Securities losses, Interbank Markets, and Monetary Policy Transmission: Evidence from the Eurozone*

Mariassunta Giannetti‡ Martina Jasova§

Caterina Mendicino¶ Dominik Supera‖

August 31, 2025

Abstract

Banks that experienced larger losses in their pledgeable securities portfolios following the July 2022 monetary policy tightening became less able to borrow through the interbank market and subsequently reduced their corporate lending, regardless of whether the securities were booked at market or historical value. These effects were less pronounced for banks with abundant collateral and for domestic subsidiaries of banking groups, which received liquidity through their group's internal capital market. Our results highlight a collateral channel in the bank-based transmission of monetary policy and show how differences in banking structure can contribute to an uneven transmission of monetary policy.

Keywords: Monetary policy tightening; interbank market; securities losses; banking groups; foreign banks

*We thank Dan Greenwald, Amiyatosh Purnanandam, James Vickery and seminar and conference participants at the Columbia Macro Lunch Seminar, the London Business School Summer Symposium, the National Bank of Belgium Empirical Financial Intermediation Workshop, the New York Fed / NYU Stern Conference on Financial Intermediation, the Research Institute for Industrial Economics (IFN) in Stockholm, the SFS Finance Cavalcade, the University of Naples Federico II, and the University of Porto. Giannetti acknowledges financial support from the Karl-Adam Bonnier Foundation. Special thanks to Nolwenn Allaire for superb research assistance. The opinions expressed herein are those of the authors and do not necessarily reflect those of the ECB or the Eurosystem. All errors are our own.

‡Stockholm School of Economics; Centre for Economic Policy Research (CEPR); European Corporate Governance Institute (ECGI); and Swedish House of Finance. Email: Mariassunta.Giannetti@hhs.se

§Barnard College, Columbia University. Email: mjasova@barnard.edu

¶European Central Bank. Email: caterina.mendicino1@ecb.int

‖Columbia Business School. Email: ds3791@columbia.edu

The collapse of Silicon Valley Bank has brought to the forefront the effects of banks' securities losses, driven by monetary tightening, on financial stability. Depending on a bank's level of capitalization and structure of liabilities, monetary tightening, through securities losses, may lead to self-fulfilling bank runs or even insolvency (Jiang et al., 2024). Policymakers and academics often overlook the effects of securities losses when banks are well-capitalized or when security valuations do not impact the bank's regulatory capital (Greenwald et al., 2024).

This paper shows that securities losses reduce the supply of credit even in well-capitalized banking systems and even when they do not directly affect regulatory capital. Banks face inherent liquidity risk due to the maturity mismatch between assets and liabilities (Diamond and Rajan, 2001, 2005). To manage negative liquidity shocks, they pledge securities as collateral in interbank markets and with central banks. When securities lose value, banks' borrowing capacity declines, constraining their ability to absorb liquidity shocks. We conjecture that, to limit their exposure to future shocks, banks reduce the share of illiquid loans on their balance sheets when collateral values fall. [1] Consequently, because of banks' precautionary behavior, a collateral-based bank lending channel of monetary policy can arise: by affecting collateral valuations, monetary tightening tightens banks' collateral constraints and reduces credit supply.

We document a bank-based collateral channel of monetary policy transmission and the conditions that amplify its effects during the latest tightening cycle, using granular euro-area data on interbank lending, bank lending to firms, and banks' securities holdings. When the European Central Bank (ECB) raised policy rates in July 2022 to curb inflation, banks with larger portfolios of long-term securities experienced greater losses in market value. These losses reduced the collateral banks could pledge in interbank markets. Consistent with a collateral channel, we find that banks incurring larger securities losses obtain significantly less credit in the interbank market. A one-standard-deviation increase in losses is associated with a 3.76% decline in interbank credit.

We further document the relevance of the collateral channel by exploiting cross-sectional

[1] The mechanism we propose differs from Kiyotaki and Moore (1997) because collateral is not used to expand balance sheets.

differences between banks. First, we show that only losses in pledgeable securities affect banks' access to the interbank market. Losses in non-pledgeable securities have a negligible impact, suggesting that the effects are not driven by a decrease in banks' net wealth. This interpretation is further supported by the finding that losses on pledgeable securities negatively affect borrowing through the repo market, with no impact on access to the unsecured market.

Second, we observe that the ability to borrow through the interbank market decreases to a larger extent for banks that had already pledged a larger proportion of their securities holdings. This again suggests that the effects are driven by a binding collateral constraint limiting banks' ability to insure against liquidity shocks. Consistent with this result, we find no evidence that banks' regulatory capital drives our results: the impact of securities losses is not stronger for less capitalized banks, supporting the conclusion that collateral constraints, rather than regulatory capital and reduced creditworthiness, are the primary mechanism restricting access to liquidity during periods in which banks are well capitalized.

Third, we examine whether securities losses have a greater impact on interbank market access when they affect regulatory capital. To this end, we compare the effects of securities classified as available-for-sale (AFS) that are marked to market with those of securities held to maturity (HTM) that rely on historical (book) valuation. We find that both AFS and HTM securities have a negative impact on a bank's access to credit in the interbank market. This suggests that the effects are not solely driven by regulatory capital considerations.

Fourth, we take into account that some banks in our sample are part of banking groups (i.e., have the same holding company), while others operate as stand-alone banks. We conjecture that the former should be able to access liquidity through the internal capital market and consequently be less negatively affected by the loss in value of their collateral. We show that, indeed, within-group interbank loans partially isolate subsidiaries located in the same country as the headquarters (i.e., domestic subsidiaries) from the effects of securities losses. The headquarters and other subsidiaries of the same group extend larger loans to those domestic subsidiaries that have experienced more significant securities losses. Integration within the banking group, however, appears to be incomplete. The foreign subsidiaries located within the eurozone that experience securities losses do not obtain loans

from other group members and receive less credit when their within-group lenders experience losses.

We further investigate whether banks more exposed to monetary tightening via securities losses on their pledgeable security holdings reduce lending to firms, and whether intra-group liquidity support mitigates this effect for subsidiaries of banking groups. Using granular credit registry data and controlling for firm-level credit demand following the methodology of Khwaja and Mian (2008), we find that banks experiencing larger securities losses reduce their corporate lending by more compared to less affected banks. The contraction in credit is economically meaningful – A one-standard-deviation increase in securities losses is associated with a 5.5% decline in lending – and applies to securities losses on both mark-to-market and held-to-maturity valued securities. Consistent with the collateral channel, the reduction in lending is sharper for banks with high collateral utilization and those with weaker ex ante liquidity positions, highlighting how constrained access to liquidity can amplify the impact of monetary tightening on corporate credit supply. Furthermore, we find that banks with larger securities losses also charge higher interest rates and grant new loans with shorter maturities.

Access to liquidity through the interbank markets and intra-group borrowing affects the credit supply to the corporate sector, with heterogeneous impacts across different types of banks. Domestic subsidiaries of banking groups are partially shielded from the negative effects of securities losses through intra-group loans and, as a result, contract their lending less than stand-alone banks that experienced a similarly strong adverse shock to the value of their security portfolios. However, due to the interbank market segmentations affecting within-group loans, foreign subsidiaries of banking groups do not benefit from such support and contract lending to the same extent as stand-alone banks. These findings underscore that liquidity redistribution within banking groups is segmented along national lines, contributing to uneven monetary policy transmission within the euro area.

We make several contributions to the literature. First, we contribute to the literature that leverages credit registry data to study the transmission mechanism of monetary policy (e.g. Jiménez et al., 2012). A few papers in this literature have exploited heterogeneity in banks' securities holdings to capture cross-sectional differences in exposure to monetary

policy shocks (e.g. Rodnyansky and Darmouni, 2017; Acharya et al., 2018; Gomez et al., 2021; Greenwald et al., 2024). While others have highlighted the effects of securities losses on bank net wealth and regulatory capital, we are the first to show that the lower value of pledgeable securities reduces banks' access to the interbank market. In this respect, we contribute to the literature on the collateral channel. The influential theories of Bernanke and Gertler (1989); Kiyotaki and Moore (1997) highlight how changes in the value of collateral amplify the credit cycle. Empirical studies have shown that a firm's ability to post collateral affects its access to debt and investment (Chaney et al., 2012; Cvijanović, 2014; Adelino et al., 2015; Bahaj et al., 2020, 2022). To the best of our knowledge, we are the first to highlight the relevance of a bank-based collateral channel, which operates through changes in liquidity in banks' assets. The mechanism we propose does not operate through banks' ability to borrow and expand their balance sheets as in Kiyotaki and Moore (1997), but rather through banks' precautionary behavior. Insofar as banks' ability to withstand negative liquidity shocks constrains their credit supply, our results complement those of Altavilla et al. (2025). While Altavilla et al. (2025) consider the positive effects of excess reserves on the credit supply, we focus on the collateral value and banks' ability to borrow through the interbank market. A shock to the value of pleadgeable securities hinders banks' ability to face future liquidity shocks. This, in turn, impairs the supply of credit as banks attempt to reduce the illiquidity of their balance sheets.

In addition, thanks to the granularity of our data, we can contribute to the debate on the circumstances under which decreases in the valuation of securities holdings affect bank lending. We show that even banks that marked their security portfolios as held to maturity and could use historical cost accounting were negatively affected by the interest rate hike because their collateral constraint became more binding, limiting access to the interbank market. Accordingly, we provide evidence that the impact of monetary policy through securities losses does not merely depend on banks' net wealth and regulatory capital requirements.

Second, we contribute to the literature on the international transmission of bank liquidity shocks. Prior research demonstrates that international banks transmit shocks to their foreign subsidiaries (e.g. Peek and Rosengren, 2000; Schnabl, 2012) and that US banks can access

liquidity from foreign subsidiaries during periods of funding stress (Cetorelli and Goldberg, 2012a). Moreover, internal capital markets within global banking groups have been shown to play a crucial role in how liquidity and monetary policy shocks in advanced economies affect lending to emerging markets (Cetorelli and Goldberg, 2012a; Morais et al., 2019). Domestically, multi-market banks have also been found to transmit positive liquidity shocks within their U.S. branch networks (Gilje et al., 2016) and to transmit negative shocks outside their core markets, defined as areas in which banks do not have branches (Cortés and Strahan, 2017). A strand of this literature studies the lending channel of monetary policy in stand-alone banks and financial conglomerates (e.g. Campello, 2002; Cetorelli and Goldberg, 2012a). We make two important innovations. First, while existing contributions rely on banks' balance sheets to measure outstanding credit, the granularity of our credit registry data allows us to compare the workings of internal and external capital markets and their effects on bank lending while controlling for corporate credit demand (Khwaja and Mian, 2008). Second, we highlight how different access to internal capital markets influences the strength of monetary policy transmission for domestic and foreign subsidiaries of a banking group. We find that being part of a banking group attenuates the effect of monetary policy shocks on the credit supply of domestic subsidiaries. However, the headquarters' propensity to provide liquidity to foreign subsidiaries facing securities losses is limited. Consequently, foreign subsidiaries remain more exposed to monetary policy shocks and contract lending, just as stand-alone banks do. Our results reveal an organizational pecking order within euro area credit groups that, differently from U.S. global banks (Cetorelli and Goldberg, 2012b), do not appear to allocate liquidity according to subsidiaries' investment opportunities.

Finally, we contribute to a growing body of literature that explores asymmetries in the transmission mechanism of monetary policy. Our results highlight a novel mechanism through which differences in banking structure produce asymmetries in monetary policy transmission (Kashyap and Stein, 2000; Beraja et al., 2019). Bank consolidation and the tendency of banking groups to acquire distant banks have often been considered an important channel for achieving a more homogeneous financial structure and an even transmission mechanism of monetary policy across geographical areas of the monetary union. The finding that liquidity is not transferred across borders within banking groups highlights that national

deposit insurance and local liquidity pools limit the extent to which bank consolidation can integrate capital markets.

1 Data

We utilize various data sources to assess whether differences in banking structure impact monetary transmission.

First, we rely on the Securities Holdings Statistics (SHS-G), which provides detailed information on debt security holdings at the ISIN-bank-quarter level. SHS-G provides granular data on security holdings, including the amount held, book value, market value, and the accounting classification of each instrument. The accounting classification enables us to determine whether the bank has applied an accounting standard that classifies the security at amortized cost (book value) or at fair value (marked to market). We focus on fixed-income securities held by banks, issued in the Eurozone, and denominated in euros, and define as pledgeable the securities that are accepted as collateral by the ECB.

Second, we utilize loan-level data from the European System of Central Banks' AnaCredit (AC) credit register, which was established in 2018. AC covers information on borrower characteristics (e.g., location, industry), loan types, loan terms (e.g., loan size, maturity, interest rate, issuance date), and the outstanding credit of a bank to a given borrower. Specifically, we use AC to analyze (i) bank lending to non-financial firms (NFCs) and (ii) interbank lending between Eurozone banks.

Finally, we complement our analysis with data from the Individual Balance Sheet Items (IBSI) database, maintained by the ECB. This database contains monthly-level information on banks' granular asset and liability items. We use time-varying variables, such as total assets, the deposit-to-total-assets ratio, the equity ratio, and the liquidity ratio, at the bank subsidiary level.

2 Monetary Tightening and Securities Losses

On July 21, 2022, the ECB increased the three key policy rates by 50 basis points. As a consequence of this decision, the interest rates on the main refinancing operations, the marginal lending facility, and the deposit facility were increased to 0.50%, 0.75%, and 0.00%, respectively. The initial rate increase was followed by nine interest rate hikes during our sample period, which ends in December 2023.

Naturally, this tightening cycle led to a repricing of the securities in the banks' portfolios, and banks that held relatively more long-term securities experienced more significant losses. Overall, euro area banks proved resilient to monetary policy shocks and were able to report Common Equity Tier 1 (CET1) capital ratios well above the requirements (Enria, 2023). Yet, the securities losses negatively affected the liquidity of their assets as the proportion of illiquid loans increased. As conjectured by Altavilla et al. (2025), this can, in turn, translate into a decrease in the supply of credit.

Data from the ECB's SHS-G allows us to compute the losses on banks' security portfolios and evaluate whether a more binding collateral constraint due to securities losses negatively affects bank lending. We observe 2,862 bank subsidiaries belonging to 498 banking groups operating across 19 euro area (EA) countries during the sample period from January 2022 to December 2023 (Figure 1 Panel A). EA banks hold a substantial amount of fixed-income securities on their balance sheets, amounting to an average of EUR 3.2 billion, or 18% of their total assets.

A key advantage of our detailed security level data is that it enables us to measure the total value change in a bank's securities portfolio by capturing fluctuations in individual security prices. Furthermore, the granularity of the SHS-G data allows us to distinguish whether, in each bank's portfolio, a security is classified as available for sale (AFS), and consequently marked to market, or held to maturity (HTM), and consequently booked at historical value. On average, as of the end of the first quarter of 2022, we observe that most securities are reported as HTM (65%), while a smaller share (35%) is classified as AFS. This repartition differs from the evidence on bank holding companies (BHCs) in the US, where the 29 largest BHCs classify 60% of their security portfolios as AFS (Greenwald et al., 2024).

The difference in the proportion of AFS and HTM securities in banks' portfolios could be due to institutional differences between the US and EA banking sectors, as well as the fact that our sample covers a total of 498 banking groups, revealing important aggregate trends as well as cross-sectional variation that goes beyond the largest EA banks.

We use the SHS-G data to compute a bank's overall securities losses as well as its securities losses in the AFS and HTM components of its portfolio. We further distinguish between securities losses affecting pledgeable securities, defined as those accepted as collateral by the ECB, and other securities. Securities eligible within the ECB collateral framework are typically also accepted as collateral in the repo market, where lenders impose higher haircuts (Jasova et al., 2024).

To focus on losses triggered by monetary tightening, abstracting from any attempts to rebalance the portfolio, we consider securities in a bank's portfolio as of the end of the first quarter of 2022, which is well before the monetary policy tightening.[2]

Holding constant the bank's security holdings, we cumulate the price changes over the period 2022 Q1 – 2023 Q3 and compute the cumulative securities losses as follows:

$$\text{securities losses}_{i,t} = \frac{\sum_s \left(\frac{P^s_t - P^s_{2022q1}}{P^s_{2022q1}} \times \text{Value Held}^s_{i,2022q1} \right)}{\text{Total Assets}_{i,2022q1}} \tag{1}$$

Our measures consider all the losses accruing to a bank on the securities it held just before the monetary tightening up to month t to take into account the effects of all monetary policy decisions. Since monetary policy decisions are often anticipated, we also consider price changes in the two months before the first increase in policy rates. As evident from Figure 2, which plots the dynamics of the losses, most of the losses were incurred in the second and third quarters of 2022, following the first interest rate hike. While other events may have driven these patterns, the securities we consider are predominantly sovereign bonds, which during our sample period exhibit limited credit risk. Any effect of political and country risk on the price of treasuries issued by certain countries and held by domestic banks will be

[2]By treating a bank's ex-ante security holdings as fixed, we do not incur the problem that banks more negatively affected by the monetary policy tightening may opportunistically choose to mark a larger fraction of their security holdings as HTM to avoid mark-to-market accounting for AFS securities (Granja, 2023). As shown in Figure 8 in the Appendix, there is no evidence that this was the case in the euro area.

controlled non-parametrically, as we always absorb country shocks through interactions of country and time fixed effects.

As of the third quarter of 2023, banks suffered, on average, securities losses of 1% of their total assets or 12% of their total equity. Figure 3, Panel A, further summarizes the distribution of overall losses on security portfolios as a share of total assets, highlighting the significant cross-sectional variation in these losses. In Panel B, we decompose the losses in the HTM and AFS portfolios, holding the classification constant as of the first quarter of 2022, and find that the largest securities losses are associated with HTM holdings. HTM losses, on average, amount to 0.84% of total assets (9.8% of total equity), while the mean AFS losses are four times smaller and amount to 0.21% of total assets (2.5% of total equity). In addition to the average losses, we also observe a smaller dispersion of AFS losses, which relates to the fact that EA banks are generally more likely to hold securities as HTM.

Securities losses also vary significantly by bank type. Figure 4 shows the distribution of losses separately for subsidiaries of banking groups (Panel A), stand-alone banks (Panel B), and for domestic and foreign subsidiaries of banking groups (Panels C and D, respectively). On average, banks within banking groups experienced losses of 1.1% of total assets, nearly double the 0.57% incurred by standalone banks. Within banking groups, domestic subsidiaries suffered losses more than twice as high as those of foreign subsidiaries (1.2% vs. 0.56% of total assets).

The large securities losses experienced by banks are linked to the fact that they hold a significant portion of their assets in securities—particularly long-duration securities, which are especially sensitive to interest rate changes. Figure 5 shows the distribution of security holdings across banks, expressed as a share of total assets, as of the first quarter of 2021—prior to the start of the ECB's monetary tightening. Panel A displays all security holdings, while Panel B focuses on a subset of long-term securities with a maturity greater than three years. There is substantial cross-sectional variation in banks' security holdings. On average, securities represent 18.4% of bank assets, with long-term securities accounting for 6.6%.

There is also substantial heterogeneity in security holdings and associated losses across Euro area countries (see Figures 6 and 7). Banks in peripheral countries, such as Italy,

Spain, Portugal, and Greece, hold significantly more securities on average than those in core countries like Germany and France. These holdings are concentrated in long-term securities with maturities over three years. Consequently, banks in peripheral countries were more exposed to the ECB's monetary tightening and incurred the largest losses.

In the empirical analysis, we will absorb country-specific shocks by including the interaction of the bank's country and time fixed effects. As shown in Table 2, securities losses are large for banks with large holdings of securities. Columns 1 to 7 show that securities losses are not correlated with other banks' characteristics, such as capitalization, reliance on deposits, or excess reserve holdings (excess liquidity), which will help identify their effects on the bank's access to the interbank market and the supply of credit to the corporate sector. In columns 8 to 13, security holdings, in turn, are negatively correlated with banks' excess reserve holdings, suggesting that securities are a substitute for excess liquidity. Moreover, banks with high security holdings borrow more in the interbank market and from the central bank, indicating that security holdings are a crucial means of accessing liquidity.

In what follows, we exploit cross-sectional variation in securities losses across banks within a country to identify the effects of the monetary policy tightening. Specifically, we analyze how changes in the value of those securities subsequently influence the bank's behavior in the interbank market and lending to firms.

3 Standalone Banks and Banking Groups within the Euro Area

To evaluate the relevance of the collateral channel of the bank-based transmission of monetary policy, we not only exploit cross-sectional differences in securities losses that impair a bank's ability to post collateral but also a bank's ability to substitute the interbank market with liquidity transfers from other subsidiaries of the same banking group. Therefore, we conjecture that banks that are part of banking groups, unlike standalone banks, can utilize the internal capital market to access liquidity.

We also consider that while banking groups in the EA encompass subsidiaries in many

EA countries, deposit insurance still segments capital requirements and liquidity pools along national borders. The extent to which these foreign subsidiaries can benefit from an internal capital market is thus an empirical question.

For these reasons, we categorize banks into three distinct groups: i) standalone banks, which are not part of any banking group, ii) domestic subsidiaries, which are banks that are part of a banking group and are located in the same country as the headquarters, and iii) foreign subsidiaries, which are banks owned by a foreign banking group. The sample comprises 1,832 standalone banks, 644 domestic subsidiaries, and 386 foreign subsidiaries.

Table 1, Panel A summarizes the descriptive statistics of the EA banking sector. Domestic and foreign subsidiaries collectively belong to 108 banking groups operating in the EA. On average, there are about 151 banks per country, with a median of 26 banks per country. In a median country, there are ten stand-alone banks, six domestic subsidiaries, and nine foreign subsidiaries; banking group subsidiaries belong to 13 banking groups, four of which are headquartered domestically. On average, a banking group owns six subsidiaries and operates in three countries. While banking groups in the EA tend to exhibit a home bias, a significant portion of their assets and corporate loans is held by foreign subsidiaries, accounting for 25% of total assets and 26% of corporate loans, respectively.

Reflecting differences in country size, the distribution of banks is significantly skewed towards the EA Big-4 countries (Germany, Italy, Spain, and France), which together account for around 72% of all banks (see Figure 1 Panel A). In contrast to the median EA country, the vast majority of banks in Big-4 countries are part of a banking group, with 150 subsidiaries compared to 70 stand-alone banks. In addition, Big-4 countries have more than twice as many domestic subsidiaries as foreign ones, with 100 domestic subsidiaries versus 50 foreign ones. These subsidiaries are part of 52 banking groups, 18 of which are headquartered in the domestic market.

While stand-alone banks are significant in numbers, they are typically small and account for a smaller proportion of total assets, corporate lending, and security holdings than subsidiaries of banking groups. Specifically, subsidiaries of banking groups hold, on average, 70% of a country's banking sector assets, with the remaining 30% held by standalone banks.

Among subsidiaries, foreign subsidiaries play a crucial role, holding more than a quarter

of total assets, while domestic subsidiaries account for 44%. These proportions are similar for corporate lending and securities holdings, with subsidiaries of banking groups representing 67% and 69%, respectively. Foreign subsidiaries are almost as important as standalone banks, accounting for 26% of corporate loans and 24% of securities held.

As Figure 1, Panel B highlights, the distribution of domestic and foreign subsidiaries is not homogeneous across the EA. Foreign subsidiaries play a disproportionately more important role in countries with smaller domestic banking systems, such as Portugal, Belgium, Luxembourg, Slovakia, Lithuania, and Estonia, where the share of corporate loans extended by foreign subsidiaries is approximately 50%.

These patterns underscore the importance of examining the impact of the collateral channel on banks with and without internal liquidity access within the banking group, as well as any potential differences in the treatment of domestic and foreign subsidiaries.

4 Securities Losses and the Interbank Market

4.1 Effects of borrowing banks' losses

Euro area banks rely heavily on the interbank market to finance their balance sheets, with an average of 13.8% of bank assets funded through interbank borrowing (see Table 1, Panel B). More importantly, the interbank market plays a crucial role in redistributing liquidity when banks face negative shocks. Banks with reduced access to the interbank market may decrease their credit supply as a precautionary measure. Because loans are illiquid assets, banks may prefer to avoid additional illiquidity arising from more lending when their ability to insure liquidity shocks through the interbank market is reduced by collateral constraints. Based on these arguments, securities losses reduce the value of a bank's collateral, impair its ability to access the interbank market, and negatively affect the bank's ability to insure liquidity shocks. If this is the case, banks may reduce the credit supply to the corporate sector to limit their exposure to liquidity risk.

To evaluate whether this is the case, we begin by examining how securities losses impact a bank's borrowing ability in the interbank market. Specifically, we estimate the following

model by ordinary least squares (OLS), where the dependent variable, Loan Amount$_{b,c,l,h,t}$ is the logarithm of the outstanding interbank credit amount issued by bank l located in country h to bank b based in country c during month t:

$$\text{Loan Amount}_{b,c,l,h,t} = \alpha + \beta \text{Securities Losses}_{b,t-1} + \delta_{b,l} + \mu_{c,t} + \theta_{h,t} + \epsilon_{b,c,l,h,t}. \quad (2)$$

The variable of interest is Securities Losses$_{b,t}$, which denotes the ratio of securities losses to total assets of the borrowing bank as described by equation (1). This variable allows us to capture how, starting from August 2022, securities losses affected a bank's participation in the interbank market. The vector $\delta_{b,l}$ denotes interactions of borrowing bank and lending bank fixed effects and controls for the strength of the interbank relation. In addition, $\mu_{c,t}$ and $\theta_{h,t}$ are interactions of the borrowing bank's country and time and the lending bank's country and time fixed effects, respectively, and capture any shocks affecting the borrowing bank's and the lending bank's countries.

Table 3 tests whether securities losses affect interbank market participation. A negative estimate of the coefficient of interest β would suggest that counterparties decrease their exposure to banks with larger securities losses. Column 1 of Table 3 shows that banks that experience more significant securities losses following the monetary tightening receive less credit in the interbank market. The effect is both statistically and economically significant. A one-standard-deviation increase in borrowing banks' losses is associated with a 3.76% decline in credit received in the interbank market.

Even if, in principle, the effect could depend on the fact that banks with larger securities losses have lower demand for credit, because the shock coincides with a drop in their lending opportunities, we consider it more plausible that the effect is supply-determined. Not only do we control for shocks affecting the bank's country, which should capture asymmetric changes in the banks' investment opportunities, but we will also demonstrate, by exploring bank lending to the corporate sector, that these banks' propensity to lend decreases, holding constant their borrowers' investment opportunities. Therefore, we use from the outset the narrative that securities losses negatively affect a bank's ability to borrow in the interbank market.

Securities losses may matter because the value of the collateral that a bank can post has decreased; however, they also negatively impact a bank's net worth. A decrease in creditworthiness can, in turn, decrease a bank's ability to access the interbank market. To evaluate the extent to which the collateral channel is at work, we distinguish between securities accepted by the ECB as collateral and other securities. Only the former are accepted as collateral in the interbank market. In column 2, we observe that a decrease in the value of pledgeable securities is associated with a decrease in the amount of funds that a bank can borrow in the interbank market. In column 3, we do not observe an analogous effect for nonpledgeable securities.

To further scrutinize the collateral channel, in column 4 we define a bank's collateral utilization rate, as the ratio of its outstanding debt to other banks to the value of its securities in March 2022. Consistent with the collateral channel, we observe that the ability to borrow through the interbank market decreases to a larger extent for banks that are likely to have posted most of their securities as collateral.

Not only do these findings support the collateral channel, but in columns 7 and 8, we observe that securities losses affect only the amount that a bank can borrow through the repo market. Securities losses appear to have no effect on banks' access to the unsecured market, suggesting that a decrease in creditworthiness is not the primary driver of banks' reduced ability to borrow in the interbank market. Put differently, the net wealth channel does not appear to drive our findings.

The negative effects of securities losses on interbank borrowing could also operate through the bank regulatory capital channel. Specifically, securities losses may impact a bank's capital position, compelling the bank to reduce its balance sheet. If the bank regulatory capital channel is at play, the impact of securities losses should be stronger for banks with lower ex-ante capital ratios. To test this mechanism, we extend specification 2 by introducing a double interaction between securities losses and the borrowing bank's capital ratio. However, as shown in column (5), this interaction is not statistically significant, suggesting that a bank's regulatory capital, as well as the net worth channel, plays a less critical role in banks' ability to obtain liquidity in the secured interbank market. This finding is consistent with the fact that securities losses did not affect the financial stability of euro area banks

(Enria, 2023) and suggests that the collateral channel is the primary mechanism driving our results.

We also consider whether securities losses matter most when they affect the bank capital requirements. This is the case if the securities, being categorized as AFS, are marked to market. Losses on HTM securities have no effect on banks' regulatory capital. In column 6, we distinguish between securities losses in HTM and AFS portfolios. Both AFS and HTM securities losses appear to negatively affect a bank's access to credit in the interbank market. An F-test cannot reject the null hypothesis that the magnitude of their effects is statistically different. These findings provide further support for the notion that the effects of securities losses we highlight do not depend on bank regulatory capital and are consistent with a collateral channel.

Table 4 focuses on losses affecting a bank's pledgeable securities and distinguishes between loans that a bank receives from subsidiaries outside and within the banking group (columns 1 and 2). While a bank's ability to borrow from banks outside the banking group substantially decreases when the value of a bank's pledgeable securities decreases, the bank appears to receive large loans from other subsidiaries within the banking group.

The effect is not only statistically significant but also economically significant. A one standard deviation increase in borrowing banks' losses is associated with a 13.6% increase in credit received from other banks in the same banking group. Thus, the decrease in interbank market borrowing for banks experiencing securities losses is entirely driven by lending from banks that do not belong to the same banking group. Intra-group lending has a counteracting effect. Importantly, within-group loans are not subject to asymmetric information and enforcement problems and are consequently uncollateralized. Thus, these findings support our interpretation that banks experiencing large securities losses have a high demand for interbank loans but are unable to access the market due to their collateral constraints. The result that the internal capital market substitutes the interbank market for subsidiaries of banking groups provides micro-foundations for the findings of the existing literature, which shows that the outstanding credit to corporations on the balance sheets of banks that are part of business groups is less sensitive to monetary policy (Campello, 2002).

4.2 Effects of Lending Banks' Losses

To the extent that a bank that has experienced securities losses is less able to attract liquidity through the interbank market, it can also become less inclined to extend credit. Given our interest in identifying the collateral channel, we continue to focus on losses affecting pledgeable securities and investigate whether collateral securities losses also affect banks' lending behavior. To this end, we estimate equation (1) and focus on the lending bank's ratio of securities losses to total assets. Equation (2) describes our empirical model:

$$\text{Loan Amount}_{b,c,l,h,t} = \beta \text{ securities losses}_{l,t-1} + \delta_{b,l} + \mu_{c,t} + \theta_{h,t} + \epsilon_{b,c,l,h,t}, \tag{3}$$

where the key variable of interest is the lending bank's ratio of securities losses to total assets (securities $\text{losses}_{l,t}$).

Column 3 of Table 4 presents the results. We find that securities losses not only affect banks' ability to receive credit but also their lending behavior. Banks that experience more significant securities losses extend less credit in the interbank market. The effect is once again statistically and economically significant, with a one-standard-deviation increase in lending banks' losses associated with an 8.9% decrease in their credit supply in the interbank market. Columns 4 and 5 reveal that the effect is entirely driven by loans to subsidiaries outside the banking group. The internal capital market is unaffected by the lending bank's securities losses.

All results on the redistribution of liquidity between and within banking groups are confirmed in columns 6 – 8 when we consider together borrowing and lending banks' securities losses. Overall, it appears that collateral valuations facilitate the functioning of the interbank market and the redistribution of liquidity, which is crucial for banks' ability to insure liquidity shocks.

5 Credit Flows Between Domestic and Foreign Subsidiaries of a Banking Group

5.1 Within-Group Lending to Domestic and Foreign Subsidiaries

Banking groups transfer liquidity to subsidiaries experiencing pledgeable securities losses, effectively substituting for the interbank market. This finding provides relevant cross-sectional variation for studying the importance of the collateral channel for the supply of credit to the corporate sector. To obtain even more granular predictions for our empirical investigation, we ask to what extent the insurance provided by the banking group differs between domestic and foreign subsidiaries. Such an investigation can also help in understanding whether cross-border consolidation through business groups favors an even transmission of monetary policy across different countries in the EA, even if deposit insurance remains national and banking groups are required to maintain local liquidity pools.

We distinguish between domestic and foreign subsidiaries of the banking group. For the within-group lending analysis, we employ two distinct definitions of domestic versus foreign subsidiaries. First, we define a subsidiary as domestic based on the geo-location of the lending and borrowing banks. The borrowing subsidiary is considered domestic if it is based in the same country as the lending subsidiary; otherwise, it is considered foreign. Second, and more importantly, we define a subsidiary as domestic with respect to the headquarters. In this case, a subsidiary is considered domestic if it is based in the same country as its banking group headquarters, and foreign otherwise. As in the earlier tests, we perform subsample analysis to facilitate interpretation.

We first ask whether there is a difference in liquidity support provided to domestic and foreign subsidiaries within a banking group that has experienced securities losses. Table 5, columns 1–4 present the results for the borrowing subsidiary's losses. Only domestic subsidiaries receive more loans from another part of the banking group when they experience considerable securities losses, whereas we do not observe similar effect for foreign subsidiaries. This is the case whether we consider foreign subsidiaries located in a different country from the lending subsidiary (column 1) or subsidiaries located in a different country from the

group headquarters (column 2).

Interestingly, columns 3 and 4 highlight the importance of border effects for the functioning of internal capital markets. In column 3, we consider the subsample of foreign subsidiaries. It appears that foreign subsidiaries support other subsidiaries that are not located in the same country as their headquarters and have experienced losses on their pledgeable securities, while in column 4, domestic subsidiaries lend to other subsidiaries located in the same country as their headquarters. Notably, the internal capital markets appear to remain segmented, arguably due to local liquidity pools and firewalls resulting from the absence of common deposit insurance.

Columns 5 and 6 consider how subsidiaries of the banking group extend liquidity when they experience securities losses. On average, subsidiaries of a banking group do not extend less credit when they experience securities losses (column 5). However, it appears that subsidiaries based in a different country than the headquarters extend less credit (column 6), suggesting that local liquidity pools and firewalls limit their ability to provide insurance within the banking group.

5.2 Between-Group Lending to Domestic and Foreign Subsidiaries

Importantly, the evidence of segmentation along national borders appears to be specific to banking groups. Table 6 examines intergroup lending and its dependence on the securities losses incurred by borrowing and lending banks. In column 1, banks that experience larger securities losses obtain less credit from other banks outside the business group, irrespective of whether they are domestic or foreign. If anything, the effect of securities losses appears to be smaller for foreign banks, defined as banks located in a different country from the borrowing subsidiary. This may capture that banks that entertain relationships with foreign lenders are the largest and most central in the interbank market.

We draw similar conclusions for lending subsidiaries. Column 2 shows that subsidiaries that experience securities losses lend less. Even though the effect appears to be statistically different from zero only for the domestic subsidiaries of a banking group, the lack of statistical significance for loans to domestic banks (defined as loans extended by banks located in the same country as the borrowing subsidiary) is largely due to a lack of power. Overall,

there is no evidence that banks outside the group provide liquidity support to other banks experiencing securities losses, whether these are domestic or foreign. Thus, border effects appear to only emerge within banking groups.

5.3 Robustness: Other Subsidiary Characteristics

One reason banking groups tend to shield their domestic subsidiaries from losses to a greater extent may be that these subsidiaries are larger and more central to the group's business. If this is the case, the border could play a minor role in explaining the segmentations in liquidity provision that we observe within the group. We should, however, observe that large foreign subsidiaries of a banking group receive relatively more liquidity support from the rest of the group when they experience securities losses.

Column 1 of Table 7 does not differentiate between domestic and foreign subsidiaries and shows that large subsidiaries indeed receive more credit from other subsidiaries of the group when they experience more extensive losses. However, column 2 shows that only large domestic subsidiaries of banking groups obtain liquidity support. The double interaction term $securitieslosses_{b,t} \times LargeSubsidiary_b$ is negative and significant, indicating that not only do large foreign subsidiaries not benefit from the intra-group liquidity support, but they also obtain less liquidity than other foreign subsidiaries.

Thus, large domestic subsidiaries, and domestic subsidiaries in general, benefit from the intra-group liquidity provision. This finding aligns with (Cetorelli and Goldberg, 2012a), which suggests that US banks obtain liquidity from their foreign subsidiaries when funding conditions at home deteriorate. However, we also show that foreign subsidiaries subject to shocks do not experience the same benefits. We also observe that foreign subsidiaries experiencing losses tend to provide less credit to other domestic subsidiaries of the group, suggesting that local liquidity pools and national deposit insurance segment the redistribution of liquidity within the banking groups following negative shocks.

6 Monetary Transmission to Corporate Lending

6.1 Main Results

This section examines whether the collateral value of banks, which influences their capacity to insure against liquidity risk, affects the supply of credit. We test whether banks that are more exposed to monetary tightening through their securities portfolios reduce lending to firms, and whether subsidiaries of banking groups that benefit from internal liquidity support shield their borrowers from such shocks. These tests are crucial for evaluating the collateral-based bank lending channel of monetary policy and also shed light on how standalone banks and domestic and foreign subsidiaries of banking groups transmit monetary tightening to the corporate sector.

Because we control for borrowers' credit demand, our analysis also informs whether the observed reduction in liquidity redistribution, across both the interbank market and to foreign subsidiaries within banking groups, reflects heterogeneity in banks' lending opportunities. If some banks reduced their liquidity demand due to limited lending prospects, then their securities losses should not be associated with reductions in credit to a given borrower.

We estimate the following equation for the outstanding credit of bank (subsidiary) b belonging to group g to firm f during month t:

$$\text{Loan Amount}_{b,g,f,t} = \alpha + \beta \text{ securities losses}_{b,t} + \gamma X_{b,t} + \delta_{f,t} + \mu_{g,t} + \theta_{b,f} + \epsilon_{b,g,f,t}. \quad (4)$$

Following (Khwaja and Mian, 2008), we include throughout the analysis interactions of firm and time fixed effects ($\delta_{f,t}$) to control for demand shocks. We also control for the strength of the relationship between a bank and a firm, including interactions of bank and firm fixed effects ($\theta_{b,f}$). Finally, in some specifications, we include subsidiary level controls ($X_{b,t}$), namely share of deposits to total assets, equity to total assets, and the logarithm of total assets, to capture group and subsidiary level financial conditions, and interactions of banking group and time fixed effects ($\mu_{g,t}$), which allow us to compare domestic and foreign subsidiaries of the same banking group. Specifically, the share of deposits to total assets allows us to control for the fact that banks may expect to experience deposit outflows when

policy interest rates increase, and for this reason, they contract their credit supply (Drechsler et al., 2017).

Table 8 shows that banks that experience larger securities losses because of monetary policy tightening lend less to a given firm relative to other banks. The estimates are robust whether we control or not for bank time-varying characteristics (columns 1 and 2). Importantly, the estimated parameter on the variable of interest is similar in columns 2 and 3 when we include interactions of group and time fixed effects. This suggests that subsidiaries of a banking group experiencing losses tend to contract lending, despite receiving liquidity from other subsidiaries within the group. However, as we will show in Table 11, the average effect conceals important differences between domestic and foreign subsidiaries of the same banking group.

The effect of securities losses is both statistically and economically significant. A one-standard-deviation increase in banks' losses is associated with a 5.48% decline in lending to firms (column 3). This appears to be the case whether the losses are in securities marked to market or accounted for at historical cost, as shown in columns 4 to 6. While the larger parameter estimate on HTM securities losses than on AFS securities losses may appear surprising, the effect of AFS and HTM securities losses on credit supply is statistically indistinguishable, as the F-test cannot reject the null that the coefficients of the AFS and HTM losses in column 6 are equal. Furthermore, in column 7, we include an interaction term between AFS securities losses and the bank's regulatory capital. Not only is the coefficient on the interaction term positive and significant, but the coefficient on AFS securities losses becomes larger in absolute value. This indicates that the negative effect of AFS securities losses on the supply of credit is larger for banks with lower regulatory capital, confirming the mechanism of Greenwald et al. (2024). The negative and significant coefficient on HTM securities losses continues to support the relevance of the bank-based collateral channel.

Table 9 further explores the mechanism through which securities losses are expected to negatively impact the supply of credit. The collateral channel would imply that the negative effect of security losses is driven by banks with high collateral utilization rates, which may face a binding collateral constraint if they experience negative liquidity shocks. Supporting the collateral channel, column 1 shows that the effect of securities losses is larger for banks

with high collateral utilization rates. Thus, collateral scarcity leads to a sharper contraction in bank lending following a monetary tightening.

Furthermore, securities losses should negatively affect the supply of credit for banks with less excess liquidity, which are less able to face deposit redemptions and other negative liquidity shocks without accessing the repo market. These banks may reduce their credit supply to increase the liquidity of their assets. In column 2, we examine whether the effect of securities losses varies across banks with different levels of ex ante liquidity. We proxy for a bank's liquidity position using excess liquidity, defined as the amount deposited with the central bank above the minimum reserve requirements. While the coefficient on securities losses is negative and significant, the double interaction between securities losses and excess liquidity is positive and statistically significant, indicating that, for a given level of securities losses, the impact is stronger for banks with weaker ex-ante liquidity positions. These findings support our hypothesis that securities losses impair banks' ability to access liquidity, which in turn reduces their propensity to extend illiquid loans. Such an interpretation is confirmed in column 3, where we interact the pledgeable securities losses with the bank's amount of borrowing from the ECB relative to the bank's total assets. The monetary tightening coincided with the phasing out of the Targeted Long-Term Refinancing Operations (TLTRO), which allowed banks to access liquidity at favorable rates from the ECB. Banks that had borrowed more through this facility are naturally more exposed to the quantitative tightening and anticipate higher liquidity needs. Securities losses should thus have a particularly negative impact on their ability to supply credit. This is precisely what the negative and significant coefficient on the interaction term suggests in column 3.

In column 4, we proxy for a bank's exposure to negative liquidity shocks, considering the stability of a bank's liabilities. We capture this using the net stable funding ratio (NSFR), which banks have to report to regulators. Banks with a higher NSFR are less exposed to negative liquidity shocks. It is thus consistent with the collateral channel that the negative effects of securities losses on these banks' credit supply are attenuated.

In column 5, we consider the Liquidity Coverage Ratio (LCR). This regulation, enacted in response to the global financial crisis, aims to ensure that banks maintain sufficient liquid assets to meet their obligations. Securities losses could matter not for the precautionary

motives we posit but because they make it harder for banks to satisfy the LCR constraint. In column 5, however, the coefficient on the interaction between a bank's securities losses and its LCR is negative and not statistically significant. Securities losses continue to have a large negative impact on the credit supply. This suggests that, if anything, banks with higher securities holdings and consequently a higher LCR reduce the supply of credit more. Thus, the effects of securities losses on the supply of credit are not mechanically driven by the LCR regulation, underscoring the importance of a bank's ability to insulate itself against future liquidity shocks.

Overall, these results are consistent with the findings of Altavilla et al. (2025), which suggest that the liquidity of bank assets matters for the credit supply. While they focus on excess reserve holdings, we highlight the complementary role of securities' valuations. As a consequence, monetary tightening, by decreasing the value of a bank's pledgeable securities, can have particularly large negative effects on the credit supply when it is accompanied by quantitative tightening and a decrease in the outstanding amount of liquidity.

Besides considering the effect of securities losses on the outstanding credit of a bank to a given borrower, we also consider their effects on the newly issued loans. Table 10 presents the results. Column 1 considers the amount of newly issued loans of a bank to a given firm. Consistent with the previous findings, the negative and statistically significant coefficient on our variable of interest suggests that banks experiencing larger securities losses extend less credit compared to banks with smaller losses. Columns 2 and 3 explore the terms of newly issued loans, specifically interest rates and loan maturities. In column 2, the positive and statistically significant coefficient indicates that banks with greater securities losses charge higher interest rates on new loans, further corroborating the evidence of a reduced credit supply. Column 3 indicates that these banks also offer new loans with shorter maturities, which may reflect increased caution in their lending practices and a desire to mitigate liquidity risks associated with long-maturity loans. Overall, the results in Table 10 suggest that securities losses not only reduce the quantity of new lending but also affect the pricing and structure of credit, amplifying the transmission of banks' securities losses to the real economy.

Table 11, column 1 distinguishes between standalone banks and subsidiaries of banking

groups. It appears that one euro of securities losses translates into a larger contraction in lending for standalone banks rather than for subsidiaries of banking groups, which can rely on the intra-group liquidity redistribution. In column 2, we focus on standalone banks and domestic subsidiaries to compare banks within the same country. The coefficient estimates in column 2 are consistent with those in column 1 and confirm that domestic subsidiaries are partially shielded from securities losses through intra-group loans.

Column 3 restricts the sample to group banks and examines the differences between domestic subsidiaries and foreign subsidiaries, defined as subsidiaries located in a country different from the headquarters of the parent company. Consistent with the finding that foreign subsidiaries of banking groups do not benefit from liquidity redistribution, they appear to contract credit significantly more than domestic subsidiaries for a euro amount of losses.

Overall, these results suggest that lower access to liquidity through the interbank markets leads banks to reduce their credit supply, and that liquidity redistribution within the banking group partially shields domestic subsidiaries from the effects of securities losses.

6.2 Robustness

We have so far provided consistent evidence that securities losses negatively affect a bank's access to the interbank market and result in a contraction in corporate lending. The mechanism tests provide suggestive evidence that banks experiencing reduced access to the interbank market, being less able to weather liquidity shocks, decrease the credit supply in order to increase their asset liquidity.

Table 12 further shocks that our conclusions remain robust when we consider the fact that monetary restrictions can impact banks through various other channels. For instance, recent work emphasizes the deposit channel (Drechsler et al., 2017) and the fact that banks lose deposits when interest rates increase, which inevitably leads to a contraction in lending. The deposit contraction could be particularly pronounced for banks with larger securities losses, driving our findings. To address this concern, we interact our control for the proportion of a bank's liabilities that are deposits with the change in the policy rate (columns 1 and 3) and also include as a control the actual change in deposits that a bank experiences over a quarter

(columns 2 and 4). Our results are qualitatively invariant, providing further support for our interpretation that access to the interbank market affects the supply of credit because it impacts banks' ability to face future liquidity shocks.

Importantly, the specifications in Table 12 also interact the other banks' time-varying controls, namely equity to total assets and the logarithm of total assets, with the change in the policy interest rates. The estimates thus show that our results are not driven by asymmetries in monetary transmission between banks of different sizes or with different levels of capitalization.

7 Conclusions

We document that collateral constraints affect bank lending. Monetary policy tightenings affect the valuations of securities that banks can pledge in the interbank market. As a result, banks experience reduced access to liquidity through the interbank market and, being less able to insure future liquidity shocks, they find it optimal to increase the liquidity of their assets and cut lending.

We show that the internal capital market within banking groups tends to mitigate the adverse effects of securities losses at their domestic subsidiaries, which, consequently, can extend more credit than similarly affected stand-alone banks. However, foreign subsidiaries of banking groups do not appear to benefit as much from the internal capital market when they experience securities losses and cut credit as much as stand-alone banks.

References

Acharya, Viral V, Tim Eisert, Christian Eufinger, and Christian Hirsch, 2018, Real effects of the sovereign debt crisis in europe: Evidence from syndicated loans, *The Review of Financial Studies* 31, 2855–2896.

Adelino, Manuel, Antoinette Schoar, and Felipe Severino, 2015, House prices, collateral, and self-employment, *Journal of Financial Economics* 117, 288–306.

Altavilla, Carlo, Miguel Boucinha, Lorenzo Burlon, Mariassunta Giannetti, and Julian Schumacher, 2025, Central bank liquidity reallocation and bank lending: Evidence from the tiering system, *Journal of Financial Economics* .

Bahaj, Saleem, Angus Foulis, and Gabor Pinter, 2020, Home values and firm behavior, *American Economic Review* 110, 2225–2270.

Bahaj, Saleem, Angus Foulis, Gabor Pinter, and Paolo Surico, 2022, Employment and the residential collateral channel of monetary policy, *Journal of Monetary Economics* 131, 26–44.

Beraja, Martin, Andreas Fuster, Erik Hurst, and Joseph Vavra, 2019, Regional heterogeneity and the refinancing channel of monetary policy, *The Quarterly Journal of Economics* 134, 109–183.

Bernanke, Ben, and Mark Gertler, 1989, Agency costs, net worth, and business fluctuations, *American Economic Review* 79, 14–31.

Campello, Murillo, 2002, Internal capital markets in financial conglomerates: Evidence from small bank responses to monetary policy, *The Journal of Finance* 57, 2773–2805.

Cetorelli, Nicola, and Linda S Goldberg, 2012a, Banking globalization and monetary transmission, *The Journal of Finance* 67, 1811–1843.

Cetorelli, Nicola, and Linda S Goldberg, 2012b, Liquidity management of us global banks: Internal capital markets in the great recession, *Journal of International Economics* 88, 299–311.

Chaney, Thomas, David Sraer, and David Thesmar, 2012, The collateral channel: How real estate shocks affect corporate investment, *American Economic Review* 102, 2381–2409.

Cortés, Kristle Romero, and Philip E Strahan, 2017, Tracing out capital flows: How financially integrated banks respond to natural disasters, *Journal of Financial Economics* 125, 182–199.

Cvijanović, Dragana, 2014, Real estate prices and firm capital structure, *The Review of Financial Studies* 27, 2690–2735.

Diamond, Douglas, and Raghuram Rajan, 2001, Liquidity risk, liquidity creation, and financial fragility: A theory of banking, *Journal of Political Economy* 109, 287–327.

Diamond, Douglas W, and Raghuram G Rajan, 2005, Liquidity shortages and banking crises, *The Journal of finance* 60, 615–647.

Drechsler, Itamar, Alexi Savov, and Philipp Schnabl, 2017, The deposits channel of monetary policy, *The Quarterly Journal of Economics* 132, 1819–1876.

Enria, Andrea, 2023, Press conference on the 2023 srep results and the supervisory priorities for 2024-26, *Speech by the Chair of the Supervisory Board of the ECB* .

Gilje, Erik P, Elena Loutskina, and Philip E Strahan, 2016, Exporting liquidity: Branch banking and financial integration, *The Journal of Finance* 71, 1159–1184.

Gomez, Matthieu, Augustin Landier, David Sraer, and David Thesmar, 2021, Banks' exposure to interest rate risk and the transmission of monetary policy, *Journal of Monetary Economics* 117, 543–570.

Granja, Joao, 2023, Bank fragility and reclassification of securities into htm, *Available at SSRN 4409834* .

Greenwald, Daniel, John Krainer, and Pascal Paul, 2024, Monetary transmission through bank securities portfolios, Technical report, National Bureau of Economic Research.

Jasova, Martina, Luc Laeven, Caterina Mendicino, José-Luis Peydró, and Dominik Supera, 2024, Systemic risk and monetary policy: The haircut gap channel of the lender of last resort, *The Review of Financial Studies* 37, 2191–2243.

Jiang, Erica Xuewei, Gregor Matvos, Tomasz Piskorski, and Amit Seru, 2024, Monetary tightening and us bank fragility in 2023: Mark-to-market losses and uninsured depositor runs?, *Journal of Financial Economics* 159, 103899.

Jiménez, Gabriel, Steven Ongena, José-Luis Peydró, and Jesús Saurina, 2012, Credit supply and monetary policy: Identifying the bank balance-sheet channel with loan applications, *American Economic Review* 102, 2301–2326.

Kashyap, Anil K, and Jeremy C Stein, 2000, What do a million observations on banks say about the transmission of monetary policy?, *American Economic Review* 90, 407–428.

Khwaja, Asim Ijaz, and Atif Mian, 2008, Tracing the impact of bank liquidity shocks: Evidence from an emerging market, *American Economic Review* 98, 1413–42.

Kiyotaki, Nobuhiro, and John Moore, 1997, Credit cycles, *Journal of Political Economy* 105, 211–248.

Morais, Bernardo, José-Luis Peydró, Jessica Roldán-Peña, and Claudia Ruiz-Ortega, 2019, The international bank lending channel of monetary policy rates and qe: Credit supply, reach-for-yield, and real effects, *The Journal of Finance* 74, 55–90.

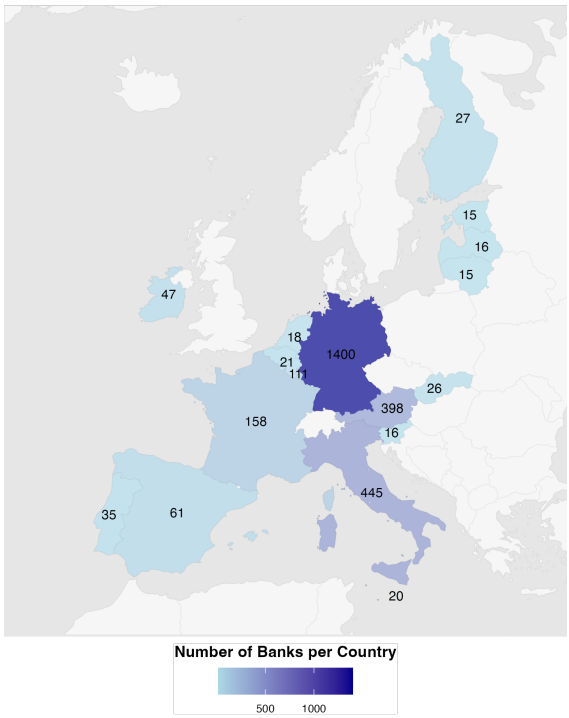
Peek, Joe, and Eric S Rosengren, 2000, Collateral damage: Effects of the japanese bank crisis on real activity in the united states, *American Economic Review* 91, 30–45.

Rodnyansky, Alexander, and Olivier M Darmouni, 2017, The effects of quantitative easing on bank lending behavior, *The Review of Financial Studies* 30, 3858–3887.

Schnabl, Philipp, 2012, The international transmission of bank liquidity shocks: Evidence from an emerging market, *The Journal of Finance* 67, 897–932.

Figure 1: Distribution of Banks within the Euro Area

(a) Geographical Distribution of Banks

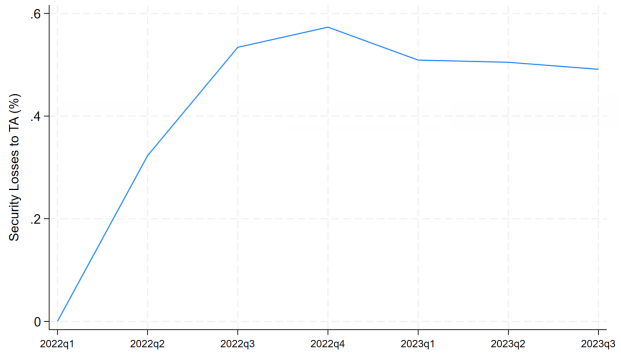


(b) Lending Share of Standalone Banks and Banking Groups



The figure plots the country-level distribution of banks and their lending shares across the Euro Area. Panel A shows the number of banks per country. Panel B decomposes the lending shares of standalone banks, domestic and foreign subsidiaries of banking groups in each Euro Area country. A stand-alone bank refers to a bank that is not part of a larger banking group. A bank (subsidiary) is classified as domestic if it is located in the same country as its banking group's headquarters, and as foreign otherwise.

Figure 2: Securities Losses Over Time

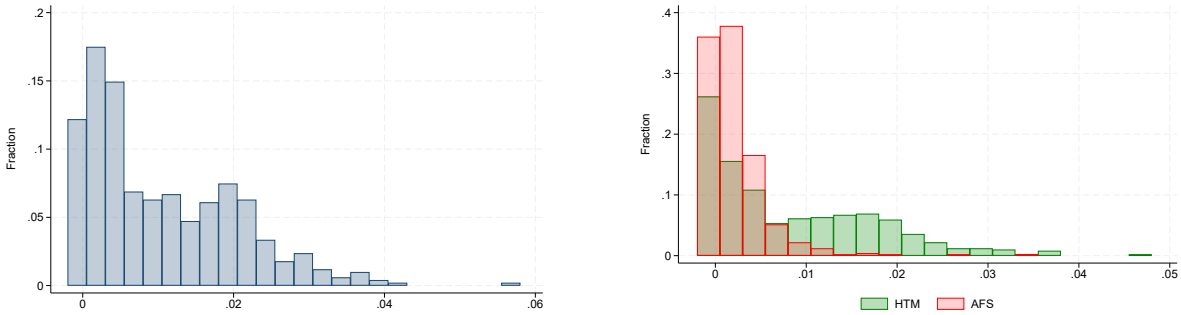


The figure presents the time-series evolution of aggregate securities losses as a share of total assets, as defined in Equation (1). Aggregate securities losses are calculated as the weighted average of individual bank losses.

Figure 3: Distribution of Securities Losses Across Banks

(a) Total Securities Losses

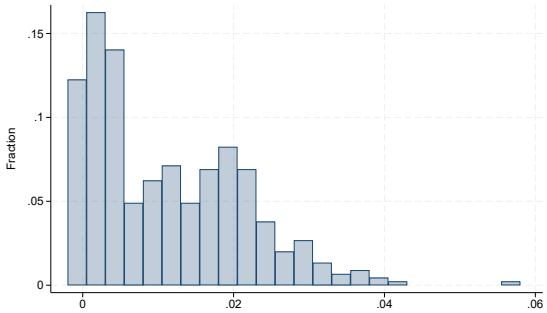
(b) HTM vs. AFS Securities Losses



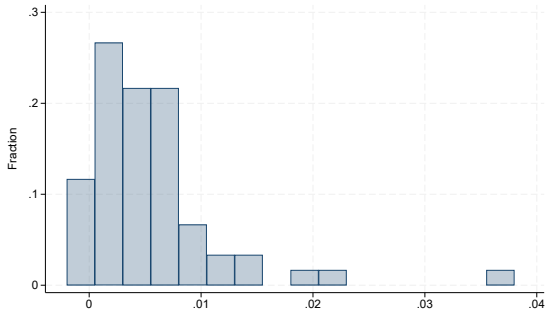
The figure shows the distribution of the securities losses accrued between 2022q1 and 2023q3, expressed as a share of total assets in 2022q1, as described by Equation 1 Panel A presents the distribution of total securities losses. Panel B plots the distribution of HTM vs. AFS securities losses, respectively.

Figure 4: Distribution of Securities Losses: Subsidiaries vs. Stand-alone Banks

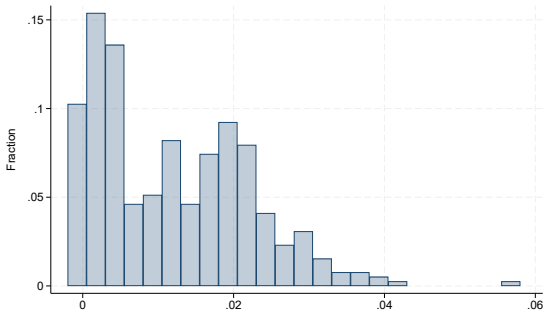
(a) Subsidiaries of Banking Groups



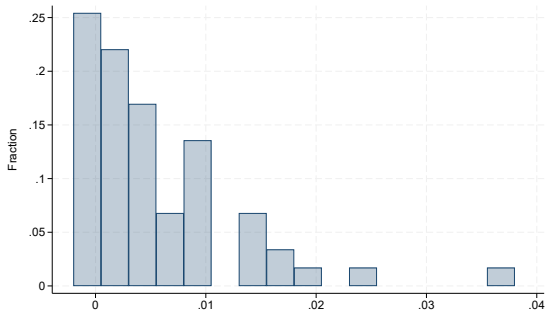
(b) Standalone Banks



(c) Domestic Subsidiaries of Banking Groups



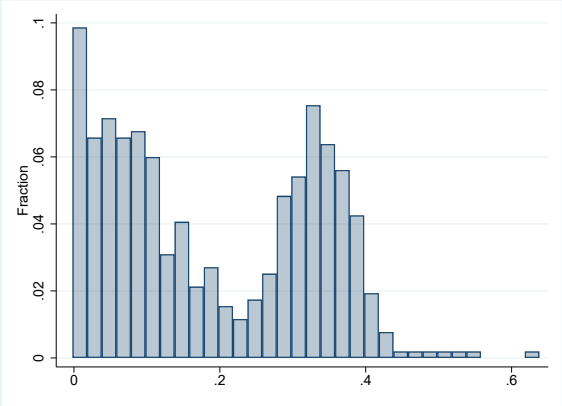
(d) Foreign Subsidiaries of Banking Groups



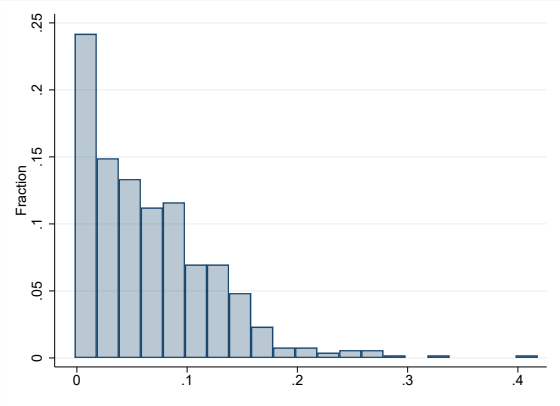
The figure shows the distribution of the securities losses accrued between 2022q1 and 2023q3, expressed as a share of total assets in 2022q1, as described by Equation 1. Panel A presents the distribution of securities losses for subsidiaries of banking groups. Panel B presents the distribution of securities losses for stand-alone banks. Panel C and D present the distribution of securities losses for domestic and foreign subsidiaries of banking groups, respectively.

Figure 5: Security Holdings by Banks

(a) All Securities



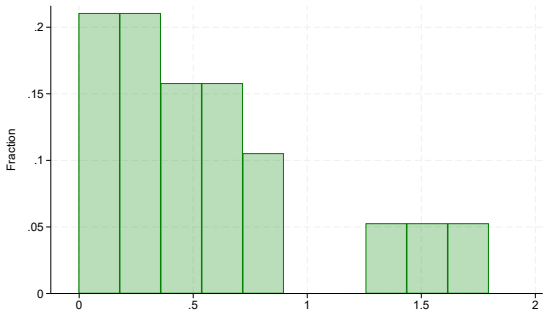
(b) Long-Term Securities



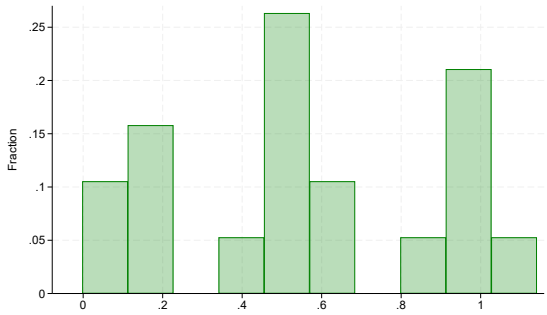
The figure plots the distribution of security holdings across banks in Euro Area countries as of 2022q1. Panels A presents the histogram of total security holdings, while Panel B focuses on long-term securities with a residual maturity greater than three years. All values are reported as a percentage of total assets.

Figure 6: Securities Losses by Country

(a) Median Bank



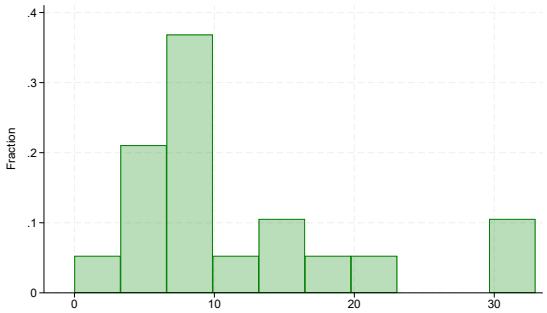
(b) Weighted Average



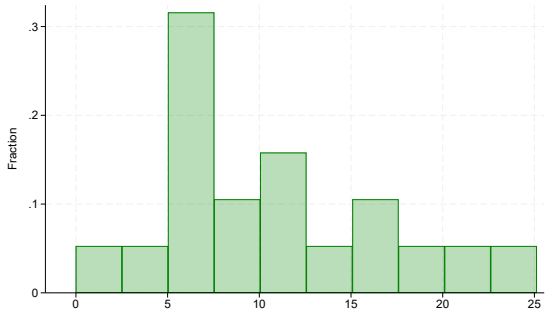
The figure plots securities losses across Euro Area countries as of 2023q3. Panel A presents the country-level securities losses of all reported securities for a median bank. Panel B plots the securities losses as a weighted average of banks within the country. All values are reported as a percentage of total assets.

Figure 7: Security Holdings by Country

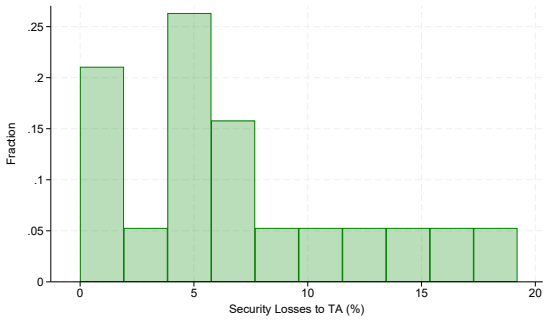
(a) All Securities (Median Bank)



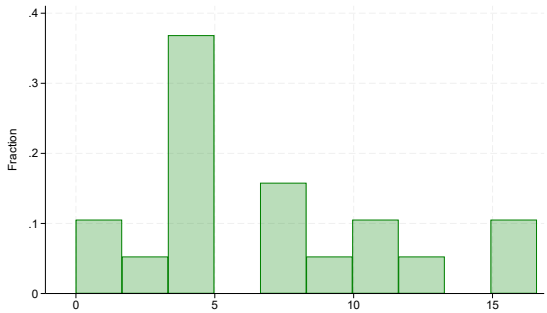
(b) All Securities (Weighted Average)



(c) Long-Term Securities (Median Bank)



(d) Long-Term Securities (Weighted Average)



The figure plots security holdings across Euro Area countries as of 2022q1. Panels A and B present the country-level security holdings of all reported securities for a median bank, as well as the weighted average, respectively. Panels C and D focus on long-term securities with a residual maturity of more than three years, showing the country-level distribution for a median bank and as a weighted average, respectively. All values are reported as a percentage of total assets.

Table 1: Summary Statistics

Panel A: Country-level summary statistics of stand-alone banks and banking groups in the Euro Area

Variable	N	Mean	SD	P10	P50	P90
Number of Banks and Banking Groups per Country						
Total Number of Banks	19	151	328	15	26	445
Number of standalone Banks	19	96	285	5	10	293
Number of Domestic Subsidiaries	19	34	64	1	6	124
Number of Foreign Subsidiaries	19	20	24	3	9	78
Number of Banking Groups Present in the Country	19	105	294	9	13	314
Composition of Banks per Country (in %)						
standalone Banks / All Banks	19	43.29	22.97	12.77	44.26	80.00
Domestic Subsidiaries Banks / All Banks	19	25.75	22.02	5.00	21.05	66.67
Foreign Subsidiaries Banks / All Banks	19	30.96	19.54	5.03	27.78	63.83
Composition of Key Balance Sheet Variables per Country (in %)						
Share of NFC Lending by stand-alone Banks	19	33.25	25.52	7.58	24.38	79.21
Share of NFC Lending by Domestic Subsidiaries	19	40.83	34.72	0.00	34.99	91.52
Share of NFC Lending by Foreign Subsidiaries	19	25.92	26.43	0.74	14.97	70.07
Share of Total Assets of stand-alone Banks	19	30.55	25.08	10.81	18.35	76.23
Share of Total Assets of Domestic Subsidiaries	19	44.24	34.56	0.27	46.06	87.04
Share of Total Assets of Foreign Subsidiaries	19	25.20	25.48	1.15	14.58	70.55
Share of Security Holdings by stand-alone Banks	19	30.93	30.14	4.14	18.76	95.88
Share of Security Holdings by Domestic Subsidiaries	19	45.55	35.69	0.00	44.70	93.21
Share of Security Holdings by Foreign Subsidiaries	19	23.52	28.26	0.00	8.30	79.87
Number of Subsidiaries and Key Characteristics per Banking Group						
Number of Subsidiaries	108	6.08	10.96	2	2.5	10
Number of Domestic Subsidiaries	108	3.94	10.08	1	1	5
Number of Foreign Subsidiaries	108	2.14	3.42	0	1	6
Number of Countries Banking Group Operates in	108	2.68	1.98	1	2	6
Share of Group NFC Lending Held Domestically	108	83.29	24.94	49.98	95.35	100.00
Share of Group Total Assets Held Domestically	108	86.25	20.87	64.15	94.67	100.00

Panel B: Bank-level security holdings, securities losses and other balance sheet variables

Variable	N	Mean	SD	P10	P50	P90
Security Holdings (as of 2022q1)						
Total Security Holdings (mil EUR)	498	3,164	8,657	38	386	9,592
Security Holdings to Total Assets (in %)	498	18.37	14.45	1.64	14.26	36.96
Long-Term Security Holdings to Total Assets (in %)	498	6.59	5.86	0.21	5.23	14.12
HTM Securities / Total Security Holdings (in %)	498	64.19	33.26	0.00	71.76	99.98
AFS Securities / Total Security Holdings (in %)	498	35.81	33.26	0.02	28.24	100.00
(ECB + Interbank Borrowing) / Total Security Holdings (in %)	498	90.92	90.08	27.77	55.55	202.89
Other Balance Sheet Variables (as of 2022q1)						
Total Assets (log)	498	8.48	2.21	5.81	8.02	11.47
Interbank Borrowing (% of Total Assets)	498	13.82	16.05	0.32	13.55	23.73

Variable	N	Mean	SD	P10	P50	P90
Securities Losses						
Securities Losses (% of Total Assets)	3486	0.87	1.02	0.00	0.51	2.19
Collateral Securities Losses (% of Total Assets)	3486	0.86	1.00	0.00	0.49	2.17
Non-Collateral Securities Losses (% of Total Assets)	3486	0.01	0.20	0.00	0.00	0.05
HTM Securities Losses (% of Total Assets)	3486	0.68	0.91	0.00	0.29	1.91
AFS Securities Losses (% of Total Assets)	3486	0.18	0.29	0.00	0.08	0.48
Securities Losses (% of Total Equity)	3486	10.26	14.42	0.00	6.37	24.79
Collateral Securities Losses (% of Total Equity)	3486	10.09	13.97	0.00	6.09	24.47
Non-Collateral Securities Losses (% of Total Equity)	3486	0.17	3.36	0.00	0.00	0.61
HTM Securities Losses (% of Total Equity)	3486	8.02	13.46	0.00	3.31	21.18
AFS Securities Losses (% of Total Equity)	3486	2.07	3.29	0.00	0.90	5.48

Panel C: Loan-Level Summary Statistics

Variable	N	Mean	SD	P10	P50	P90
Interbank Lending						
Loan Amount (log)	67,845	16.27	3.48	11.75	16.62	20.39
Securities Losses of Borrowing Banks (% of Total Assets)	67,609	0.66	0.62	0.08	0.45	1.59
Securities Losses of Lending Banks (% of Total Assets)	67,341	0.65	0.60	0.08	0.45	1.59
Repo Amount (log)	14,820	18.04	2.32	14.92	18.42	21.00
Repo Rates (in %)	14,820	1.03	1.53	-0.35	0.01	3.60
Corporate Lending						
Loan Amount (log)	19,005,930	12.23	1.76	10.31	12.07	14.48
Number of Bank Relationships	19,005,930	3.40	4.25	2	3	6
Securities Losses (% of Total Assets)	19,005,930	0.79	0.57	0.08	0.81	1.34

Table 2: Securities Losses, Security Holdings and Bank Characteristics

	Securities Losses							Security Holdings					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Security Holdings$_b$/TA$_b$	0.0554***	0.0535***	0.0535***	0.0543***	0.0537***	0.0523***	0.0507***						
	(0.00264)	(0.00300)	(0.00301)	(0.00341)	(0.00352)	(0.00364)	(0.00324)						
log(TA$_b$)		-0.000267	-0.000347	-0.000392	-0.000503	-0.000525	-0.000197	-0.0321***	-0.0323***	-0.0206***	-0.0296***	-0.0286***	-0.0251***
		(0.000201)	(0.000229)	(0.000278)	(0.000321)	(0.000321)	(0.000292)	(0.00261)	(0.00307)	(0.00376)	(0.00412)	(0.00401)	(0.00418)
Deposits$_b$/TA$_b$			-0.00137	-0.00221	-0.00231	-0.000205	0.00119		-0.00273	-0.0472	-0.0606	0.0414	0.0724
			(0.00199)	(0.00226)	(0.00227)	(0.00272)	(0.00255)		(0.0283)	(0.0310)	(0.0454)	(0.0353)	(0.0480)
Excess Liquidity$_b$/TA$_b$				-0.00126	-0.00213	-0.000398	-0.00391			-0.365***	-0.406***	-0.285***	-0.309***
				(0.00581)	(0.00595)	(0.00607)	(0.00530)			(0.0779)	(0.0765)	(0.0778)	(0.0772)
ECB Borrowing$_b$/TA$_b$					0.00663	0.0111	-0.00693				0.587***	0.742***	0.686***
					(0.00956)	(0.0101)	(0.00889)				(0.123)	(0.123)	(0.125)
Interbank Borrowing$_b$/TA$_b$						0.00680	-0.0000627					0.328***	0.339***
						(0.00488)	(0.00435)					(0.0621)	(0.0633)
Total Capital Ratio$_b$							0.00294						0.0284
							(0.00222)						(0.0327)
N	498	498	498	498	498	498	498	498	498	498	498	498	498
R^2	0.464	0.466	0.466	0.467	0.467	0.468	0.468	0.229	0.230	0.230	0.230	0.231	0.231

The table reports the results examining the relationship between bank securities losses, security holdings, and various bank characteristics. In Columns (1)–(7), the dependent variable is the securities losses accrued between 2022q1 and 2023q3, expressed as a share of total assets in 2022q1, as defined in Equation 1. In Columns (8)–(13), the dependent variable is the security holdings as a share of total assets in 2022q1. All bank characteristics are measured as of 2022q1. TA denotes bank total assets. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 3: Types of Securities Losses and the Interbank Market

	Loan Amount							
	All Instruments						Repo	Non-Repo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All Securities Losses$_{b,t-1}$	-3.691***							
	(1.403)							
Collateral Securities Losses$_{b,t-1}$		-9.006***		-6.226*	-9.953***		-25.22***	2.480
		(3.211)		(3.325)	(3.632)		(5.602)	(4.592)
Non-Collateral Securities Losses$_{b,t-1}$			-1.236					
			(1.014)					
Collateral Securities Losses$_{b,t-1}$				-4.939***				
×Collateral Util. Rate$_{b,2022q1}$				(1.251)				
Collateral Securities Losses$_{b,t-1}$					2.088			
×Total Capital Ratio$_{b,2022q1}$					(3.458)			
Collateral AFS Securities Losses$_{b,t-1}$						-13.24**		
						(5.441)		
Collateral HTM Securities Losses$_{b,t-1}$						-6.930**		
						(3.325)		
Bank Lender – Bank Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Lender – Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Borrower – Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	120,799	120,005	120,005	99,344	120,005	120,005	13,258	85,280
R^2	0.899	0.898	0.898	0.896	0.898	0.898	0.809	0.888

The table reports the results of the relationship between banks' behavior in the interbank market and securities losses. We examine the effect of borrowing banks' losses, where the dependent variable is the natural logarithm of the outstanding interbank credit amount issued by bank l to bank b during month t. securities losses are calculated based on equation (1). The collateral utilization rate is defined as the ratio of ECB and interbank borrowing to total security holdings in Q1 2022. The Total Capital Ratio is defined as the ratio of the sum of Tier 1 and Tier 2 capital to risk-weighted assets as of 2022 Q1. OLS regressions are used to estimate the models. Standard errors are two-way clustered at the borrowing bank-time and lending bank-time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 4: Securities Losses and Interbank Market

	Loan Amount							
	Borrowing Banks' Losses		Lending Banks' Losses			Borrowing and Lending Banks' Losses		
	Between Groups	Within Group	All	Between Groups	Within Group	All	Between Groups	Within Group
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Collateral Securities Losses$_{b,t-1}$	-16.73***	13.61***				-6.563***	-15.56***	9.269**
	(3.778)	(3.971)				(2.342)	(5.839)	(3.839)
Collateral Securities Losses$_{l,t-1}$			-8.896**	-10.26**	0.273	-9.598***	-9.900**	-1.017
			(3.467)	(4.840)	(4.280)	(3.592)	(4.936)	(4.203)
Bank Lender – Bank Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Lender – Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Borrower – Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	99,134	20,855	51,879	35,330	16,518	51,150	35,151	15,968
R^2	0.881	0.907	0.882	0.841	0.916	0.880	0.841	0.910

The table reports the results of the relationship between banks' behavior in the interbank market and securities losses for the subsamples of between-group and within-group loans, as described by equations (2) and (3). The dependent variable is the natural logarithm of the outstanding interbank credit amount issued by a lending bank l to a borrowing bank b during month t. Securities losses are calculated based on equation (1). Standard errors are two-way clustered at the borrowing bank-time and lending bank-time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 5: Within-Group Lending to Domestic and Foreign Subsidiaries

	Loan Amount					
	Borrowing Subsidiary's Losses				Lending Subsidiary's Losses	
Definition of domestic/foreign:	Domestic†	Domestic‡	Domestic‡	Domestic‡	Domestic†	Domestic‡
Lending by:	All	All	Foreign subs.	Domestic subs.	All	All
	(1)	(2)	(3)	(4)	(5)	(6)
Collateral Securities Losses$_{b,t-1}$ × Foreign$_b$	-8.960	3.573	71.22*	-4.625		
	(13.30)	(12.72)	(39.40)	(13.57)		
Collateral Securities Losses$_{b,t-1}$ × Domestic$_b$	10.82***	9.948***	8.796	5.346*		
	(3.690)	(3.834)	(7.820)	(2.956)		
Collateral Securities Losses$_{l,t-1}$ × Foreign$_b$					-6.681	-62.79***
					(12.82)	(13.24)
Collateral Securities Losses$_{l,t-1}$ × Domestic$_b$					1.003	5.021
					(4.487)	(4.689)
Bank Lender – Bank Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes
Country Lender – Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country Borrower – Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	16,132	16,132	1,420	15,214	16,423	16,423
R^2	0.910	0.910	0.867	0.922	0.916	0.916

The table presents the results of the effects of banks' securities losses on within-group lending to domestic and foreign subsidiaries, as described by equations (2) and (3). The dependent variable is the natural logarithm of the outstanding intra-bank credit amount issued by a lending bank l to a borrowing bank b during month t. Securities losses are calculated based on equation (1). Two different definitions of domestic versus foreign borrowing (lending) subsidiaries are used. Domestic† is based on the location of the lending and borrowing bank: the borrowing subsidiary is classified as domestic if it is located in the same country as the lending subsidiary, and as foreign otherwise. Domestic‡ is based on the subsidiary's location relative to its headquarters: the subsidiary is classified as domestic if it is located in the same country as its banking group's headquarters, and foreign otherwise. Standard errors are two-way clustered at the borrowing bank-time and lending bank-time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 6: Between-Group Lending to Domestic and Foreign Subsidiaries

	Loan Amount	
	Borrowing Subsidiary's Losses	Lending Subsidiary's Losses
	(1)	(2)
Collateral Securities Losses$_{b,t-1}$	-4.119*	
×Foreign$_b$	(-1.71)	
Collateral Securities Losses$_{b,t-1}$	-22.92***	
×Domestic$_b$	(5.939)	
Collateral Securities Losses$_{l,t-1}$		-6.699
×Foreign$_l$		(6.421)
Collateral Securities Losses$_{l,t-1}$		-13.57**
×Domestic$_l$		(5.590)
Bank Lender – Bank Borrower FE	Yes	Yes
Country Lender – Time FE	Yes	Yes
Country Borrower – Time FE	Yes	Yes
N	35271	35243
R^2	0.842	0.841

The table presents the results of the effects of banks' securities losses on between-group lending to domestic and foreign subsidiaries, as described by equations (2) and (3). The dependent variable is the natural logarithm of the outstanding interbank credit amount issued by a lending bank l to a borrowing bank b during month t. Securities losses are calculated based on equation (1). Domestic dummy is based on the location of the lending and borrowing bank: the borrowing subsidiary is classified as domestic if it is located in the same country as the lending subsidiary, and as foreign otherwise. Standard errors are two-way clustered at the borrowing bank-time and lending bank-time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 7: Large Subsidiaries and Intra-Group Domestic and Foreign Lending

	Loan Amount	
	(1)	(2)
Collateral Securities Losses$_{b,t-1}$	8.025**	26.48*
	(3.857)	(14.56)
Collateral Securities Losses$_{b,t-1}$× Large Subsidiary$_b$	11.22**	-58.02***
	(5.245)	(20.95)
Collateral Securities Losses$_{b,t-1}$× Domestic$_b$		-22.56
		(14.89)
Collateral Securities Losses$_{b,t-1}$× Large Subsidiary$_b$× Domestic$_b$		67.87***
		(21.48)
Bank Lender – Bank Borrower FE	Yes	Yes
Country Borrower – Time FE	Yes	Yes
Country Lender – Time FE	Yes	Yes
N	19,267	16,091
R^2	0.906	0.909

The table presents the results of the effects of banks' securities losses on intra-group lending to domestic and foreign subsidiaries, differentiated by subsidiary size. The dependent variable is the natural logarithm of the outstanding interbank credit amount issued by a lending bank l to a borrowing bank b during month t. Securities losses are calculated based on Equation (1). Large Subsidiary is a dummy variable, which takes the value of one if the subsidiary's total assets rank above the median of total assets within its banking group, and zero otherwise. Domestic is an indicator variable that takes the value of one if the subsidiary is located in the same country as its banking group's headquarters, and zero otherwise. Standard errors are two-way clustered at the borrowing bank-time and lending bank-time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 8: Securities Losses and Bank Lending to Firms

	Loan Amount						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collateral Securities Losses$_{b,t-1}$	-2.910***	-2.542***	-5.476***				
	(0.572)	(0.541)	(0.576)				
Collateral HTM Securities Losses$_{b,t-1}$				-7.120***		-6.489***	-7.742***
				(0.838)		(0.872)	(0.669)
Collateral AFS Securities Losses$_{b,t-1}$					-5.727***	-3.868***	-10.543***
					(1.069)	(1.048)	(2.427)
Collateral AFS Securities Losses$_{b,t-1}$							42.139***
$\times$Total Capital Ratio$_{b,2022q1}$							(12.161)
Bank Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Bank – Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm – Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Banking Group – Time FE	No	No	Yes	Yes	Yes	Yes	Yes
N	16,290,844	16,290,840	16,290,839	16,290,839	16,290,839	16,290,839	15,803,384
R^2	0.972	0.972	0.972	0.972	0.972	0.972	0.972

The table presents the results of the effects of banks' securities losses on bank lending to firms, as described by Equation (4) The dependent variable is the natural logarithm of the outstanding credit issued by a bank (subsidiary) b to a firm f during month t. Securities losses are calculated based on Equation 1. Total Capital Ratio is defined as the ratio of the sum of Tier 1 and Tier 2 capital to risk-weighted assets in 2022q1. Standard errors are two-way clustered at the bank and time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 9: Securities Losses and Bank Lending to Firms: Mechanism

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
Collateral Securities Losses$_{b,t-1}$	-5.204***	-4.725***	-4.498***	-23.633***	-7.267***
	(0.945)	(0.873)	(0.906)	(7.693)	(1.117)
Collateral Securities Losses$_{b,t-1}$	-2.588***				
×Collateral Utilization Rate$_{b,2022q1}$	(0.354)				
Collateral Securities Losses$_{b,t-1}$		16.989**			
×Excess Liquidity$_{b,2022q1}$		(7.499)			
Collateral Securities Losses$_{b,t-1}$			-30.073***		
×ECB Borrowing$_{b,2022q1}$			(5.155)		
Collateral Securities Losses$_{b,t-1}$				12.458**	
×NSFR$_{b,2022q1}$				(5.886)	
Collateral Securities Losses$_{b,t-1}$					-0.577
×LCR$_{b,2022q1}$					(0.394)
Bank Controls	Yes	Yes	Yes	Yes	Yes
Bank – Firm FE	Yes	Yes	Yes	Yes	Yes
Firm – Time FE	Yes	Yes	Yes	Yes	Yes
Banking Group – Time FE	Yes	Yes	Yes	Yes	Yes
N	12,536,511	12,610,601	12,610,594	6,072,830	5,685,891
R^2	0.968	0.967	0.968	0.974	0.974

The table presents the results of the effects of banks' securities losses on bank lending to firms, as described by Equation (4) The dependent variable is the natural logarithm of the outstanding credit issued by a bank (subsidiary) b to a firm f during month t. Securities losses are calculated based on Equation 1. Collateral utilization rate is defined as the ratio of ECB + interbank borrowing to total security holdings as of 2022q1. Excess liquidity is defined as liquidity deposited with the central bank in excess of the minimum reserve requirements as of 2022q1. ECB Borrowing represents the ratio of bank funding from the central bank (ECB) to total assets as of 2022q1. NSFR represents Net Stable Funding Ratio as if 2022q1. LCR represents Liquidity Coverage Ratio as of 2022q1. Standard errors are two-way clustered at the bank and time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 10: Securities Losses and New Loans to Firms

	Loan Amount	Rates	Maturity
	(1)	(2)	(3)
Collateral Securities Losses$_{b,t-1}$	-3.138**	0.688***	-13.93**
	(1.284)	(0.164)	(6.816)
Controls	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Industry-Country-Time FE	Yes	Yes	Yes
Banking Group-Time FE	Yes	Yes	Yes
N	383,092	383,092	383,092
R^2	0.787	0.869	0.824

The table presents the results of the effects of banks' securities losses on the new bank of lending to firms, as described by Equation (4). In column 1, the dependent variable is the natural logarithm of the new credit issued by a bank (subsidiary) b to a firm f in month t. In column 2, the dependent variable is the annualized interest rate on the newly issued loan by a bank (subsidiary) b to a firm f in month t. In column 3, the dependent variable is the log of original maturity of the newly issued loan by a bank (subsidiary) b to a firm f in month t. Securities losses are calculated based on Equation 1. Standard errors are two-way clustered at the bank and time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 11: Securities Losses, Banking Group Structure and Lending

	Loan Amount		
	All Banks	Domestic Banks	Banking Groups
	(1)	(2)	(3)
Collateral Securities Losses$_{b,t-1}$× Stand-Alone Bank$_b$	-6.761***	-7.368***	
	(2.052)	(2.064)	
Collateral Securities Losses$_{b,t-1}$× Subsidiary$_b$	-1.951***	-1.985***	
	(0.8181)	(0.855)	
Collateral Securities Losses$_{b,t-1}$× Foreign Subsidiary$_b$			-4.125***
			(1.093)
Collateral Securities Losses$_{b,t-1}$× Domestic Subsidiary$_b$			-1.446***
			(0.556)
Bank Controls	No	No	No
Bank – Firm FE	Yes	Yes	Yes
Firm – Time FE	Yes	Yes	Yes
Banking Group – Time FE	No	No	Yes
N	16,290,844	13,748,918	10,611,217
R^2	0.972	0.972	0.974

The table presents the results of the effects of banks' securities losses on bank lending to firms, by differentiating different types of banks. The dependent variable is the natural logarithm of the outstanding credit issued by a bank (subsidiary) b to a firm f during month t. Securities losses are calculated based on Equation (1). Column 1 contrasts the lending behavior of stand-alone banks with subsidiaries of the banking groups. Column 2 repeats the analysis from Column 1 but restricts the sample to stand-alone banks and domestic subsidiaries within the same country. Column 3 restricts the sample to banking group subsidiaries and examines differences between domestic and foreign subsidiaries. A subsidiary is classified as domestic if it is located in the same country as its banking group's headquarters, and as foreign otherwise. Standard errors are two-way clustered at the bank and time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Table 12: Security Losses, Interbank Market and Bank Lending to Firms: Robustness

	Loan Amount			
	Interbank Market		Lending to Firms	
	(1)	(2)	(3)	(4)
Collateral Security Losses$_{b,t-1}$	-10.711***	-10.993***	-4.912***	-5.081***
	(3.265)	(3.891)	(0.580)	(0.652)
Bank Controls × Δ ECB Rate	Yes	Yes	Yes	Yes
Bank Control for Deposit Growth	No	Yes	No	Yes
Baseline Bank Controls	Yes	Yes	Yes	Yes
Bank Lender – Bank Borrower FE	Yes	Yes	-	-
Country Lender – Time FE	Yes	Yes	-	-
Country Borrower – Time FE	Yes	Yes	-	-
Bank – Firm FE	-	-	Yes	Yes
Firm – Time FE	-	-	Yes	Yes
Banking Group – Time FE	-	-	Yes	Yes
N	120,005	120,005	16,290,839	16,290,839
R^2	0.898	0.898	0.972	0.972

The table reports robustness checks on the effects of banks' security losses on interbank borrowing and lending to firms. In Columns (1) and (2), the dependent variable is the natural logarithm of the outstanding interbank credit amount issued by bank l to bank b during month t. In Columns (3) and (4), the dependent variable is the natural logarithm of the outstanding credit issued by a bank (subsidiary) b to a firm f during month t. Security losses are calculated based on Equation 1. Bank controls include the ratio of deposits to total assets, the ratio of equity to total assets, and the logarithm of total assets. Deposit growth is defined as the monthly change in total deposits, normalized by lagged total assets. The ECB rate corresponds to the Deposit Facility Rate. In Columns (1) and (2), standard errors are two-way clustered at the borrowing bank-time and lending bank-time level. In Columns (3) and (4), standard errors are two-way clustered at the bank and time level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively.

Internet Appendix

Figure 8: Importance of AFS Portfolio over Time

(a) Share of Securities in AFS Portfolio



(b) Reclassification



The figure examines changes in the importance of the AFS (Available for Sale) portfolio. Panel A plots the distribution of the share of all securities held in the AFS portfolio as a percentage of total security holdings in 2022 Q1 versus 2023 Q3. Panel B uses observations at the bank-ISIN level and focuses on the subset of securities that a specific bank b has reported in both AFS and HTM portfolios in different periods. It plots the share of securities from this restricted sample that are reported as part of the AFS portfolio in 2022 Q1 versus 2023 Q3.