel trend results in Fig. 1 generally support a causal interpretation of our main results.

5.3.3. Levels and alternative treatment group definitions

Next, we test the robustness of our results to the use of levels rather than change in Tier 1 ratio, ordinary equity, retained earnings,

[37] The observed decline (Fig. 1) in relative quarter 1 for the growth in retained earnings could potentially reflect a resultant effect of the cut in loan growth observed in relative quarter 0 (and to a lesser extent, relative quarter 1). This is a plausible explanation for the following reasons. Table 1 shows that less-capitalized banks tend to lend more (mean *Loans* = 0.749) relative to better-capitalized banks (mean *Loans* = 0.643). This should reasonably imply that the former's business model relies heavily on lending activities relative to the latter. Indeed, Table 1 indicates that the average loan-to-deposit ratio of treated banks (mean *Loans_Deposits* = 0.935) is much higher than that of control banks (0.847). To the extent that treated banks significantly shrink lending to adjust their Tier 1 ratio upon adoption of ASC 842 in relative quarter 0 (and marginally in relative quarter 1), this should reasonably yield a loss of interest income, leading to a significant reduction in retained earnings growth in relative quarter 1. Moreover, a closer examination of Fig. 1 suggests that banks may have deliberately slowed the pace of credit cuts in quarters 1 and 2 to ease pressure on future profitability and, consequently, retained earnings. This could partly explain the marginally significant (insignificant) treatment effect in relative quarter 1 (2) for loan growth and the corresponding treatment effect for Tier 1 ratio growth in the same period.

loans, and investment securities. We present results for the dynamic specification in Fig. 2. In summary, the results align with our inferences. We also examine the sensitivity of our results to alternative definitions of the treatment group. In this regard, we redefine our treatment variable based on banks in the lowest *2 deciles*, *bottom* versus *top quartile*, and *bottom* versus *top tercile* of the Tier 1 ratio distribution in 2018Q4. We present the results in Table 10**, Panels A, B, and C,** respectively. Overall, our inferences remain unchanged.

5.3.4. Alternative DID design

An inherent limitation of our difference-in-differences design is that, by employing a binary treatment indicator that typically assumes treatment "turns on" for less-capitalized banks upon the adoption of ASC 842 relative to better-capitalized banks, it does not allow for variation in treatment intensity (Callaway et al., 2024). This is especially relevant because the effect of full risk-weighting the ROU operating lease asset on regulatory capital ratios potentially varies based on banks' operating lease intensity. In this sense, a binary treatment indicator may lead to an overestimation of the treatment effect. To mitigate such a concern, we employ an alternative difference-in-differences design with a continuous treatment. To do so, we use banks' as-if capitalized operating lease commitments (scaled by total assets) – *Op_Lease* – as the continuous difference-in-differences treatment variable and interact it with *ASC_842*, our post-adoption dummy variable. The results, presented in **Panel D** of Table 10, show that our inferences remain unchanged when we employ a continuous difference-in-differences setup.

A related concern about our empirical design is that the estimated treatment effects may simply be due to chance (or random by design) since the new lease accounting standard is a one-time regulatory shock. However, our parallel trend analysis (effectively a time-based placebo test) in Section 5.3.2 mitigates this concern as it shows that the treatment effects in the pre-ASC 842 quarters are insignificant (and close to zero) in all models. The effects only emerge in the quarter of adoption. In essence, while we do acknowledge the potential inherent limitation of our difference-in-differences design, the analysis in this section coupled with our parallel trend tests corroborates the empirical validity of our identified treatment effects.

6. Impact of ASC 842 on local economies

To the extent that banks adjust their Tier 1 regulatory capital ratios primarily by cutting back on lending, this may potentially have an adverse macroeconomic impact (Chen et al., 2025; Juelsrud & Wold, 2020). Following Chen et al. (2025), we test for such adverse economic effects via the unemployment rate at the Metropolitan Statistical Area (MSA) level.[38],[39],[40] Based on a sample of 3816 MSA-month observations from January 2019 to December 2019, we estimate the following model:

$$Unemployment\ rate_{msa,m} = \beta_0 + \beta_1 Treated\ market\ share_{msa} \times April_m + \beta_2 Treated\ market\ share_{msa} \times May_m$$

$$+ \cdots \beta_9 Treated\ market\ share_{msa} \times December_m + \omega_l Control_{msa,m} + \lambda_{msa} + \theta_m + \varepsilon_{msa,m} \quad (14)$$

where $Unemployment\ rate_{msa,m}$ is the unemployment rate in a given MSA, *msa*, in month *m*. $Treated\ market\ share_{msa}$ is the deposit share in an MSA in 2018 for our treated banks. $April_m$, May_m, ..$December_m$ are indicators for the respective months from April to December 2019.[41] We interact each of these monthly indicators with $Treated\ market\ share_{msa}$. We also add MSA-level control variables, including the natural logarithm of per capita personal income and population (measured in 2018). Another set of controls we include in the model is the weighted averages of banks' characteristics in 2018Q4, using their share of deposits in an MSA in 2018 as the weights.

Each of the above control variables is interacted with the monthly indicators and is represented as $Control_{msa,m}$. We include MSA-level fixed effects, year-month fixed effects, and cluster standard errors at the MSA level.[42] In Table 11, **Panel A**, we present descriptives for the two key variables: *Unemployment rate* and *Treated market share*. The average *Unemployment rate* is 3.765 % with a

[38] Prior literature uses the unemployment rate as an outcome for changes in bank credit supply (see Duygan-bump et al., 2015; Jiménez et al., 2017). Moreover, unemployment rates effectively capture the aggregate effects of shifts in credit availability to businesses directly affected as well as any potential spillover effects to other firms (Chen et al., 2025; Juelsrud & Wold, 2020).

[39] We focus our analyses in this section on the MSA level rather than the county level because, to the extent that MSAs – which are functionally integrated economic regions – are composed of multiple counties (or county equivalents), any potential impact of credit cuts (due to ASC 842) by treated banks on overall economic activity would be reasonably more discernible at the MSA level (a relatively aggregate level) than at the individual county level given the former encompasses more economic activity than the latter, making it easier to statistically identify such aggregate effects. Moreover, because the number of banks within an MSA should reasonably be greater than in a county, any slack created by treated banks could potentially be absorbed by other banks within the MSA, making the effect we document represent the most conservative estimates of the local economic impact of the new lease standard.

[40] We do not use Dealscan corporate loans data to examine how the new lease accounting standard impacts corporate borrowers and their employment decisions because we find no evidence that treated banks cut back on commercial lending following the adoption of ASC 842.

[41] We exclude the months of January to March based on the assumption that an ASC 842-induced cut in bank credit would intuitively take some time to reflect on overall economic activity (e.g., through layoffs). We allow for one quarter (i.e., 3 months) for such effects to manifest in the monthly unemployment rates.

[42] Data on monthly unemployment rates for MSAs are retrieved from the Bureau of Labor Statistics (BLS). Per capita personal income and population data are obtained from the Bureau of Economic Analysis (BEA), and we obtain deposit data aggregated at the MSA level for banks using the Summary of Deposits (SOD) compiled by the FDIC.

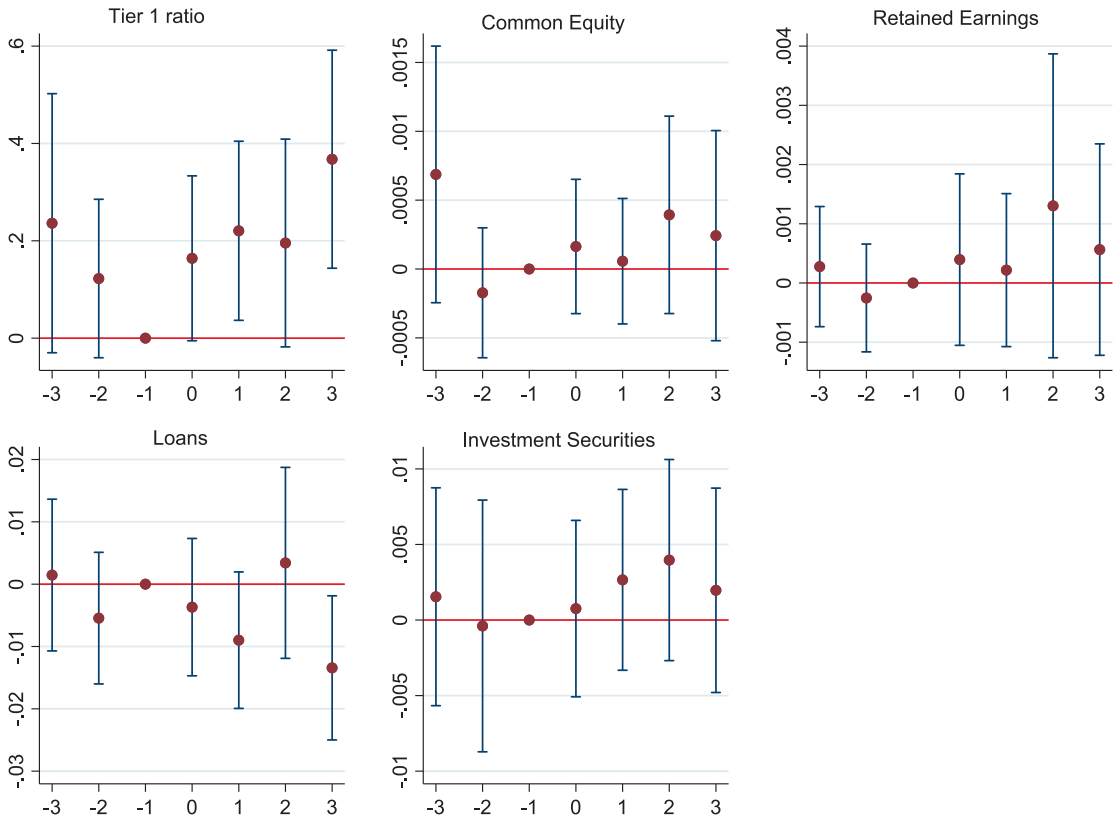

Fig. 2. Dynamic Difference-in-Differences: ASC 842 and Regulatory Capital Management (levels). **Notes:** This figure graphically presents the point estimates of the dynamic DiD specification in Eq. (13) with the dependent variables being the levels rather than the growth rates of Tier 1 ratio, ordinary equity, retained earnings, loans, and investment securities; the observation window runs from 2015Q1 to 2019Q4, and the event window is restricted to the interval [-3; +3]; treatment effects to the left extreme of the event window are accumulated at β_{-3} accordingly; the x-axis denotes the relative quarters from the effective date of ASC 842, with 0 depicting the actual quarter of the shock (2019Q1); the quarter prior to the shock (-1(2018Q4)) is the omitted category, and the y-axis presents the estimated treatment effect within a 95 percent confidence interval.

standard deviation of 1.18 %, consistent with a varying level of economic environment in MSAs during 2019. The average *Treated market share* is 0.504 with a standard of 0.284. **Panel B** presents the results for the interactions between *Treated market share* and the monthly dummies. From Panel B, we observe that the coefficients on the interaction terms from May to December are all significantly positive, with the lowest in July (*Coeff* = 3.040, *t*-stat = 2.312) and the highest in November (*Coeff* = 4.861, *t*-stat = 4.848).[43] The results suggest that MSAs in which treated banks have the largest market share tend to experience higher unemployment rates in 2019. This effect is economically significant in the sense that an increase in *Treated market share* from the 5th to the 10th percentile is associated with an increase in monthly unemployment rates between 4.9 % and 7.9 % relative to the sample mean. Overall, the evidence in this section is consistent with the new lease accounting standard having a potentially significant negative impact on local economies in the year of adoption, consistent with practitioners' concerns.

7. Conclusion

In its effort to ensure improved comparability and transparency of operating lease recognition, the FASB issued ASC 842, which mandates all lessees to capitalize previously disclosed operating lease commitments by recognizing an asset and a corresponding liability on their balance sheet. An additional requirement for banks is that capitalized operating lease assets must also be fully risk-weighted for regulatory capital purposes upon adoption of the new standard. Industry experts argue that such a mandate could trigger banks to adjust their balance sheets in ways that may yield adverse real economic effects. In this vein, this study examines

[43] The coefficient on the interaction between *Treated market share* and the monthly indicator for April might be insignificant probably because the effect of the ASC 842-induced credit cut might not have begun to manifest in the MSA unemployment rates given that such an effect reasonably takes some time.

Table 10
Robustness: Alternative Treatment Group Definition and Alternative Difference-in-Differences Specification.

Panel A: Lowest 2 Deciles					
	(1)	(2)	(3)	(4)	(5)
Variables	Δ *Ln(Tier 1 ratio)*	Δ *Ln(CE)*	Δ *Ln(RE)*	Δ *Ln(Loan)*	Δ *Ln(IS)*
*Treat*ASC_842*	0.017***	−0.012	−0.012	−0.011**	−0.002
	(4.956)	(−1.268)	(−0.936)	(−2.588)	(−0.225)
Constant	0.447***	−0.360	−0.004	−0.752***	−0.356
	(3.467)	(−0.792)	(−0.013)	(−5.052)	(−1.226)
Observations	4,323	3,997	4,134	4,323	4,323
Adj. R2	0.020	0.042	0.071	0.244	0.105
Controls	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes
Panel B: Bottom vs Top Quartile					
	(1)	(2)	(3)	(4)	(5)
Variables	Δ *Ln(Tier 1 ratio)*	Δ *Ln(CE)*	Δ *Ln(RE)*	Δ *Ln(Loan)*	Δ *Ln(IS)*
*Treat*ASC_842*	0.022***	−0.005	−0.016	−0.018***	−0.007
	(4.020)	(−0.490)	(−1.156)	(−3.206)	(−0.685)
Constant	0.655***	−0.653**	−0.069	−0.864***	−0.546
	(3.321)	(−2.058)	(−0.142)	(−4.017)	(−1.176)
Observations	2,158	1,986	2,114	2,158	2,158
Adj. R^2	0.038	0.090	0.042	0.190	0.078
Controls	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes
Panel C: Bottom vs Top Tercile					
	(1)	(2)	(3)	(4)	(5)
Variables	Δ *Ln(Tier 1 ratio)*	Δ *Ln(CE)*	Δ *Ln(RE)*	Δ *Ln(Loan)*	Δ *Ln(IS)*
*Treat*ASC_842*	0.018***	0.006	−0.012	−0.015***	−0.006
	(4.190)	(0.527)	(−1.122)	(−3.162)	(−0.597)
Constant	0.620***	−0.282	−0.040	−0.893***	−0.501
	(3.751)	(−0.565)	(−0.104)	(−4.475)	(−1.267)
Observations	2,899	2,688	2,808	2,899	2,899
Adj. R^2	0.027	0.111	0.052	0.224	0.093
Controls	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes
Panel D: Continuous Difference-in-Differences Design					
	(1)	(2)	(3)	(4)	(5)
Variables	Δ *Ln(Tier 1 ratio)*	Δ *Ln(CE)*	Δ *Ln(RE)*	Δ *Ln(Loan)*	Δ *Ln(IS)*
Op_Lease ASC_842*	0.018**	−0.006	0.015	−0.037**	−0.000
	(2.439)	(−0.284)	(0.527)	(−2.343)	(−0.014)
Constant	0.157	−0.128	0.343*	−0.293***	−0.171
	(1.490)	(−0.409)	(1.751)	(−2.625)	(−0.772)
Observations	4,054	3,763	3,865	4,054	4,054
Adj. R^2	0.002	0.029	0.048	0.226	0.100
Controls	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes

Notes: In this table we present robustness tests based on alternative definitions of our treatment group (Panels A-C) and an alternative difference-in-differences design (Panel D). In Panel A, *Treat* takes a value of 1 for banks in the lowest 2 deciles of the Tier 1 ratio distribution in 2018Q4 and zero otherwise. In Panel B, *Treat* takes a value of 1 for banks in the bottom quartile of the Tier 1 ratio distribution in 2018Q4 (i.e., the treated group) and zero for banks in the top quartile (i.e., the control group), and in Panel C, *Treat* takes a value of 1 for banks in the bottom tercile of the Tier 1 ratio distribution in 2018Q4 (i.e., the treated group) and zero for banks in the top tercile (i.e., the control group). In Panel D, we employ a continuous difference-in-differences design with banks' as-if capitalized operating lease commitments (scaled by total assets) – *Op_Lease* – as the continuous difference-in-differences treatment variable. The growth rate for *quarter t* denotes the (approximate) percentage change from *quarter t* − 1 to *quarter t*. *t*-statistics, based on robust standard errors clustered by bank, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

whether, and most importantly, how banks manage their regulatory capital ratios following the adoption of ASC 842.

We find that banks most affected by the new lease accounting standard – ex-ante less capitalized banks – adjust their Tier 1 ratio higher, relative to better-capitalized banks, by cutting back on loan growth rather than issuing new equity, retaining earnings, or selling investment securities. Cross-sectional tests show that the above effect is stronger for less-capitalized banks with higher

Table 11
Impact of ASC 842 on Local Economies.

Panel A: Descriptive Statistics at the MSA-Month Level

	N	Mean	SD	P5	P10	Median
Unemployment rate	3816	3.765	1.180	2.3	2.5	3.5
Treated market share	3816	0.504	0.284	0.071	0.132	0.488

Panel B: ASC 842 and MSA Unemployment Rates

Variables	(1) *Unemployment rate*
*Treat market share*April*	0.273
	(0.222)
*Treated market share*May*	3.524***
	(3.322)
*Treated market share*June*	3.921***
	(2.914)
*Treated market share*July*	3.040**
	(2.312)
*Treated market share*August*	4.377***
	(3.434)
*Treated market share*September*	4.529***
	(3.705)
*Treated market share*October*	4.383***
	(3.628)
*Treated market share*November*	4.861***
	(4.848)
*Treated market share*December*	3.360***
	(3.787)
Constant	2.395**
	(2.145)
Controls	Yes
Observations	3,816
Adj. R^2	0.916
MSA FE	Yes
Year-month FE	Yes

Notes: This table presents results estimating the economic impact of ASC 84 on unemployment rate in metropolitan statistical areas (MSAs). Panel A reports the descriptive statistics for *Unemployment rate* and *Treated market share* for a sample of 3,816 MSA-month observations from January to December 2019. *Unemployment rate* is the monthly unemployment rate in a given MSA. *Treated market share* is the deposit share in an MSA in 2018 for our treated banks. Panel B presents the regression results for Eq. (14). *t*-statistics, based on robust standard errors clustered by MSA, are in parentheses. *. **, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

operating lease commitments, ex-ante. In line with a desired capital ratio channel, we find that banks adjust towards an optimal Tier 1 capital ratio following adoption of the new standard, and the effect is stronger among less-capitalized banks. Consistent with a regulatory risk channel, we further document that the upward adjustment in Tier 1 ratio and the corresponding cut in loan growth are pronounced for less-capitalized banks that are riskier, pay higher dividends, and those that have no implicit government guarantee. Additional analysis also shows that metropolitan statistical areas in which less-capitalized banks have the largest market share experience higher unemployment rates in the year of adoption, consistent with ASC 842 potentially hurting local economies..

Our paper has important policy implications. Specifically, our results that full risk-weighting of ROU assets under ASC 842 potentially hurt local economies should be of interest to federal banking regulators, who should perhaps reconsider their decision to allow capitalized assets to attract regulatory capital. In the case of ASC 842, we share the same sentiment with practitioners who believe a *lease-by-lease* approach to risk-weighting might be a relatively better way to link recognized assets to regulatory capital ratios. In this spirit, an equipment leasing expert, Bill Bosco, argues that banks' equipment leases carry no capital risk and hence, should be zero-weighted for regulatory capital purposes because such leases are typically required under current US bankruptcy liquidation laws to be returned to the lessor (with no future lease obligations to lessee) in the event the lessee bank becomes bankrupt.

Similarly, real estate branch offices (which constitute a significant portion of US banks' operating leases) also potentially carry only a minimal capital risk because when a lessee bank becomes bankrupt, regulators usually arrange for another bank to assume the branch, reducing any loss of future rental income to the lessor. In a rare case where another bank does not assume the leased branch, then the lessor's claim for future rent damages will be limited to the higher amount between one year's rent or 15 percent of the remaining lease duration, with a maximum cap of three years' rent. Bill Bosco thus argues that, perhaps, operating leases on banks' real estate branches should attract only a small risk-weight of about 10 percent to reflect their treatment under bankruptcy liquidation. On the backdrop of the foregoing, we believe that tailored regulatory capital decisions by federal banking regulators, which reflect the substance of a lease arrangement, could be a step in the right direction. Also, whether banks should fully risk-weight, partially risk-weight (e.g., 10 %, 20 %, 50 %), or zero-weight capitalized assets is a related policy insight that could have implications on the extent to which banks shrink credit supply in response to such mandates.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jaccpubpol.2026.107404.

Data availability

Data will be made available on request.

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