

Banks' Motivations for Designating Securities as Held to Maturity

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Abstract

We show that banks classify fixed-rate debt investment securities as held to maturity (HTM) rather than as available for sale (AFS) when HTM classification provides preferred financial accounting and regulatory capital treatments, not because they have a distinct economically motivated intent and ability to hold the securities to maturity. Specifically, we document predictably divergent security classifications by three categories of banks that differ in whether the regulatory AOCI filter, which removes accumulated other comprehensive income from Tier 1 capital, applies in four subperiods of our 2012–2022 sample period. The boundaries of the subperiods reflect changes in the AOCI filter's applicability in 2014 and 2019 and the sharp rise in interest rates beginning in late 2021. We further find that the categories of banks differ in the interest rate risk of their AFS securities and the extents to which they hedge that risk and finance their assets with uninsured deposits.

Keywords: banks; investment securities; held to maturity; regulatory capital; AOCI filter.

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1. Introduction

As interest rates rose beginning in August 2021, banks experienced increasingly large unrealized losses on fixed-rate debt investment securities (hereafter “securities”) (Jiang et al. 2023b; McPhail, Schnabl, and Tuckman 2023). To avoid the recognition of future unrealized losses, many banks transferred (i.e., reclassified) available-for-sale (AFS) securities—which under GAAP are recognized at fair value with unrealized gains and losses recorded in accumulated other comprehensive income (AOCI), a component of owners’ equity—to held-to-maturity (HTM) securities, which are recognized at amortized cost (Granja 2023). Unrealized losses on securities and other fixed-rate assets motivated deposit runs during March 2023 at three U.S. regional banks: Silicon Valley, Signature, and First Republic (Jiang et al. 2023a; Drechsler et al. 2023). In response to these deposit runs, the allowed classification of securities as HTM has again come into question for both the non-recognition of unrealized losses and the unverifiability of firms’ asserted intent to hold securities to maturity (Peters 2023; Mahoney 2023).

In this study, we provide two sets of empirical findings relevant to this question. We first provide evidence that banks’ classifications of securities as HTM versus AFS are shaped by the evolving regulatory treatment of their unrealized gains and losses on AFS securities recorded in AOCI and by their desire to avoid the recognition of unrealized losses when interest rates are expected to rise, rather than by banks having a distinct economically motivated positive intent and ability to hold the securities to maturity. When applied to a bank, the regulatory “AOCI filter” excludes the bank’s AOCI from its Tier 1 (and total) capital. We examine three categories of banks that differ regarding whether and when AOCI is included in regulatory capital during four subperiods of our 2012–2022 sample period. The three bank categories we examine reflect banks’ size and complexity as of 2019Q4: (1) “advanced approaches” banks with assets above \$700 billion or foreign exposures above \$75 billion, (2) “opt-out” banks with assets from \$250 billion to \$700 billion or foreign exposures from \$10 billion to \$75 billion, and (3) “non-advanced approaches” banks with assets below \$250 billion and foreign exposures below \$10 billion. We describe the applicability of the AOCI filter to the three categories of banks during the four subperiods below and summarize this applicability in Appendix A.

During the first subperiod (2012Q1–2013Q2) of our sample period, the AOCI filter applied to all three bank categories, thereby protecting their regulatory capital from unrealized gains and losses on AFS securities. We find that all three sets of banks classified over 80 percent of their securities as AFS during this subperiod. During the second subperiod (2013Q3–2019Q3), under the initial U.S. implementation of Basel III, the AOCI filter was phased out over five years for banks with assets above \$250 billion or foreign exposures above \$10 billion, which included the advanced approaches and opt-out banks.¹ Consistent with Chircop and Novatny-Farkas (2016) and Kim, Kim, and Ryan (2019), we find that both of these categories of banks transferred large amounts of AFS securities to HTM during this subperiod, both in isolation and relative to non-advanced approaches banks. We refer to the first and second subperiods as the pre-Basel III and Basel III periods, respectively.

At the beginning of the third subperiod (2019Q4–2021Q3), under the Federal Reserve’s 2019 tailoring rules implementing certain provisions of the Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018 (EGRRCPA), the AOCI filter was reinstated for the opt-out banks, as long as they opted out of the AOCI filter removal, which all of the banks did. We find that the opt-out banks promptly transferred substantially all their HTM securities to AFS, while the advanced approaches banks continued to add to their HTM securities. We refer to the third subperiod as the tailoring rules period.

During the fourth subperiod (2021Q4–2022Q4), interest rates rose sharply, yielding very sizeable unrealized losses for all three sets of banks, potentially driving their tangible owners’ equity negative. Banks with negative tangible owners’ equity are restricted from borrowing from the Federal Home Loan Banks, the second most important source of bank financing after deposits.² Consistent with Granja (2023), we find that all three sets of banks—including the opt-out banks, which just two years before had transferred

¹ Four of the five opt-out banks were subject to the AOCI filter phase-out beginning on January 1, 2014: American Express due to its foreign exposure and Capital One, PNC, and U.S. Bancorp due to their size. Schwab became subject to the AOCI filter removal (the phase-out being complete) in the first quarter of 2019 after its assets first exceeded \$250 billion in the second quarter of 2018.

² We discuss banks’ tangible owners’ equity and why banks with negative tangible owners’ equity are restricted from borrowing from the Federal Home Loan Banks in Section 2.

substantially all of their HTM securities to AFS—transferred substantial amounts of AFS securities to HTM during this subperiod, which we refer to as the interest rate rise period.

Collectively, our first set of empirical findings constitutes the most complete and compelling evidence to date of the fluidity of banks' classification of securities as HTM rather than AFS. Prior studies generally have examined banks' securities classifications around single events, such as banks' initial adoption of FAS 115 in 1994 (Hodder, Kohlbeck, and McAnally 2002), the phase-out of the AOCI filter for advanced approaches banks in 2014 (Chircop and Novatny-Farkas 2016; Kim et al. 2019), and the recent interest rate rise (Granja 2023). While these studies show that banks exercise discretion over their securities classifications—for example, Granja (2023) finds that banks with lower capital ratios, more uninsured deposits, and higher interest rate risk were more likely to transfer securities to HTM during the interest rate rise period—it is impossible to piece together patterns in given banks' securities classifications over time from these studies. We show that all three categories of banks reclassify securities to obtain their preferred financial accounting and regulatory capital treatments given the changes in the applicability of the AOCI filter and interest rate movements during each of the four subperiods of our sample period.

Most strikingly, we show that the opt-out banks reversed their classification of securities three times during our sample period: from AFS to HTM as the AOCI filter was phased out during the Basel III period, back to AFS as the AOCI filter was restated during the tailoring rules period, and then back to HTM during the interest rate rise period. Hence, the opt-out banks effectively first asserted that they had the intent and ability to hold securities to maturity, then that they did not have this intent or ability, and finally that they had this intent and ability again. In our view, such readily changeable assertions regarding firms' intent to hold securities to maturity are inconsistent with the GAAP requirements for HTM classification.³

³ ASC 320-10-25-1 states that firms must have the positive intent and ability to hold securities to maturity to classify securities as HTM. ASC 320-10-25-6, 9, and 14 state that sales or transfers of securities out of HTM are allowed only in highly restrictive circumstances. Paragraphs 58-77 of the Background Information and Basis for Conclusions section of FAS 115 further explain the strictness of this requirement and its importance in the FASB's decision to allow HTM securities to be recognized at amortized cost. For example, paragraph 59 states that "if management's intention to hold a debt security to maturity is uncertain, it is not appropriate to carry that investment at amortized cost; amortized cost is relevant only if a security is actually held to maturity." Similarly, paragraph 76 states that "[t]he Board believes that gains trading with held-to-maturity securities to meet an enterprise's capital requirements is

Also notably, we show that advanced approaches banks increased the percentage of their securities classified as HTM from under two percent at the beginning of our sample period in 2012Q1 to 30 percent in 2016Q4, the end of Kim et al.'s (2019) sample period, and then to 57 percent at the end of our sample period in 2022Q4. This historically high percentage of HTM securities (see footnotes 11 and 12) is concerning given that it is difficult for banks to manage the interest rate risk of HTM securities through sale or transfer to AFS due to the HTM tainting rules,⁴ and impossible for them to manage this risk through derivatives-based hedges that qualify for hedge accounting.⁵

Moreover, the prior studies that examine transfers of securities out of HTM, the only type of transfer that GAAP meaningfully constrains, examine a case where such transfers were expressly allowed: the securities classification do-over allowed at the end of 1995 by paragraph 65 of the FASB's FAS 115 Q&A Guide (Hodder et al. 2002). In contrast, the opt-out banks ascribed \$212 billion (over 90 percent) of their transfers of \$228 billion of securities out of HTM in late 2019 and early 2020 to the tailoring rules.⁶ They did so despite the tailoring rules neither being one of the types of regulatory changes for which GAAP allows transfers or sales of securities out of HTM (ASC 320-10-25-6, 9, and 14) nor consistent with the FASB's discussion of when regulatory capital-motivated sales or transfers of HTM securities are appropriate in the basis for conclusions of FAS 115 (paragraphs 75 and 76). Despite this requirement, none of the opt-out banks indicated that their HTM portfolios were tainted by the transfers, a conclusion that

inconsistent with the held-to-maturity notion." We discuss GAAP requirements for classifying securities as HTM in detail in Section 2.

⁴ Under ASC 320-10-35-8 and 9, the sale or transfer of any HTM security in circumstances other than those expressly allowed in ASC 320-10-25-6, 9, and 14 taints the firm's entire HTM portfolio, requiring the portfolio to be reclassified to AFS. Under SEC guidance, the firm that taints its HTM portfolio is prohibited from classifying a security as HTM for two years. We discuss the HTM tainting rules in detail in Section 2.

⁵ Hedges of the interest rate risk of HTM securities do not qualify for hedge accounting under ASC 815-20-25-12(d), 15(f), 43(c)(2), and 43(d)(2), even as part of hedges of the overall risk of the securities.

⁶ One of the opt-out banks, PNC Financial, ascribes the remaining \$16 billion of the opt-out banks' transfers of securities out of HTM to its adoption of two accounting standards updates (ASUs) with effective dates within a day of the effective date of the tailoring rules that allowed firms to transfer securities with prepayment risk (ASU 2019-04) and floating-rate securities referencing LIBOR (ASU 2020-04) out of HTM without tainting their HTM portfolios. We explain in Section 2 that only one of the three opt-out banks that invoked the tailoring rules to transfer securities out of HTM (U.S. Bancorp) could have instead invoked ASU 2019-04 to do so for its HTM securities with prepayment risk (but not for its other HTM securities).

would have made it difficult for them to transfer securities back to HTM starting in late 2021. Further, none of these banks provide any explanation for why the tailoring rules constitute a valid basis for these transfers, and none of their auditors mentioned the transfers in their audit opinions or appear to have objected to them. These findings demonstrate what we view as loose adherence to the HTM tainting rules.

More generally, our first set of empirical findings suggests that banks' assertions about their intent and ability to hold securities to maturity are not adequately evaluated by auditors, regulators, or anyone else, perhaps because these assertions are inherently unverifiable. Regardless of the reason, these findings support recent calls to limit or eliminate the allowed classification of securities as HTM.

Our second set of empirical findings pertains to banks' management of the interest rate risk of their securities. We hypothesize that banks more actively manage the risk of AFS securities when the AOCI filter does not apply. This hypothesis is motivated by prior research examining earlier settings, which shows that the AOCI filter induces banks to hold riskier AFS securities. Kim et al. (2019) show that the advanced approaches banks hold less credit risky AFS securities as the AOCI filter is partially phased out during the first three years of the Basel III period. Bischof, Laux, and Leuz (2021) examine cross-country variation in the AOCI filter during the financial crisis and find that banks in countries with stronger AOCI filters took weaker corrective actions in response to unrealized losses on AFS securities during the crisis. We extend Kim et al.'s (2019) findings through the remainder of the Basel III period and the entirety of the tailoring rules and interest rate rise periods.

We first examine changes in the weighted-average maturity of AFS securities for the three categories of banks during the four subperiods. We find that as the AOCI filter is phased out for the advanced approaches and opt-out banks during the Basel III period, both categories of banks reduce the weighted-average maturity of their AFS securities. When the AOCI filter is reinstated for the opt-out banks in the tailoring rules period, these banks increase the weighted-average maturity of their AFS securities, while the advanced approaches continue to reduce the weighted-average maturity of their AFS securities. These findings are consistent with the AOCI filter phase-out leading the advanced approaches and opt-out

banks to increase their management of the interest rate risk of AFS securities, while the AOCI filter reinstatement leads the opt-out banks to reduce this management.

We then examine the extent to which the three categories of banks use derivatives that qualify for fair value hedge accounting to hedge the interest rate risk of AFS securities from 2018, the first year that firms are required to disclose information about these hedges, to 2022. Recent research in finance examines interest rate and liquidity risks arising from banks' largely unhedged fixed-rate assets and runnable non-FDIC guaranteed no-term deposits (Jiang et al. 2023a,b; McPhail, Schnabl, and Tuckman 2023; Drechsler et al. 2023). Consistent with the findings of these papers, we provide evidence that the non-advanced approaches banks do not appreciably fair value hedge the interest rate risk of AFS securities. In contrast, the advanced approaches banks increase the proportion of AFS securities they fair value hedge from 10 percent in 2018Q1 to 37 percent in 2022Q4, with about 60 percent of this increase occurring during the interest rate rise period. While the opt-out banks fair value hedged the interest rate risk of AFS securities nearly as much as advanced approaches banks did in 2018Q1, they decrease this proportion through mid-2020, by which time they, like non-advanced approaches banks, do not appreciably fair value hedge the interest rate risk of their AFS securities. About two-thirds of this decrease occurs in 2019Q4–2020Q2 around the effective date of the tailoring rules.

Lastly, we find that, for all three categories of banks, asset-liability management (i.e., economic hedges) of the interest rate risk of securities using deposits decreased during our sample period due to disproportionate increases in their runnable non-FDIC insured deposits. Given these increases, which reduce banks' ability to hold securities to maturity, the increasing HTM classification of securities by all three categories of banks during the interest rate rise period raises further concern about the appropriateness of banks' HTM classification as well as about the stability of banks.

Our second set of empirical findings extends Kim et al. (2019) and Bischof, Laux, and Leuz (2021) by providing further evidence that the AOCI filter incentivizes banks to reduce their management of interest

rate risk. These findings provide support for the Federal Reserve’s proposed rule to restrict the applicability of the AOCI filter to banks with assets below \$100 billion.⁷

2. Background, Related Literature, and Hypotheses

Increases in interest rates beginning in the second half of 2021

The Federal Reserve’s Federal Open Market Committee raised the target federal funds rate from 0 to 0.25 percent on March 16, 2022 to 5.25 to 5.5 percent on July 26, 2023, where it remains at the time of this writing in March 2024. Market expectations about the target federal funds rate influence interest rates economywide. The medium-to-long maturity market interest rates that most affect the value of banks’ assets began to rise at various points in the second half of 2021.⁸ As relevant market interest rates rose, the values of fixed-rate financial assets fell substantially. To illustrate, for a fixed-rate asset with a duration of five years and no interest rate optionality, an instantaneous increase in the relevant market rate of 3.8 percent (which equals the increase in the five-year Treasury bond yield from 0.65 percent on August 3, 2021 to 4.45 percent on October 20, 2022, the period that experienced the bulk of the ultimate yield increase) decreases the value of the asset by almost 19 percent. Marsh and Laliberte (2023) report that banks’ unrealized losses on securities equaled approximately 30 percent of their total Tier 1 capital at the end of 2022.

Accounting for Securities

The accounting guidance for securities stems primarily from FAS 115, a 1993 standard written in the wake of the thrift crisis. The political environment that led to FAS 115 is instructive for the accounting issues arising from the current turmoil in the banking industry. The thrift crisis was primarily attributable to thrifts’ holdings of long-duration fixed-rate residential mortgages financed by zero contractual duration

⁷ In the cover letter to the Federal Reserve’s April 2023 post-mortem review of Silicon Valley Bank, Michael S. Barr, the Federal Reserve’s Vice Chair for Supervision, states that “we should require a broader set of firms to take into account unrealized gains or losses on available-for-sale securities, so that a firm’s capital requirements are better aligned with its financial positions and risk” (Barr 2023, p. 3). Following up on this statement, in July 2023, the Board of Governors of the Federal Reserve System proposed to remove the AOCI filter for banks with assets of \$100 billion or more (<https://www.govinfo.gov/content/pkg/FR-2023-09-18/pdf/2023-19200.pdf>).

⁸ Yields on U.S. Treasuries of longer maturities began to increase further before the first increase in the target federal funds rate in March 2022. For example, the yield on 3-month U.S. Treasuries started to rise in early January 2022, while the yield on 5-year U.S. Treasuries started to rise no later than August 2021.

(but sticky) demand and savings deposits. These assets experienced large economic losses as interest rates rose sharply during the 1970s, peaked in 1981, and remained high through the remainder of the 1980s. Due to the use of amortized cost accounting, these large losses were initially unrecognized for accounting (and regulatory) purposes. Over the long lives of the assets, the losses were gradually realized and thus recognized. Meanwhile, deposits became less sticky in part because alternatives to deposits, such as Merrill Lynch's introduction of the cash management account in 1977, developed. As these events occurred, many banks invested in risky assets in gambles for resurrection, worsening the crisis (White 1991).

Motivated by this history, in 1990, the SEC's Chair (Richard Breeden) and top accounting personnel (Edmund Coulson and Robert Bayless) publicly argued that market value accounting should be required for marketable securities (Breeden 1990), while the banking and insurance industries and their regulators pushed back against this position (Johnson and Swieringa 1996, p. 159). FAS 115, which as of 2009 is codified in Accounting Standards Codification (ASC) 320, is a political compromise that reflects aspects of the divergent preferences of these parties (Johnson and Swieringa 1996, pp. 166-172).

Specifically, ASC 320 allows distinct accounting treatments for securities based primarily on the asserted intent of the holder. Consistent with the expressed preferences of the banking and insurance industries and their regulators, securities for which the holder asserts it has the intent and ability to hold to maturity are classified as HTM and recognized at amortized cost. Partly consistent with the expressed preferences of the SEC, securities for which the holder asserts no intent are classified as AFS and recognized at fair value on the balance sheet, but with unrealized gains and losses recorded in AOCI.⁹ Panel A of Appendix B summarizes the accounting requirements for the three securities classifications.

⁹ Prior to the January 2018 effective date of ASU 2016-01, which requires equity securities to be recognized at fair value with unrealized gains and losses recorded in net income, ASC 320 prohibited the classification of equity securities as HTM, so banks classified these securities as either AFS or trading. We exclude equity securities from AFS securities throughout our sample period. However, all banks include unrealized gains and losses on equity securities in net income (and thus Tier 1 capital) under ASU 2016-01, and this raises issues analogous to those investigated in the paper. In untabulated analysis, we tested whether affected banks reduced their holdings of equity securities around the effective date of the ASU. Consistent with our findings for debt securities, we find that banks with high equity securities (defined as either above median or greater than 0.5 percent of assets) prior to the effective date of ASU 2016-01 reduced their equity securities around that date relative to banks with low equity securities.

Because credit losses on securities typically are recognized to a significant extent (currently under ASC 320's impairment rules for AFS securities and ASC 326's current expected credit loss model for HTM securities),¹⁰ unrealized gains and losses primarily reflect the effects of interest rate movements on the value of fixed-rate securities.

The AOCI filter and the tailoring rules

FAS 115's main accounting innovation was to require AFS securities to be recognized at fair value, with cumulative gains and losses recorded in AOCI. Prior to the application of the AOCI filter to all banks in January 1995, AOCI was included in banks' Tier 1 (and total) regulatory capital. Hence, to avoid volatility in regulatory capital, upon their adoption of FAS 115, many banks classified sizeable portions of their securities as HTM, thereby maintaining the prior amortized cost accounting for regulatory purposes.¹¹

This classification choice quickly turned out poorly, because interest rates rose sharply from early 1994 to early 1995, yielding large unrealized losses on banks' fixed-rate HTM securities subject to restrictions on sale or transfer. To mitigate this problem, bank regulators implemented the AOCI filter in January 1995. In paragraph 65 of the FAS 115 Q&A Guide issued in November 1995, the FASB provided a securities classification do-over that enabled firms to sell and reclassify their HTM securities by year-end 1995 without tainting their HTM portfolios. Many banks used this do-over to reduce their HTM securities.¹²

The AOCI filter applied to all banks until December 31, 2013. Then, under the initial U.S. implementation of Basel III, for banks with greater than \$250 billion assets or \$10 billion foreign exposure, the AOCI filter was phased out over five years beginning on January 1, 2014. Finally, under the Federal Reserve's tailoring rules implementing provisions of EGRRCPA, the AOCI filter was reinstated for banks with assets between \$250 billion and \$700 billion or foreign exposures from \$10 billion to \$75 billion as

¹⁰ Prior to a bank's adoption of ASC 326—which occurred from January 2020 to January 2023, depending on the bank's size, listing status, and adoption choice—its HTM securities were also subject to ASC 320's impairment rules.

¹¹ Hodder et al. (2002) report that the median bank holding company in their sample classified 51 percent of its securities as AFS upon the adoption of FAS 115. As the median bank holding company does not hold any trading securities, that bank classified 49 percent of its securities as HTM.

¹² Hodder et al. (2002) report that the median bank in their sample raised the proportion of securities classified as AFS from 51 percent prior to the moratorium to 85 percent afterward.

of December 31, 2019, if the banks opted out of the inclusion of AOCI in regulatory capital. All five affected banks did opt out, which is why we refer to them as the “opt-out” banks.

Transfers of securities from HTM to AFS in general and in response to the tailoring rules

Except in allowed circumstances discussed below, firms cannot sell HTM securities or transfer the securities to other categories without tainting their HTM portfolios. When a firm’s HTM portfolio is tainted, ASC 320-10-35-9 requires the firm to transfer the entire HTM portfolio to AFS. The firm generally cannot classify any securities as HTM for two years.¹³

Two sets of guidance in ASC 320 specify when firms may sell HTM securities or transfer them to another category without tainting their HTM portfolios. First, ASC 320-10-25-6 allows firms to transfer securities out of HTM in six specified circumstances. These circumstances clearly do not apply to three opt-out banks’ transfers of securities from HTM to AFS for which they invoke the tailoring rules.¹⁴ Moreover, ASC 320-10-25-7 states that firms may not analogize to these six circumstances.

Second, ASC 320-10-25-10 allows firms to transfer securities out of HTM without taint upon the occurrence of an event that meets four conditions: the event is “isolated...nonrecurring...unusual for the reporting entity...[and] could not be reasonably anticipated.” ASC 320-10-25-11 states that “Other than extremely remote disaster scenarios (such as a run on a bank or an insurance entity), very few events would meet all four of these conditions.”

¹³ The two-year tainting period reflects SEC guidance from the previously described period of increasing interest rates in 1994 and 1995 when banks found themselves holding too many HTM securities, specifically, a January 10, 1995 speech by Tracey C. Barber of the SEC staff at the 22nd Annual National Conference on Current SEC Developments (EY 2023, p. 59). The idea behind the tainting period is the firm needs to develop policies and procedures that reestablish the credibility of its assertions regarding the intent and ability to hold securities.

¹⁴ These circumstances are (1) a significant deterioration in the creditworthiness of the issuer of the security; (2) a change in tax law that eliminates or reduces the tax-exempt status of the security; (3) a major business combination or disposition that requires the firm to rebalance its securities portfolio to maintain the desired interest rate or credit risk exposure; (4) a significant regulatory change regarding the type or magnitude of permissible investments; (5) a significant increase in capital requirements that requires the firm to downsize; and (6) a significant change in regulatory risk weights for securities. While the tailoring rules affect the measurement of Tier 1 capital for the opt-out banks that hold AFS securities, which may seem to pertain to circumstance (5), these rules do not increase the opt-out banks’ capital requirements, both because unrealized gains and losses equal zero on average and because the banks had the option to keep the AOCI filter removed. Moreover, the tailoring rules do not affect the capital requirements for HTM securities in any fashion.

Three opt-out banks invoked the tailoring rules to transfer \$212 billion of securities out of HTM at the end of 2019 or early 2020: Capital One, Schwab, and U.S. Bancorp. As the tailoring rules do not correspond to any of the six circumstances specified in ASC 320-10-25-6, the banks must have done so based on ASC 320-10-25-10. Changes in regulatory capital definitions—which do not directly affect banks’ economic capital, occur with considerable frequency, and are subject to regularly changing political influences¹⁵—do not appear to meet any of ASC 320-10-25-10’s four conditions, not to mention all four conditions. The reinstatement of the AOCI filter—which the opt-out banks surely viewed as a favorable development, as they would not have elected to opt out of the filter removal otherwise—does not constitute anything approaching an “extremely remote disaster scenario.” None of these banks indicated that their HTM portfolios were tainted by these transfers, a conclusion that would have made it difficult for them to transfer securities back to HTM during the interest rate rise period. Regardless of whether ASC 320-10-25-10 applies to these transfers, the opt-out banks’ transfer of securities first into HTM, then out of HTM, and then back into HTM illustrates that their intent to hold securities to maturity is both fluid and primarily motivated by their preferred financial accounting and regulatory capital treatments rather than by a distinct economically motivated intent and ability to hold the securities to maturity.

In addition, the FASB periodically writes standards that affect the accounting for HTM securities or that, had the standards been in existence previously when firms classified securities as HTM, might have induced firms to instead classify the securities as AFS. In these standards, the FASB often provides firms with “one-time” options to sell or transfer HTM securities without tainting their HTM portfolios. The FASB issued three ASUs with effective dates close to the effective date of the tailoring rules that provided such options. ASUs 2017-12 and 2019-04, which allow hedge accounting for last-of-layer hedges of portfolios of prepayable assets, allowed any firm to transfer securities eligible to be the hedged item in a last-of-layer hedge out of HTM without taint upon the adoption of the ASUs on January 1, 2019 and 2020, respectively,

¹⁵ For example, the Trump-era EGRRCPA unwound provisions of the Obama-era Dodd-Frank Act and regulations implementing that act.

even if the firm had no intention to engage in such a hedge.¹⁶ ASU 2020-04, which provides accounting expedients and exceptions regarding the replacement of LIBOR with other reference rates, provided banks with a one-time option to transfer floating-rate securities that were classified as HTM before January 1, 2020 and that referenced LIBOR out of HTM at any time from 2020 to 2022.

For transfers of fixed-rate securities from HTM to AFS around the 2019 year-end effective date of the tailoring rules, only ASU 2019-04 constituted a potential alternative basis for these transfers, and it did so only for securities with prepayment risk (e.g., residential mortgage-backed securities, not U.S. Treasury securities) and for banks that had not previously transferred securities out of HTM under ASU 2017-12 a year prior, which ruled out Capital One and Schwab. PNC Financial, which did not invoke the tailoring rules for any transfers of securities out of HTM, invoked ASU 2019-04 to transfer \$16.2 billion of securities from HTM to AFS on January 1, 2020. U.S. Bancorp presumably could have invoked ASU 2019-04 rather than the tailoring rules for most of its transfer of \$43.6 billion of securities out of HTM on December 31, 2019, though its financial reports do not mention either ASU 2019-04 or last-of-layer hedges.

Hypotheses

We propose two hypotheses that extend the first two hypotheses in Kim et al. (2019), which pertain to the behavior of the advanced approaches and opt-out banks around the phase-out of the AOCI filter beginning in 2014 under the initial U.S. implementation of Basel III. We base these hypotheses on the assumption that the disclosure of unrealized losses on HTM securities in financial and regulatory reports is not an adequate substitute for recognition of these losses, both in terms of the internal management of the bank as well as the monitoring of the bank by regulators and other external parties. This assumption is consistent with the typical findings in the broad recognition versus disclosure literature (e.g., Muller, Riedl, and Sellhorn 2015), some of which document that the equity market's incorporation of banks' disclosed unrealized losses on AFS and HTM securities is incomplete (e.g., Boulland, Lobo, and Paugram 2019).

¹⁶ For regular adopters with December 31 fiscal year ends, the effective date of ASU 2017-12 is January 1, 2019, a year before the effective date of the tailoring rules, and the effective date of ASU 2019-04 is January 1, 2020, one day after the effective date of the tailoring rules. A firm could transfer securities out of HTM upon the adoption of ASU 2019-04 only if it had not previously made such a transfer upon the adoption of ASU 2017-04.

Most pertinently, Choi, Goldsmith-Pinkham, and Yorulmazer (2023) and Dick-Nielsen and Thimsen (2024) find that banks' disclosed unrealized losses on AFS and HTM securities and estimated unrealized losses on loans were not priced by the market prior to the March 2023 bank runs.¹⁷

Specifically, our first hypothesis extends Kim et al.'s (2019) H1, which states that the advanced approaches and opt-out banks increase the classification of securities as HTM around the AOCI filter phase-out to protect their regulatory capital from unrealized gains and losses on securities. We hypothesize that advanced approaches and opt-out banks transfer securities from AFS to HTM during the Basel III period, but that the opt-out banks then transfer securities from HTM to AFS when the AOCI filter is reinstated during the tailoring rules period to avoid the restrictions on the sale or transfer of HTM securities as well as on the use of hedge accounting for these securities. Consistent with Granja (2023), we further hypothesize that all three categories of banks transfer securities from AFS to HTM early in the interest rate rise period once they understand that interest rates are likely to continue to rise.

This hypothesis reflects our expectation that banks' security classifications usually reflect the following pecking order of desired outcomes given accounting and regulatory requirements: (1) lower volatility of GAAP net income and regulatory capital, which favors HTM classification *if* the AOCI filter does not apply and has no implications otherwise; (2) allow flexibility regarding the sale, transfer, and accounting hedging of securities, which favors AFS classification; and (3) lower volatility of GAAP owners' equity, which favors HTM classification. We expect (2) and (3) to switch places in the pecking order when a bank's tangible owners' equity becomes in danger of becoming negative, because a Federal Housing Finance Agency rule prohibits the Federal Home Loan Banks, the second most important source

¹⁷ A recognition-versus-disclosure question that, to the best of our knowledge, has not been directly addressed empirically but is worthy of future research is whether and how recognition versus disclosure of unrealized losses and other items influences bank regulators' decisions. Some indirect evidence related to our setting is provided by Gopalan and Granja (2023), who show that during 2022 bank regulators reduced the liquidity (L) and sensitivity to risk (S) components, but not the capital (C) component, of CAMELS ratings for banks with greater exposure to interest rate risk as measured by the share of long-term securities. However, Gopalan and Granja (2023) do not examine whether bank regulators incorporated unrealized losses on securities into these ratings.

of bank financing after deposits,¹⁸ from lending to a bank with negative tangible owners' equity unless its primary regulator provides a waiver (Berry 2022; American Bankers Association and Independent Community Bankers of America 2022).¹⁹ We expect this danger to arise for many banks in all three categories early in the interest rate rise period given the high potential, now realized, for future unrealized losses on AFS securities. Panel B of Appendix B summarizes the preferred security classifications for each of the three categories of banks in each of the four subperiods given these pecking orders.

Our second hypothesis extends Kim et al.'s (2019) H2, which states that advanced approaches banks reduce the risk of both AFS and HTM securities around the phase-out of the AOCI filter. Unlike Kim et al. (2019), we limit this hypothesis to the risk of AFS (i.e., not HTM) securities, for two reasons. First, only one of the opt-out banks holds any HTM securities during the tailoring rules period after the second quarter of 2020, and this bank holds only a small amount of these securities, so the level and change in the risk of opt-out banks' HTM securities during the tailoring rules period cannot be reliably interpreted. Second, the primary difference between advanced approaches and opt-out banks during the tailoring rules period pertains to the reinstatement of the AOCI filter, which only involves AFS securities. We also examine the risk of the AFS plus HTM securities, however, to determine whether and the extent to which our findings for AFS securities are attributable to banks transferring long-maturity securities between AFS and HTM.

We hypothesize that the advanced approaches and opt-out banks decrease the interest rate risk of AFS securities during the Basel III period, but that the opt-out banks increase the interest rate risk of AFS securities during the tailoring rules period, and that all three categories of banks decrease the interest rate risk of AFS securities during the interest rate rise period. Like our first hypothesis, this hypothesis reflects the assumption that banks are always concerned about the volatility of their net income and regulatory

¹⁸ Federal Home Loan Bank advances typically constitute about five percent of bank liabilities, with this percentage rising in periods when other forms of wholesale bank financing dry up (Gissler and Narajabad 2017).

¹⁹ Tangible common equity is a non-GAAP measure that excludes most intangible assets but includes AOCI. The Federal Housing Finance Agency's rule is codified in 12 CFR 1266.4 (b)(1): "A [Federal Home Loan] Bank shall not make a new advance to a member without positive tangible capital unless the member's appropriate federal banking agency or insurer requests in writing that the Bank make such advance. The Bank shall promptly provide the FHFA with a copy of any such request."

capital, and that they become concerned about the volatility of their owners' equity when the danger arises that their tangible owners' equity will turn negative.

While we do not propose any hypotheses in this regard, we also conduct empirical analyses of the extent to which banks economically hedge the interest rate risk of their fixed-rate securities, the values of which vary inversely with the relevant market interest rates. Banks can economically hedge these value fluctuations in two primary ways. First, they can use interest rate derivatives that may be designated and qualify as fair value hedges of the interest rate risk of their fixed-rate AFS securities.²⁰ In contrast, hedges of the interest rate risk of fixed-rate HTM securities cannot qualify for hedge accounting under ASC 815-20-25-12d and 15f. Second, banks can engage in asset-liability management by holding liabilities with a similar duration as their securities. Banks' primary form of asset-liability management typically involves deposits that have no contractual maturity but in most circumstances are sticky and pay interest rates that exhibit low sensitivity to market interest rate movements. This sort of asset-liability management works only as long as the deposits remain sticky and with low interest rate sensitivity. Non-FDIC-insured deposits are more likely to run, as evidenced by the deposit runs in March 2023 at Silicon Valley, Signature, and First Republic banks, all of which had high proportions of uninsured deposits. More generally, the insured and uninsured deposits of all banks have become more interest rate sensitive as interest rates have risen beginning in August 2021 (Kang-Landsberg, Luck, and Plosser 2023).

3. Sample and Data

Our sample consists of 297 publicly listed U.S. bank and thrift holding companies and stand-alone banks and thrifts (hereafter collectively "banks") from the first quarter of 2012 to the fourth quarter of 2022.²¹ Following the approach described in Appendix C, we hand collect securities transferred between

²⁰ An accounting hedge of the interest rate risk of a fixed-rate asset or liability is a fair value hedge, whereas an accounting hedge of a floating-rate asset or liability is a cash flow hedge.

²¹ Most listed banking entities are structured as bank holding companies (Kim and Kim 2023). Schwab is a thrift holding company. We include stand-alone banks and thrifts in the sample primarily because two recently failed regional banks, Signature and First Republic, and (at least) one regional bank downgraded in 2023, Zions, are stand-alone banks. The sample includes 259 bank holding companies, 22 thrift holding companies, 14 stand-alone banks, and 2 stand-alone thrifts.

AFS and HTM from the notes to the financial statements in banks' Form 10-K filings. For securities transferred from HTM to AFS, we determine from these notes whether the transfers tainted the banks' HTM portfolios and, if not, the reasons why the transfers did not taint the portfolios.

We obtain most financial variables, including non-FDIC insured deposits (which we measure as total deposits less deposits with balances below \$250,000), from the FR Y-9C filings for bank holding companies and Call Reports for stand-alone banks. However, we calculate the weighted-average maturity of AFS securities using data from banks' Form 10-Q and 10-K filings because this data is more consistently disaggregated by maturity bucket than the data in regulatory filings.²² ASC 320 requires quarterly disclosure of the amounts of each major type of AFS securities maturing in four buckets: 1 year or less, 1–5 years, 5–10 years, and over 10 years. We use XBRL to collect the amounts of AFS securities in these buckets, filling in about 30% of missing data with hand collection from the filings. We also collect the amounts of fixed-rate AFS securities that are fair value hedged, which we compare to total AFS securities to determine the amount of hedging, from the financial statement notes in banks' Form 10-Q and 10-K filings, because this information is only available from these filings. ASU 2017-12 first mandates that firms disclose the carrying amount of hedged assets for hedges that receive hedge accounting in 2018Q1. Hence, we observe the amounts of banks' fair value hedges of AFS securities beginning in that quarter.

Lastly, we obtain three-month U.S. Treasury rates from the Federal Reserve Bank of St. Louis. Appendix D provides the definitions of all model variables.

Table 1, Panel A reports descriptive statistics for the model variables for the full sample pooled across years. Panels B, C, and D report these statistics separately for the advanced approaches, opt-out, and non-advanced approaches, respectively, banks. In the full sample, AFS (HTM) securities, on average, constitute 15.4 (3.4) percent of assets. The opt-out banks hold the highest percentages of both classifications

²² Specifically, over five years is the longest maturity bucket for securities in Schedule HC-B of the Y-9C filings for bank holding companies. While Schedule RC-B in the Call Reports for stand-alone or subsidiary banks includes maturity buckets for most types of securities that exhibit a similar level of aggregation as the maturity buckets in financial reports, for other mortgage-backed securities (i.e., any type of mortgage-backed securities other than pass-throughs, including CMOs, REMICs, and stripped securities), an appreciable type of securities for banks, this schedule indicates only whether the expected average life is above or below three years.

of securities at 17.6 percent for AFS and 8.5 percent for HTM. The statistics for the other variables generally are similar to those in prior banking papers.

4. Empirical Results

Visual Evidence of Securities Transfers

To provide descriptive evidence regarding our first hypothesis, we first discuss figures that depict trends in securities transfers by the advanced approaches, opt-out, and non-advanced approaches banks in each year of our 2012–2022 sample period. Figure 1 depicts the dollar amounts of security transfers from AFS to HTM in Panel A and from HTM to AFS in Panel B. Throughout the sample period, advanced approaches banks primarily transferred AFS securities to HTM. The only appreciable exception to this occurred in 2018, when four of these banks transferred sizeable amounts of securities from HTM to AFS upon their early adoption of ASU 2017-12.

Like the advanced approaches banks, the opt-out banks solely transferred securities from AFS to HTM prior to the tailoring rules. At the end of 2019 and in early 2020, around the effective date of the tailoring rules, the opt-out banks transferred substantially all their HTM securities to AFS. As interest rates rose beginning in August 2021, the opt-out banks transferred large amounts of securities from AFS to HTM.

The non-advanced approaches banks have transfers in both directions in the years prior to the interest rate rise period. The largest security transfers are from HTM to AFS in 2018 and 2019, 74 percent (46 of 62) of which invoke ASU 2017-12 or ASU 2019-04. Of these 46 transfers, 76 percent (35) of the banks involved do not have fair value hedges of AFS securities through the end of 2022, suggesting opportunism in their ASU invocations. Similar to the advanced approaches and opt-out banks, the non-advanced approaches banks transfer securities from AFS to HTM in 2021 and 2022 as interest rates rise.

Figure 2 depicts the cumulative effects of these transfers and the initial classifications of newly acquired securities for the three categories of banks in each sample year. Panel A depicts the mean ratio of AFS securities to total assets, Panel B depicts the mean ratio of HTM securities to total assets, and Panel C depicts the mean ratio of HTM securities to the sum of AFS and HTM securities. Because the last ratio

abstracts from growth in the sum of AFS and HTM securities, the trends are easiest to interpret in Panel C, so we discuss only this panel.

For the advanced approaches banks, the proportion of HTM securities rises steadily from about three percent in 2012 to 44 percent in 2021Q3, consistent with the AOCI filter phase out incentivizing HTM classification, and then to 57 percent in 2022Q4, due to the combination of the interest rate rise and the filter removal. For the opt-out banks, this proportion also rises strongly until the effective date of the tailoring rules, at which point it falls sharply to near zero until interest rates begin rising. By 2022Q4, the proportion increases to about 36 percent. For the non-advanced approaches banks, the proportion of HTM securities gradually rises from about 11 percent in 2012 to 18 percent in 2015Q3, then gradually declines back to 11 percent at the end of 2020, and then strongly increases to 23 percent at the end of 2022.

Figure 3 disaggregates the two types of security transfers by the opt-out banks depicted in Figure 1, distinguishing the four opt-out banks that engaged in such transfers. Two of these banks made the predicted transfers around each of the phase-out of the AOCI filter, tailoring rules, and increase in interest rates. U.S. Bancorp transferred securities from AFS to HTM in 2012 in advance of the phase-out of the AOCI filter, then transferred all its HTM securities to AFS in 2019 around the tailoring rules, and finally transferred securities from AFS to HTM in 2021 and 2022 as interest rates rose. Schwab transferred securities from AFS to HTM in 2017 in advance of becoming an advanced approaches bank, then transferred all its HTM securities as AFS in 2019 and 2020 around the tailoring rules, and finally transferred securities from AFS to HTM in 2022 as interest rates rose. The other two opt-out banks made the predicted transfers only at two of these times. Capital One transferred securities from AFS to HTM in 2013 in advance of the phase-out of the AOCI filter and then transferred all its HTM securities to AFS in 2019 around the tailoring rules, but it did not transfer securities from AFS to HTM in 2021 and 2022 as interest rates rose. PNC transferred almost all its HTM securities to AFS in 2019 around the tailoring rules, and it transferred securities from AFS to HTM in 2021 and 2022 as interest rates rose.

Figure 4 disaggregates the transfers of securities from HTM to AFS by the opt-out banks in 2018, 2019, and 2020 depicted in Panel B of Figure 1, distinguishing the rationales for these transfers provided

by the four opt-out banks that engaged in such transfers. The tailoring rules are the predominant rationale in both 2019 and 2020, being invoked by Capital One (\$33.2 billion) and U.S. Bancorp (\$43.6 billion) as of December 31, 2019 and by Schwab (\$136.1 billion) as of January 1, 2020. In addition, ASU 2017-12 was invoked by Capital One (\$9.0 billion) in 2018Q1 (which disclosed last-of-layer hedges that year) and by Schwab (\$8.8 billion) as of January 1, 2019 (despite it having no fair value hedges of AFS securities until 2023Q1). Lastly, PNC invoked ASU 2019-04 (\$16.2 billion) as of January 1, 2020 and ASU 2020-04 (\$49 million) in 2020Q2.

Table 1, Panel E summarizes the number, dollar amount, and associated percentages of transfers of securities from HTM to AFS by all sample banks during the sample period by the stated reasons why the transfers do not taint the banks' HTM portfolios or if the transfers taint the portfolios. We classify a transfer as tainting the HTM portfolio if the bank states that the transfer taints the portfolio or if the bank provides no reason why the transfer does not taint the portfolio and its HTM securities are always zero during the two years after the transfer. Of the 118 total transfers from HTM to AFS, 39 (33.1 percent by frequency but only 3.1 percent by dollar amount) taint the banks' HTM portfolios. The most frequent non-taint reasons are ASU 2017-12 (41 transfers, 34.8 percent) and ASU 2019-04 (14 transfers, 11.9 percent), but the dominant reason in terms of dollar amount is the tailoring rules (\$231.8 billion, 72.3 percent). Interestingly, two non-advanced approaches banks, Truist Financial and Ally Financial, invoke the tailoring rules as the reason for transfers. Truist Financial was formed in the December 2019 merger of BB&T and SunTrust, is larger than three of the opt-out banks, and would have been subject to the AOCI filter removal if not for the tailoring rules. Because neither BB&T nor SunTrust were subject to the AOCI filter removal, we do not classify Truist as an opt-out bank. Ally Financial states that it is no longer subject to liquidity coverage ratio requirements under the tailoring rules. Being freed from these requirements, which do not distinguish AFS and HTM securities, Ally presumably wants the ability to sell the transferred securities.

Regression Analyses of Securities Transfers

To formally test our first hypothesis and the supportive patterns depicted in Figures 1–4, Table 2 reports estimations of spline (i.e., piecewise linear, with the line segments meeting at knots) regression

models that examine how the advanced approaches, opt-out, and non-advanced approaches banks change the classifications of their securities as the AOCI filter is first phased out for the advanced approaches and opt-out banks and then reinstated for the opt-out banks, and finally as interest rates rise toward the end of the 2012–2022 sample period. The dependent variables in these models are one of the following four measures of securities classifications: AFS securities divided by total assets, $AFS/Asset_{i,t}$, in column (1); HTM securities divided by total assets, $HTM/Asset_{i,t}$, in column (2); AFS and HTM securities divided by total assets, $Sec/Asset_{i,t}$, in column (3); and HTM securities divided by total AFS and HTM securities, $HTM/Sec_{i,t}$, in column (4).

The explanatory variables of interest are the interactions between indicators for the three bank categories—advanced approaches (*AA*), opt-out (*opt-out*), and non-advanced approaches (*non-AA*)—and variables that capture the count of quarters during each of the four subperiods of the 2012–2022 sample period: (i) the six quarters before the October 2013 issuance of the final rule for the initial U.S. implementation of Basel III (2012Q1–2013Q2) (pre-Basel III);²³ (ii) the 25 quarters from the issuance of the final rule to the quarter prior to the December 31, 2019 effective date of the tailoring rules (2013Q3–2019Q3) (Basel III); (iii) the eight quarters from the effective date of the tailoring rules to the third quarter of 2021 (2019Q4–2021Q3) (the tailoring rules); and (iv) the five quarters with increasing interest rates (2021Q4–2022Q4) (interest rate rise).²⁴ The quarter-count variable for each subperiod takes a value of zero for the quarters before that period, n for the n^{th} quarter of the period, with n taking values from 1 to the number of quarters in the subperiod, N_s (which equals 6, 25, 8, and 5 for the pre-Basel III, Basel III, tailoring rules, and interest rate rise periods, respectively), and N_s for all subsequent quarters. We denote these

²³ We chose 2013Q3 as the start of the Basel III period because the advanced approaches and opt-out banks often cited the final rule as the reason for transfers of securities from AFS to HTM in 2013Q3 and Q4.

²⁴ We chose 2021Q4 as the first quarter of the interest rate rise period because this is the quarter in which market expectations that interest rates would increase over the near term first jumped strongly. For example, predictions of the federal funds target rate in 2022 by the Federal Reserve Board members and Federal Reserve Bank presidents increased by 0.6 percent from September to December 2021, three times the 0.2 percent increase from June to September 2021. Federal Reserve Board, Summary of Economic Projections for December 14-15 FOMC meeting, <https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20211215.pdf> and <https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20210922.pdf>.

quarter-count variables by the period name followed by *QC*. For example, *Tailoring Rules QC* takes a value of zero for quarters up to 2019Q3 and one for 2019Q4, increases by one for each subsequent quarter during the period up to eight for 2021Q3, and equals eight for all subsequent quarters.

The spline regression model, which also includes five bank-quarter control variables commonly used in bank research and bank fixed effects, is

$$\begin{aligned} \text{Dependent variable}_{i,t} = & \sum_s \sum_c \beta_{c,s} (\text{Bank category } c \times \text{Subperiod } s \text{ QC}) \\ & + \gamma \text{ Controls}_{i,t} + \text{Bank fixed effects.} \end{aligned} \quad (1)$$

Our hypotheses pertain to the signs of the coefficients $\beta_{c,s}$, which equal the estimated average quarterly increases in the dependent variable during subperiod $s \in \{\text{pre-Basel III, Basel III, tailoring rules, interest rate rise}\}$ for banks of category $c \in \{\text{AA, opt-out, non-AA}\}$.

We do not include time fixed effects in the spline regression models used in our primary tests, as doing so would remove the average time trends for the full sample during the four subperiods. Given that non-advanced approaches banks constitute over 95 percent of the sample banks, the inclusion of time fixed effects would approximately suppress the time trends for these banks in all subperiods as well as the trends for any other categories of banks that behave in similar ways in given subperiods. This would be a particular problem for the interest rate rise period during which we expect all three categories of banks to behave the same way. Even for the other subperiods, we view the trends for each of the three categories of banks as more interpretable than the differences of the trends for the advanced approaches and opt-out banks from the suppressed and unexplained trends for the non-advanced approaches banks. In supplemental analysis discussed in Section 5, however, we modify equation (1) by adding time fixed effects and deleting the interactive explanatory variables for the non-advanced approaches banks. Our inferences about the securities classification and interest rate risk–management behavior of the advanced approaches and opt-out banks during the periods prior to the interest rate rise are mostly unaffected.

Columns (1)–(4) of Table 2 report the estimations of equation (1) with $HTM/Assets_{i,t}$, $HTM/Assets_{i,t}$, $Sec_{i,t}/Assets_{i,t}$, and $HTM/Sec_{i,t}$, respectively, as the dependent variable. For ease of interpretation, we again

focus on the estimation of the model with the dependent variable $HTM/Sec_{i,t}$ reported in column (4). For this dependent variable, the findings of Kim et al. (2019) and our first hypothesis imply that the coefficients $\beta_{AA, Basel III}$ and $\beta_{opt-out, Basel III}$ are positive, because the phase-out of the AOCI filter during the Basel III period provided these banks with the incentive to increase HTM securities. This hypothesis further posits that the coefficient $\beta_{opt-out, tailoring rules}$ is negative, because the tailoring rules reinstated the AOCI filter for the opt-out banks, reversing this incentive. Lastly, this hypothesis posits that the coefficient $\beta_{c, interest rate rise}$ is positive for all three categories of banks c , as the banks insulate their regulatory capital from unrealized losses from expected future increases in interest rates.

As hypothesized, the coefficient 0.010 ($p < 0.01$) on $AA * Basel III QC$ reported in column (4) of Table 2 is highly significantly positive, indicating that the advanced approaches banks increase the proportion of their securities classified as HTM (“the HTM proportion”) by 1.0 percent per quarter during the Basel III period. Extending this finding, we find that these banks continue to significantly increase the HTM proportion by 0.7 percent per quarter during the tailoring rules period. Also as hypothesized, we find that advanced approaches banks highly significantly increase this proportion by very sizeable 3.8 percent per quarter during the interest rate rise period, indicating the strength of the banks’ preference to avoid recognizing future unrealized losses when they expect interest rates to rise. This preference is also reflected in our findings for the opt-out and non-advanced approaches banks discussed below.

Unexpectedly, the coefficient on $opt-out * Basel III QC$ reported in column (4), while positive, is insignificant despite the upward slope in the HTM proportion for the opt-out banks depicted in Figure 2, Panel C. This insignificance is attributable mostly to the spline regression allocating much of the large jump in the HTM proportion from 2013Q2 to Q3 to the pre-Basel III period rather than Basel III period so that the line segments for the two subperiods meet at the knot at the end of the former period, and in part to the limited number of opt-out banks. As hypothesized, and unlike our findings for the advanced approaches banks, we find that the opt-out banks highly significantly decrease the HTM proportion by 5.2 percent per quarter during the tailoring rules period. Also as hypothesized, we find that the opt-out banks highly significantly increase the HTM proportion by 9.9 percent per quarter during the interest rate rise period.

We find that the non-advanced approaches banks exhibit no significant change in the HTM proportion during the Basel III period and highly significantly decrease this proportion by 0.6 percent per quarter during the tailoring rules period. As hypothesized, we find these banks highly significantly increase the HTM proportion by 2.7 percent per quarter during the interest rate rise period.

In summary, the visual evidence depicted in Figures 1–4 and the spline regression results reported in Table 2 are, with the exception of the positive but insignificant coefficient on *opt-out*Basel III QC* in column (4) of Table 2, consistent with our first hypothesis. Specifically, we show that the phase-out of the AOCI filter for the advanced approaches and opt-out banks leads the advanced approaches banks to transfer securities from AFS to HTM during the Basel III period, that the reinstatement of the AOCI filter for the opt-out banks leads these banks to transfer securities from HTM to AFS during the tailoring rules period, and that the interest rate rise leads all three categories of banks to transfer securities from AFS to HTM during the interest rate rise period. These transfers are all consistent with the banks’ accounting and regulatory incentives summarized in Appendix B, Panel B, and no distinct economic motivations appear to explain the transfers. The transfers of securities to HTM occur even though these transfers make it more difficult or impossible for the banks to manage the interest rate risk of the securities through sale, transfer, and derivatives-based hedges that receive hedge accounting. As discussed in Section 6, these results thus provide support for recent calls to limit or eliminate the HTM security classification in GAAP.

Visual Evidence of Changes in AFS Securities Interest Rate Risk

To provide descriptive evidence regarding our second hypothesis, Figure 5 depicts the weighted-average maturity of AFS securities for the three categories of banks in each sample year. For advanced approaches banks, the weighted-average maturity of AFS securities exhibits a slight peak at the end of the pre-Basel III period but is overall quite flat from 2012Q1 to 2016Q2, bouncing around in a range from approximately 7.5 to 8.3 years. This weighted-average maturity then increases noticeably to approximately 8.5 years in 2016Q3; this increase is entirely attributable to Bank of America redefining maturity from

expected maturity to contractual maturity.²⁵ This distortion in the time-series can be eliminated either by consistently defining the maturity of residential mortgage backed-securities as 15 years for Bank of America, an approach that is also presented in Figure 5, or by dropping the bank from the sample. After 2016Q3, the weighted-average maturity declines almost monotonically over the remaining sample period to approximately six years in 2022Q4. The pattern of weighted-average maturity up to 2016Q3 is at most modestly explained by the phase-out of the AOCI filter, consistent with the finding of Chircop and Novatny-Farkas (2016) that the advanced approaches banks insignificantly reduced the weighted-average maturity of their AFS securities during the partial phase-out of the AOCI filter through 2014Q3. In contrast, the decline in this weighted-average maturity in subsequent quarters is consistent with the ongoing phase-out of the filter eventually increasing advanced approaches banks' incentives sufficiently for them to reduce the interest rate risk of AFS securities. This incentive strengthens in the interest rate rise period.

For the opt-out banks, the weighted-average maturity of AFS securities is quite flat at approximately 10.3 years until 2014Q2, at which point it drops steadily to approximately 7.4 years in 2018Q4, consistent with the phase-out of the AOCI filter increasing the banks' incentive to reduce the interest rate risk of AFS securities. The weighted-average maturity then rises steadily to approximately 9 years in 2022Q2, consistent with the reinstatement of the AOCI filter under the tailoring rules reversing the banks' incentive to reduce the risk of AFS securities. The weighted-average maturity then drops in the final two quarters of the sample period to approximately 8 years, as the opt-out banks reduce the maturity of AFS securities as interest rates rise.

For the non-advanced approaches banks, the weighted-average maturity of AFS securities is quite flat at approximately 10 years through the end of 2018, at which point it rises to approximately 10.6 years in 2021Q4, perhaps reflecting a search for yield when interest rates fell during the COVID-19 pandemic.

²⁵ Bank of America's Form 10-Q filing for 2016Q3, p. 118, indicates that its maturity disclosures reflect the contractual maturity of securities, whereas its Form 10-Q filing for 2016Q2, p. 138, indicates that these disclosures reflect the expected maturity of securities. This change is primarily important for fixed-rate residential mortgage-backed securities, for which the underlying mortgages are prepayable without penalty.

The weighted-average maturity then falls to approximately 9.7 years in 2022Q4, as the banks reduce the maturity of AFS securities as interest rates rise.

Regression Analyses of Changes in AFS Securities Interest Rate Risk

To formally test our second hypothesis and the supportive patterns depicted in Figure 5, Table 3 reports estimations of spline regression models that examine how the advanced approaches, opt-out, and non-advanced approaches banks change the interest rate risk of their AFS securities during the four subperiods of our 2012–2022 sample period. The spline models have the same structure and explanatory variables as equation (1), as well as analogous interpretations of coefficients as in Table 2. The dependent variables are one of the following measures of the interest rate risk of AFS securities or of AFS plus HTM (hereafter, total) securities: the weighted-average maturity of AFS securities, $AFS\ Maturity_{i,t}$, in column (1); the weighted-average maturity of AFS securities calculated consistently using 15 years as the maturity of residential mortgage-backed securities for Bank of America, $AFS\ Maturity\ Adj_{i,t}$, in column (2); the weighted-average maturity of AFS securities setting the value of the variable as missing for Bank of America, $AFS\ Maturity\ exBoA_{i,t}$, in column (3); and the weighted-average maturity of total securities calculated consistently using 15 years as the life of residential mortgage-backed securities for Bank of America, $Sec\ Maturity\ Adj_{i,t}$, in column (4). While our second hypothesis pertains to the interest rate risk of AFS securities, we examine the fourth dependent variable to determine whether and the extent to which changes in the weighted-average maturity of AFS securities reflect transfers of long-maturity securities between the AFS and HTM securities portfolios.

The dependent variables in columns (2) and (4) reflect one approach to sterilizing Bank of America’s redefinition of maturity from expected maturity to contractual maturity in 2016Q3, which yields the dramatic increase in $AFS\ Maturity_{i,t}$ for the advanced approaches banks in that quarter depicted in Figure 5. The dependent variable in column (3) reflects an alternative approach to this sterilization that can equally well be viewed as a sample restriction. The two approaches yield similar reductions of the coefficient $\beta_{AA, Basel\ III}$, and neither approach affects our inferences regarding any of the other coefficients involved in our second hypothesis.

For the dependent variable in columns (1)–(3), our second hypothesis posits that the coefficients $\beta_{AA, \text{Basel III}}$ and $\beta_{\text{opt-out}, \text{Basel III}}$ are negative, because the phase-out of the AOCI filter during the Basel III period provided the advanced approaches and opt-out banks with the incentive to decrease the maturity of AFS securities. This hypothesis further posits that the coefficient $\beta_{\text{opt-out}, \text{tailoring rules}}$ is positive, because the tailoring rules reinstated the AOCI filter for the opt-out banks. Lastly, this hypothesis posits that the coefficient $\beta_{c, \text{interest rate rise}}$ is negative for all three categories of banks c , as each of these categories decrease the maturity of AFS securities to avoid unrealized losses during the interest rate rise period.

To sidestep the need to discuss the effects of the distortion resulting from Bank of America redefining the maturity of residential mortgage-backed securities in 2016Q3, we discuss only the estimations with dependent variables *AFS Maturity Adj_{i,t}* and *Sec Maturity Adj_{i,t}* reported in columns (2) and (4), respectively, of Table 3. Consistent with our second hypothesis, these results indicate that the advanced approaches banks reduce the weighted-average maturity of AFS securities during the Basel III period. Specifically, the weakly significant coefficient -0.016 ($p < 0.10$) on *AA*Basel III QC* in column (2) implies that advanced approaches banks decrease this weighted-average maturity by 0.016 years per quarter during the Basel III period. However, the highly significant coefficient 0.015 ($p < 0.01$) on *AA*Basel III QC* in column (4) implies that advanced approaches banks increase the weighted-average maturity of total securities by 0.015 years per quarter during the Basel III period. Collectively, these coefficients suggest that the advanced approaches banks both transferred long-maturity securities from AFS to HTM and acquired additional long-maturity securities and classified them as HTM during the Basel III period, thereby increasing the weighted-average maturity of total securities.

These results indicate that the advanced approaches banks continue to significantly reduce the weighted-average maturity of AFS securities during the tailoring rules and interest rate rise periods. Specifically, the highly significantly negative coefficient on *AA*Tailoring Rule QC* in column (2) implies that advanced approaches banks decrease this weighted-average maturity by 0.153 years per quarter during the tailoring rules period, while the highly significantly negative coefficient on *AA*Interest Rate Rise QC* in column (2) implies that advanced approaches banks decrease the weighted-average maturity by 0.170

years per quarter during the interest rate rise period. The coefficients on these variables are also highly significantly negative in column (4), albeit less so than in column (2), consistent with the reduction of the weighted-average maturity of AFS securities during these subperiods being partly attributable to the transfer of long-maturity securities from AFS to HTM.

Also consistent with our second hypothesis, the highly significantly negative coefficient on *opt-out*Basel III QC* in column (2) implies that the opt-out banks decrease the weighted-average maturity of AFS securities by 0.131 years per quarter during the Basel III period. The corresponding coefficient in column (4) has similar magnitude and significance, suggesting that this decrease did not result from the opt-out banks transferring long-maturity securities from AFS to HTM. Most importantly, and in striking contrast to the findings for advanced approaches banks discussed above, the highly significantly positive coefficient on *opt-out*Tailoring Rule QC* in column (2) implies that the opt-out banks increase the weighted-average maturity of AFS securities by 0.117 years per quarter during the tailoring rules period. However, the corresponding coefficient in column (4) is insignificant and close to zero, suggesting that this increase is entirely attributable to the opt-out banks transferring long-maturity securities from HTM to AFS. Unexpectedly, the insignificant coefficient on *opt-out*Interest Rate Rise QC* in column (2) indicates that the opt-out banks did not reduce the weighted-average maturity of AFS securities during the interest rate rise period. Inspection of Figure 5 reveals that this insignificance is attributable to this maturity increasing early and decreasing late in the subperiod. However, the corresponding coefficient in column (4) is significantly positive, suggesting that the weighted-average maturity of AFS securities would have risen had the opt-out banks not transferred long maturity securities from AFS to HTM during the subperiod.

While we make no hypothesis regarding the non-advanced approaches banks prior to the interest rate rise period, the results indicate that these banks do not significantly change the maturity of AFS securities during the Basel III period and highly significantly increase this maturity by 0.135 years per quarter during the tailoring rules period. Lastly, as hypothesized, the results indicate that the non-advanced approaches banks highly significantly decrease the weighted-average maturity of AFS securities by 0.263 years per quarter during the interest rate rise period. All these effects are similar for the maturity of total

securities in column (4), suggesting that they are not attributable to transfers of long-maturity securities between AFS and HTM.

In summary, except for the negative but insignificant coefficient for the opt-out banks during the interest rate rise period, the visual evidence depicted in Figure 5 and the spline regression results reported in Table 3 are consistent with our second hypothesis. Specifically, the phase-out of the AOCI filter for advanced approaches and opt-out banks in the Basel III period leads these banks to reduce the weighted-average maturity of their AFS securities, the reinstatement of the AOCI filter for the opt-out banks in the tailoring rules period leads these banks to increase this maturity, and the advanced approaches and non-advanced approaches banks decrease the maturity during the interest rate rise period.

In isolation, the results for the weighted-average maturity of AFS securities for the advanced approaches and opt-out banks during the Basel III and tailoring rules periods indicate that the AOCI filter encourages banks to accept interest rate risk in their AFS securities portfolios, and thus support recent calls to eliminate or restrict the applicability of the AOCI filter (Barr 2023). However, some of these results are attributable to banks' transfers of long-maturity securities between the AFS and HTM portfolios, which suggests that any decision about the AOCI filter should be made in conjunction with decisions about whether to limit or eliminate the HTM category or restrict transfers between AFS and HTM.

Admittedly, the results of the tests of our second hypothesis are not as sharp around the regulatory changes as the prior results of the tests of the first hypothesis regarding the three categories of banks' classification of securities. This lesser sharpness likely reflects the greater amount of time necessary to change the interest rate risk of securities than to change their accounting classifications. It may also reflect limitations of the calculation of the weighted-average maturity using the wide maturity buckets in financial report disclosures.

Evidence of the Extents of Hedging of Fixed-Rate AFS Securities and Uninsured Deposits

In this section, we provide descriptive evidence regarding the extents to which the three categories of banks economically hedge their fixed-rate AFS securities using interest rate derivatives that qualify for hedge accounting or with runnable non-FDIC guaranteed deposits. Reflecting the increase in uninsured

deposits since the most recent increase in the FDIC insurance cap to \$250,000 per depositor in 2008, average uninsured deposits as a percentage of assets is 36.5 percent in the full sample and 55.1 (35.1) [35.8] percent for the advanced approaches (opt-out) [non-advanced approaches] banks.

Figure 6 depicts the amortized cost of AFS securities that are designated as the hedged items in qualifying fair value hedges divided by the amortized cost of all AFS securities (the “hedging ratio”). The figure depicts the hedging ratio beginning in 2018Q1, the first quarter for which banks provide the necessary data under ASU 2017-12. The figure shows that the advanced approaches banks dramatically increased their average hedging ratio from approximately 10 percent in 2018Q1 to over 35 percent in 2022Q4. In contrast, the opt-out banks, which engaged in almost as much hedging as the advanced approaches banks in 2018Q1, reduced their hedging ratio by about 70 percent by 2022Q3, with the decline primarily occurring around the effective date of the tailoring rules. The non-advanced approaches banks hedged relatively little throughout the sample period. While we do not discuss the estimations of spline regression models analogous to those in prior tables to conserve space, for completeness, column (1) of Table 4 reports the estimation of such a model with the hedging ratio as the dependent variable.

Figure 7 depicts banks’ non-FDIC insured deposits divided by total assets beginning in 2012Q1. This ratio is consistently higher for the advanced approaches banks than for the opt-out and non-advanced approaches banks. The ratio generally rises for all three categories of banks during our sample period until early 2022, shortly after interest rates start increasing. Comparison of Figures 1 and 7 reveals that at this time uninsured deposits constitute an unusually high proportion of total assets for all three categories of banks, increasing their exposure to run risk, yet they are transferring large amounts of securities from AFS to HTM.²⁶ The ratio falls during the remainder of 2022 as uninsured depositors withdraw funds. The decrease in the ratio in 2022 is largest for the opt-out banks and smallest for the advanced approaches banks, which depositors may view as too big to fail. While we do not discuss the estimations of spline regression

²⁶ This time-series finding complements Granja’s (2023) cross-sectional finding that banks with higher uninsured deposits were more likely to transfer securities to HTM during the interest rate rise period.

models analogous to those in prior tables to conserve space, for completeness, column (2) of Table 4 reports the estimation of such a model with the ratio of uninsured deposits to assets as the dependent variable.

In summary, the visual evidence depicted in Figures 6 and 7 and the spline regression results reported in Table 4 indicate that, in the wake of the tailoring rules, the opt-out banks both have hedged the interest rate risk of their fixed-rate AFS securities to a low and decreasing extent and are increasingly exposed to runs of uninsured deposits that would cause their asset-liability management to fail. In contrast, the advanced approaches banks have hedged the interest rate risk of their fixed-rate AFS securities to a considerably greater extent as interest rates rose, though these banks have even higher levels of uninsured deposits than the opt-out banks. Whether the advanced approaches banks are sufficiently well hedged or otherwise protected (e.g., by too-big-to-fail policies) so that runs of uninsured deposits are unlikely to occur remains to be determined. The non-advanced approaches banks have not hedged the interest rate risk of their fixed-rate AFS securities appreciably and are increasingly exposed to runs of uninsured deposits.

5. Supplemental Analyses

In this section, we briefly discuss three sets of untabulated supplemental analyses. First, we conduct analyses to determine whether banks' transfers of securities from AFS to HTM, which reduced their ability to manage the risk of the securities, are associated with negative consequences for the banks. We regress banks' average bond returns in quarter $q+1$ and their change in uninsured deposits divided by total assets in quarter $q+1$ on their transfers of securities from AFS to HTM scaled by either total assets or securities in quarter q . We find that the coefficients on the transfers are highly significantly negative for the full sample of banks and for the subsamples of opt-out and non-advanced approaches banks, but that the coefficients are insignificant for the subsample of advanced approaches banks. Hence, transfers of securities from AFS to HTM appear to be associated with negative consequences for the opt-out and non-advanced approaches banks. We also conduct these analyses for securities transfers from HTM to AFS and find that these transfers have positive consequences that are concentrated in the opt-out banks, which transferred very large amounts of securities out of HTM without tainting.

Second, as mentioned in Section 3, we reestimate the spline regressions reported in Tables 2 through 4, adding time (year-quarter) fixed effects and deleting the interactive variables for the non-advanced approaches banks, as the time fixed effects approximately capture the time trends for these banks in each subperiod. The inferences regarding the behavior of the advanced approaches and opt-out banks in the Basel III and tailoring rules periods, in which we expect their behavior to differ from that of the non-advanced banks, are the same as those drawn from our primary results with the following exception. The reestimated Table 3 regressions indicate that the opt-out banks insignificantly change the weighted-average maturity of AFS securities during the tailoring rules period, whereas Table 3 reports that the opt-out banks increase this maturity during this subperiod. This exception is explained by the non-advanced approaches banks also increasing this maturity in the tailoring rules period.

Third, while we document strikingly discretionary behavior by the opt-out banks, these banks are not strictly comparable to either the larger advanced approaches banks or the smaller non-advanced approaches banks. Hence, to provide comfort regarding the robustness of these results, we constructed a synthetic control for the opt-out banks following prior studies (e.g., Abadie, Diamond, and Hainmueller 2010; Abadie 2021; Bourveau, Coulomb, and Sangnier 2021).²⁷ To implement the synthetic control method, we first combine the opt-out banks into a single treatment unit by averaging the values of the variables in our main analyses for these banks. Using the tailoring rules as the policy treatment for the opt-out banks, we set the Basel III period as the pre-treatment period and the tailoring rules and interest rate rise periods as the post-treatment period. We construct the synthetic control from the five smallest advanced approaches banks and the five largest non-advanced approaches banks (excluding Truist because its behavior is similar to that of the opt-out banks for reasons discussed in Section 4). We weight the observations for the ten control banks to match the average of each outcome variable for the treatment unit during the pre-treatment

²⁷ The synthetic control method is typically applied in a setting with a small number of affected aggregate entities (e.g., countries or regions) and a small number of unaffected entities. With few potential control entities, it is often difficult to find a single control entity that provides a good comparison for each treatment entity. Hence, a synthetic control is constructed as a weighted average of the control entities to approximate the characteristics of the average of the treatment entities (Abadie 2021).

period as closely as possible.²⁸ We then compare the trends in each outcome variable for the treatment unit and the synthetic control in both the pre- and post-treatment periods. For each outcome variable, we find that the treatment unit behaves similarly to the synthetic control prior to the tailoring rules, consistent with the synthetic control constituting a valid counterfactual of what would have been observed for the opt-out banks in the absence of the policy treatment, but significantly differently afterward, consistent with the behavior of the opt-out banks documented in our primary results.

6. Implications for Accounting Standard Setting and Bank Regulation

In the wake of the March 2023 failures of Silicon Valley, Signature, and First Republic banks, the allowed classification of securities as HTM and the AOCI filter, both of which ignore unrealized gains and losses on securities, have come into question, as they often do after financial crises. Regarding HTM classification, Sandy Peters, the head of financial reporting policy for the CFA Institute, and Jeff Mahoney, the General Counsel for the Council of Institutional Investors recommend that the FASB consider the elimination of the HTM classification because “fair value accounting for financial instruments, accompanied by robust disclosures, provides investors with more informative reporting than...amortized cost accounting that accompanies the held-to-maturity classification for debt securities” (Mahoney 2023, p. 4); because “management intent and business model do not change the value of financial instruments. The HTM classification only makes it harder for investors and depositors to see” (Peters 2023); and because the unverifiability of firms’ asserted intent to hold securities to maturity (Mahoney 2023, p. 6, citing a 1991 U.S. General Accounting Office report issued in the wake of the thrift crisis, which raised very similar concerns about amortized cost accounting). Regarding the AOCI filter, in the cover letter to the Federal Reserve’s April 2023 post-mortem review of Silicon Valley Bank, Michael S. Barr, the Federal Reserve’s

²⁸ Specifically, we first explain the average of the outcome variable over the pre-treatment period using the averages of the control variables in our main analyses (*Size*, *EBLLP*, *Deposit*, *CapRatio Lag*, and *Net Income*) over this period as well as the outcome variable in the first and last quarters of the pre-treatment period. The inclusion of lagged outcome variables in the set of predictor variables follows Abadie et al. (2010, p. 499) and yields closer to perfectly parallel trends in the outcome variables for the synthetic control and the treatment entity in the pre-treatment period, but it does not affect our inferences. We then estimate the optimal weights for the ten control banks by minimizing the mean squared prediction error for the average of the outcome variable over the pre-treatment period.

Vice Chair for Supervision, states that “we should require a broader set of firms to take into account unrealized gains or losses on available-for-sale securities, so that a firm’s capital requirements are better aligned with its financial positions and risk” (Barr 2023, p. 3).

Our study provides evidence that directly supports two of these concerns. First, consistent with management’s intent to hold securities to maturity being unverifiable, we show that banks’ classification of securities as HTM is fluid and driven by the goal of protecting their regulatory capital and tangible owners’ equity from unrealized losses. This protection became desirable for the advanced approaches and opt-out banks when the AOCI filter was phased out during the Basel III period, and for all banks when interest rates started rising sharply in late 2021. When the opt-out banks ceased to need this protection due to the restatement of the AOCI filter in the tailoring rules period, these banks transferred very sizeable amounts of securities out of HTM, mostly justifying the transfers by questionable invocations of the tailoring rules to transfer securities out of HTM without taint. This evidence provides support for recent calls to limit or eliminate the HTM category and the associated amortized cost accounting for securities.

In our estimation, however, limiting or eliminating the HTM category would be difficult because the political environment that led to FAS 115 discussed in Section 2 appears to remain largely unchanged.²⁹ This environment reflects disagreement about the relative importance of the accounting for securities (1) being robust to the infrequent but severely unfavorable economic circumstances under which banks’ economic hedges of fixed-rate securities by deposits that lack contractual maturity but are usually sticky breaks down versus (2) capturing the frequent and relatively favorable economic circumstances where this hedge holds. A more feasible alternative might be to increase enforcement of the existing GAAP restrictions on transfers of securities in and out of HTM.

²⁹ For example, in a survey titled “Banks’ Business Model” conducted by the Kent A. Clark Center for Global Markets at Chicago Booth on May 17, 2023, the 39 surveyed financial economists exhibit considerable variation in their responses to the question “For the purposes of capital regulation, banks should be required to mark their holdings of Treasury and Agency securities to market at all times (even though their loans are not marked to market).” See <https://www.kentclarkcenter.org/surveys/banks-business-model/> for a summary of the panelists’ diverse responses.

Second, consistent with the AOCI filter reducing banks' incentive to manage their risks, we provide evidence that the advanced approaches and opt-out banks reduce the weighted-average maturity of their AFS securities as the AOCI filter is phased out during the Basel III period. We further show that when the AOCI filter is reinstated for the opt-out banks in the tailoring rules period, these banks increase the maturity of their AFS securities and reduce their fair value hedges of those securities, while the advanced approaches banks continue to reduce the maturity of their AFS securities and increase their fair value hedges of those securities. Some of these changes in the maturity of AFS securities appear attributable to banks' transfers of long-maturity securities between the AFS and HTM portfolios. This evidence provides support for the July 27, 2023 proposed rule that would phase out the AOCI filter for banks with assets above \$100 billion over three years starting on July 1, 2025 to achieve "better alignment of regulatory capital with market participants' assessment of loss-absorbing capacity."³⁰

The expansion of the phase-out of the AOCI filter is also subject to disagreement for much the same reasons as discussed above regarding the limitation or elimination of the HTM category. In addition, our findings suggest that, if this rule is accepted, the affected banks would transfer AFS securities to HTM and classify a greater proportion of newly acquired securities as HTM. Hence, we recommend that any decision about the AOCI filter be made in conjunction with decisions about whether to limit or eliminate the HTM category or to restrict transfers of securities in and out of HTM.

7. Conclusion

The regulatory "AOCI filter" removes accumulated other comprehensive income, which primarily includes unrealized gains and losses on available-for-sale (AFS) securities, from banks' Tier 1 (and total) capital. In this study, we examine the classifications of securities as AFS versus as held to maturity (HTM) and the management of the interest rate risk of AFS securities during 2012–2022 by three categories of banks differentially subject to the AOCI filter during this period: (1) "advanced approaches" banks with assets above \$700 billion or foreign exposures above \$75 billion, (2) "opt-out" banks with assets from \$250

³⁰ <https://www.govinfo.gov/content/pkg/FR-2023-09-18/pdf/2023-19200.pdf>

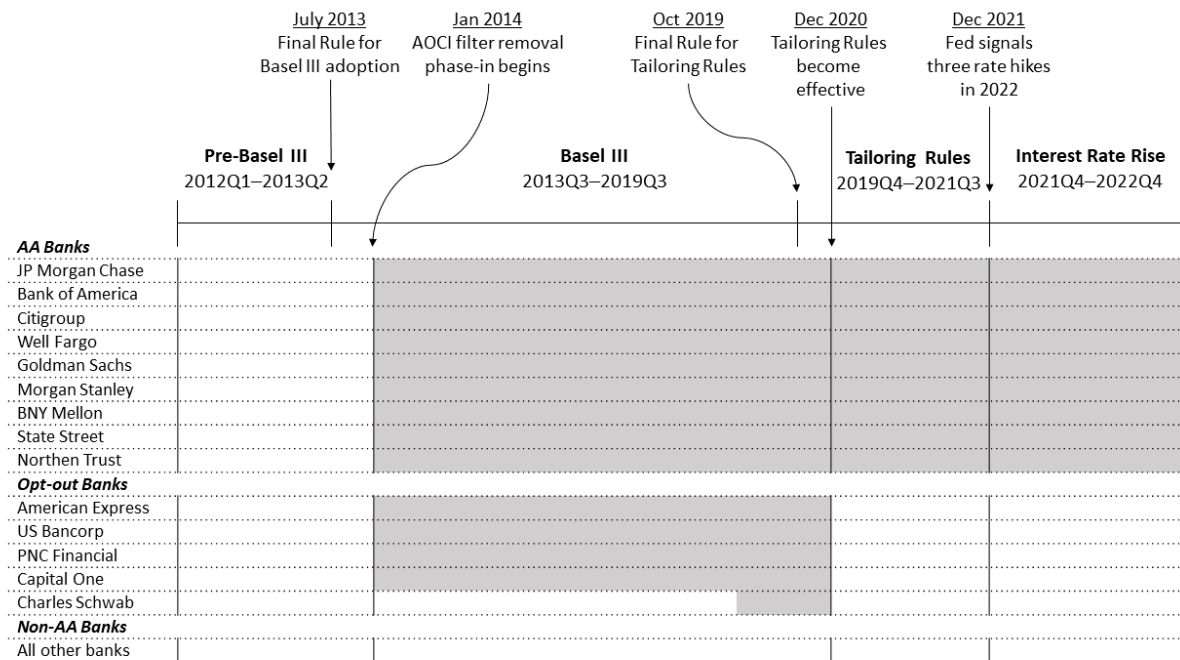
billion to \$700 billion or foreign exposures from \$10 billion to \$75 billion, and (3) “non-advanced approaches” banks with assets below \$250 billion and foreign exposures below \$10 billion. We examine the behavior of these categories of banks during four subperiods: (1) the “pre-Basel III” period 2012Q1–2013Q2, during which the AOCI filter applied to all three bank categories, thereby protecting their regulatory capital from unrealized gains and losses on AFS securities; (2) the “Basel III” period 2013Q3–2019Q3, during which the AOCI filter was phased out over five years for the advanced approaches and opt-out banks; (3) the “tailoring rules” period 2019Q4–2021Q3, during which the AOCI filter was reinstated for the opt-out banks; and (4) the “interest rate rise” period 2021Q4–2022Q4, when interest rates rose sharply, yielding very sizeable unrealized losses for all three sets of banks.

We hypothesize and provide visual and spline regression evidence that the phase-out of the AOCI filter during the Basel III period incentivized advanced approaches and opt-out banks to transfer AFS securities as HTM and to reduce the interest rate risk of AFS securities, that the reinstatement of the AOCI filter during the tailoring rules period reversed these incentives for the opt-out banks, and that the sharp increase in interest rates during the interest rate rise period provided all banks with the incentive to transfer AFS securities as HTM and to reduce the risk of AFS securities. We also provide visual and spline regression evidence that the advanced approaches banks hedge the interest rate risk of fixed-rate AFS securities to an appreciable and increasing extent during our sample period, while the opt-out banks do so to a lesser and decreasing extent and the non-advanced approaches banks do so hardly at all. We find that the percentage of deposits that are not insured by the FDIC increases strongly for all three categories of banks until the interest rate rise period when withdrawals of these deposits begin. Our findings have implications for accounting standard setting and bank regulation discussed in the prior section.

Appendix A

Timeline of Events and the Applicability of the AOCI Filter by Bank Category

The top of the figure below plots the timeline of events around the four distinct subperiods of our sample period that we examine: (1) the pre-Basel III period before the issuance of the final rule specifying the phase-out of the AOCI filter for advanced approaches banks, including the opt-out banks (2012Q1–2013Q2); (2) the Basel III period during which the AOCI filter is phased out for these banks (2013Q3–2019Q3); (3) the tailoring rules period in which the AOCI filter is reinstated for the opt-out banks (2019Q4–2021Q3); and (4) the interest rate rise period (2021Q4–2022Q4). Below the timeline, the periods during which AOCI filter is being phased-out or is fully removed for each of the individual advanced approaches and opt-out banks are shaded in gray. Charles Schwab’s AOCI filter was removed (the phase-out being complete) in 2019Q1 because it passed the \$250 billion asset threshold in 2018.



Appendix B
Accounting Classification of Debt Securities and Banks' Preferred Classification

Panel A. Accounting Classification of Debt Securities

Classification	Required Intent	Balance Sheet Measurement	Periodic Unrealized Gains/Losses
Held to maturity (HTM)	Intent and ability to hold to maturity	Amortized cost	Not recognized
Available for sale (AFS)	None (catchall for no firm intent)	Fair value	Recognized in accumulated other comprehensive income (AOCI)
Trading	Intent to trade	Fair value	Recognized in net income

Panel B. Banks' Preferred Security Classifications by Category of Bank and Subperiod

	Subperiod			
	Pre-Basel III 2012Q1–2013Q2	Basel III 2013Q3–2019Q3	Tailoring Rules 2019Q4–2021Q3	Interest Rate Rise 2021Q4–2022Q4
Advanced approaches	AFS	→ HTM	HTM	HTM
Opt-out	AFS	→ HTM	→ AFS	→ HTM
Non-advanced approaches	AFS	AFS	AFS	→ HTM

Arrows indicate changes in the classification preferences of the three bank categories from one subperiod to the next.

Appendix C

Examples of Disclosure of Securities Transferred Between AFS and HTM

Banks disclose transfers of securities between AFS and HTM in the notes to the financial statements, typically either the investment securities note (see the examples from Charles Schwab’s 2020Q1 Form 10-Q filing and New York Community Bancorp’s 2017Q2 Form 10-Q filing below) or the significant accounting policies note. Banks also typically disclose these transfers in the cash flow statement as supplemental information about significant non-cash investing activities (see the Charles Schwab example). To determine whether a transfer of securities from HTM to AFS tainted a bank’s HTM portfolio, we read the bank’s note disclosures in the period of the transfer. We deem the bank’s HTM portfolio tainted if the bank indicates the portfolio is tainted or if the bank provides no reason why the transfer does not taint the portfolio and its HTM securities balance is always zero during the following two years.

Example of disclosure in the notes without tainting (emphasis added):

“In accordance with ASC 320 and as of January 1, 2020, the Company transferred all of its investment securities designated as HTM to the AFS category **without tainting** our intent to hold other debt securities to maturity.”

Charles Schwab Corp 2020Q1 10-Q, note 4 (Investment Securities), p. 32.

<https://www.sec.gov/Archives/edgar/data/316709/000031670920000021/schw-03312020x10q.htm>

Example of disclosure in the notes with tainting (emphasis added):

“... during the six months ended June 30, 2017, the Company sought to take advantage of favorable bond market conditions and **sold held-to-maturity securities** with an amortized cost of \$521.0 million resulting in gross proceeds of \$547.9 million including a gross realized gain of \$26.9 million. **Accordingly**, the Company **transferred the remaining \$3.0 billion of held-to-maturity securities to available-for-sale** with a net unrealized gain of \$82.8 million classified in other comprehensive loss in the Consolidated Statements of Condition.”

New York Community Bancorp 2017Q2 10-Q, note 4 (Securities), p. 7.

<https://www.sec.gov/Archives/edgar/data/910073/000119312517252739/d420470d10q.htm>

Example of disclosure in the cash flow statement:

THE CHARLES SCHWAB CORPORATION			
Condensed Consolidated Statements of Cash Flows			
(in Millions)			
(Unaudited)			
		Three Months Ended March 31,	
		2020	2019
Supplemental Cash Flow Information			
Non-cash investing activity:			
Securities transferred from held to maturity to available for sale, at fair value	\$	136,099	\$ 8,771

Appendix D
Variable Definitions

Variable Name	Definition
AFS/Asset	Fair value of AFS securities (1773) minus AFS equity securities (A511) divided by total assets (2170) until 2017Q4 and fair value of AFS debt securities (1773) divided by total assets (2170) since 2018Q1, from bank regulatory filings.
HTM/Asset	Amortized cost of HTM securities (1754) divided by total assets (2170), from bank regulatory filings.
Sec/Asset	Sum of the fair value of AFS securities (1773) and amortized cost of HTM securities (1754) divided by total assets (2170), from bank regulatory filings. AFS equity securities (A511) is subtracted from fair value of AFS securities until 2017Q4.
HTM/Sec	Amortized cost of HTM securities (1754) divided by the sum of the fair value of AFS securities (1773) and amortized cost of HTM securities (1754), from bank regulatory filings. AFS equity securities (A511) is subtracted from fair value of AFS securities until 2017Q4.
AFS Maturity	Maturity-weighted AFS debt securities where the maturity weights are 0.5 for maturities one year or less; 3 for maturities over one year through five years; 7.5 for maturities over five years through ten years; 15 for maturities over 10 years and securities with no single maturity, following English et al. (2018).
AFS Maturity Adj.	Same as <i>AFS Maturity</i> except that, for Bank of America, all mortgage-backed securities other than commercial mortgage-backed securities are classified as having maturities over 10 years during the quarters until 2016Q4.
Sec Maturity Adj.	Maturity-weighted AFS and HTM debt securities adjusting for Bank of America until 2016Q4, calculated with the same weights as <i>AFS Maturity Adj.</i>
Hedged AFS/AFS	Amortized cost basis of hedged AFS debt securities (from 10-Q and 10-K filings) divided by the amortized cost of AFS debt securities (1772) from bank regulatory filings. Available since 2018Q1.
Uninsured Deposits/Asset	Total deposits (2200) minus deposits of \$250,000 or less (F045+F049), aggregated from Call Reports, divided by total assets (2170), from bank regulatory filings.
AA	Equals one for nine banks designated advanced approaches under the tailoring rules.
opt-out	Equals one for five banks that opted out of the AOCI filter under the tailoring rules.
non-AA	Equals one for banks that were never subject to AOCI filter removal.
Pre-Basel III QC	Takes a value of one for 2012Q1, increases by one for each subsequent quarter during the period up to six for 2013Q2, and equals six for all subsequent quarters
Basel III QC	Takes a value of zero for quarters up to 2013Q2 and one for 2013Q3, increases by one for each subsequent quarter during the period up to 25 for 2019Q3, and equals 25 for all subsequent quarters.
Tailoring Rule QC	Takes a value of zero for quarters up to 2019Q3 and one for 2019Q4, increases by one for each subsequent quarter during the period up to eight for 2021Q3, and equals eight for all subsequent quarters.
Interest Rate Rise QC	Takes a value of zero for quarters up to 2021Q3 and one for 2021Q4, and increases by one for each subsequent quarter during the period up to 5 for 2022Q4.
Size	Natural logarithm of total assets measured in thousands (2170), from bank regulatory filings.

EBLLP	Earnings (4301) before loan loss provisions (4230) divided by one-quarter-lagged total loans (B528), from bank regulatory filings.
Deposit	Total deposits (6631+6633) divided by total assets (2170), from bank regulatory filings.
CapRatio Lag	One-quarter-lagged total equity (G105) divided by total assets (2170), from bank regulatory filings.
Net Income	Net income (4340) divided by one-quarter-lagged total assets (2170), from bank regulatory filings.

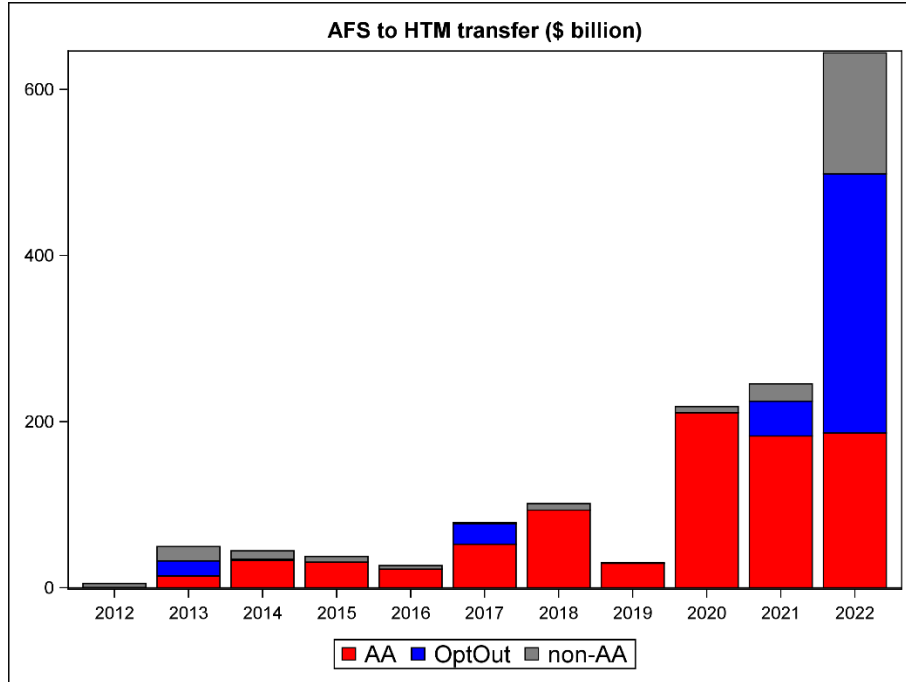
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Figure 1
Transfers of Investment Securities between AFS and HTM Classifications
Each Year from 2012 to 2022 by Bank Category

Panel A. Transfers from AFS to HTM



Panel B. Transfers from HTM to AFS

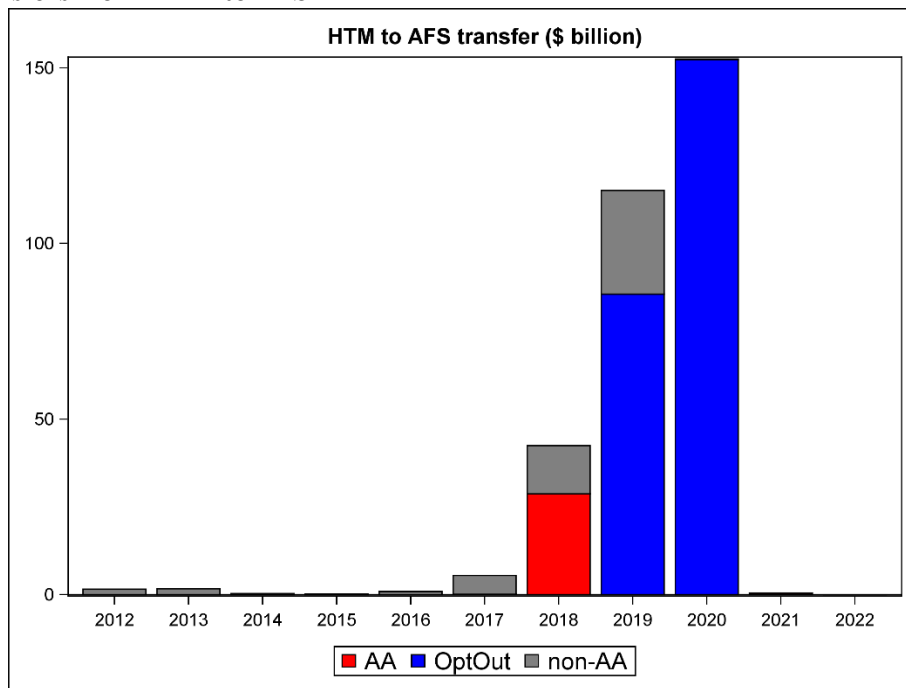
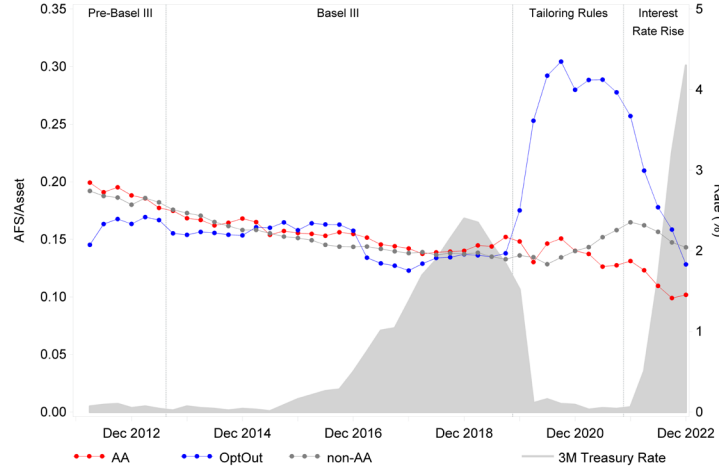
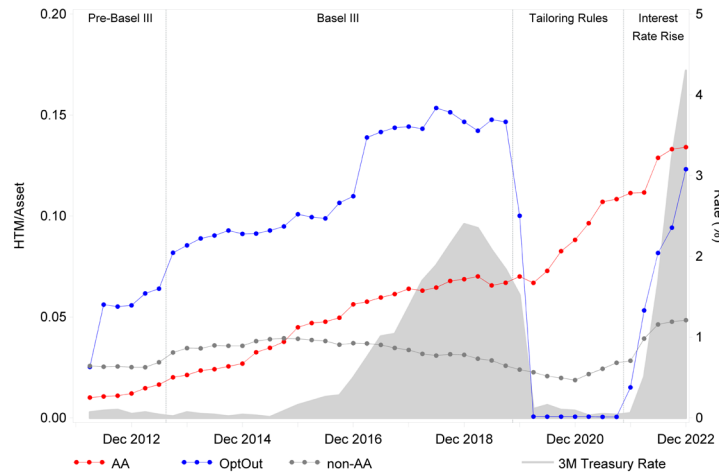


Figure 2
AFS and HTM Investment Securities as Proportions of Assets
Each Year from 2012 to 2022 by Bank Category

Panel A. AFS Securities/Assets



Panel B. HTM Securities/Assets



Panel C. HTM Securities/(AFS + HTM Securities)

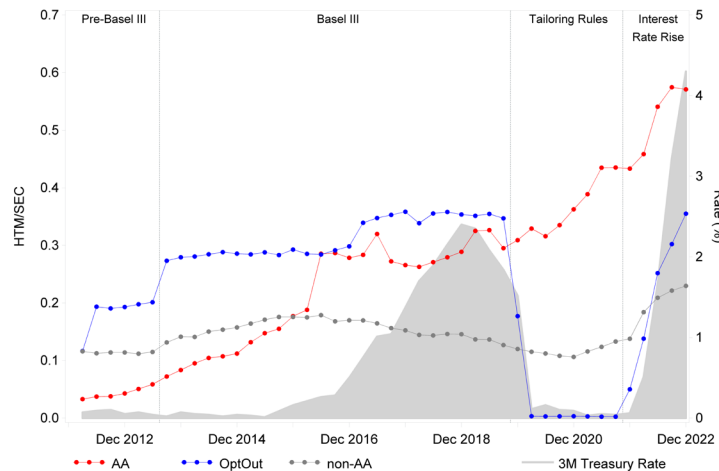
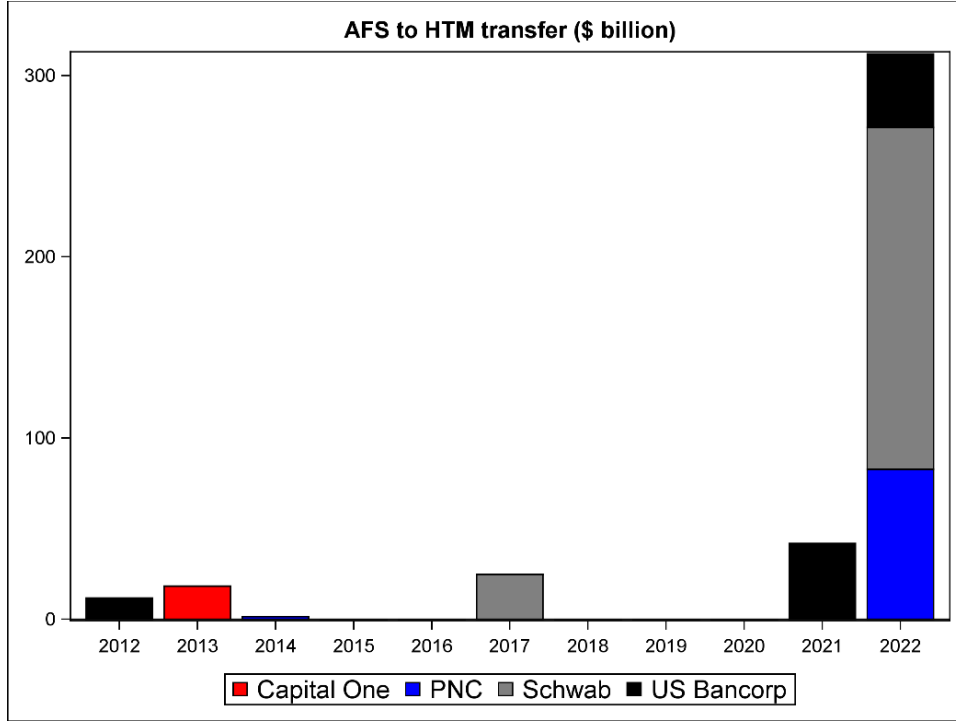


Figure 3
Transfers of Investment Securities between AFS and HTM Classifications
Each Year from 2012 to 2022 by Individual Opt-out Banks

Panel A. Transfers from AFS to HTM



Panel B. Transfers from HTM to AFS

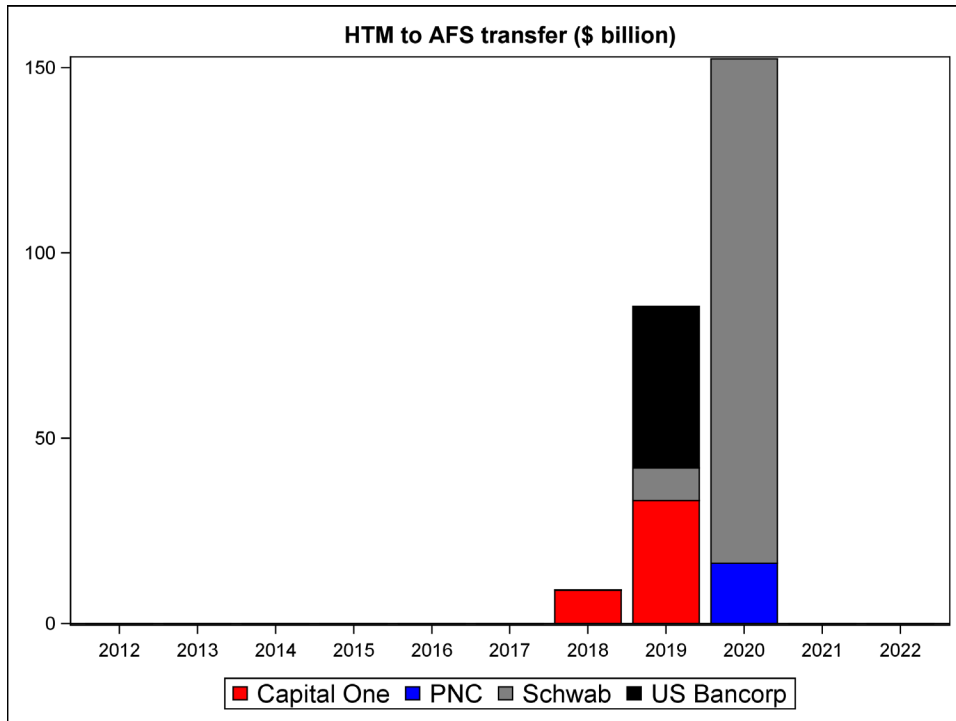
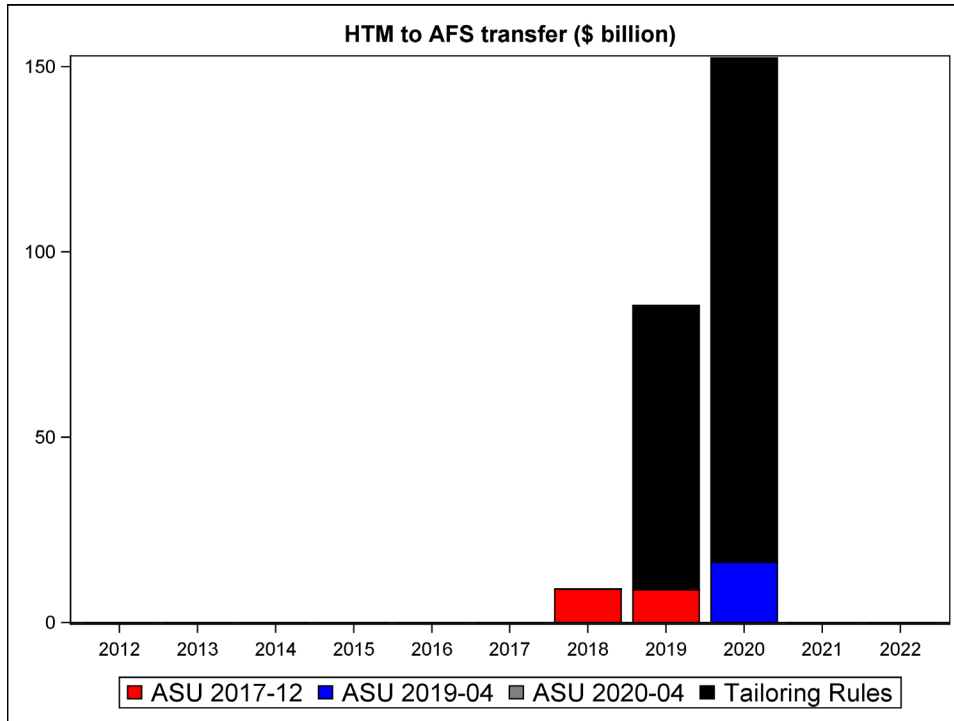


Figure 4
Transfers of Investment Securities from HTM to AFS Classifications
Each Year from 2012 to 2022 by Opt-out Banks Distinguishing Bases for Transfers



Note: While not visible in the figure due to the small amount involved, in 2020, PNC Financial transferred \$49 million of floating-rate securities from HTM to AFS without tainting its HTM portfolio as allowed by ASU 2020-04 (Reference Rate Reform).

Figure 5
Weighted-Average Maturity or Time to First Repricing of AFS Securities
from 2012 to 2022 by Bank Category

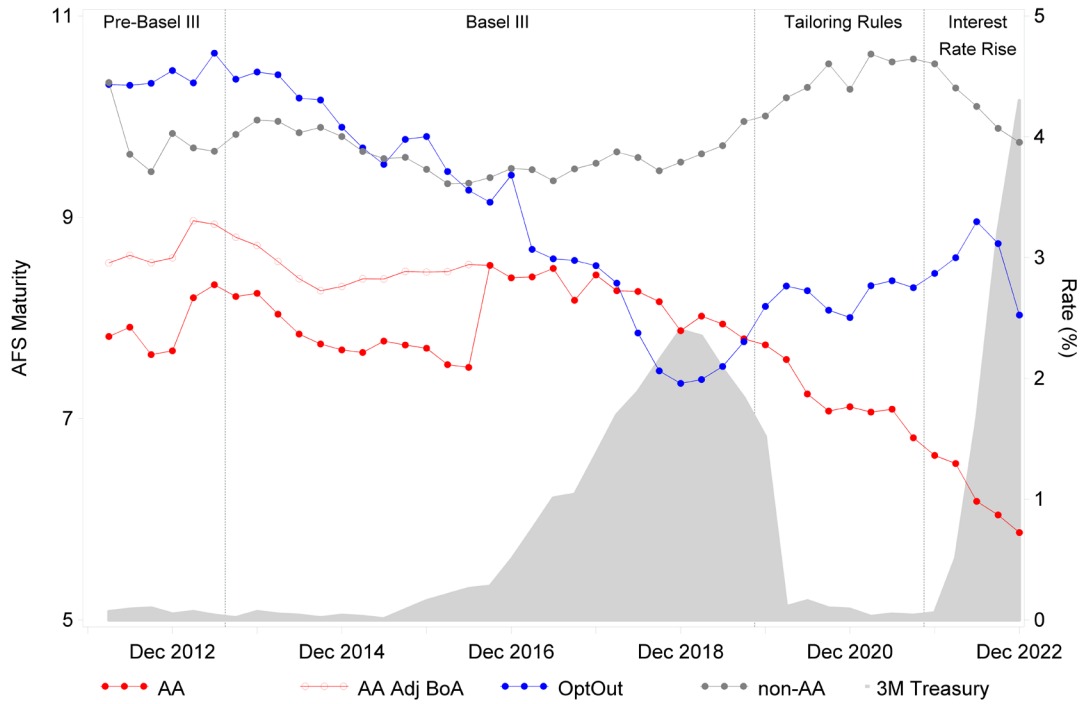


Figure 6
Extent of Fair Value Hedges of Fixed-Rate AFS Securities
by Bank Category

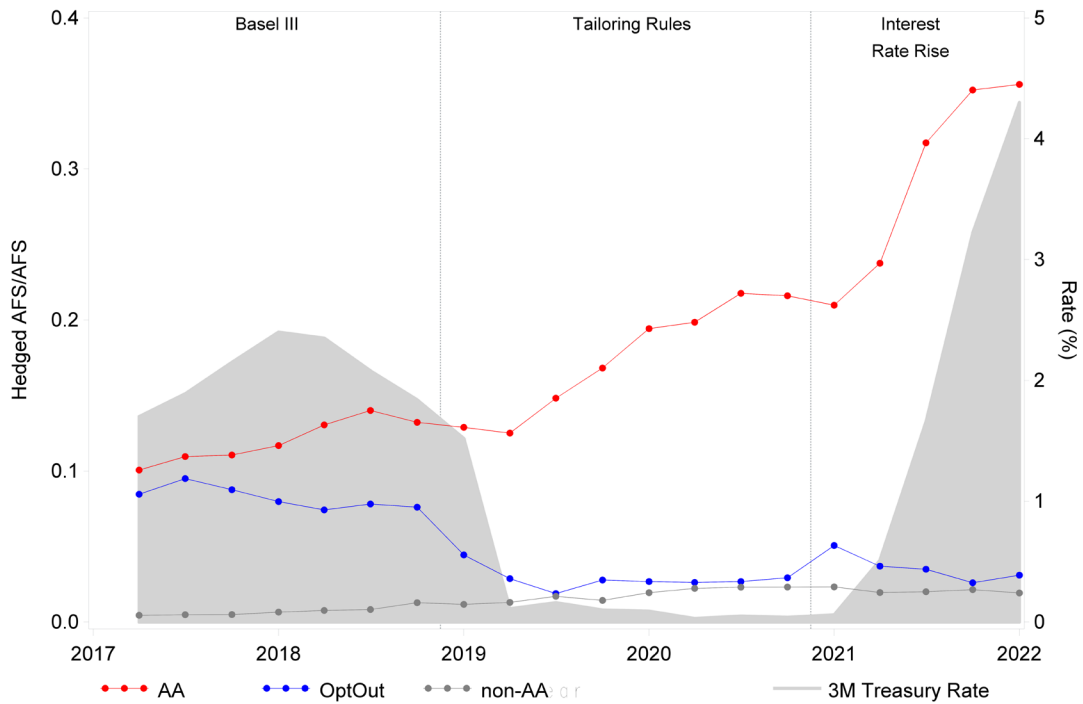


Figure 7
Ratio of Non-FDIC Insured Deposits to Total Assets
by Bank Category

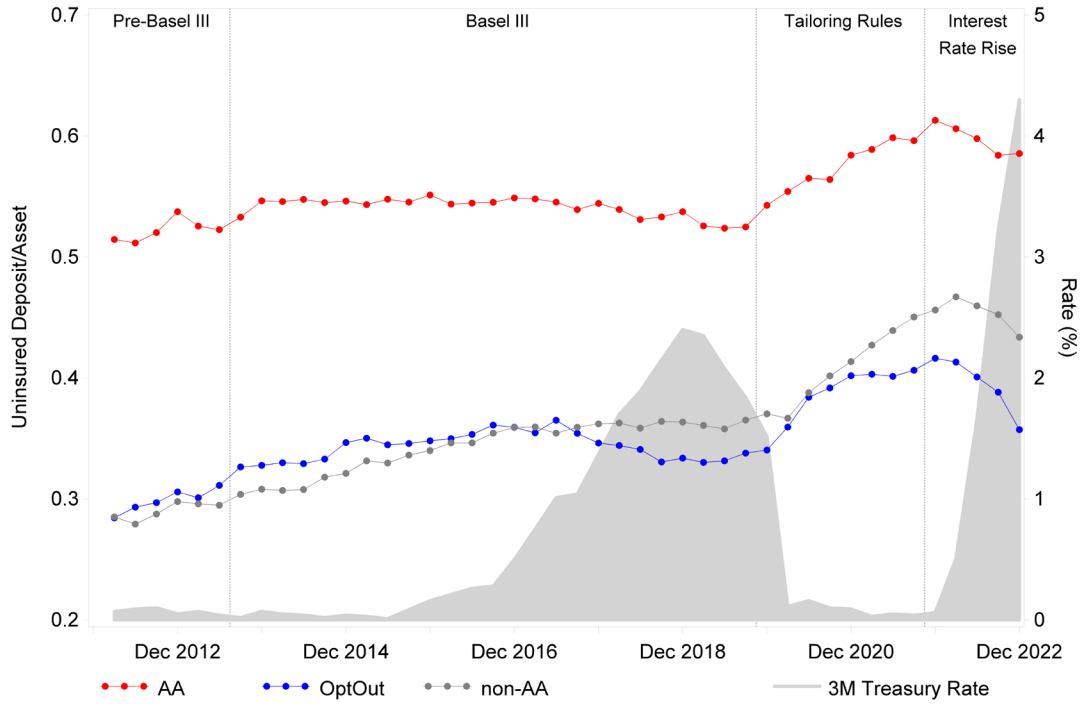


Table 1
Summary Statistics

This table presents descriptive statistics for the model variables over the 2012–2022 sample period. Panel A reports the mean, standard deviation, and first through third quartiles of the variables for the pooled sample of banks. Panels B – D report the same statistics for the advanced approaches (AA), opt-out, and non-advanced approaches (non-AA) banks, respectively. Panel E summarizes the number, amounts, and percentages of transfers of securities from HTM to AFS by our sample banks during our sample period by the stated reasons why the transfers do not taint the banks’ HTM portfolios or if they taint the portfolios. As discussed in Appendix C, we classify a transfer as tainting the HTM portfolio if the bank states that the transfer taints the portfolio or if the bank provides no reason why it does not taint the portfolio and classifies no securities as HTM for two years after the transfer. Appendix D provides the definitions for all variables.

Panel A: All Banks

VARIABLES	# Obs.	Mean	S.D.	P25	P50	P75
AFS/Asset	11,089	0.154	0.096	0.092	0.135	0.200
HTM/Asset	11,089	0.034	0.063	0.000	0.004	0.046
Sec/Asset	11,089	0.188	0.113	0.112	0.166	0.239
HTM/Sec	11,089	0.152	0.217	0.000	0.033	0.255
AFS Maturity	9,979	9.734	3.716	6.814	10.545	12.873
AFS Maturity Adj.	9,979	9.744	3.716	6.835	10.563	12.877
Sec Maturity Adj.	9,979	9.975	3.611	7.280	10.751	13.014
UnDep/Asset	10,964	0.365	0.153	0.263	0.350	0.449
Hedged AFS/AFS	6,198	0.017	0.080	0.000	0.000	0.000
Size	11,089	15.895	1.673	14.803	15.636	16.690
EBLLP	11,089	0.039	0.707	0.005	0.006	0.007
Deposit	11,089	0.773	0.112	0.745	0.799	0.839
CapRatio Lag	11,089	0.113	0.038	0.093	0.108	0.126
Net Income	11,089	0.003	0.018	0.002	0.003	0.003

Panel B: Advanced Approaches (AA) Banks

VARIABLES	# Obs.	Mean	S.D.	P25	P50	P75
AFS/Asset	396	0.151	0.096	0.084	0.139	0.215
HTM/Asset	396	0.059	0.054	0.013	0.044	0.097
Sec/Asset	396	0.210	0.123	0.136	0.185	0.316
HTM/Sec	396	0.254	0.188	0.104	0.223	0.370
AFS Maturity	375	7.644	2.864	5.290	7.573	10.033
AFS Maturity Adj.	375	7.915	3.026	5.302	7.778	10.380
Sec Maturity Adj.	375	8.835	3.421	6.287	8.698	11.953
UnDep/Asset	396	0.551	0.195	0.413	0.495	0.770
Hedged AFS/AFS	252	0.138	0.166	0.000	0.077	0.235
Size	396	20.578	1.036	19.701	20.723	21.468
EBLLP	396	0.017	0.012	0.010	0.013	0.023
Deposit	396	0.551	0.226	0.497	0.602	0.717
CapRatio Lag	396	0.095	0.014	0.085	0.095	0.105
Net Income	396	0.002	0.001	0.002	0.002	0.003

Panel C: Opt-out Banks

VARIABLES	# Obs.	Mean	S.D.	P25	P50	P75
AFS/Asset	219	0.176	0.128	0.113	0.149	0.211
HTM/Asset	219	0.085	0.122	0.000	0.046	0.099
Sec/Asset	219	0.261	0.196	0.186	0.211	0.249
HTM/Sec	219	0.233	0.221	0.000	0.218	0.401
AFS Maturity	219	9.006	3.754	5.574	10.555	12.403
Sec Maturity Adj.	219	9.388	3.825	5.532	10.609	12.587
UnDep/Asset	219	0.351	0.081	0.297	0.350	0.419
Hedged AFS/AFS	140	0.035	0.072	0.000	0.000	0.042
Size	219	19.546	0.446	19.100	19.677	19.868
EBLLP	219	0.015	0.007	0.008	0.013	0.020
Deposit	219	0.643	0.144	0.652	0.693	0.725
CapRatio Lag	219	0.114	0.023	0.099	0.117	0.133
Net Income	219	0.004	0.003	0.003	0.003	0.004

Panel D: Non-Advanced Approaches (Non-AA) Banks

VARIABLES	# Obs.	Mean	S.D.	P25	P50	P75
AFS/Asset	10,474	0.154	0.095	0.092	0.134	0.199
HTM/Asset	10,474	0.032	0.061	0.000	0.003	0.041
Sec/Asset	10,474	0.186	0.109	0.112	0.163	0.236
HTM/Sec	10,474	0.147	0.217	0.000	0.026	0.241
AFS Maturity	9,385	9.835	3.719	6.944	10.688	12.963
Sec Maturity Adj.	9,385	10.034	3.605	7.355	10.829	13.066
UnDep/Asset	10,349	0.358	0.147	0.260	0.346	0.443
Hedged AFS/AFS	5,806	0.011	0.070	0.000	0.000	0.000
Size	10,474	15.641	1.322	14.741	15.540	16.459
EBLLP	10,474	0.040	0.727	0.005	0.006	0.007
Deposit	10,474	0.784	0.093	0.754	0.802	0.841
CapRatio Lag	10,474	0.114	0.038	0.093	0.109	0.127
Net Income	10,474	0.003	0.018	0.002	0.003	0.003

Panel E: Transfers of Securities from HTM to AFS by Stated Reason Why No Taint or if Taint

Reason for Transfer	Number	Percent	\$ billion	Percent
ASU 2017-12	41	34.8	55.0	17.2
taint HTM portfolio	39	33.1	10.1	3.1
ASU 2019-04	14	11.9	21.7	6.8
tailoring rules	5	4.2	231.8	72.3
Volcker rule	4	3.4	0.6	0.2
credit deterioration	3	2.5	0.1	0.0
merger	3	2.5	0.5	0.2
other - not taint HTM portfolio	2	1.7	0.0	0.0
ASU 2020-04	2	1.7	0.5	0.2
Basel III	2	1.7	0.1	0.0
COVID-19	1	0.9	0.1	0.0
Office of Management and Budget rule reducing interest subsidies for certain municipal (Build America) bonds	1	0.9	0.0	0.0
close to maturity	1	0.9	0.0	0.0
Total	118	100	320.5	100

Table 2
Changes in Security Holdings

This table reports the estimation of spline (i.e., piecewise linear, with the line segments meeting at knots) regression models that capture how the AFS and HTM securities held by advanced approaches (AA), opt-out, and non-advanced approaches (non-AA) banks changed over the 2012–2022 sample period. The knots in the models are located at the interior boundaries of the four subperiods of our sample period: (i) pre-Basel III (2012Q1–2013Q2), (ii) Basel III (2013Q3–2019Q3), (iii) tailoring rules (2019Q4–2021Q3), and (iv) interest rate rise (2021Q4–2022Q4). The dependent variables are AFS securities divided by total assets, $AFS/Asset_{i,t}$, in column (1); HTM securities divided by total assets, $HTM/Asset_{i,t}$, in column (2); total securities divided by total assets, $Sec/Asset_{i,t}$, in column (3); and HTM securities divided by total securities, $HTM/Sec_{i,t}$, in column (4). The explanatory variables of interest are the interactions between the indicators for AA, opt-out, and non-AA banks and the quarterly count variables for the four subperiods. The coefficient on each interaction term equals the estimated quarterly change in the dependent variable for the specified bank category in the specified subperiod. Appendix D provides the definitions of all variables. Standard errors corrected for heteroscedasticity and clustered by the intersection of bank type and subperiod are reported in parentheses. ***, **, and * denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

VARIABLES	(1) <i>AFS/Asset</i>	(2) <i>HTM/Asset</i>	(3) <i>Sec/Asset</i>	(4) <i>HTM/Sec</i>
AA*Pre-Basel III QC	-0.006*** (0.001)	0.002*** (0.000)	-0.004*** (0.001)	0.010*** (0.002)
AA*Basel III QC	-0.001*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.010*** (0.001)
AA*Tailoring Rule QC	-0.000 (0.001)	0.003*** (0.001)	0.002** (0.001)	0.007** (0.003)
AA*Interest Rate Rise QC	-0.008*** (0.001)	0.007*** (0.000)	-0.001 (0.000)	0.038*** (0.002)
opt-out*Pre-Basel III QC	-0.004 (0.003)	0.006 (0.004)	0.001* (0.001)	0.025*** (0.008)
opt-out*Basel III QC	-0.000 (0.001)	0.002 (0.001)	0.002*** (0.000)	0.001 (0.003)
opt-out*Tailoring Rule QC	0.022*** (0.003)	-0.023*** (0.004)	-0.001 (0.001)	-0.052*** (0.009)
opt-out*Interest Rate Rise QC	-0.044*** (0.004)	0.035*** (0.003)	-0.009*** (0.001)	0.099*** (0.007)
non-AA*Pre-Basel III QC	-0.004*** (0.001)	0.003*** (0.001)	-0.001** (0.000)	0.011*** (0.003)
non-AA*Basel III QC	-0.002*** (0.000)	-0.001** (0.000)	-0.002*** (0.000)	-0.001 (0.001)
non-AA*Tailoring Rule QC	0.004*** (0.001)	-0.002*** (0.000)	0.003*** (0.001)	-0.006*** (0.001)
non-AA*Interest Rate Rise QC	-0.003 (0.002)	0.006*** (0.001)	0.003 (0.003)	0.027*** (0.002)
Size	-0.006 (0.006)	0.015** (0.006)	0.009 (0.011)	0.041 (0.025)
EBLLP	0.001 (0.001)	-0.000 (0.000)	0.001 (0.001)	-0.000 (0.001)

Deposit	-0.044 (0.031)	0.014 (0.015)	-0.029 (0.032)	0.029 (0.049)
CapRatio Lag	-0.228* (0.119)	-0.161*** (0.028)	-0.388** (0.132)	-0.048 (0.259)
Net Income	-0.035*** (0.010)	0.004 (0.007)	-0.031*** (0.004)	0.018 (0.019)
# Observations	11,089	11,089	11,089	11,089
Firm FE	YES	YES	YES	YES
Adj. R-squared	0.739	0.744	0.817	0.655

Table 3
Changes in Weighted-Average Maturity of AFS Securities and Total Securities

This table reports the estimation of spline (i.e., piecewise linear, with the line segments meeting at knots) regression models that capture how the weighted-average maturity of the AFS securities and total (i.e., AFS plus HTM) securities held by advanced approaches (AA), opt-out, and non-advanced approaches (non-AA) banks changed over the 2012–2022 sample period. The knots in the models are located at the interior boundaries of the four subperiods of our sample period: (i) pre-Basel III (2012Q1–2013Q2), (ii) Basel III (2013Q3–2019Q3), (iii) tailoring rules (2019Q4–2021Q3), and (iv) interest rate rise (2021Q4–2022Q4). The dependent variables are the weighted-average maturity of AFS securities, *AFS Maturity*_{*i,t*}, in column (1); this maturity calculated consistently using 15 years as the life of residential mortgage-backed securities for Bank of America, *AFS Maturity Adj*_{*i,t*}, in column (2); this maturity treating the observations for Bank of America as missing, *AFS Maturity exBoA*_{*i,t*}, in column (3); and the weighted-average maturity of AFS and HTM securities maturity calculated consistently using 15 years as the life of residential mortgage-backed securities for Bank of America, *Sec Maturity Adj*_{*i,t*}, in column (4). The explanatory variables of interest are the interactions between the indicators for AA, opt-out, and non-AA banks and the quarterly count variables for the four subperiods. The coefficient on each interaction term equals the estimated quarterly change in the dependent variable for the specified bank category in the specified subperiod. Appendix D provides the definitions of all variables. Standard errors corrected for heteroscedasticity and clustered by the intersection of bank type and subperiod are reported in parentheses. ***, **, and * denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

VARIABLES	(1) <i>AFS</i> <i>Maturity</i>	(2) <i>AFS</i> <i>Maturity</i> <i>Adj</i>	(3) <i>AFS</i> <i>Maturity</i> <i>exBoA</i>	(4) <i>Sec</i> <i>Maturity</i> <i>Adj</i>
AA*Pre-Basel III QC	0.020 (0.035)	0.015 (0.030)	0.064** (0.023)	0.109*** (0.014)
AA*Basel III QC	0.018* (0.009)	-0.016* (0.007)	-0.004 (0.005)	0.015*** (0.003)
AA*Tailoring Rule QC	-0.168*** (0.021)	-0.153*** (0.017)	-0.125*** (0.015)	-0.091*** (0.012)
AA*Interest Rate Rise QC	-0.162*** (0.014)	-0.170*** (0.012)	-0.167*** (0.009)	-0.030*** (0.006)
opt-out*Pre-Basel III QC	0.098* (0.049)	0.098* (0.049)	0.098* (0.049)	0.139*** (0.036)
opt-out*Basel III QC	-0.131*** (0.012)	-0.131*** (0.012)	-0.131*** (0.012)	-0.107*** (0.006)
opt-out*Tailoring Rule QC	0.116*** (0.035)	0.117*** (0.035)	0.116*** (0.035)	-0.024 (0.019)
opt-out*Interest Rate Rise QC	-0.013 (0.030)	-0.013 (0.031)	-0.013 (0.031)	0.159*** (0.037)
non-AA*Pre-Basel III QC	-0.074*** (0.012)	-0.074*** (0.011)	-0.074*** (0.012)	-0.048*** (0.011)
non-AA*Basel III QC	-0.012 (0.009)	-0.012 (0.009)	-0.012 (0.009)	-0.014** (0.005)
non-AA*Tailoring Rule QC	0.133*** (0.018)	0.135*** (0.018)	0.134*** (0.018)	0.109*** (0.008)
non-AA*Interest Rate Rise QC	-0.263*** (0.018)	-0.263*** (0.018)	-0.263*** (0.018)	-0.196*** (0.009)

Size	0.555** (0.225)	0.548** (0.226)	0.552** (0.225)	0.685*** (0.130)
EBLLP	-0.037* (0.020)	-0.037* (0.020)	-0.037* (0.020)	-0.039* (0.019)
Deposit	-0.933 (0.962)	-1.125 (1.022)	-1.019 (0.989)	-1.690* (0.938)
CapRatio Lag	2.896 (3.640)	2.892 (3.647)	2.830 (3.660)	2.060 (2.755)
Net Income	0.486*** (0.139)	0.459*** (0.140)	0.472*** (0.139)	0.407*** (0.124)
# Observations	9,976	9,976	9,932	9,976
Firm FE	YES	YES	YES	YES
Adj. R-squared	0.654	0.655	0.655	0.687

Table 4
Hedging of Fixed-Rate AFS Securities and of Uninsured Deposits

This table reports the estimation of spline (i.e., piecewise linear, with the line segments meeting at knots) regression models that capture the extent of economic hedging of the interest rate risk of fixed-rate AFS securities using interest-rate derivatives that qualify for fair value hedge accounting or uninsured deposits by the various bank categories changed over the sample period. The knots in the models are located at the interior boundaries of the four subperiods of our sample period: (i) pre-Basel III (2012Q1–2013Q2), (ii) Basel III (2013Q3–2019Q3), (iii) tailoring rules (2019Q4–2021Q3), and (iv) increasing interest rates (2021Q4–2022Q4). Because data on fair value hedges of AFS securities first become reliably available in 2018Q1, the analysis of this form of economic hedging starts then. The dependent variables are hedged AFS securities divided by total AFS securities, *Hedged AFS/AFS_{i,t}*, in column (1); and uninsured deposits divided by total deposits, *Uninsured Deposits/Asset_{i,t}*, in column (2). The explanatory variables of interest are the interactions between the indicators for the three bank categories and the quarterly count variables for the four subperiods. The coefficient on each interaction term equals the estimated quarterly change in the dependent variable for the specified bank category in the specified subperiod. Appendix D provides the definitions of all variables. Standard errors corrected for heteroscedasticity and clustered by the intersection of bank type and subperiod are reported in parentheses. ***, **, and * denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

VARIABLES	(1) <i>Hedged AFS/AFS</i>	(2) <i>Uninsured Deposit/Asset</i>
AA*Pre-Basel III QC		0.004*** (0.001)
AA*Basel III QC	0.004 (0.003)	-0.001*** (0.000)
AA*Tailoring Rule QC	0.008* (0.003)	0.004*** (0.001)
AA*Interest Rate Rise QC	0.032*** (0.004)	-0.003*** (0.001)
opt-out*Pre-Basel III QC		0.011*** (0.002)
opt-out*Basel III QC	-0.008* (0.004)	-0.001* (0.000)
opt-out*Tailoring Rule QC	-0.006* (0.003)	0.006*** (0.001)
opt-out*Interest Rate Rise QC	0.002 (0.002)	-0.010*** (0.002)
non-AA*Pre-Basel III QC		0.006*** (0.001)
non-AA*Basel III QC	0.000 (0.000)	0.001*** (0.000)
non-AA*Tailoring Rule QC	-0.000 (0.000)	0.006*** (0.001)
non-AA*Interest Rate Rise QC	-0.002** (0.001)	0.000 (0.002)
Size	0.043*** (0.009)	0.028*** (0.009)
EBLLP	0.001** (0.000)	0.001* (0.001)

Deposit	0.108** (0.039)	0.435*** (0.008)
CapRatio Lag	0.013 (0.118)	-0.010 (0.059)
Net Income	0.006 (0.143)	0.046** (0.020)
# Observations	4,730	10,964
Firm FE	YES	YES
Adj. R-squared	0.601	0.915
